Solicitation 12150-693

Port Condo Large Water Main Improvements (P11080)

Bid Designation: Public

CITY OF FORT LAUDERDALE

City of Fort Lauderdale

Bid 12150-693
Port Condo Large Water Main Improvements (P11080)

Bid Number	12150-693
Bid Title	Port Condo Large Water Main Improvements (P11080)
Bid Start Date	Oct 15, 2018 3:38:56 PM EDT
Bid End Date	Nov 20, 2018 2:00:00 PM EST
Question & Answer End Date	Nov 13, 2018 5:00:00 PM EST
Bid Contact	Maureen Lewis, MBA, CPPB Procurement Specialist II Finance 954-828-5239 maureenl@fortlauderdale.gov
Contract Duration	**One Time Purchase**
Contract Renewal	Not Applicable
Prices Good for	**120 days**
Pre-Bid Conference	**Nov 1, 2018 10:00:00 AM EDT** **Attendance is optional** **Location: 4th Floor Conference Room** **City Hall** **100 N. Andrews Avenue** **Fort Lauderdale, Florida 33301**

Bid Comments

The City of Fort Lauderdale, Florida (City) is seeking bids from qualified bidders, hereinafter referred to as the Contractor, to provide construction services for the City's Public Works Department, in accordance with the terms, conditions, and specifications contained in this Invitation To Bid (ITB).

Sealed bids will be received electronically until 2:00 P.M., local time, on **TUESDAY NOVEMBER 20, 2018, and opened immediately thereafter in the 5th Floor Conference Room, City Hall, 100 North Andrews Avenue, Fort Lauderdale, Florida, 33301, for BID NO., 12150-693, PROJECT NO., 11080, PORT CONDO LARGE WATER MAIN IMPROVEMENTS.**

This Project consists of Drawing File No., **WS-06-14, eleven (11)** sheets.

This Project is located on Grande Drive between Eisenhower Boulevard and the Intracoastal Water Way, and includes the construction by the open-cut method of approximately 1,300 linear feet of 12-inch polyvinyl chloride water main to replace an existing 6-ich water main. The Project also includes, but is not limited to, the installation of new fire hydrants, reconnecting all service lines, testing, installation of air release valves and restoration of all affected areas.
NOTE: Payment on this contract will be made by Visa or MasterCard.
Licensing Requirements: Possession of a Certified Underground Utility and Excavation Contractor License or General Contractor License is required for this Project.

Pre-Bid Meeting: A pre-bid meeting will be held on THURSDAY, NOVEMBER 1, 2018, at 10:00 a.m., local time, at City Hall, 100 N. Andrews Avenue, 4th Floor Conference Room,
Fort Lauderdale, Florida.

While attendance is not mandatory, it is strongly suggested that all Contractors attend the pre-proposal conference. It will be the sole responsibility of the bidder to inspect the City's
location(s)/facilities and become familiar with the scope of the City's requirements and systems prior to submitting a proposal. No variation in price or conditions shall be permitted based upon a claim of ignorance. Submission of a proposal will be considered evidence that the proposer has familiarized himself with the nature and extent of the work, equipment, materials, and labor required.

Bidding blanks may be obtained **free of charge** at BIDSYNC.COM. Drawing Plans are on file in the Public Works Department, City of Fort Lauderdale, at 100 North Andrews Avenue, 4th floor,
(Monday through Friday, 8:00 am to 4:30 pm) at a **NON-REFUNDABLE cost of $25.00 (including sales tax per set). Only cash or cashier's check made payable to the City of Fort**
Lauderdale is accepted.

It will be the sole responsibility of the bidder to ensure that his bid is submitted prior to the bid opening date and time listed. **PAPER BID SUBMITTALS WILL NOT BE ACCEPTED. BIDS MUST BE SUBMITTED ELECTRONICALLY VIA BIDSYNC.COM.**

Bid Security: A certified check, cashier's check, bank officer's check or bid bond for **FIVE percent (5%) of the bid amount, made payable to the City of Fort Lauderdale, Florida, shall**
accompany each proposal.

Bid Bonds:
Bidders can submit bid bonds for projects four different ways.

1) BidSync allows bidders to submit bid bonds electronically directly through their system using **Surety 2000**. For more information on this feature and to access it, contact BIDSYNC customer
care department.

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business days after bid opening, with the company name, bid number and title clearly indicated.

3) Bidders can **hand deliver** their bid bond in a sealed envelope to the Finance Department, Procurement Services Division, 100 North Andrews Avenue, Room 619, Fort Lauderdale, FL 33301-
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Certified Checks, Cashier's Checks and Bank Drafts
These **cannot** be submitted via BIDSYNC, nor are their images allowed to be uploaded and submitted with your electronic bid. These forms of securities, as well as hard copy bid bonds, must be received on or before the Invitation to Bid (ITB) opening date and time, at the Finance Department, Procurement Services Division, 100 North Andrews Avenue, Room 619, Fort Lauderdale, FL
33301-1016, with the bid number and title clearly indicated on the envelope. It is the bidder's sole responsibility to ensure that his bid bond or other bid security is received by the Procurement Services Division before time of bid opening. Failure to adhere to this requirement may be grounds to consider the bid as non-responsive. The City of Fort Lauderdale reserves the right to waive any informality in any or all bids and to reject any or all bids.

For information concerning technical specifications, please utilize the question/answer feature provided by BIDSYNC at www.bidsync.com. Questions of a material nature must be received prior to the cut-off date specified in the solicitation. Material changes, if any, to the scope of services or bidding procedures, will only be transmitted by written addendum. (See addendum section of BIDSYNC Site). **Contractors please note:** No part of your bid can be submitted via FAX. No variation in price or conditions shall be permitted based upon a claim of ignorance. Submission of a bid will be considered evidence that the Contractor has familiarized himself with the nature and extent of the work, equipment, materials, and labor required. The entire bid response must be submitted in accordance with all specifications contained in this solicitation.

Information on bid results and projects currently out to bid can be obtained on the City's website – http://www.fortlauderdale.gov/departments/finance/procurement-services. For general inquiries, please call (954) 828-5933.

Item Response Form

Item	**12150-693--01-01 - Base Bid Total: Survey Control and As-builts**
Lot Description	Base Bid Total
Quantity	**1 lump sum**
Unit Price	
Delivery Location	**City of Fort Lauderdale**
	See ITB Specifications

See ITB Specifications
Fort Lauderdale FL 33301
Qty 1

Description
Payment for Survey (Control and As-Builts) will be made at the lump sum price identified for such work

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Item	**12150-693--01-02 -** Base Bid Total: Erosion Control (Stormwater Pollution Prevention **Control):**
Lot Description	Base Bid Total
Quantity	**1 lump sum**
Unit Price	
Delivery Location	**City of Fort Lauderdale** See ITB Specifications See ITB Specifications Fort Lauderdale FL 33301 **Qty** 1

Description
Payment for Stormwater Pollution Prevention and Control

Item	**12150-693--01-03 -** Base Bid Total: Bid, Performance, and Payment Bonds
Lot Description	Base Bid Total
Quantity	**1 lump sum**
Unit Price	
Delivery Location	**City of Fort Lauderdale** See ITB Specifications See ITB Specifications Fort Lauderdale FL 33301 **Qty** 1

Description
Payment for Bid, Performance and Payment Bonds

Item	**12150-693--01-04 - Base Bid Total: Testing Densities**
Lot Description	Base Bid Total
Quantity	**1 lump sum**
Unit Price	
Delivery Location	**City of Fort Lauderdale** See ITB Specifications See ITB Specifications Fort Lauderdale FL 33301 **Qty** 1

Description
Payment for density testing of soils, bedding, and backfilling

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Item	**12150-693--01-05 -** Base Bid Total: Traffic Control/MOT
Lot Description	Base Bid Total
Quantity	**1 lump sum**

Unit Price

Delivery Location **City of Fort Lauderdale**
See ITB Specifications
See ITB Specifications
Fort Lauderdale FL 33301
Qty 1

Description
Payment for traffic control

Item **12150-693--01-06 -** Base Bid Total: Furnish and Install 12**-inch PVC Water Main**

Lot Description Base Bid Total

Quantity **1300 linear foot**

Unit Price

Delivery Location **City of Fort Lauderdale**
See ITB Specifications
See ITB Specifications
Fort Lauderdale FL 33301
Qty 1300

Description
Payment to furnish install 12-inch PVC Water Main

Item **12150-693--01-07 -** Base Bid Total: Furnish and Install 6**-inch PVC Water Main**

Lot Description Base Bid Total

Quantity **121 linear foot**

Unit Price

Delivery Location **City of Fort Lauderdale**
See ITB Specifications
See ITB Specifications
Fort Lauderdale FL 33301
Qty 121

Description
Payment to furnish install 6-inch PVC Water Main

Item **12150-693--01-08 -** Base Bid Total: Furnish and Install 4**-inch PVC Water Main**

Lot Description Base Bid Total

Quantity **25 linear foot**

Unit Price

Delivery Location **City of Fort Lauderdale**
See ITB Specifications
See ITB Specifications
Fort Lauderdale FL 33301
Qty 25

Description
Payment to furnish install 4-inch PVC Water Main

Item **12150-693--01-09 -** Base Bid Total: Remove and Dispose of Abandoned 16**-inch Forcemain**

Lot Description Base Bid Total

Quantity **1300 linear foot**

Unit Price

Delivery Location **City of Fort Lauderdale**

See ITB Specifications
See ITB Specifications
Fort Lauderdale FL 33301
Qty 1300

Description
Payment to Remove and dispose of 16-inch forcemain

Item **12150-693--01-10 -** Base Bid Total: Furnish and Install 1**-1/2 inch Water Service Line:**

Lot Description Base Bid Total

Quantity **5 each**

Unit Price

Delivery Location **City of Fort Lauderdale**

See ITB Specifications
See ITB Specifications
Fort Lauderdale FL 33301
Qty 5

Description
Payment to Furnish and Install 1-1/2-inch Poly Water Service and reconnect existing services.

Item **12150-693--01-11 -** Base Bid Total: Furnish and Install Fire Hydrant with Miscellaneous **Ductile Iron Fittings and g**

Lot Description Base Bid Total

Quantity **3 each**

Unit Price

Delivery Location **City of Fort Lauderdale**

See ITB Specifications
See ITB Specifications
Fort Lauderdale FL 33301
Qty 3

Description
Payment to furnish and install fire hydrant and all piping, valves and appurtenances

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Item **12150-693--01-12 -** Base Bid Total: Furnish and Install 12**-inch X 6-inch Ductile Iron Tee**

Lot Description Base Bid Total

Quantity **6 each**

Unit Price

Delivery Location **City of Fort Lauderdale**

See ITB Specifications
See ITB Specifications
Fort Lauderdale FL 33301
Qty 6

Description
Payment to furnish and install 12-inch x 6-inch ductile iron tee

Item	**12150-693--01-13 -** Base Bid Total: Furnish and Install 12**-inch X 4-inch Ductile Iron Tee**
Lot Description	Base Bid Total
Quantity	**1 each**
Unit Price	
Delivery Location	**City of Fort Lauderdale** See ITB Specifications See ITB Specifications Fort Lauderdale FL 33301 **Qty** 1

Description
Payment to furnish and install 12-inch x 4-inch ductile iron tee

Item	**12150-693--01-14 -** Base Bid Total: Furnish and Install 24**-inch X 12-Inch Tapping Sleeve**
Lot Description	Base Bid Total
Quantity	**1 each**
Unit Price	
Delivery Location	**City of Fort Lauderdale** See ITB Specifications See ITB Specifications Fort Lauderdale FL 33301 **Qty** 1

Description
Payment to furnish and install 24-inch x 12-inch Tapping Sleeve

Item	**12150-693--01-15 -** Base Bid Total: Furnish and Install 6**-inch X 6-Inch Tapping Sleeve**
Lot Description	Base Bid Total
Quantity	**2 each**
Unit Price	
Delivery Location	**City of Fort Lauderdale** See ITB Specifications See ITB Specifications Fort Lauderdale FL 33301 **Qty** 2

Description
Payment to furnish and install 6-inch x 6-inch Tapping Sleeve

Item	**12150-693--01-16 -** Base Bid Total: Furnish and Install 12**-inch Tapping Valve**
Lot Description	Base Bid Total
Quantity	**1 each**
Unit Price	
Delivery Location	**City of Fort Lauderdale** See ITB Specifications See ITB Specifications Fort Lauderdale FL 33301

Qty 1

Description
Payment to furnish and install 12-inch Tapping Valve

Item **12150-693--01-17 -** Base Bid Total: Furnish and Install 6**-inch Tapping Valve**

Lot Description Base Bid Total

Quantity **2 each**

Unit Price

Delivery Location **City of Fort Lauderdale**
See ITB Specifications
See ITB Specifications
Fort Lauderdale FL 33301
Qty 2

Description
Payment to furnish and install 6-inch Tapping Valve

Item **12150-693--01-18 -** Base Bid Total: Furnish and Install 12**-inch Gate Valve**

Lot Description Base Bid Total

Quantity **3 each**

Unit Price

Delivery Location **City of Fort Lauderdale**
See ITB Specifications
See ITB Specifications
Fort Lauderdale FL 33301
Qty 3

Description
Payment to furnish and install 12-inch Gate Valve, Box and Extension

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Item **12150-693--01-19 -** Base Bid Total: Furnish and Install 6**-inch Gate Valve**

Lot Description Base Bid Total

Quantity **7 each**

Unit Price

Delivery Location **City of Fort Lauderdale**
See ITB Specifications
See ITB Specifications
Fort Lauderdale FL 33301
Qty 7

Description
Payment to furnish and install 6-inch Gate Valve Box and Extension

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Item **12150-693--01-20 -** Base Bid Total: Furnish and Install 12**-inch 45 Degree Bends**

Lot Description Base Bid Total

Quantity **16 each**

Unit Price

Delivery Location **City of Fort Lauderdale**

See ITB Specifications
See ITB Specifications
Fort Lauderdale FL 33301
Qty 16

Description
Payment to furnish and install 12-inch 45 Degree Bends

Item	**12150-693--01-21 -** Base Bid Total: Furnish and Install 6**-inch 45 Degree Bends**
Lot Description	Base Bid Total
Quantity	**4 each**
Unit Price	
Delivery Location	**City of Fort Lauderdale** See ITB Specifications See ITB Specifications Fort Lauderdale FL 33301 **Qty** 4

Description
Payment to furnish and install 6-inch 45 Degree Bends

Item	**12150-693--01-22 -** Base Bid Total: Furnish and Install 2**-inch Air Release Valve with Manhole**
Lot Description	Base Bid Total
Quantity	**1 each**
Unit Price	
Delivery Location	**City of Fort Lauderdale** See ITB Specifications See ITB Specifications Fort Lauderdale FL 33301 **Qty** 1

Description
Payment to furnish and Install 2-inch Air Release Valve with Manhole

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Item	**12150-693--01-23 -** Base Bid Total: Furnish and Install Sample Points
Lot Description	Base Bid Total
Quantity	**8 each**
Unit Price	
Delivery Location	**City of Fort Lauderdale** See ITB Specifications See ITB Specifications Fort Lauderdale FL 33301 **Qty** 8

Description
Payment to furnish and Install Sample Points

Item	**12150-693--01-24 -** Base Bid Total: Remove and Restore Concrete Curb and Gutter:
Lot Description	Base Bid Total

Quantity	**40 linear foot**
Unit Price	
Delivery Location	**City of Fort Lauderdale** See ITB Specifications See ITB Specifications Fort Lauderdale FL 33301 **Qty** 40

Description
Payment to furnish Remove and Restore Concrete Curb and Gutter:

Item	**12150-693--01-25 -** Base Bid Total: Remove and Restore Concrete Sidewalk
Lot Description	Base Bid Total
Quantity	**45 square yard**
Unit Price	
Delivery Location	**City of Fort Lauderdale** See ITB Specifications See ITB Specifications Fort Lauderdale FL 33301 **Qty** 45

Description
Payment to furnish Remove and Restore Concrete Sidewalk

Item	**12150-693--01-26 -** Base Bid Total: Remove and Replace Brick Pavers
Lot Description	Base Bid Total
Quantity	**100 square yard**
Unit Price	
Delivery Location	**City of Fort Lauderdale** See ITB Specifications See ITB Specifications Fort Lauderdale FL 33301 **Qty** 100

Description
Payment to furnish Remove and Replace Brick Pavers

Item	**12150-693--01-27 -** Base Bid Total: Furnish and install Limerock Base and 2.5**-inch Asphalt for Trench Restoration:**
Lot Description	Base Bid Total
Quantity	**700 square yard**
Unit Price	
Delivery Location	**City of Fort Lauderdale** See ITB Specifications See ITB Specifications Fort Lauderdale FL 33301 **Qty** 700

Description
Payment to furnish and install Limerock Base and 2.5-inch Asphalt for Trench Restoration:

Item	**12150-693--01-28 -** Base Bid Total: Mill and Resurface 1.5**-inch of Existing Asphalt:**
Lot Description	Base Bid Total
Quantity	**2900 square yard**
Unit Price	
Delivery Location	**City of Fort Lauderdale** See ITB Specifications See ITB Specifications Fort Lauderdale FL 33301 **Qty** 2900

Description
Payment to Mill and Resurface 1.5-inch of Existing Asphalt:

Item	**12150-693--01-29 -** Base Bid Total: Thermoplastic Pavement Markings and Signage **Replacement**
Lot Description	Base Bid Total
Quantity	**1 lump sum**
Unit Price	
Delivery Location	**City of Fort Lauderdale** See ITB Specifications See ITB Specifications Fort Lauderdale FL 33301 **Qty** 1

Description
Payment to restore Thermoplastic Pavement Markings and Signage Replacement

Item	**12150-693--02-01 -** Bid Alternate: Bid Alternate 1 **- 12-inch HDPE DR11 Water Main (Horizontal Directional Drilling)**
Lot Description	Bid Alternate
Quantity	**1 lump sum**
Unit Price	
Delivery Location	**City of Fort Lauderdale** See ITB Specifications See ITB Specifications Fort Lauderdale FL 33301 **Qty** 1

Description
Payment to furnish and install 12-inch water main by the horizontal directional drilling method

CITY OF FORT LAUDERDALE
CONTRACT AND SPECIFICATIONS PACKAGE

BID NO. 12150-693

PROJECT NO. 11080

PORT CONDO LARGE WATER MAIN IMPROVEMENTS

Issued on Behalf of: The Public Works Department
100 North Andrews Avenue
Fort Lauderdale, Florida 33301

DANIEL FISHER, P.E.
PROJECT MANAGER II

MAUREEN LEWIS, MBA, CPPB
PROCUREMENT SPECIALIST II
Telephone: (954) 828-5239 E-mail: maureenl@fortlauderdale.gov

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DIVISION 2 (cont'd)

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FLORIDA DEPARTMENT OF TRANSPORTATION

APPENDIX

DRAWINGS (BOUND SEPARATELY)

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Note: **The following documents are available electronically for completion and must be returned with your bid along with your bid security, proof of insurance, and proof of required licenses/certifications.**

INVITATION TO BID

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This Project is located on Grande Drive between Eisenhower Boulevard and the Intracoastal Water Way, and includes the construction by the open-cut method of approximately 1,300 linear feet of 12-inch polyvinyl chloride water main to replace an existing 6-ich water main. The Project also includes, but is not limited to, the installation of new fire hydrants, reconnecting all service lines, testing, installation of air release valves and restoration of all affected areas.

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INSTRUCTIONS TO BIDDERS

The following instructions are given for the purpose of guiding bidders in properly preparing their bids or proposals. These directions have equal force and weight with the specifications and strict compliance is required with all of these provisions.

QUALIFICATIONS OF BIDDERS – No proposal will be accepted from, nor will any contract be awarded to, any person who is in arrears to the CITY OF FORT LAUDERDALE, upon any debt or contract, or who has defaulted, as surety or otherwise, upon any obligation to the City, or who is deemed irresponsible or unreliable by the City Commission of Fort Lauderdale.

PERSONAL INVESTIGATION - Bidders shall satisfy themselves by personal investigation, and by such other means as they may think necessary or desirable, as to the conditions affecting the proposed work and the cost. No information derived from maps, plans, specifications, or from the Engineer, City Manager, or their assistants shall relieve the Contractor from any risk or from fulfilling all terms of the contract.

INCONSISTENCIES – Any seeming inconsistency between different provisions of the plans, specifications, proposal or contract, or any point requiring explanation must be inquired into by the bidder, in writing, at least ten (10) days prior to the time set for opening proposals. After proposals are opened, the bidders shall abide by the decision of the Engineer as to such interpretation.

ADDENDA AND INTERPRETATIONS - No interpretations of the meaning of the plans, specifications or other contract documents will be made orally to any bidder. Prospective bidders must request such interpretation in writing as instructed in the bid package. To be considered, such request must be received by the Questions and Answers deadline as indicated in BIDSYNC.COM. Material changes, if any, to the scope of services or bidding procedures will only be transmitted by written addendum. **It is the bidder's responsibility to verify if addendums have been issued in BIDSYNC.COM.** Failure of any bidder to receive any such addenda or interpretation shall not relieve any bidder from any obligation under his bid as submitted. All addenda so issued shall become a part of the contract document. **Bidder** shall verify **in BIDSYNC.COM** that he has all addenda before submitting a bid.

LEGAL CONDITIONS - Bidders are notified to familiarize themselves with the provisions of the laws of the State of Florida relating to hours of labor on municipal work, and with the provisions of the laws of the State of Florida and the Charter and the ordinances of the City of Fort Lauderdale.

PUBLIC ENTITY CRIMES - A person or affiliate who has been placed on the convicted vendor list following a conviction for a public entity crime may not submit a bid on a contract to provide any goods or services to a public entity, may not submit a bid on a contract with a public entity for the construction or repair of a public building or public work, may not submit bids on leases of real property to a public entity, may not be awarded or perform work as a Contractor, supplier, subcontractor, or consultant under a contract with any public entity, and may not transact business with any public entity in excess of the threshold amount provided in Section 287.017, Florida Statutes, for CATEGORY TWO for a period of thirty-six (36) months from the date of being placed on the convicted vendor list.

FORMS OF PROPOSALS - Each proposal and its accompanying statements must be made on the blanks provided. THE FORMS MUST BE SUBMITTED ELECTRONICALLY, IN GOOD ORDER WITH ALL BLANKS COMPLETED, and must show the name of the bidder and a statement as to its contents.

INSTRUCTIONS TO BIDDERS (continued)

FORMS OF PROPOSALS (CONTINUED) - The proposal must be signed by one duly authorized to do so, and in case signed by a deputy or subordinate, the principal's properly written authority to such deputy or subordinate must accompany the proposal. No proposal will be accepted, for any reason whatsoever, which is not submitted to the City as stated above, within the specified time.

INSURANCE - Contractor shall provide and shall require all of its sub-contractors to provide, pay for, and maintain in force at all times during the term of the Agreement, such insurance, including Property Insurance (Builder's Risk), Commercial General Liability Insurance, Business Automobile Liability Insurance, Workers' Compensation Insurance, Employer's Liability Insurance, and Umbrella/Excess Liability, as stated below. Such policy or policies shall be issued by companies authorized to do business in the State of Florida and having agents upon whom service of process may be made in the State of Florida.

BID BOND - A certified check, cashier's check or bank officer's check, for the sum set forth in the advertisement, made payable to the City of Fort Lauderdale, Florida, or bid bond in such amount, shall accompany each proposal as evidence of the good faith and responsibility of the bidder. The check or bond shall be retained by the City as liquidated damages should the bidder refuse to or fail to enter into a contract for the execution of the work embraced in this proposal, in the event the proposal of the bidder is accepted. Retention of such amount shall not be construed as a penalty or forfeiture.

The above bond or check shall be a guarantee that the bidder will, if necessary, promptly execute a satisfactory contract and furnish good and sufficient bonds. As soon as a satisfactory contract has been executed and the bonds furnished and accepted, the check or bond accompanying the proposal of the successful bidder will be returned to him. The certified or other checks or bid bonds of the unsuccessful bidders will be returned to them upon the acceptance of the bid of the successful bidder. If the successful bidder shall not enter into, execute, and deliver such a contract and furnish the required bonds within ten (10) days after receiving notice to do so, the certified or other check or bid bond shall immediately become the property of the City of Fort Lauderdale as liquidated damages. Retention of such amount shall not be construed as a penalty or forfeiture.

FILLING IN BIDS - All prices must be electronically submitted in the proposal pages, and all proposals must fully cover all items for which proposals are asked and no other. Bidders are required to state the names and places of residence of all persons interested, and if no other person is interested, the bidder shall distinctly state such fact and shall state that the proposal is, in all respects, fair and without collusion or fraud. Where more than one person is interested, it is required that all persons interested or their legal representative make all verification and subscribe to the proposal.

PRICES QUOTED: Deduct any discount offered and quote firm net unit prices. In the case of a discrepancy in computing the amount of the bid, the unit price quoted will govern. All prices quoted shall be F.O.B. destination, freight prepaid (Bidder pays and bears freight charges, Bidder owns goods in transit and files any claims), unless otherwise stated in Special Conditions. Each item must be bid separately. No attempt shall be made to tie any item or items contained in the ITB with any other business with the City.

BIDS FIRM FOR ACCEPTANCE: Bidder warrants, by virtue of bidding, that his bid and the prices quoted in his bid will be firm for acceptance by the City for a period of one hundred and twenty (120) days from the date of bid opening unless otherwise stated in the ITB. The City shall award contract within this time period or shall request to the recommended awarded vendor an extension to hold pricing, until products/services have been awarded.

ADDITIONAL ITEMS OR SERVICES: The City may require additional items or services of a similar nature, but not specifically listed in the contract. The Contractor agrees to provide such items or

INSTRUCTIONS TO BIDDERS (continued)

services, and shall provide the City prices on such additional items or services. If the price(s) offered are not acceptable to the City, and the situation cannot be resolved to the satisfaction of the City, the City reserves the right to procure those items or services from other vendors, or to cancel the contract upon giving the Contractor thirty (30) days written notice.

DELETION OR MODIFICATION OF SERVICES: The City reserves the right to delete any portion of the Contract at any time without cause, and if such right is exercised by the City, the total fee shall be reduced in the same ratio as the estimated cost of the work deleted bears to the estimated cost of the work originally planned. If work has already been accomplished on the portion of the Contract to be deleted, the Contractor shall be paid for the deleted portion on the basis of the estimated percentage of completion of such portion.

If the Contractor and the City agree on modifications or revisions to the task elements, after the City has approved work to begin on a particular task or project, and a budget has been established for that task or project, the Contractor will submit a revised budget to the City for approval prior to proceeding with the work.

CAUSES FOR REJECTION - No proposal will be canvassed, considered or accepted which, in the opinion of the City Commission, is informal or unbalanced, or contains inadequate or unreasonable prices for any items; each item must carry its own proportion of the cost as nearly as is practicable. Any alteration, erasure, interlineation, or failure to specify bids for all items called for in the schedule shall render the proposal informal.

REJECTION OF BIDS - The City reserves the right to reject any bid if the evidence submitted by the bidder, or if the investigation of such bidder, fails to satisfy the City that such bidder is properly qualified to carry out the obligations and to complete the work contemplated. Any or all proposals will be rejected, if there is reason to believe that collusion exists among bidders. A proposal will be considered irregular and may be rejected, if it shows serious omissions, alterations in form, additions not called for, conditions or unauthorized alternates, or irregularities of any kind. The City reserves the right to reject any or all proposals and to waive such technical errors as may be deemed best for the interests of the City.

BID PROTEST PROCEDURE: Any proposer or bidder who is not recommended for award of a contract and who alleges a failure by the City to follow the City's procurement ordinance or any applicable law may protest to the Procurement Division – Deputy Director of Finance, by delivering a letter of protest within five (5) days after a Notice of Intent to award is posted on the City's website at the following link: http://www.fortlauderdale.gov/departments/finance/procurement-services/notices-of-intent-to-award.

The complete protest ordinance may be found on the City's website at the following link: https://library.municode.com/fl/fort_lauderdale/codes/code_of_ordinances?nodeId=COOR_CH2AD_ARTVFI_DIV2PR_S2-182DIREPR

WITHDRAWALS - Any bidder may, without prejudice to himself, withdraw his proposal at any time prior to the expiration of the time during which proposals may be submitted. Such request for withdrawal must be in writing and signed in the same manner and by the same person who signed the proposal. After expiration of the period for receiving proposals, no proposal can be withdrawn, modified, or explained.

CONTRACT - The bidder to whom award is made shall execute a written contract to do the work and maintain the same in good repair until final acceptance by the proper authorities, and shall furnish good and sufficient bonds as specified within ten (10) days after receiving such contract for execution. If the bidder to whom the first award is made fails to enter into a contract as provided, the award may be annulled and the contract let to the next lowest bidder who is reliable, responsible, and responsive

INSTRUCTIONS TO BIDDERS (continued)

in the opinion of the City Commission, and that bidder shall fulfill every stipulation and obligation as if such bidder were the original party to whom award was made.

The contract shall provide that the Contractor agrees to correct any defective or faulty work or material, which may appear within one (1) year after completion of the work and receipt of final payment.

ENFORCEMENT OF SPECIFICATIONS - Copies of the specifications will be placed in the hands of all the assistants to the Engineer and Inspectors employed on the work, who shall enforce each and every requirement of the contract. Such assistants shall have no authority to vary from such requirements.

COPIES OF DRAWING PLANS - Copies of the drawing plans are on file in the Public Works Department, City Hall, 4th Floor, 100 N. Andrews Avenue, Fort Lauderdale, Florida 33301.

SURETY BOND – The Contractor shall execute and record in the public records of Broward County, Florida, a payment and performance bond in an amount at least equal to the Contract Price with a surety insurer authorized to do business in the State of Florida as surety, ("Bond"), in accordance with Section 255.05, Florida Statutes (2018), as may be amended or revised, as security for the faithful performance and payment of all of the Contractor's obligations under the Contract Documents.

The successful bidder shall furnish a performance and payment bond in compliance with Section 255.05, Florida Statutes, written by a Corporate Surety company, holding a Certificate of Authority from the Secretary of the Treasury of the United States as acceptable sureties on federal bonds, in an amount equal to the total amount payable by the terms of the contract, executed and issued by a Resident Agent licensed by and having an office in the State of Florida, representing such Corporate Surety, conditioned for the due and faithful performance of the work, and providing in addition to all other conditions, that if the Contractor, or his or its subcontractors, fail to duly pay for any labor, materials, or other supplies used or consumed by such Contractor, or his or its subcontractor or subcontractors, in performance of the work contracted to be done, the Surety will pay the same in the amount not exceeding the sum provided in such bonds, together with interest at the rate of fifteen percent (15%) per annum, and that they shall indemnify and save harmless the City of Fort Lauderdale to the extent of any and all payments in connection with carrying out of the contract, which the City may be required to make under the law.

The Contractor is required at all times to have a valid surety bond in force covering the work being performed. A failure to have such bond in force at any time shall constitute a default on the part of the Contractor. A bond written by a surety, which becomes disqualified to do business in the State of Florida, shall automatically constitute a failure on the part of the Contractor to meet the above requirements.

Such bond shall continue in effect for one (1) year after completion and acceptance of the work with liability equal to at least twenty-five percent (25%) of contract price, or an additional bond shall be conditioned that the Contractor will correct any defective or faulty work or material which appear within one (1) year after completion of the contract, upon notification by the City, except in contracts which are concerned solely with demolition work, in which cases twenty-five percent (25%) liability will not be applicable.

AUDIT OF CONTRACTOR'S RECORDS - Upon execution of the Contract, the City reserves the right to conduct any necessary audit of the Contractor's records. Such an audit, or audits, may be conducted by the City or its representatives at any time prior to final payment, or thereafter, for a period up to three (3) years. The City may also require submittal of the records from either the Contractor, the Subcontractor, or both. For the purpose of this Section, records shall include all books

INSTRUCTIONS TO BIDDERS (continued)

of account, supporting documents and papers deemed necessary by the City to assure compliance with the contract provisions.

Failure of the Contractor or Subcontractor to comply with these requirements may result in disqualification or suspension from bidding for future contracts or disapproval as a Subcontractor at the option of the City.

The Contractor shall assure that each of its Subcontractors will provide access to its records pertaining to the project upon request by the City.

PERIODIC ESTIMATE FOR PARTIAL PAYMENT - After the Contractor has submitted a periodic estimate for partial payment, approved and certified by the Public Works Department, the City shall make payment in the manner provided in the Contract Documents and in accordance with Florida's Prompt Payment Act, Section 218, Florida Statutes.

RESERVATION FOR AWARD AND REJECTION OF BIDS - The City reserves the right to accept or reject any or all bids, part of bids, and to waive minor irregularities or variations to specifications contained in bids, and minor irregularities in the bidding process. The City also reserves the right to award the contract on a split order basis, lump sum basis, individual item basis, or such combination as shall best serve the interest of the City. The City reserves the right to make an award to the responsive and responsible bidder whose product or service meets the terms, conditions, and specifications of the ITB and whose bid is considered to best serve the City's interest. In determining the responsiveness of the offer and the responsibility of the Bidder, the following shall be considered when applicable: the ability, capacity and skill of the Bidder to perform as required; whether the Bidder can perform promptly, or within the time specified, without delay or interference; the character, integrity, reputation, judgment, experience and efficiency of the Bidder; the quality of past performance by the Bidder; the previous and existing compliance by the Bidder with related laws and ordinances; the sufficiency of the Bidder's financial resources; the availability, quality and adaptability of the Bidder's supplies or services to the required use; the ability of the Bidder to provide future maintenance, service or parts; the number and scope of conditions attached to the bid.

MINORITY AND WOMEN BUSINESS ENTERPRISE PARTICIPATION AND BUSINESS - It is the desire of the City of Fort Lauderdale to increase the participation of minority (MBE) and women-owned (WBE) businesses in its contracting and procurement programs. While the City does not have any preference or set aside programs in place, it is committed **to a policy of equitable participation for these firms.** The City of Fort Lauderdale wants to increase the participation of Minority Business Enterprises (MBE), Women Business Enterprises (WBE), and Small Business Enterprises (SBE) in its procurement activities. If your firm qualifies in accordance with the below definitions please indicate in the space provided in this ITB.

Minority Business Enterprise (MBE) "A Minority Business" is a business enterprise that is owned or controlled by one or more socially or economically disadvantaged persons. Such disadvantage may arise from cultural, racial, chronic economic circumstances or background or other similar cause. Such persons include, but are not limited to: Blacks, Hispanics, Asian Americans, and Native Americans.

The term "Minority Business Enterprise" means a business at least fifty-one percent (51%) of which is owned by minority group members or, in the case of a publicly owned business, at least fifty-one percent (51%) of the stock of which is owned by minority group members. For the purpose of the preceding sentence, minority group members are citizens of the United States who include, but are not limited to: Blacks, Hispanics, Asian Americans, and Native Americans.

INSTRUCTIONS TO BIDDERS (continued)

Women Business Enterprise (WBE) a "Women Owned or Controlled Business" is a business enterprise at least fifty-one percent (51%) of which is owned by females or, in the case of a publicly owned business, at least fifty-one percent (51%) of the stock of which is owned by females.

Small Business Enterprise (SBE) "Small Business" means a corporation, partnership, sole proprietorship, or other legal entity formed for the purpose of making a profit, which is independently owned and operated, has either fewer than 100 employees or less than $1,000,000 in annual gross receipts.

BLACK includes persons having origins in any of the Black racial groups of Africa.

WHITE includes persons whose origins are Anglo-Saxon and Europeans and persons of Indo-European decent including Pakistani and East Indian.

HISPANIC includes persons of Mexican, Puerto Rican, Cuban, Central and South American, or other Spanish culture or origin, regardless of race.

NATIVE AMERICAN includes persons whose origins are American Indians, Eskimos, Aleuts, or Native Hawaiians.

ASIAN AMERICAN includes persons having origin in any of the original peoples of the Far East, Southeast Asia, the Indian subcontinent, or the Pacific Islands.

DEBARRED OR SUSPENDED BIDDERS OR PROPOSERS - The bidder or proposer certifies, by submission of a response to this solicitation, that neither it nor its principals and subcontractors are presently debarred or suspended by any Federal department or agency.

LOBBYING ACTIVITIES - **ALL CONTRACTORS PLEASE NOTE**: Any contractor submitting a response to this solicitation must comply, if applicable, with City of Fort Lauderdale Ordinance No. C-00-27 & Resolution No. 07-101, Lobbying Activities. Copies of Ordinance No., C-00-27, and Resolution No. 07-101, may be obtained from the City Clerk's Office on the 7th Floor of City Hall, 100 N. Andrews Avenue, Fort Lauderdale, Florida 33301. The ordinance may also be viewed on the City's website at http://www.fortlauderdale.gov/clerk/LobbyistDocs/lobbyist_ordinance.pdf.

PROJECT 11080

SPECIAL CONDITIONS

01. PURPOSE

The City of Fort Lauderdale, Florida (City) is seeking bids from qualified bidders, hereinafter referred to as the Contractor, to provide construction services for the City's Public Works Department, in accordance with the terms, conditions, and specifications contained in this Invitation To Bid (ITB).

02. TRANSACTION FEES

The City of Fort Lauderdale uses BidSync (www.bidsync.com) to distribute and receive bids and proposals. There is no charge to vendors/contractors to register and participate in the solicitation process, nor will any fees be charged to the awarded contractor.

03. SUBMISSION OF BIDS

It is the sole responsibility of the Contractor to ensure that their bid is submitted electronically through BidSync at www.bidsync.com and that any bid security not submitted via BidSync reaches the City of Fort Lauderdale, Procurement Services Division, 6th floor, Room 619, 100 N. Andrews Avenue, Fort Lauderdale, FL 33301, in a sealed envelope marked on the outside with the ITB solicitation number and Contractor's name, no later than the time and date specified in this solicitation. **PAPER BID SUBMITALS WILL NOT BE ACCEPTED. PLEASE SUBMIT YOUR BID RESPONSE ELECTRONICALLY.**

04. INFORMATION OR CLARIFICATION

For information concerning procedures for responding to this solicitation, contact **Maureen Lewis**, **Procurement Specialist II**, at (954) 828-5239 or email at maureenl@fortlauderdale.gov. Such contact shall be for clarification purposes only.

For information concerning technical specifications please utilize the Question/Answer feature provided by BidSync at www.bidsync.com. Questions of a material nature must be received prior to the cut-off date specified in the solicitation. Material changes, if any, to the scope of services or bidding procedures will only be transmitted by written addendum. (See addendum section of BidSync Site). **Contractors please note**: No part of your bid can be submitted via FAX. No variation in price or conditions shall be permitted based upon a claim of ignorance. Submission of a bid will be considered evidence that the Contractor has familiarized himself with the nature and extent of the work, and the equipment, materials, and labor required. The entire bid response must be submitted in accordance with all specifications contained in this solicitation. The questions and answers submitted in BidSync shall become part of any contract that is created from this ITB.

05. CONTRACT TIME

5.1 The Contractor recognizes that TIME IS OF THE ESSENCE. The Work shall commence within **60** calendar days of the date of the Notice to Proceed.

5.2 The Work shall be Substantially Completed within **110** calendar days after the date when the Contract Time commences to run as provided in the Notice to Proceed.

5.3 The Work shall be finally completed on the Final Completion Date and ready for final payment in accordance with this Agreement within **140** calendar days after the date when the Contract Time commences to run as provided in the Notice to Proceed.

The City of Fort Lauderdale reserves the right to waive any informality in any bid and to reject any or all bids. The City of Fort Lauderdale reserves the right to reduce or delete any of the bid items.

At time of award of contract, the City reserves the right to set a maximum dollar limit that may be expended on this project. Contract quantities of any or all items may be increased, reduced, or eliminated to adjust the contract amount to coincide with the amount of work necessary or to bring the contract value to within the established limit. All quantities are estimated and the City reserves the right to increase, reduce, or eliminate the contract quantities in any amount.

The undersigned bidder affirms that he has or will obtain all equipment necessary to complete the work described, that he has or will obtain all required permits and licenses from the appropriate agencies, and that his firm is authorized to do business in the State of Florida.

06. BID SECURITY

A certified check, cashier's check, bank officer's check or bid bond for **FIVE** percent **(5%)** of the bid amount, made payable to the City of Fort Lauderdale, Florida, shall accompany each proposal.

07. REQUIRED LICENSES/CERTIFICATIONS

Contractor must possess the following licenses/certifications to be considered for award.

Certified Underground Utility and Excavation Contractor License **OR** General Contractor License

Note: Contractor must have proper licensing and be able to provide evidence of same, if requested, at time of award.

08. SPECIFIC EXPERIENCE REQUIRED

The following expertise is required to be considered for this contract. Specific references attesting to this expertise must be submitted with bid.

The contractor must have previous experience in constructing water main transmission systems and infrastructure, including individual projects with at least 2,000 linear feet of water main pipes, 12-inches in diameter or larger, in the state of Florida within the last ten (10) years. Bidder shall submit proof of construction experience for a minimum of three (3) projects of similar scope and scale (or larger) and shall, for each project listed, identify location; dates of construction; project names and overall scope; scope of work that was self-performed by Contractor; and client's name, address, telephone number and e-mail address.

NOTE: REFERENCES SHALL NOT INCLUDE ONLY CITY OF FORT LAUDERDALE EMPLOYEES OR WORK PERFORMED FOR THE CITY. THE CITY IS ALSO INTERESTED IN WORK EXPERIENCE AND REFERENCES FROM ENTITIES OTHER THAN THE CITY OF FORT LAUDERDALE.

By signing this bid solicitation, contractor is affirming that this expertise will be provided for this contract at no additional charge.

09. BID ALLOWANCE

Allowance for permits: Payments will be made to the contractor based on the actual cost of permits upon submission of paid permit receipts. The City shall not pay for other costs related to obtaining or securing permits.

The amount indicated is intended to be sufficient to cover the entire project. If the City Permit fees exceed the allowance indicated, the City will reimburse the contractor the actual amount of City Permit Fees required for project completion.

Allowances	$
Permit fee allowance	5000
TOTAL	**$5,000**

Note: The City will add this allowance to your bid.

10. INSURANCE REQUIREMENTS *(See Article 10, Bonds and Insurance, of the Contract for details)*

10.1 As a condition precedent to the effectiveness of this Agreement, during the term of this Agreement and during any renewal or extension term of this Agreement, the Contractor, at the Contractor's sole expense, shall provide insurance of such types and with such terms and limits as noted below. Providing proof of and maintaining adequate insurance coverage are material obligations of the Contractor. The Contractor shall provide the City a certificate of insurance evidencing such coverage. The Contractor's insurance coverage shall be primary

insurance for all applicable policies. The limits of coverage under each policy maintained by the Contractor shall not be interpreted as limiting the Contractor's liability and obligations under this Agreement. All insurance policies shall be from insurers authorized to write insurance policies in the State of Florida and that possess an A.M. Best rating of A-, VII or better. All insurance policies are subject to approval by the City's Risk Manager.

The coverages, limits, and endorsements required herein protect the interests of the City, and these coverages, limits, and endorsements may not be relied upon by the Contractor for assessing the extent or determining appropriate types and limits of coverage to protect the Contractor against any loss exposure, whether as a result of this Agreement or otherwise. The requirements contained herein, as well as the City's review or acknowledgement, are not intended to and shall not in any manner limit or qualify the liabilities and obligations assumed by the Contractor under this Agreement.

The following insurance policies and coverages are required:

10.1.1 Commercial General Liability

Coverage must be afforded under a Commercial General Liability policy with limits not less than:

- $1,000,000 each occurrence and $2,000,000 aggregate for Bodily Injury, Property Damage, and Personal and Advertising Injury
- $1,000,000 each occurrence and $2,000,000 aggregate for Products and Completed Operations

Policy must include coverage for Contractual Liability and Independent Contractors.

The City and the City's officers, employees, and volunteers are to be covered as additional insureds with a CG 20 26 04 13 Additional Insured – Designated Person or Organization Endorsement or similar endorsement providing equal or broader Additional Insured Coverage with respect to liability arising out of activities performed by or on behalf of the Contractor. The coverage shall contain no special limitation on the scope of protection afforded to the City or the City's officers, employees, and volunteers.

10.1.2 Business Automobile Liability

Coverage must be afforded for all Owned, Hired, Scheduled, and Non-Owned vehicles for Bodily Injury and Property Damage in an amount not less than $1,000,000 combined single limit each accident.

If the Contractor does not own vehicles, the Contractor shall maintain coverage for Hired and Non-Owned Auto Liability, which may be satisfied by way of endorsement to the Commercial General Liability policy or separate Business Auto Liability policy.

10.1.3 Workers' Compensation and Employer's Liability

Coverage must be afforded per Chapter 440, Florida Statutes. Any person or entity performing work for or on behalf of the City must provide Workers' Compensation insurance. Exceptions and exemptions will be allowed by the City's Risk Manager, if they are in accordance with Florida Statute.

The Contractor waives, and the Contractor shall ensure that the Contractor's insurance carrier waives, all subrogation rights against the City and the City's officers, employees, and volunteers for all losses or damages. The City requires the policy to be endorsed with WC 00 03 13 Waiver of our Right to Recover from Others or equivalent.

The Contractor must be in compliance with all applicable State and federal workers' compensation laws, including the U.S. Longshore Harbor Workers' Act and the Jones Act, if applicable.

10.1.4 Umbrella/Excess Liability: The Contractor shall provide umbrella/excess coverage with limits of no less than $2,000,000 excess of Commercial General Liability, Automobile Liability and Employer's Liability.

Insurance Certificate Requirements

a. The Contractor shall provide the City with valid Certificates of Insurance (binders are unacceptable) no later than thirty (30) days prior to the start of work contemplated in this Agreement.
b. The Contractor shall provide to the City a Certificate of Insurance having a thirty (30) day notice of cancellation; ten (10) days' notice if cancellation is for nonpayment of premium.
c. In the event that the insurer is unable to accommodate the cancellation notice requirement, it shall be the responsibility of the Contractor to provide the proper notice. Such notification will be in writing by registered mail, return receipt requested, and addressed to the certificate holder.
d. In the event the Agreement term goes beyond the expiration date of the insurance policy, the Contractor shall provide the City with an updated Certificate of Insurance no later than ten (10) days prior to the expiration of the insurance currently in effect. The City reserves the right to suspend the Agreement until this requirement is met.
e. The Certificate of Insurance shall indicate whether coverage is provided under a claims-made or occurrence form. If any coverage is provided on a claims-made form, the Certificate of Insurance must show a retroactive date, which shall be the effective date of the initial contract or prior.
f. The City shall be named as an Additional Insured on all liability policies, with the exception of Workers' Compensation.
g. The City shall be granted a Waiver of Subrogation on the Contractor's Workers' Compensation insurance policy.
h. The title of the Agreement, Bid/Contract number, event dates, or other identifying reference must be listed on the Certificate of Insurance.

The Certificate Holder should read as follows:
City of Fort Lauderdale
100 N. Andrews Avenue
Fort Lauderdale, FL 33301

The Contractor has the sole responsibility for the payment of all insurance premiums and shall be fully and solely responsible for any costs or expenses as a result of a coverage deductible, co-insurance penalty, or self-insured retention; including any loss not covered because of the operation of such deductible, co-insurance penalty, self-insured retention, or coverage exclusion

or limitation. Any costs for adding the City as an Additional Insured shall be at the Contractor's expense.

If the Contractor's primary insurance policy/policies do not meet the minimum requirements, as set forth in this Agreement, the Contractor may provide evidence of an Umbrella/Excess insurance policy to comply with this requirement.

The Contractor's insurance coverage shall be primary insurance as applied to the City and the City's officers, employees, and volunteers. Any insurance or self-insurance maintained by the City covering the City, the City's officers, employees, or volunteers shall be non-contributory.

Any exclusion or provision in the insurance maintained by the Contractor that excludes coverage for work contemplated in this Agreement shall be unacceptable and shall be considered breach of contract.

All required insurance policies must be maintained until the contract work has been accepted by the City, or until this Agreement is terminated, whichever is later. Any lapse in coverage shall be considered breach of contract. In addition, Contractor must provide to the City confirmation of coverage renewal via an updated certificate should any policies expire prior to the expiration of this Agreement. The City reserves the right to review, at any time, coverage forms and limits of Contractor's insurance policies.

The Contractor shall provide notice of any and all claims, accidents, and any other occurrences associated with this Agreement shall be provided to the Contractor's insurance company or companies and the City's Risk Management office as soon as practical.

It is the Contractor's responsibility to ensure that any and all of the Contractor's independent contractors and subcontractors comply with these insurance requirements. All coverages for independent contractors and subcontractors shall be subject to all of the applicable requirements stated herein. Any and all deficiencies are the responsibility of the Contractor.

NOTE: CITY PROJECT NUMBER AND NAME MUST APPEAR ON EACH CERTIFICATE, AND THE CITY OF FORTLAUDERDALE MUST BE NAMED ON THE CERTIFICATE AS AN "ADDITIONAL INSURED" ON ALL LIABILITY POLICIES, WITH THE EXCEPTION OF WORKERS' COMPENSATION.

A Sample Insurance Certificate shall be included with the proposal to demonstrate the firm's ability to comply with insurance requirements. Provide a previous certificate or other evidence listing the insurance companies' names for all required coverage, and the dollar amounts of the coverage.

11. PERFORMANCE AND PAYMENT BOND: _____**100%**_____

Number of awards anticipated: _____**1**_____

12. CITY PROJECT MANAGER

The Project Manager is hereby designated by the City as **Daniel Fisher, P.E.** whose address is 100 North Andrews, 4th Floor, Fort Lauderdale, FL 33301, telephone number: **(954) 828-5850**, and e-mail address is dfisher@fortlauderdale.gov. The Project Manager will assume all duties and responsibilities and will have the rights and authorities assigned to the Project Manager in the Contract Documents in connection with completion of the Work in accordance with this Agreement.

13. LIQUIDATED DAMAGES *(See Article 16, Liquidated Damages, of the Contract for details)*
Upon failure of the Contractor to complete the Work within the time specified for completion, the Contractor shall pay to the City the sum of **Five Hundred Dollars ($500.00)** for each and every calendar day that the completion of the Work is delayed beyond the time specified in this Agreement for completion, as fixed and agreed liquidated damages and not as a penalty, so long as the delay is caused by the Contractor. (See Article 16, Liquidated Damages Clause, of the Contract)

14. PAYMENT (*See Article 7, Payment, of the Contract for other details*)

The City shall make payment to the Contractor through utilization of the City's P-Card Program. The City has implemented a Purchasing Card (P-Card) Program utilizing both VISA and MASTERCARD networks. Purchases from this contract will be made utilizing the City's Purchasing Card. Contractor will receive payment from the purchasing card in the same manner as other credit card purchases. Accordingly, bidders must presently have the ability to accept these credit cards or take whatever steps necessary to implement the ability before the start of the contract term, or contract award by the City. The City reserves the right to revise this program as necessary. All costs associated with the Contractor's participation in this purchasing program shall be borne by the Contractor.

15. WORK SCHEDULE (including overtime hours):

Regular work hours: **8:00 am to 5:00 pm, Monday through Friday.**
City Inspector Hours: **8:00 am to 4:30 pm, Monday through Friday.**

Any inspection requested by the contractor outside those hours will be considered overtime to be paid by the Contractor.

16. INSPECTION OVERTIME COST: $146

CITY OF FORT LAUDERDALE
CONSTRUCTION AGREEMENT

THIS AGREEMENT made and entered into this _____ day of _____, 2018, by and between the City of Fort Lauderdale, a Florida municipal corporation (City) and _____, (Contractor), (parties);

WHEREAS, the City desires to retain a contractor for the Project as expressed in its Invitation to Bid No., _____, Project Number, _____, which was opened on _____; and,

WHEREAS, the Contractor has expressed its willingness and capability to perform the necessary work to accomplish the Project.

NOW, THEREFORE, the City and the Contractor, in consideration of the mutual covenants and conditions contained herein and for other good and valuable consideration, the receipt and sufficiency is hereby acknowledged, agree as follows:

ARTICLE 1 – DEFINITIONS

Whenever used in this Agreement or in other Contract Documents, the following terms have the meanings indicated which are applicable to both the singular and plural forms:

1.1 Agreement – This written Agreement between the City and the Contractor covering the work to be performed including other Contract Documents that are attached to or incorporated in the Agreement.

1.2 Application for Payment – The form accepted by the City which is to be used by the Contractor in requesting progress or final payment and which is to include such supporting documentation as is required by the Contract Documents.

1.3 Approve – The word approve is defined to mean review of the material, equipment or methods for general compliance with design concepts and with the information given in the Contract Documents. It does not imply a responsibility on the part of the City to verify in every detail conformance with plans and specifications.

1.4 Bid – The offer or Bid of the Contractor submitted on the prescribed form setting forth the total prices for the Work to be performed.

1.5 Bid Documents –This Agreement, advertisement for Invitation to Bids, the Instructions to Bidders, the Bid Form (with supplemental affidavits and agreements), the Contract Forms, General Conditions, the Supplementary Conditions, the Specifications, and the Plans, which documents all become an integral part of the Contract Documents.

1.6 Certificate of Substantial Completion - Certificate provided by the City certifying that all Work, excluding the punch list items, has been completed, inspected, and accepted by the City.

1.7 Change Order - A change order is defined as a written order to a contractor approved by the City, authorizing a revision of an underlying agreement between the City and a contractor that is directly related to the original scope of work or an adjustment in the original contract price or the contract time directly related to the original scope of work, issued on or after the effective date of the contract.

1.8 City – The City of Fort Lauderdale, Florida, including but not limited to its employees, agents, officials, representatives, contractors, subcontractors, volunteers, successors and assigns, with whom the Contractor has entered into the Agreement and for whom the Work is to be provided.

1.9 Contract Documents – The Contract Documents shall consist of this Agreement, Exhibits to this Agreement, Public Construction Bond, Performance Bond, Payment Bond and Certificates of Insurance, Notice of Award and Notice to Proceed, General Conditions as amended by the Special Conditions, Technical Specifications, Plans/Drawings, Addenda, Bid Form and supplement Affidavits and Agreements, all applicable provisions of State and Federal Law and any modification, including Change Orders or written amendments duly delivered after execution of Agreement, Invitation to Bid, Instructions to Bidders and Bid Bond, Contractor's response to the City's Invitation to Bid, Schedule of Completion, Schedule of Values, all amendments, modifications and supplements, change orders and work directive changes issued on or after the Effective Date of the Agreement, as well as any additional documents that are required to be submitted under the Agreement.

Permits on file with the City and or those permits to be obtained shall be considered directive in nature and will be considered a part of this Agreement. A copy of all permits shall be given to the City for inclusion in the Contract Documents. Terms of permits shall be met prior to acceptance of the Work and release of the final payment.

1.10 Contract Price – The monies payable to the Contractor by the City under the Contract Documents and in accordance with the line item unit prices listed in the Bid.

1.11 Contract Time – The number of calendar days stated in the Agreement for the completion of the Work. The dates on which the work shall be started and shall be completed as stated in the Notice to Proceed.

1.12 Contractor – The person, firm, company, or corporation with whom the City has entered into the Agreement, including but not limited to its employees, agents, representatives, contractors, subcontractors, their subcontractors and their other successors and assigns.

1.13 Day – A calendar day of twenty-four (24) hours ending at midnight.

1.14 Defective – An adjective which when modifying the word "Work" refers to work that is unsatisfactory, faulty, or deficient, or does not conform to the Contract Documents or does not meet the requirements of any inspection, test or approval referred to in the Contract Documents, or has been damaged prior to the Project Manager's recommendation of final payment.

1.15 Effective Date of the Agreement – The effective date of the agreement shall be the date the City Commission approves the work. The contractor shall provide all required payment and performance bonds and insurances to the City within ten (10) calendar days following the City Commission approval. Upon verification of all bonds and insurances, the City will issue a notice to proceed (NTP) to the Contractor. Contract time will commence on the date when the Notice to Proceed is issued. The Contractor shall commence the work immediately upon receipt of the Notice to Proceed. Failure of the contractor to proceed with the work will constitute non-performance of the Contractor and would be ground for termination of the contract per ARTICLE 17 of the Agreement.

1.16 Final Completion Date – The date the Work is completed, including completion of the final punch list, and delivered along with those items specified in the Contract Documents and is accepted by the City.

1.17 Hazardous Materials (HAZMAT) - Any solid, liquid, or gaseous material that is toxic, flammable, radioactive, corrosive, chemically reactive, or unstable upon prolonged storage in quantities that could pose a threat to life, property, or the environment defined in Section 101(14) of Comprehensive Environmental Response, Compensation and Liability Act of 1980 and in 40 CFR 300.6. Also defined by 49 CFR 171.8 as a substance or material designated by the Secretary of Transportation to be capable of posing an unreasonable risk to health, safety, and property when transported in commerce and which has been so designated.

1.18 Hazardous Substance - As defined by Section 101(14) of the Comprehensive Environmental Response, Compensation and Liability Act; any substance designated pursuant to Section 311(b) (2) (A) of the Clean Water Act; any element, compound, mixture, solution or substance designated pursuant to Section 102 identified under or listed pursuant to Section 3001 of the Solid Waste Disposal Act {but not including any waste listed under Section 307[a] of the Clean Water Act}; any hazardous air pollutant listed under Section 112 of the Clean Air Act; and any imminently hazardous chemical substance or mixture pursuant to Section 7 of the Toxic Substances Control Act. The term does not include petroleum, including crude oil or any fraction thereof, which is not otherwise specifically listed or designated as a hazardous substance in the first sentence of this paragraph, and the term does not include natural gas, natural gas liquids, liquefied natural gas, or synthetic gas usable for fuel (or mixtures of natural gas and such synthetic gas).

1.19 Hazardous Waste - Those solid wastes designated by OSHA in accordance with 40 CFR 261 due to the properties of ignitability, corrosivity, reactivity, or toxicity. Any material that is subject to the Hazardous Waste Manifest requirements of the EPA specified in 40 CFR Part 262.

1.20 Holidays - Those designated non-work days as established by the City Commission of the City of Fort Lauderdale.

1.21 Inspection – The term “inspection” and the act of inspecting as used in this Agreement is defined to mean the examination of construction to ensure that it conforms to the design concept expressed in the plans and specifications. This term shall not be construed to mean supervision, superintending and/or overseeing.

1.22 Notice of Award - The written notice by City to the Contractor stating that upon compliance by the Contractor with the conditions precedent enumerated therein, within the time specified that the City will sign and deliver this Agreement.

1.23 Notice to Proceed – A written notice given by the City to the Contractor fixing the date on which the Contract Time will commence to run and on which the Contract Time will end.

1.24 Plans - The drawings which show the character and scope of the work to be performed and which have been prepared or approved by the City and are referred to in the Contract Documents.

1.25 Premises (otherwise known as Site or Work Site) – means the land, buildings, facilities, etc. upon which the Work is to be performed.

1.26 Project – The total construction of the Work to be provided as defined in the Contract Documents.

1.27 Project Manager - The employee of the City, or other designated individual who is herein referred to as the Project Manager, will assume all duties and responsibilities and will have the rights and authorities assigned to the Project Manager in the contract Documents in connection with completion of the Work in accordance with this Agreement. The Project Manager, or designee, shall be the authorized agent for the City unless otherwise specified.

1.28 Punch List - The City's list of Work yet to be done or be corrected by the Contractor, before the Final Completion date can be determined by the City.

1.29 Record Documents - A complete set of all specifications, drawings, addenda, modifications, shop drawings, submittals and samples annotated to show all changes made during the construction process.

1.30 Record Drawings or "As-Builts" - A set of drawings which show significant changes in the work made during construction and which are usually based on drawings marked up in the field and other data furnished by the contractor. These documents will be signed and sealed by the Engineer of Record or a Professional Land Surveyor licensed in the State of Florida.

1.31 Substantially Completed Date – A date when the Contractor has requested in writing, stating that the Work is substantially completed and is ready for an inspection and issuance of a final punch list for the Project.

1.32 Work – The entire completed delivered product or the various separately identifiable parts thereof required to be furnished under the Contract Documents. Work is the result of performing services, furnishing labor and furnishing and incorporating material and equipment into the product, all as required by the Contract Documents.

ARTICLE 2 – SCOPE OF WORK

2.1 The Contractor shall complete all work as specified or indicated in the Contract Documents. The Project for which the Work under the Contract Documents may be the whole or only part is generally described as follows:

PORT CONDO LARGE WATER MAIN IMPROVEMENTS
ITB 12150-693 PROJECT 11080

2.2 All Work for the Project shall be constructed in accordance with the Drawings and Specifications. The Work generally involves:

PROJECT DESCRIPTION

This project is located on Grande Drive between Eisenhower Boulevard and the Intracoastal Water Way, and includes the construction by the open-cut method of approximately 1,300 linear feet of 12-inch polyvinyl chloride water main to replace an existing 6-ich water main. The project also includes but is not limited to the installation of new fire hydrants, reconnecting all service lines, testing, installation of air release valves, and restoration of all affected areas.

2.3 Within ten (10) days of the execution of this Agreement, the Contractor shall submit a Construction Schedule, Schedule of Values and a listing of those subcontractors that will be utilized by the Contractor. The general sequence of the work shall be submitted by the Contractor and approved by the City before any work commences. The City reserves the right to issue construction directives necessary to facilitate the Work or to minimize any conflict with operations.

ARTICLE 3 – PROJECT MANAGER

3.1 The Project Manager is hereby designated by the City as **Daniel Fisher, P.E.**, whose address is 100 N. Andrews Avenue, 4th Floor, Fort Lauderdale, FL 33301, telephone number: **(954) 828-5850**, and email address is dfisher@fortlauderdale.gov. The Project Manager will assume all duties and responsibilities and will have the rights and authorities assigned to the Project Manager in the Contract Documents in connection with completion of the Work in accordance with this Agreement.

ARTICLE 4 – CONTRACT DOCUMENTS

The Contract Documents which comprise the entire Agreement between the City and Contractor are attached to this Agreement, are made a part hereof and consist of the following:

4.1 This Agreement.

4.2 The Contract Documents may only be altered, amended, or repealed in accordance with the specific provisions of the terms of this Agreement.

4.3 Exhibits to this Agreement: (Plans sheets [ ] to [ ] inclusive).

4.4 Public Construction Bond, Performance Bond, Payment Bond and Certificates of Insurance.

4.5 Notice of Award and Notice to Proceed.

4.6 General Conditions as amended by the Special Conditions.

4.7 Technical Specifications.

4.8 Plans/Drawings.

4.9 Addenda number _____ through _____, inclusive.

4.10 Bid Form and supplement Affidavits and Agreements.

4.11 All applicable provisions of State and Federal Law.

4.12 Invitation to Bid No., _____, Instructions to Bidders, and Bid Bond.

4.13 Contractor's response to the City's Invitation to Bid No., _____, dated _____.

4.14 Schedule of Completion and Schedule of Values.

4.15 All amendments, modifications and supplements, change orders and work directive changes issued on or after the Effective Date of the Agreement.

4.16 Any additional documents that are required to be submitted under the Agreement.

4.17 Permits on file with the City and or those permits to be obtained shall be considered directive in nature and will be considered a part of this Agreement. A copy of all permits shall be given to the City for inclusion in the Contract Documents. Terms of permits shall be met prior to acceptance of the Work and release of the final payment.

In the event of any conflict between the documents or any ambiguity or missing specification or instruction, the following priority is established:

a. Specific direction from the City Manager (or designee).

b. Approved change orders, addenda or amendments.

c. Specifications (quality) and Drawings (location and quantity).

d. Supplemental conditions or special terms.

e. General Terms and Conditions.

f. This Agreement dated _____, and any attachments.

g. Invitation to Bid No., _____, and the specifications prepared by the City.

h. Contractor's response to the City's Invitation to Bid No., _____, dated _____.

i. Schedule of Values.

j. Schedule of Completion.

If during the performance of the Work, Contractor finds a conflict, error or discrepancy in the Contract Documents, Contractor shall so report to the Project Manager, in writing, at once and before proceeding with the Work affected shall obtain a written interpretation or clarification from the City.

It is the intent of the specifications and plans to describe a complete Project to be constructed in accordance with the Contract Documents. Any Work that may reasonably be inferred from the specifications or plans as being required to produce the intended result shall be supplied whether or not it is specifically called for. When words which have a well-known technical or trade meaning are used to describe Work, materials, or equipment, such works shall be interpreted in accordance with such meaning. Reference to standard specifications, manuals or codes of any technical society, organization or associations, or to the code of any governmental authority whether such reference be specific or implied, shall mean the latest standard specification, manual or code in effect as of the Effective Date of this Agreement, except as may be otherwise specifically stated. However, no provision of any referenced standard specification, manual or code (whether or not specifically incorporated by reference in the Contract Documents) shall change the duties and responsibilities of the City, the Contractor, or any of their agents or employees from those set forth in the Contract Documents.

ARTICLE 5 – CONTRACT TIME

5.1 The Contractor recognizes that **TIME IS OF THE ESSENCE**. The Work shall commence within **60** calendar days of the date of the Notice to Proceed.

5.2 The Work shall be Substantially Completed within **110** calendar days after the date when the Contract Time commences to run as provided in the Notice to Proceed.

5.3 The Work shall be finally completed on the Final Completion Date and ready for final payment in accordance with this Agreement within **140** calendar days after the date when the Contract Time commences to run as provided in the Notice to Proceed.

ARTICLE 6 – CONTRACT PRICE

6.1 City shall pay Contractor for performance of the Work in accordance with Article 7, subject to additions and deletions by Change Order, as provided for in this Agreement.

6.2 The parties expressly agree that the Contract Price, which shall not exceed the amount of **$**_____, constitutes the total maximum compensation payable to Contractor for performing the Work, plus any Work done pursuant to a Change Order. The Contract Price is in accordance with the line item unit prices listed in the Bid. Line items are based on a unit price cost multiplied by a defined quantity. Any

additional duties, responsibilities and obligations assigned to or undertaken by Contractor shall be at Contractor's expense without change to the Contract Price.

6.3 The Contract Price constitutes the compensation payable to Contractor for performing the Work plus any Work done pursuant to a Change Order. All duties, responsibilities and obligations assigned to or undertaken by Contractor shall be at Contractor's expense without change in the Contract price.

ARTICLE 7 – PAYMENT

7.1 Contractor shall submit Applications for Payment in accordance with the Contract Documents. Applications for Payment will be processed by City as provided in the General Conditions.

7.2 Progress Payments. City shall make progress payments on account of the Contract Price on the basis of Contractor's monthly Applications for Payment, which shall be submitted by the Contractor between the first (1st) and the tenth (10th) day after the end of each calendar month for which payment is requested. All progress payments will be made on the basis of the progress of the Work completed.

7.3 Prior to Final Completion, progress payments will be made in an amount equal to ninety percent (90%) of the value of Work completed less in each case the aggregate of payments previously made.

7.4 Final Payment. Upon final completion of the Work in accordance with the General Conditions, as may be supplemented, the City shall pay Contractor an amount sufficient to increase total payments to one-hundred percent (100%) of the Contract Price. However, not less than ten percent (10%) of the Contract Price shall be retained until Record Drawings (as-builts), specifications, addenda, modifications and shop drawings, including all manufacturers' instructional and parts manuals are delivered to and accepted by the City.

7.5 City may withhold, in whole or in part, payment to such extent as may be necessary to protect itself from loss on account of:

7.5.1 Defective work not remedied.
7.5.2 Claims filed or reasonable evidence indicating probable filing of claims by other parties against Contractor or City because of Contractor's performance.
7.5.3 Failure of Contractor to make payments properly to Subcontractors or for material or labor.
7.5.4 Damage to another contractor not remedied.
7.5.5 Liquidated damages and costs incurred by Consultant for extended construction administration, if applicable.
7.5.6 Failure of Contractor to provide any and all documents required by the Contract Documents.

When the above grounds are removed or resolved satisfactory to the Project Manager, payment shall be made in whole or in part.

7.6 The City shall make payment to the Contractor in accordance with the Florida Prompt Payment Act, Section 218.70, Florida Statutes.

7.7 The City shall make payment to the Contractor through utilization of the City's P-Card Program. The City has implemented a Purchasing Card Program utilizing both VISA and MASTERCARD network. Purchases made from this Contract shall be made using the City's Purchasing Card. Contractor will receive payment from the purchasing card in the same manner as other credit card purchases. Accordingly, bidders must presently have the ability to accept these credit cards or take whatever steps necessary to implement the ability before the start of the contract term, or contract award by the City. The City reserves the right to revise this program as necessary. All costs associated with the implementation of this purchasing program shall be borne by the Contractor.

ARTICLE 8 – CONTRACTOR'S REPRESENTATIONS

In order to induce the City to enter into this Agreement, Contractor makes the following representations upon which the City has relied:

8.1 Contractor is qualified in the field of public construction and in particular to perform the Work and services set forth in this Agreement.

8.2 Contractor has visited the Work Site, has conducted extensive tests, examinations and investigations and represents and warrants a thorough familiarization with the nature and extent of the Contract Documents, the Work, locality, soil conditions, moisture conditions and all year-round local weather and climate conditions (past and present), and, in reliance on such tests, examination and investigations conducted by Contractor and the Contractor's experts, has determined that no conditions exist that would in any manner affect the Proposed Price and that the project can be completed for the Proposed Price submitted within the Contract Time as defined in this Agreement. Furthermore, Contractor warrants and confirms that he is totally familiar with, understands and obligates Contractor to comply with all federal, state and local laws, ordinances, rules, regulations and all market conditions that affect or may affect the cost and price of materials and labor needed to fulfill all provisions of this Agreement or that in any manner may affect cost, progress or performance of the Work.

8.3 The Contractor has satisfied itself as to the nature and location of the Work under the Contract Documents, the general and local conditions of the Project, particularly those bearing upon availability of transportation, disposal, handling and storage of materials, availability of labor, water, electric power, and roads, the conformation and conditions at the ground based on City provided reports, the type of equipment and facilities needed preliminary to and during the prosecution of the Work and all other matters which can in any way affect the Work or the cost thereof under the Contract Documents.

8.4 The Contractor has also studied carefully all reports of investigations and tests of subsurface and latent physical conditions at the site or otherwise affecting cost, progress or performance of the Works, and finds and has further determined that no conditions exist that would in any manner affect the Proposed Price and that the project can be completed for the Proposed Price submitted.

8.5 Contractor has made or caused to be made examinations, investigations, tests and studies of such reports and related data in addition to those referred to in Paragraphs 8.2, 8.3 and 8.4 above as he deems necessary for the performance of the Work at the Contract Prices, within the Contract Time and in accordance with the other terms and conditions of the Contract Documents; and no additional examinations, investigations, tests, reports or similar data are, or will be, required by Contractor for such purposes.

8.6 Contractor has correlated the results of all such observations, examinations, investigations, tests, reports and data with the terms and conditions of the Contract Documents.

8.7 Contractor has given City written notice of all conflicts, errors or discrepancies that he has discovered in the Contract Documents and the written resolution by City is acceptable to the Contractor.

8.8 Labor

8.8.1 The Contractor shall provide competent, suitable qualified personnel to survey and lay out the Work and perform construction as required by the Contract Documents. The Contractor shall at all times maintain good discipline and order at the site.

8.8.2 The Contractor shall, at all times, have a competent superintendent, capable of reading and thoroughly understanding the drawings and specifications, as the Contractor's agent on the Work, who shall, as the Contractor's agent, supervise, direct and otherwise conduct the Work.

8.8.3 The Contractor shall designate the superintendent on the job to the City, in writing, immediately after receipt of the Notice to Proceed. The Contractor understands and agrees that the superintendent's physical presence on the job site is indispensable to the successful completion of the Work. If the superintendent is frequently absent from the job site, the Project Manager may deliver written notice to the Contractor to stop work or terminate the Contract in accordance with Article 17.

8.8.4 The Contractor shall assign personnel to the job site that have successfully completed training programs related to trench safety, confined space and maintenance of traffic. A certified "competent person" shall be assigned to the job site. Personnel certified by the International Municipal Signal Associations with Florida Department of Transportation qualifications are required relative to maintenance of traffic. Failure to pursue the Work with the properly certified supervisory staff may result in notice to stop work or terminate the Contract in accordance with Article 17.

8.9 Materials:

8.9.1 The Contractor 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, initial operation and completion of Work.

8.9.2 All material and equipment shall be of good quality and new, except as otherwise provided in the Contract Documents. Suppliers shall be selected and paid by the Contractor; the City reserves the right to approve all suppliers and materials.

8.10 Work Hours: Except in connection with the safety or protection of persons, or the Work, or property at the site or adjacent thereto, and except as otherwise indicated in the Supplementary Conditions, all work at the site shall be performed during regular working hours between 7 a.m. and 6:00 p.m., Monday through Friday. The Contractor will not permit overtime work or the performance of work on Saturday, Sunday or any legal holiday (designated by the City of Fort Lauderdale) without the Project Manager's written consent at least seventy-two (72) hours in advance of starting such work. If the Project Manager permits overtime work, the Contractor shall pay for the additional charges to the City with respect to such overtime work. Such additional charges shall be a subsidiary obligation of the Contractor and no extra payment shall be made to the Contractor for overtime work. It shall be noted that the City's Inspector work hours are from 8:00 a.m. to 4:30 p.m. and any work requiring inspection oversight being performed outside of this timeframe shall be paid for by the Contractor as Inspector overtime. The cost to the Contractor to reimburse the City for overtime inspection is established at direct-labor and overtime costs for each person or inspector required. Incidental overtime costs for engineering, testing and other related services will also be charged to the Contractor at the actual rate accrued.

8.11 Patent Fee and Royalties: The Contractor shall pay all license fees and royalties and assume all costs incident to the use in the performance of the Work or the incorporation in the Work, or any invention, design, process, product or device which is the subject of patent rights or copyrights held by others. The Contractor hereby expressly binds himself or itself to indemnify and save harmless the City from all such claims and fees and from any and all suits and action of every name and description that may be brought against City on account of any such claims, fees, royalties, or costs for any such invention or patent, and from any and all suits or actions that may be brought against said City for the infringement of any and all patents or patent rights claimed by any person, firm corporation or other entity.

8.12 Permits: The Contractor shall obtain and pay for all permits and licenses. There shall be no allowance for Contractor markup, overhead or profit for permits and licenses. The Contractor shall pay all government charges which are applicable at the time of opening of proposals. It shall be the responsibility of the Contractor to secure and pay for all necessary licenses and permits of a temporary nature necessary for the prosecution of Work.

8.13 Law and Regulations: The Contractor shall give all notices and comply with all laws, ordinances, rules and regulations applicable to the Work. If the Contractor observes that the specifications or plans are at variance therewith, the Contractor shall give the Project Manager prompt written notice thereof, and any necessary changes shall be adjusted by any appropriate modifications. If the Contractor performs any work knowing or having reason to know that it is contrary to such laws, ordinances, rules and regulations, and without such notice to the Project Manager, the Contractor shall bear all costs arising therefrom; however, it shall not be the Contractor's primary responsibility to make certain that the specifications and plans are in accordance with such laws, ordinances, rules and regulations.

8.14 Taxes: The Contractor shall pay all sales, consumer, use and other similar taxes required to be paid by him in accordance with the laws of the City of Fort Lauderdale, County of Broward, State of Florida.

8.15 Contractor Use of Premises: The Contractor shall confine construction equipment, the storage of materials and equipment and the operations of workmen to areas permitted by law, ordinances, permits and/or the requirements of the Contract Documents, and shall not unreasonably encumber the premises with construction equipment or other materials or equipment.

The Contractor shall not enter upon private property for any purpose without first securing the permission of the property owner in writing and furnishing the Project Manager with a copy of said permission. This requirement will be strictly enforced, particularly with regard to such vacant properties as may be utilized for storage or staging by the Contractor.

The Contractor shall conduct his work in such a manner as to avoid damage to adjacent private or public property. Any damage to existing structures of work of any kind, including permanent reference markers or property corner markers, or the interruption of a utility service, shall be repaired or restored promptly at no expense to the City or property owner.

The Contractor will preserve and protect all existing vegetation such as trees, shrubs and grass on or adjacent to the site which do not reasonably interfere with the construction, as determined by the Project Manager. The Contractor will be responsible for repairing or replacing any trees, shrubs, lawns and landscaping that may be damaged due to careless operation of equipment, stockpiling of materials, tracking of grass by equipment or other construction activity. The Contractor will be liable for, or will be required to replace or restore at no expense to the City all vegetation not protected or preserved as required herein that may be destroyed or damaged.

During the progress of the work, the Contractor shall keep the premises free from accumulations of waste materials, rubbish and debris resulting from the Work. At the completion of the Work, the Contractor shall remove all waste materials, rubbish and debris from and about the premises as well as all tools, appliances, construction equipment and machinery, and surplus materials and shall leave the site clean and ready for occupancy by the City. The Contractor shall restore to their original condition those portions of the site not designated for alteration by the Contract Documents at no cost to the City.

8.16 Project Coordination: The Contractor shall provide for the complete coordination of the construction effort. This shall include, but not necessarily be limited to, coordination of the following:

8.16.1 Flow of material and equipment from suppliers.
8.16.2 The interrelated work with affected utility companies.
8.16.3 The interrelated work with the City where tie-ins to existing facilities are required.
8.16.4 The effort of independent testing agencies.
8.16.5 Notice to affected property owners as may be directed by the Project Manager.

8.17 Project Record Documents and Final As-Builts (Record Drawings): Contractor shall be responsible for maintaining up-to-date redline as-built drawings, on site, at all times during construction. All as-built information shall be surveyed and verified by a professional land surveyor registered in the State of Florida. Contractor shall provide the City with a minimum of three (3) sets of signed and sealed record drawings (Final As-Builts) and a CD of the electronic drawings files created in AutoCad 2014 or later. All costs associated with survey work required for construction layout and as-built preparation shall be the responsibility of the Contractor.

8.18 Safety and Protection:

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

8.18.1.1 All employees working on the project and other persons who may be affected thereby.

8.18.1.2 All the Work and all materials or equipment to be incorporated therein, whether in storage on or off the site.

8.18.1.3 Other 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.

8.18.2 The Contractor shall comply with all applicable laws, ordinances, rules, regulations and orders of any public body having jurisdiction for the safety of persons or property or to protect them from damage, injury or loss; and shall erect and maintain all necessary safeguards for such safety and protection. The Contractor shall notify owners of adjacent property and utilities when execution of the Work may affect them at least seventy-two (72) hours in advance (unless otherwise required). All damage, injury or loss to any property caused, directly or indirectly, in whole or in part by the Contractor, any subcontractor or anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable, shall be remedied by the Contractor. The Contractor's duties and responsibilities for safety and protection of the Work shall continue until such time as all the Work is completed and accepted by the City.

8.19 Emergencies: In emergencies affecting the safety or protection of persons or the Work or property at the site or adjacent thereto, the Contractor, without special instruction or authorization from the City is obligated to act to prevent threatened damage, injury or loss. The Contractor shall give the Project Manager prompt written notice of any significant changes in the Work or deviations from the Contract Documents caused thereby.

8.20 Risk of Loss: The risk of loss, injury or destruction shall be on the Contractor until acceptance of the Work by the City. Title to the Work shall pass to the City upon acceptance of the Work by the City.

8.21 Environmental: The Contractor has fully inspected the Premises and agrees, except as to the presence of any asbestos, to accept the Premises in an "as is" physical condition, without representation or warranty by the City of any kind, including, without limitation, any and all existing environmental claims or obligations that may arise from the presence of any "contamination" on, in or about the Premises. Further, Contractor and all entitles claiming by, through or under the Contractor, releases and discharges the City, from any claim, demand, or cause of action arising out of or relating to the Contractor's use, handling, storage, release, discharge, treatment, removal, transport, decontamination, cleanup, disposal and/or presence of any hazardous substances including asbestos on, under, from or about the Premises. The Contractor shall have no liability for any pre-existing claims or "contamination" on the Premises.

The Contractor shall not use, handle, store, discharge, treat, remove, transport, or dispose of Hazardous Substances including asbestos at, in, upon, under, to or from the Premises until receipt of instructions from the City. At such time, a City approved Change Order, which shall not include any profit, shall authorize the Contractor to perform such services.

The Contractor shall immediately deliver to the Project Manager complete copies of all notices, demands, or other communications received by the Contractor from any governmental or quasi-governmental authority or any insurance company or board of fire underwriters or like or similar entities regarding in any way alleged violations or potential violations of any Environmental Law or otherwise asserting the existence or potential existence of any condition or activity on the Premises which is or could be dangerous to life, limb, property, or the environment.

For other and additional consideration, the Contractor hereby agrees, at its sole cost and expense, to indemnify and protect, defend, and hold harmless the City and its respective employees, agents, officials, officers, representatives, contractors and subcontractors, successors, and assigns (hereafter the "City") from and against any and all claims, demands, losses, damages, costs, expenses, including but not limited to mitigation, restoration, and natural restoration expenses, liabilities, assessments, fines, penalties charges, administrative and judicial proceedings and orders, judgments, causes of action, in law or in equity, remedial action requirements and/or enforcement actions of any kind (including, without limitation, attorneys' fees and costs) directly or indirectly arising out of or attributable to, in whole or in part, the Contractor's use, handling, storage, release, threatened release, discharge, treatment, removal, transport, decontamination, cleanup, disposal and/or presence of a Hazardous Substance (excluding asbestos) on, under, from, to or about the Premises or any other activity carried on or undertaken on or off the Premises by the Contractor or its employees, agents or subcontractors, in connection with the use, handling, storage, release, threatened release, discharge, treatment, mitigation, natural resource restoration, removal, transport, decontamination, cleanup, disposal and/or presence or any Hazardous Substance including asbestos located, transported, or present on, undue, from, to, or about the Premises. This indemnity is intended to be operable under 42 U.S.C. sections 9607, as amended, and any successor section.

The scope of the indemnity obligations includes, but is not limited to: (a) all consequential damages; (b) the cost of any required or necessary repair, cleanup, or detoxification of the applicable real estate and the preparation and implementation of any closure, remedial or other required plan, including without limitation; (i) the costs of

removal or remedial action incurred by the United States government or the State of Florida or response costs incurred by any other person, or damages from injury to destruction of, or loss of, natural resources, including the cost of assessing such injury, destruction, or loss, incurred pursuant to the Comprehensive Environmental Response, Compensation and Liability Act, as amended; (ii) the clean-up costs, fines, damages, or penalties incurred pursuant to any applicable provisions of Florida law; and (iii) the cost and expenses of abatement, correction or cleanup, fines, damages, response costs, or penalties which arise from the provisions of any other statute, law, regulation, code ordinance, or legal requirement state or federal; and (c) liability for personal injury or property damage arising under any statutory or common law tort theory, including damages assessed for the maintenance of a public private nuisance, response costs, or for the carrying on of an abnormally dangerous activity.

8.22 No Extended Damages: For other and additional good and valuable consideration the receipt and sufficiency of which is hereby acknowledged, the Contractor covenants and agrees that in the event of any delay of construction or for any other reason or allegation or claim, and notwithstanding the reason of the delay, reason, claim or allegation or who caused them or the construction delay or whether they were caused by the City, that there will be no entitlement to Contractor to or for any direct or indirect financial damages or losses for extended corporate overhead impact, extended project overhead impacts, project support services, mobilization or demobilization or by whatever other label or legal concept or theory and types of names or labels or basis such claims may have, or any business damages or losses of whatever type or nature, and Contractor hereby waives any right to make any such claim or claims. This provision will have application and effect when construction delays are anticipated and agreed upon by both the City and the Contractor.

8.23 No Liens: If any Subcontractor, supplier, laborer, or materialmen of Contractor or any other person directly or indirectly acting for or through Contractor files or attempts to file a mechanic's or construction lien against the real property on which the work is performed or any part or against any personal property or improvements or claim against any monies due or to become due from the City to Contractor or from Contractor to a Subcontractor, for or on account of any work, labor, services, material, equipment, or other items furnished in connection with the Work or any Change Order, Contractor agrees to satisfy, remove, or discharge such lien or claim at its own expense by bond, payment, or otherwise within twenty (20) days of the filing or from receipt of written notice from the City.

Additionally, until such time as such lien or claim is satisfied, removed or discharged by Contractor, all monies due to Contractor, or that become due to Contractor before the lien or claim is satisfied, removed or otherwise discharged, shall be held by City as security for the satisfaction, removal and discharge of such lien and any expense that may be incurred while obtaining such. If Contractor shall fail to do so, City shall have the right, in addition to all other rights and remedies provided by this Agreement or by law, to satisfy, remove, or discharge such lien or claim by whatever means City chooses at the entire and sole cost and expense of Contractor which costs and expenses shall, without limitation, include attorney's fees, litigation costs, fees and expenses and all court costs and assessments.

8.24 Weather Emergencies: Upon issuance of a Hurricane Watch by the National Weather Service, the Contractor shall submit to the City a plan to secure the work area in the

event a Hurricane Warning is issued. The plan shall detail how the Contractor will secure the Premises, equipment and materials in a manner as to prevent damage to the Work and prevent materials and equipment from becoming a hazard to persons and property on and around the Premises. The plan shall include a time schedule required to accomplish the hurricane preparations and a list of emergency contacts that will be available and in the City before, during and immediately after the storm.

Upon issuance of a Hurricane Warning by the National Weather Service, if the Contractor has not already done so, the Contractor shall implement its hurricane preparedness plan. Cost of development and implementation of the hurricane preparedness plan shall be considered as incidental to construction. Cost of any clean up and rework required after the storm will be considered normal construction risk within Florida and shall not entitle the Contractor to any additional compensation. Contractor shall be entitled to request an extension in time for completion of the Work, in accordance with the provisions of Article 15 of this Agreement, equal to the time he is shut down for implementation of the preparedness plan, the duration of the storm and a reasonable period to restore the Premises.

8.25 Force Majeure: No Party shall hold the other responsible for damages or for delays in performance caused by force majeure, acts of God, or other acts or circumstances beyond the control of the other party or that could not have been reasonably foreseen and prevented. For this purposes, such acts or circumstances shall include, but not be limited to weather conditions affecting performance, floods, epidemics, war, riots, strikes, lockouts, or other industrial disturbances, or protest demonstrations. Should such acts or circumstances occur, the parties shall use their best efforts to overcome the difficulties arising therefrom and to resume the Work as soon as reasonably possible with the normal pursuit of the Work.

Inclement weather, continuous rain for less than three (3) days or the acts or omissions of subcontractors, third-party contractors, materialmen, suppliers, or their subcontractors, shall not be considered acts of force majeure.

No Party shall be liable for its failure to carry out its obligations under the Agreement during a period when such Party is rendered unable by force majeure to carry out its obligation, but the obligation of the Party or Parties relying on such force majeure shall be suspended only during the continuance of the inability and for no longer period than the unexpected or uncontrollable event.

The Contractor further agrees and stipulates, that its right to excuse its failure to perform by reason of force majeure shall be conditioned upon giving written notice of its assertion that a Force Majeure delay has commenced within 96 hours after such an occurrence. The CONTRACTOR shall use its reasonable efforts to minimize such delays. The CONTRACTOR shall promptly provide an estimate of the anticipated additional time required to complete the Project.

8.26 Participation by Disadvantaged Business Enterprises in Department of Transportation Financial Assisted Contracts: The recipient shall not discriminate on the basis of race, color, national origin, or sex in the award and performance of any DOT-assisted contract or in the administration of its DBE program or the requirements of 49 CFR part 26. The recipient shall take all necessary and reasonable steps under 49 CFR part 26 to ensure nondiscrimination in the award and administration of DOT-assisted

contracts. The recipient's DBE program, as required by 49 CFR part 26 and as approved by DOT, is incorporated by reference in this agreement. Implementation of this program is a legal obligation and failure to carry out its terms shall be treated as a violation of this agreement. Upon notification to the recipient of its failure to carry out its approved program, the Department may impose sanctions as provided for under part 26 and may, in appropriate cases, refer the matter for enforcement under 18 U.S.C. 1001 and/or the Program Fraud Civil Remedies Act of 1986 (31 U.S.C. 3801 *et seq.*).

Additionally, the contractor assures that they, the sub recipient or the subcontractor shall not discriminate on the basis of race, color, national origin, or sex in the performance of this contract. The contractor shall carry out applicable requirements of 49 CFR part 26 in the award and administration of DOT-assisted contracts. Failure by the contractor to carry out these requirements is a material breach of this contract, which may result in the termination of this contract or such other remedy as the recipient deems appropriate. (This additional language must be included in each subcontract the prime contractor signs with a subcontractor.)

ARTICLE 9 – CITY'S RESPONSIBILITIES

9.1 The City shall furnish the data required of the City under the Contract Documents promptly and shall make payments to the Contractor promptly after they are due as provided in Article 7.

9.2 The City's duties in respect of providing lands and easements and providing engineering surveys to establish reference points are set forth in the Contract Documents.

9.3 <u>Technical Clarifications and Interpretations:</u>

9.3.1 The City shall issue, with reasonable promptness, such written clarifications or interpretations of the Contract Documents as it may determine necessary, which shall be consistent with or reasonably inferable from the overall intent of the Contract Documents. Should the Contractor fail to request interpretation of questionable items in the Contract Documents, the City shall not entertain any excuse for failure to execute the Work in a satisfactory manner.

9.3.2 The City shall interpret and decide matters concerning performance under the requirements of the Contract Documents, and shall make decisions on all claims, disputes or other matters in question. Written notice of each claim, dispute or other matter will be delivered by claimant to the other Party but in no event later than five (5) days after the occurrence of event, and written supporting date will be submitted to the other Party within five (5) days after such occurrence. All written decisions of the City on any claim or dispute will be final and binding.

9.4 The Contractor shall perform all Work to the reasonable satisfaction of the City in accordance with the Contract Documents. In cases of disagreement or ambiguity, the City shall decide all questions, difficulties, and disputes of whatever nature, which may arise under or by reason of this Agreement or the quality, amount and value of the Work, and the City's decisions on all claims, questions and determination are final.

ARTICLE 10 – BONDS AND INSURANCE

10.1 Public Construction and Other Bonds: The Contractor shall furnish Public Construction or Performance and Payment Bonds ("Bond"), each in an amount at least equal to the Contract Price as security for the faithful performance and payment of all the Contractor's obligations under the Contract Documents. These Bonds shall remain in effect until at least one (1) year after the date of final payment, except as otherwise provided by law. All Bonds shall be furnished and provided by the surety and shall be in substantially the same form as prescribed by the Contract Documents and be executed by such sureties as (i) are licensed to conduct business in the State of Florida, and (ii) are named in the current list of Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies as published in Circular 570 (amended) by the Audit Staff Bureau of Accounts, U.S. Treasury Department and (iii) otherwise meet the requirements set forth herein that apply to sureties. All Bonds signed by an agent must be accompanied by a certified copy of the authority to act.

10.1.1 Performance Bond: The Contractor shall execute and record in the public records of Broward County, Florida, a payment and performance bond in an amount at least equal to the Contract Price with a surety insurer authorized to do business in the State of Florida as surety, ("Bond"), in accordance with Section 255.05, Florida Statutes (2014), as may be amended or revised, as security for the faithful performance and payment of all of the Contractor's obligations under the Contract Documents.

A Corporate Surety Bond legally issued, meeting the approval of, and running to the City in an amount not less than the Contract Price of such improvements, conditioned that the Contractor shall maintain and make all repairs to the improvements constructed by the Contractor at their own expense and free of charge to the City, for the period of one (1) year after the date of acceptance of the Work within such period by reason of any imperfection of the material used or by reason of any defective workmanship, or any improper, imperfect or defective preparation of the base upon which any such improvement shall be laid.

10.2 Disqualification of Surety: If the Surety on any Bond furnished by the Contractor is declared bankrupt or becomes insolvent or its right to do business is terminated in the State of Florida or it ceases to meet the requirements of clauses (i) and (ii) of Paragraph 10.1, the Contractor shall within five (5) days thereafter substitute another Bond and Surety, both of which shall be acceptable to the City.

10.3 Insurance

10.3.1 As a condition precedent to the effectiveness of this Agreement, during the term of this Agreement and during any renewal or extension term of this Agreement, the Contractor, at the Contractor's sole expense, shall provide insurance of such types and with such terms and limits as noted below. Providing proof of and maintaining adequate insurance coverage are material obligations of the Contractor. The Contractor shall provide the City a certificate of insurance evidencing such coverage. The Contractor's insurance coverage shall be primary insurance for all applicable policies. The limits of coverage under each

policy maintained by the Contractor shall not be interpreted as limiting the Contractor's liability and obligations under this Agreement. All insurance policies shall be from insurers authorized to write insurance policies in the State of Florida and that possess an A.M. Best rating of A-, VII or better. All insurance policies are subject to approval by the City's Risk Manager.

The coverages, limits, and endorsements required herein protect the interests of the City, and these coverages, limits, and endorsements may not be relied upon by the Contractor for assessing the extent or determining appropriate types and limits of coverage to protect the Contractor against any loss exposure, whether as a result of this Agreement or otherwise. The requirements contained herein, as well as the City's review or acknowledgement, are not intended to and shall not in any manner limit or qualify the liabilities and obligations assumed by the Contractor under this Agreement.

The following insurance policies and coverages are required:

10.3.2 Commercial General Liability

Coverage must be afforded under a Commercial General Liability policy with limits not less than:

- $1,000,000 each occurrence and $2,000,000 aggregate for Bodily Injury, Property Damage, and Personal and Advertising Injury
- $1,000,000 each occurrence and $2,000,000 aggregate for Products and Completed Operations

Policy must include coverage for Contractual Liability and Independent Contractors.

The City and the City's officers, employees, and volunteers are to be covered as additional insureds with a CG 20 26 04 13 Additional Insured – Designated Person or Organization Endorsement or similar endorsement providing equal or broader Additional Insured Coverage with respect to liability arising out of activities performed by or on behalf of the Contractor. The coverage shall contain no special limitation on the scope of protection afforded to the City or the City's officers, employees, and volunteers.

10.3.3 Business Automobile Liability

Coverage must be afforded for all Owned, Hired, Scheduled, and Non-Owned vehicles for Bodily Injury and Property Damage in an amount not less than $1,000,000 combined single limit each accident.

If the Contractor does not own vehicles, the Contractor shall maintain coverage for Hired and Non-Owned Auto Liability, which may be satisfied by way of endorsement to the Commercial General Liability policy or separate Business Auto Liability policy.

10.3.4 Workers' Compensation and Employer's Liability

Coverage must be afforded per Chapter 440, Florida Statutes. Any person or entity performing work for or on behalf of the City must provide Workers' Compensation insurance. Exceptions and exemptions will be allowed by the City's Risk Manager, if they are in accordance with Florida Statute.

The Contractor waives, and the Contractor shall ensure that the Contractor's insurance carrier waives, all subrogation rights against the City and the City's

officers, employees, and volunteers for all losses or damages. The City requires the policy to be endorsed with WC 00 03 13 Waiver of our Right to Recover from Others or equivalent.

The Contractor must be in compliance with all applicable State and federal workers' compensation laws, including the U.S. Longshore Harbor Workers' Act and the Jones Act, if applicable.

10.3.5 Umbrella/Excess Liability: The Contractor shall provide umbrella/excess coverage with limits of no less than $2,000,000 excess of Commercial General Liability, Automobile Liability and Employer's Liability.

Insurance Certificate Requirements

a. The Contractor shall provide the City with valid Certificates of Insurance (binders are unacceptable) no later than thirty (30) days prior to the start of work contemplated in this Agreement.
b. The Contractor shall provide to the City a Certificate of Insurance having a thirty (30) day notice of cancellation; ten (10) days' notice if cancellation is for nonpayment of premium.
c. In the event that the insurer is unable to accommodate the cancellation notice requirement, it shall be the responsibility of the Contractor to provide the proper notice. Such notification will be in writing by registered mail, return receipt requested, and addressed to the certificate holder.
d. In the event the Agreement term goes beyond the expiration date of the insurance policy, the Contractor shall provide the City with an updated Certificate of Insurance no later than ten (10) days prior to the expiration of the insurance currently in effect. The City reserves the right to suspend the Agreement until this requirement is met.
e. The Certificate of Insurance shall indicate whether coverage is provided under a claims-made or occurrence form. If any coverage is provided on a claims-made form, the Certificate of Insurance must show a retroactive date, which shall be the effective date of the initial contract or prior.
f. The City shall be named as an Additional Insured on all liability policies, with the exception of Workers' Compensation.
g. The City shall be granted a Waiver of Subrogation on the Contractor's Workers' Compensation insurance policy.
h. The title of the Agreement, Bid/Contract number, event dates, or other identifying reference must be listed on the Certificate of Insurance.

The Certificate Holder should read as follows:
City of Fort Lauderdale
100 N. Andrews Avenue
Fort Lauderdale, FL 33301

The Contractor has the sole responsibility for the payment of all insurance premiums and shall be fully and solely responsible for any costs or expenses as a result of a coverage deductible, co-insurance penalty, or self-insured retention; including any loss not covered because of the operation of such deductible, co-insurance penalty, self-insured retention, or coverage exclusion or limitation. Any costs for adding the City as an Additional Insured shall be at the Contractor's expense.

If the Contractor's primary insurance policy/policies do not meet the minimum requirements, as set forth in this Agreement, the Contractor may provide evidence of an Umbrella/Excess insurance policy to comply with this requirement.

The Contractor's insurance coverage shall be primary insurance as applied to the City and the City's officers, employees, and volunteers. Any insurance or self-insurance maintained by the City covering the City, the City's officers, employees, or volunteers shall be non-contributory.

Any exclusion or provision in the insurance maintained by the Contractor that excludes coverage for work contemplated in this Agreement shall be unacceptable and shall be considered breach of contract.

All required insurance policies must be maintained until the contract work has been accepted by the City, or until this Agreement is terminated, whichever is later. Any lapse in coverage shall be considered breach of contract. In addition, Contractor must provide to the City confirmation of coverage renewal via an updated certificate should any policies expire prior to the expiration of this Agreement. The City reserves the right to review, at any time, coverage forms and limits of Contractor's insurance policies.

The Contractor shall provide notice of any and all claims, accidents, and any other occurrences associated with this Agreement shall be provided to the Contractor's insurance company or companies and the City's Risk Management office as soon as practical.

It is the Contractor's responsibility to ensure that any and all of the Contractor's independent contractors and subcontractors comply with these insurance requirements. All coverages for independent contractors and subcontractors shall be subject to all of the applicable requirements stated herein. Any and all deficiencies are the responsibility of the Contractor.

Contractor must keep insurance in force until the third anniversary of expiration of this Agreement or the third anniversary of acceptance of work by the City.

NOTE: CITY PROJECT NUMBER AND NAME MUST APPEAR ON EACH CERTIFICATE, AND THE CITY OF FORTLAUDERDALE MUST BE NAMED ON THE CERTIFICATE AS AN "ADDITIONAL INSURED" ON ALL LIABILITY POLICIES, WITH THE EXCEPTION OF WORKERS' COMPENSATION.

A Sample Insurance Certificate shall be included with the proposal to demonstrate the firm's ability to comply with insurance requirements. Provide a previous certificate or other evidence listing the insurance companies' names for all required coverage, and the dollar amounts of the coverage.

ARTICLE 11- WARRANTY AND GUARANTEE, TESTS AND INSPECTIONS, CORRECTION, REMOVAL OR ACCEPTANCE OF DEFECTIVE WORK

11.1 Warranty: The Contractor warrants and guarantees to the City that all Work will be in accordance with the Contract Documents and will not be defective. Prompt notice of all defects shall be given to the Contractor. All defective work, whether or not in place, may be rejected, corrected or accepted as provided in this Article.

11.1.1 Warranty of Title: The Contractor warrants to the City that it possesses good, clear and marketable title to all equipment and materials provided and that there are no pending liens, claims or encumbrances against the equipment and materials.

11.1.2 Warranty of Specifications: The Contractor warrants that all equipment, materials and workmanship furnished, whether furnished by the Contractor, its subcontractors or suppliers, will comply with the specifications, drawings and other descriptions supplied or adopted and that all services will be performed in a workmanlike manner.

11.1.3 Warranty of Merchantability: The Contractor warrants that any and all equipment to be supplied pursuant to this Agreement is merchantable, free from defects, whether patent or latent in material or workmanship, and fit for the ordinary purposes for which it is intended.

11.2 Tests and Inspections: Contractor shall retain the services of an independent, certified, testing lab to perform all testing as required by the specifications, Contract drawings, and any applicable permitting agency. Contractor shall provide evidence of certification to the City before the work and testing is done. Testing results shall be submitted to the Engineer for review and approval at the time the results are provided to the Contractor. The Contractor shall give the Project Manager and City Inspector a minimum of twenty-four (24) hours' advanced notice of readiness of the Work for all required inspections, tests, or approvals and shall notify all applicable permitting agencies in a timely manner based on requirements set forth in the permit documents.

11.2.1 Neither observations by the Project Manager nor inspections, tests or approvals by others shall relieve the Contractor from its obligations to perform the Work in accordance with the Contract Documents.

11.3 Uncovering Work: If any work that is to be inspected, tested or approved is covered without approval or consent of the Project Manager, it must, if requested by the Project Manager, be uncovered for observation and/or testing. Such uncovering and replacement shall be at the Contractor's sole expense unless the Contractor has given the Project Manager timely notice of the Contractor's intention to cover such Work and the Project Manager has not acted with reasonable promptness in response to such notice.

11.3.1 If the Project Manager considers it necessary or advisable that Work covered in accordance with Paragraph 11.2.1, 11.2.2 and 11.2.3 be observed by the City or inspected or tested by others, the Contractor at the City's request, shall uncover, expose or otherwise make available for observation, inspection or testing as the Project Manager may require, that portion of the Work in question, furnishing all necessary labor, material and equipment. If it is found that such Work is defective, the Contractor shall bear all the expenses of such uncovering, exposure, observation, inspection and testing and of satisfactory reconstruction, including compensation for additional professional services, and an appropriate deductive Change Order shall be issued. If, however, such work is not found to be defective, the Contractor shall be allowed an increase in the Contract Price or an extension of the Contract Time, or both, directly

attributable to such uncovering, exposure, observation, inspection testing and reconstruction if he makes a claim therefore as provided in Articles 14 and 15.

11.4 City May Stop the Work: If the Work is defective, or the Contractor fails to supply sufficient skilled supervisory personnel or workmen or suitable materials or equipment or the work area is deemed unsafe, the City may order the Contractor 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 or any other party. The City will not award any increase in Contract Price or Contract Time if the Work is stopped due to the circumstances described herein.

11.5 Correction or Removal of Defective Work Before Final Payment: If required by the Project Manager, the Contractor shall promptly, without cost to the City and as Specified by the Project Manager, either correct any defective Work, whether or not fabricated, installed or completed, or if the Work has been rejected by the City remove it from the site and replace it with non-defective Work.

11.6 One Year Correction Period After Final Payment: If within one (1) year after the date of final acceptance, or such longer period of time as may be prescribed by law or by the terms of any applicable special guarantee required by the Contract Documents, any work is found to be defective, the Contractor shall promptly, without cost to the City and in accordance with the City's written instructions, either correct such defective Work, or, if it has been rejected by the City, remove it from the site and replace it with non-defective Work.

If The Contractor does not promptly comply with the terms of such instructions or in an emergency where delay would cause serious risk of loss or damage, the City may have the defective Work corrected or the rejected Work removed and replaced, and all direct and indirect costs for such removal and replacement, including compensation for additional professional services, shall be paid by the Contractor.

11.7 Acceptance of Defective Work, Deductions: If, instead of requiring correction or removal and replacement of defective Work, the City, at the city's sole option, prefers to accept it, the City may do so. In such a case, if acceptance occurs prior to the Project Manager's recommendation of final payments, a Change Order shall be issued incorporating the necessary revisions in the Contracts Documents, including appropriate reduction in the Contract Price; or if the acceptance occurs after such recommendation, an appropriate amount shall be paid by the Contractor to the City.

11.8 City May Correct Defective Work: If the Contractor fails within a reasonable time after written notice of the Project Manager to proceed to correct defective Work or to remove and replace rejected Work as required by the Project Manager in accordance with Paragraph 11.5, or if the Contractor fails to perform the Work in accordance with the Contract Documents, the City may, after seven (7) days written notice to the Contractor, correct and remedy any such deficiency. In exercising its rights under this paragraph, the City shall proceed expeditiously. To the extent necessary to complete corrective and remedial action, the City may exclude the Contractor from all or part of the site, take possession of all or part of the Work, suspend the Contractor's services related thereto and take possession of the Contractor's tools, construction equipment and materials stored at the site or elsewhere. The Contractor shall allow the City's

representative agents and employees such access to the site as may be necessary to enable the City to exercise its rights under this paragraph. All direct and indirect costs of the City in exercising such rights shall be charged against the Contractor in an amount verified by the Project Manager, and a Change Order shall be issued incorporating the necessary revisions in the Contract Documents and a reduction in the Contract Price. Such direct and indirect costs shall include, in particular but without limitation, compensation for additional professional services required and costs of repair and replacement of work of others destroyed or damaged by correction, removal or replacement of the Contractor's defective Work. The Contractor shall not be allowed an extension of the Contract Time because of any delay in performance of the Work attributable to the exercise by the City of the City's right hereunder.

ARTICLE 12 – INDEMNIFICATION

12.1 Disclaimer of Liability: The City shall not at any time, be liable for injury or damage occurring to any person or property from any cause, whatsoever, arising out of Contractor's construction and fulfillment of this agreement.

12.2 Indemnification: For other, additional good valuable consideration, the receipt and sufficiency of which is hereby acknowledged:

12.2.1 Contractor shall, at its sole cost and expense, indemnify and hold harmless the City, its representatives, employees and elected and appointed officials from or on account of all claims, damages, losses, liabilities and expenses, direct, indirect or consequential including but not limited to fees and charges of engineers, architects, attorneys, consultants and other professionals and court costs arising out of or in consequence of the performance of this Agreement at all trial and appellate levels. Indemnification shall specifically include but not be limited to claims, damages, losses, liabilities and expenses arising out of or from (a) the negligent or defective design of the project and Work of this Agreement; (b) any act, omission or default of the Contractor, its Subcontractors, agents, servants or employees; (c) any and all bodily injuries, sickness, disease or death; (d) injury to or destruction of tangible property, including any resulting loss of use; (e) other such damages, liabilities, or losses received or sustained by any person or persons during or on account of any operations connected with the construction of this Project including the warranty period; (f) the use of any improper materials; (g) any construction defect including both patent and latent defects; (h) failure to timely complete the work; (i) the violation of any federal, state, county or city laws, ordinances or regulations by Contractor, its subcontractors, agents, servants, independent contractors or employees; (j) the breach or alleged breach by Contractor of any term of the Agreement, including the breach or alleged breach of any warranty or guarantee.

12.2.2 Contractor agrees to indemnify, defend, save and hold harmless the City, its officers, agents and employees, from all damages, liabilities, losses, claims, fines and fees, and from any and all suits and actions of every name and description that may be brought against City, its officers, agents and employees, on account of any claims, fees, royalties, or costs for any invention or patent and/or for the infringement of any and all copyrights or patent rights claimed by any person, firm, or corporation.

12.2.3 Contractor shall pay all claims, losses, liens, settlements or judgments of any nature in connection with the foregoing indemnifications including, but not limited to, reasonable attorney's fees and costs for trails and appeals.

12.2.4 If any Subcontractor, supplier, laborer, or materialmen of Contractor or any other person directly or indirectly acting for or through Contractor files or attempts to file a mechanic's or construction lien against the real property on which the work is performed or any part or against any personal property or improvements thereon or make a claim against any monies due or to become due from the City to Contractor or from Contractor to a Subcontractor, for or on account of any work, labor, services, material, equipment, or other items furnished in connection with the Work or any change order, Contractor agrees to satisfy, remove, or discharge such lien or claim at its own expense by bond, payment, or otherwise within five (5) days of the filing or from receipt of written notice from the City.

Additionally, until such time as such lien or claim is satisfied, removed or discharged by Contractor, all monies due to Contractor, or that become due to Contractor before the lien or claim is satisfied, removed or otherwise discharged, shall be held by City as security for the satisfaction, removal and discharge of such lien and any expense that may be incurred while obtaining the discharge. If Contractor shall fail to do so, City shall have the right, in addition to all other rights and remedies provided by this Agreement or by law, to satisfy, remove, or discharge such lien or claim by whatever means City chooses at the entire and sole cost and expense of Contractor which costs and expenses shall, without limitation, include attorney's fees, litigation costs, fees and expenses and all court costs and assessments, and which shall be deducted from any amount owing to Contractor. In the event the amount due Contractor is less than the amount required to satisfy Contractor's obligation under this, or any other article, paragraph or section of this Agreement, the Contractor shall be liable for the deficiency due the City.

12.2.5 The Contractor and the City agree that Section 725.06(2), Florida Statutes controls the extent and limits of the indemnification and hold harmless provisions of this Agreement, if any, and that the parties waive any defects in the wording of this Article that runs afoul of said statutory section.

ARTICLE 13 – CHANGES IN THE WORK

13.1 Without invalidating this Agreement, the City may, at any time or from time to time order additions, deletions or revisions in the Work through the issuance of Change Orders. Upon receipt of a Change Order, the Contractor shall proceed with the Work involved. All 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 as provided in Article 14 or Article 15 on the basis of a claim made by either Party.

13.2 The Project Manager may authorize minor changes in the work not involving an adjustment in the Contract Price or the Contract Time, which are consistent with the

overall intent of the Contract Documents. Such changes must be in writing and signed by the City and the Contractor.

13.3 If notice of any change affecting the general scope of the Work or change in the Contract Price is required by the provisions of any Bond to be given to the Surety, it will be the Contractor's responsibility to so notify the Surety, and the amount of each applicable Bond shall be adjusted accordingly. The Contractor shall furnish proof of such adjustment to the City.

ARTICLE 14 – CHANGE OF CONTRACT PRICE

Change of Contract Price, approved by City, shall be computed as follows:

14.1 Cost of the Work: The term "Cost of the Work" means the sum of all direct costs necessarily incurred and paid by Contractor in the proper performance of the Work. Except as otherwise may be agreed to in writing by the City, these costs shall be in amounts no higher than those prevailing in the City and shall include only the following items and shall not include any of the costs itemized in Paragraph 14.3:

14.1.1 Payroll costs for employees in the direct employ of the Contractor in the performance of the Work under schedules of job classifications agreed upon by the City and the Contractor. Payroll costs for employees not employed full time on the Work shall be apportioned on the basis of their time spent on the Work. Payroll costs shall include, but not be limited to, salaries and wages plus and cost of fringe benefits which shall include social security contributions, unemployment, excise and payroll taxes, worker's compensation, health and retirement benefits, bonuses, sick leave, vacation and applicable holiday pay.

14.1.2 Cost of all materials and equipment furnished and incorporated in the Work, including costs of transportation and storage, and required suppliers and field services. All cash discounts, rebates and refunds and all returns from sale of surplus materials and equipment shall accrue to the City, and the Contractor shall make provisions so that they may be obtained.

14.1.3 Supplemental costs including the following:

14.1.3.1 Cost, including transportation and maintenance of all materials, supplies, equipment, machinery, appliances, office and temporary facilities at the site and hand tools not owned by the workers, which are consumed in the performance of the Work.

14.1.3.2 Rentals of all construction equipment and machinery and the parts whether rented from the Contractor or others in accordance with rental agreements approved by the City, and the costs of transporting, loading, unloading, installation, dismantling and removal. The rental of any such equipment, machinery or parts shall cease when the use is no longer necessary for the Work.

14.1.3.3 Sales, consumer, use or similar taxes related to the Work and for which the Contractor is liable, imposed by laws and regulations.

14.1.3.4 Royalty payments and fees for permits and licenses.

14.1.3.5 The cost of utilities, fuel and sanitary facilities at the Work site.

14.1.3.6 Minor expenses such as telegrams, long distance telephone calls, telephone service at the site, expressage and similar petty cash items in connection with the Work.

14.1.3.7 Cost of premiums for additional bonds and insurance required because of changes in the Work.

14.2 The Contract Price may only be increased by a Change Order when Work is modified in accordance with Article 13 and approved by the City in writing. Any claim for an increase in the Contract Price resulting from a Change Order shall be based on written notice delivered to the Project Manager within ten (10) days of the occurrence of the Change Order giving rise to the claim. Notice of the amount of the claim with supporting data shall be included in the Change Order and delivered within twenty (20) days of such occurrence unless Project Manager allows an additional period of time to ascertain accurate cost data. Any change in the Contract Price resulting from any such claim shall be incorporated in the Change Order. **IT IS EXPRESSLY AND SPECIFICALLY AGREED THAT ANY AND ALL CLAIMS FOR CHANGES TO THE CONTRACT PRICE SHALL BE WAIVED IF NOT SUBMITTED IN STRICT ACCORDANCE WITH THE REQUIREMENTS OF THIS SECTION.**

14.3 Not Included in the Cost of the Work: The term "cost of the Work" shall not include any of the following:

14.3.1 Payroll costs and other compensation of the Contractor's officers executives, principals (of partnership and sole proprietorships), general managers, engineers, architects, estimators, attorneys, auditor, accountants, purchasing and contracting agents, expediters, timekeepers, clerks and other personnel employed by the Contractor whether at the site or in the Contractor's principal or branch office for general administration of the work and not specifically included in the agreed upon schedule of job classifications referred to in Paragraph 14.1.1, all of which are to be considered administrative costs covered by the Contractor's fee.

14.3.2 Expenses of the Contractor's principal and branch offices other than the Contractor's office at the site.

14.3.3 Any part of the Contractor's capital expenses, including interest on the Contractor's capital employed for the Work and charges against the Contractor for delinquent payments.

14.3.4 Cost of premiums for all bonds and for all insurance whether or not the Contractor is required by the Contract Documents to purchase and maintain the same.

14.3.5 Costs due to the negligence of the Contractor, any subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, including but not limited to, the correction of defective Work,

disposal of materials or equipment wrongly supplied and making good any damage to property.

14.3.6 Other overhead or general expense costs of any kind and the costs of any item not specifically and expressly included in Paragraph 14.1

14.4 Basis of Compensation: The Contractor's compensation, allowed to the Contractor for overhead and profit, shall be determined as follows:

14.4.1 A mutually acceptable negotiated fee:

14.4.1.1 For costs incurred under Paragraphs 14.1.1 and 14.1.2, the Contractor's fee shall not exceed five percent (5%).

14.4.1.2 No fee shall be payable on the basis of costs itemized under Paragraphs 14.1.3.1, 14.1.3.2, 14.1.3.3, 14.1.3.4, 14.1.3.5, 14.1.3.6, 14.1.3.7, 14.3.1, 14.3.2, 14.3.3, 14.3.4, 14.3.5 and 14.3.6.

14.4.1.3 The amount of credit to be allowed by the Contractor to the City for any such change which results in a net decrease plus a deduction in the Contractor's fee by an amount equal to five percent (5%) for the net decrease.

14.4.1.4 When both additions and credits are involved in any one change the combined overhead and profit shall be figured on the basis of net increase if any, however, not to exceed five percent (5%) of the agreed compensation. Profit will not be paid on any Work not performed.

14.5 Cost Breakdown Required: Whenever the cost of any Work is to be determined pursuant to this Article, the Contractor will submit in form acceptable to the City an itemized cost breakdown together with supporting documentation. Whenever a change in the Work is to be based upon mutual acceptance of a lump sum, whether the amount is an addition, credit, or no-charge-in-cost, the Contractor shall submit an estimate substantiated by a complete itemized breakdown:

14.5.1 The breakdown shall list quantities and unit prices for materials, labor, equipment and other items of cost.

14.5.2 Whenever a change involves the Contractor and one (1) or more subcontractors and the change is an increase in the agreed compensation, the overhead and profit percentage for the Contractor and each subcontractor shall be itemized separately.

14.6 Time for the City to Approve Extra Work: Any Extra Work in an amount up to and not exceeding a cumulative amount of $25,000 for a specific project can be approved by the City Manager and shall require a written Change Order proposal to be submitted to the Public Works Director for submittal and approval by the City Manager. Extra Work exceeding the cumulative amount of $25,000 for a specific project must be approved by the City Commission and a written Change Order proposal must be submitted to the Public Works Director for submittal and approval by the City Manager and City

Commission. No financial or time claim for delay to the project resulting from the Change Order approval process outlined above under Section 14.6 will be allowed.

ARTICLE 15 – CHANGE OF THE CONTRACT TIME

15.1 The Contract Time may only be changed by a Change Order. Any claim for an extension in the Contract Time shall be based on written notice delivered to the Project Manager within five (5) days of the occurrence of the event giving rise to the claim. Any change in the Contract Time resulting from any such claim shall be incorporated in a Change Order.

15.2 The Contract Time will be extended in an amount equal to time lost due to delays beyond the control of the Contractor if a claim is made there for as provided in Paragraph 15.1. Such delays shall include but not be limited to, acts or neglect by the City, or to fires, floods, labor disputes, epidemics, abnormal weather conditions, or acts of God.

15.3 All time limits stated in the Contract Documents are of the essence. The provisions of this Article 15 shall not exclude recovery for damages for delay by the Contractor.

15.4 Delays caused by or resulting from entities, contractors or subcontractors who are not affiliated with the CONTRACTOR (non-affiliated Contractors) shall not give rise to a claim by the CONTRACTOR for damages for increases in material and/or labor costs. Such entities, contractors and subcontractors include, but are not limited to, the City's contractors and subcontractors, Florida Power and Light Company, AT&T and Florida East Coast Railway, LLC.

15.5 Rights of Various Interests: Whenever work being done by City's forces or by other contractors is contiguous to or within the limits of work covered by this Contract, the respective rights of the various interests involved shall be established by the Project Manager to secure the completion of the various portions of the work in general harmony.

ARTICLE 16 – LIQUIDATED DAMAGES

16.1 Upon failure of the Contractor to complete the Work within the time specified for completion, the Contractor shall pay to the City the sum of **Five Hundred Dollars ($500.00)** for each and every calendar day that the completion of the Work is delayed beyond the time specified in this Agreement for completion, as fixed and agreed liquidated damages and not as a penalty, so long as the delay is caused by the Contractor. Should an act of God or the acts or omissions of the City, its agents or representatives, in derogation to the terms of this Agreement cause the delay, the Contractor shall not be responsible for the delay nor liquidated damages. Liquidated damages are fixed and agreed upon between the Parties, recognizing the impossibility of precisely ascertaining the amount of damages that will be sustained by the City as a consequence of such delay and both parties desiring to obviate any question of dispute concerning the amount of damages and the cost and effect of the failure of the Contractor to complete the Work on time. Liquidated damages shall apply separately to each portion of the Work for which a time of completion is given. The City shall have the right to deduct from or retain any compensation which may be due or which may become due and payable to the Contractor the amount of liquidated damages,

and if the amount retained by the City is insufficient to pay in full such liquidated damages, the Contractor shall pay all liquidated damages in full. The Contractor shall be responsible for reimbursing the City, in addition to liquidated damages or other damages for delay, for all costs of engineering, architectural fees, and inspection and other costs incurred in administering the construction of the Project beyond the completion date specified or beyond an approved extension of time granted to the Contractor whichever is later. Delays caused by or resulting from entities, contractors or subcontractors who are not affiliated with the Contractor shall not give rise to a claim by Contractor for damages for increase in material and/or labor costs. Such entities, contractors and subcontractors include, but are not limited to, the City's contractors and subcontractors, Florida Power and Light Company, AT&T, and Florida East Coast Railway, LLC.

16.2 No Extended Damages: For other and additional good and valuable consideration the receipt and sufficiency of which is hereby acknowledged, the Contractor covenants and agrees that in the event of any delay of construction or for any reason, allegation or claim, and notwithstanding the reason of the delay, reason, claim or allegation or who caused them or the construction delay or whether they were caused by the City, that there will be no entitlement to Contractor to or for any direct or indirect financial damages or losses for extended corporate overhead impact, extended project overhead impacts, project support services, mobilization or demobilization or by whatever other label or legal concept or theory and types of names or labels or basis such claims may have, or any business damages or losses of whatever type or nature, and Contractor hereby waives any right to make any such claim or claims. This provision will have application and effect when construction delays are anticipated and agreed upon by both the City and the Contractor.

ARTICLE 17 – SUSPENSION OF WORK AND TERMINATION

17.1 City May Suspend Work: The City may, at any time and without cause, suspend the Work or any portion of the Work for a period of not more than ninety (90) days by notice in writing to the Contractor which shall fix the date on which Work shall be resumed. The Contractor shall resume the Work on the date fixed. The Contractor will be allowed an increase in the Contract Price or an extension of the Contract Time, or both, directly attributable to any suspension, if the Contractor makes a claim as provided in Articles 14 and 15.

17.2 City's Right to Terminate Contract: The City may terminate this Agreement upon fifteen (15) calendar days' written notice upon the occurrence of any one or more of the following events:

17.2.1 If the Contractor commences a voluntary case or a petition is filed against the Contractor, under any chapter of the Bankruptcy Code, or if the Contractor takes any equivalent or similar action by filing a petition or otherwise under any other federal or state law in effect at such time relating to the bankruptcy or insolvency.

17.2.2 If the Contractor makes a general assignment for the benefit of creditors.

17.2.3 If a trustee, receiver, custodian or agent of the Contractor is appointed under applicable law or under Contract, whose appointment or authority to take

charge of property of the Contractor is for the purpose of enforcing a lien against such property or for the purpose of general administration of such property for the benefit of the Contractor's creditors.

17.2.4 If Contractor fails to begin the Work within fifteen (15) calendar days after the Project Initiation Date, or fails to perform the Work with sufficient workers and equipment or with sufficient materials to ensure the prompt completion of the Work, or shall perform the Work unsuitably, or cause it to be rejected as defective and unsuitable, or shall discontinue the prosecution of the Work pursuant to the accepted schedule or if Contractor shall fail to perform any material term set forth in the Contract Documents, or from any other cause whatsoever shall not carry on the Work in an acceptable manner, Project Manager may give notice in writing to Contractor and its Surety of such delay, neglect or default, specifying the same.

17.2.5 If the Contractor repeatedly fails to make prompt payments to subcontractors or for labor, material or equipment.

17.2.6 If the Contractor repeatedly disregards proper safety procedures.

17.2.7 If the Contractor disregards any local, state or federal laws or regulations.

17.2.8 If the Contactor otherwise violates any provisions of this Agreement.

17.3 If Contractor, within a period of ten (10) calendar days after such notice, shall not proceed in accordance therewith, the City may exclude the Contractor from the Work site and take the prosecution of the Work out of the hands of the Contractor, and take possession of the Work and all of the Contractor's tools, appliances, construction equipment and machinery at the site and use them without liability to the City for trespass or conversion, incorporate in the Work all materials and equipment stored at the site or for which the City has paid the Contractor but which are stored elsewhere, and finish the Work as the City may deem expedient. In this instance, the Contractor shall not be entitled to receive any further compensation until the Work is finished.

17.3.1 If after notice of termination of Contractor's right to proceed, it is determined for any reason that Contractor was not in default, the rights and obligations of City and Contractor shall be the same as if the notice of termination had been issued pursuant to the Termination for Convenience clause as set forth in Section 17.5 below.

17.3.2 Upon receipt of Notice of Termination pursuant to Sections 17.2 or 17.5, Contractor shall promptly discontinue all affected work unless the Notice of Termination directs otherwise and deliver or otherwise make available to City all data, drawings, specifications, reports, estimates, summaries and such other information as may have been required by the Contract Documents whether completed or in process.

17.4 If the Contractor commits a default due to its insolvency or bankruptcy, the following shall apply:

17.4.1 Should this Agreement be entered into and fully executed by the parties, funds released and the Contractor (Debtor) files for bankruptcy, the following shall occur:

17.4.1.1 In the event the Contactor files a voluntary petition under 11 U.S.C. 301 or 302, or an order for relief is entered under 11 U.S.C. 303, the Contractor shall acknowledge the extent, validity, and priority of the lien recorded in favor of the City. The Contractor further agrees that in the event of this default, the City shall, at its option, be entitled to seek relief from the automatic stay pursuant to 11 U.S.C. 362. The City shall be entitled to relief from the automatic stay pursuant to 11 U.S.C. 362(d) (1) or (d) (2), and the Contactor agrees to waive the notice provisions in effect pursuant to 11 U.S.C. 362 and any applicable Local Rules of the United States Bankruptcy Court. The Contactor acknowledges that such waiver is done knowingly and voluntarily.

17.4.1.2 Alternatively, in the event the City does not seek stay relief, or if stay relief is denied, the City shall be entitled to monthly adequate protection payments within the meaning of 11 U.S.C. 361. The monthly adequate protection payments shall each be in an amount determined in accordance with the Note and Mortgage executed by the Contractor in favor of the City.

17.4.1.3 In the event the Contractor files for bankruptcy under Chapter 13 of Title 11, United States Code in additional to the foregoing provisions, the Contractor agrees to cure any amounts in arrears over a period not to exceed twenty-four (24) months from the date of the confirmation order, and such payments shall be made in addition to the regular monthly payments required by the Note and mortgage. Additionally, the Contractor shall agree that the City is over secured and, therefore, entitled to interest and attorney's fees pursuant to 11 U.S.C. 506(b). Such fees shall be allowed and payable as an administrative expense. Further, in the event the Contractor has less than five (5) years of payments remaining on the Note, the Contractor agrees that the treatment afforded to the claim of the City under any confirmed plan of reorganization shall provide that the remaining payments shall be satisfied in accordance with the Note, and that the remaining payments or claim shall not be extended or amortized over a longer period than the time remaining under the Note.

17.4.2 Should this Agreement be entered into and fully executed by the parties, and the funds have not been forwarded to Contractor, the following shall occur:

17.4.2.1 In the event the Contractor files a voluntary petition pursuant to 11 U.S.C. 301 or 302, or an order for relief is entered under 11 U.S.C. 303., the Contractor acknowledges that the commencement of a bankruptcy proceeding constitutes an event of default under the terms of this Agreement. Further, the Contractor acknowledges that this Agreement constitutes an executory contract within the meaning of 11 U.S.C. 365. The Contractor acknowledges that this Agreement is not capable of being assumed pursuant to 11 U.S.C. 365(c)(2), unless the

City expressly consents in writing to the assumption. In the event the City consents to the assumption, the Contractor agrees to file a motion to assume this Agreement within ten (10) days after receipt of written consent from the City, regardless of whether the bankruptcy proceeding is pending under Chapter 7, 11, or 13 of Title 11 of the United States Code. The Contractor further acknowledges that this Agreement is not capable of being assigned pursuant to 11 U.S.C. 365(b)(1).

17.5 Termination for Convenience: This Contract may be terminated for convenience in writing by City upon thirty (30) days written notice to Contractor (delivered by certified mail, return receipt requested) of intent to terminate and the date on which such termination becomes effective. In such case, Contractor shall be paid for all work executed and expenses incurred prior to termination in addition to termination settlement costs reasonably incurred by Contractor relating to commitments which had become firm prior to the termination. Payment shall include reasonable profit for work/services satisfactorily performed. No payment shall be made for profit for work/services which have not been performed.

17.6 Where the Contractor's service have been so terminated by the City, the termination shall not affect any rights of the City against the Contractor then existing or which may thereafter accrue. Any retention or payment of moneys due the Contractor by the City will not release the Contractor from liability.

17.7 The Contractor has no right, authority or ability to terminate the Work except for the wrongful withholding of any payments due the Contractor from the City.

ARTICLE 18 – DISPUTE RESOLUTION

18.1 Resolution of Disputes: Questions, claims, difficulties and disputes of whatever nature which may arise relative to the technical interpretation of the Contract Documents and fulfillment of this Agreement as to the character, quality, amount and value of any work done and materials furnished, or proposed to be done or furnished under or, by reason of, the Contract Documents which cannot be resolved by mutual agreement of Contract Administrator and Contractor shall be submitted to the Consultant for resolution. When either party has determined that a disputed question, claim, difficulty or dispute is at an impasse, that party shall notify the other party in writing and submit the question, claim, difficulty or dispute to the Consultant for resolution. The parties may agree to a proposed resolution at any time without the involvement and determination of the Consultant.

18.1.1 Consultant shall notify Contract Administrator and Contractor in writing of Consultant's decision within twenty-one (21) calendar days from the date of the submission of the question, claim, difficulty or dispute, unless Consultant requires time to gather information or allow the parties to provide additional information.

18.1.2 In the event the determination of a dispute by the Consultant under this Article is unacceptable to any of the parties hereto, the party objecting to the determination must notify the other party and the City Manager, in writing within ten (10) days after receipt of the determination. The notice must state

the basis of the objection and the proposed resolution. Final resolution of such dispute shall be made by the City Manager. The City Manager's decision shall be final and binding on the parties.

18.1.3 All non-technical administrative disputes (such as billing and payment) shall be determined by Contract Administrator.

18.1.4 During the pendency of any dispute and after a determination thereof, Contractor, Consultant, and Contract Administrator shall act in good faith to mitigate any potential damages including utilization of construction schedule changes and alternate means of construction. During the pendency of any dispute arising under this Agreement, other than termination herein, Contractor shall carry on the Work and adhere to the progress schedule. The Work shall not be delayed or postponed pending resolution of any disputes or disagreements.

18.1.5 For any disputes which remain unsolved, within sixty (60) calendar days after Final Completion of the Work, the parties shall participate in mediation to address all unresolved disputes. A mediator shall be mutually agreed upon by the parties. Should any objection not be resolved in mediation, the parties retain all their legal rights and remedies under applicable law. If a party objecting to a determination, fails to comply in strict accordance with the requirements of this Article, said party specifically waives all of its rights provided hereunder, including its rights and remedies under applicable law.

ARTICLE 19 – NOTICES

19.1 All notices required by any of the Contract Documents shall be in writing and shall be deemed delivered upon mailing by certified mail, return receipt requested to the following:

To the City:

City Manager
City of Fort Lauderdale
100 North Andrews Avenue
Fort Lauderdale, Florida 33301

with copy to the:

Project Manager and City Attorney
City of Fort Lauderdale
100 North Andrews Avenue
Fort Lauderdale, Florida 33301

To the Contractor:

_____
_____
_____
_____

ARTICLE 20 – LIMITATION OF LIABILITY

20.1 The City desires to enter into this Agreement only if in so doing the City can place a limit on the City's liability for any cause of action arising out of this Agreement, so that the City's liability for any breach never exceeds the sum of $1,000. For other good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, the Contractor expresses its willingness to enter into this Agreement with the knowledge that the Contractor's recovery from the City to any action or claim arising from the Agreement is limited to a maximum amount of $1,000, which amount shall be reduced by the amount actually paid by the City to the Contractor pursuant to this Agreement, for any action or claim arising out of this Agreement. Nothing contained in this paragraph or elsewhere in this Agreement is in any way intended either to be a waiver of the limitation placed upon the City's liability as set forth in Section 768.28, Florida Statutes, or to extend the City's liability beyond the limits established in said Section 768.28; and no claim or award against the City shall include attorney's fees, investigative costs, expert fees, suit costs or pre-judgment interest.

20.2 No Extended Damages: For other and additional good and valuable consideration the receipt and sufficiency of which is hereby acknowledged, the Contractor covenants and agrees that in the event of any delay of construction or for any reason, allegation or claim, and notwithstanding the reason of the delay, reason, claim or allegation or who caused them or the construction delay or whether they were caused by the City, that there will be no entitlement to Contractor to or for any direct or indirect financial damages or losses for extended corporate overhead impact, extended project overhead impacts, project support services, mobilization or demobilization or by whatever other label or legal concept or theory and types of names or labels or basis such claims may have, or any business damages or losses of whatever type or nature, and Contractor hereby waives any right to make any such claim or claims. This provision will have application and effect when construction delays are anticipated and agreed upon by both the City and the Contractor.

ARTICLE 21 – GOVERNING LAW

21.1 This Agreement shall be governed by the laws of the State of Florida. Both Parties agree that the courts of the State of Florida shall have jurisdiction of any claim arising in connection with this Agreement. Venue for any claim, objection or dispute arising out of this Agreement shall be in Broward County, Florida. **By entering into this Contract, Contractor and City hereby expressly waive any rights either party may have to a trial by jury or any civil litigation related to, or arising out of the Project. Contractor shall specifically bind all subcontractors to the provisions of this Contract.**

ARTICLE 22 – MISCELLANEOUS

22.1 The duties and obligations imposed by this Agreement and the rights and remedies available to the parties and, in particular but without limitation, the warranties, guaranties and obligations imposed upon the Contractor and all of the rights and remedies available to the City, are in addition to, and are not to be construed in any way as a limitation of, any rights and remedies available to any or all of them which are otherwise imposed or available by laws or regulations, by special warranty or

guarantee or by other provisions of the Contract Documents, and the provisions of this Paragraph will be as effective as if repeated specifically in the Contract Documents, and the provisions of this Paragraph will survive final payment and termination or completion of this Agreement.

22.2 The Contractor shall not assign or transfer this Agreement or its rights, title or interests. The obligations undertaken by the Contractor pursuant to this Agreement shall not be delegated or assigned to any other person or firm. Violation of the terms of this Paragraph shall constitute a material breach of Agreement by the Contractor and the City any, at its discretion, cancel this Agreement and all rights, title and interest of the Contractor which shall immediately cease and terminate.

22.3 The Contractor and its employees, volunteers and agents shall be and remain an independent contractors and not agents or employees of the City with respect to all of the acts and services performed by and under the terms of this Agreement. This Agreement shall not in any way be constructed to create a partnership, association or any other kind of joint undertaking or venture between the Parties.

22.4 The City reserves the right to audit the records of the Contractor relating in any way to the Work to be performed pursuant to this Agreement at any time during the performance and term of this Agreement and for a period of three (3) years after completion and acceptance by the City. If required by the City, the Contractor agrees to submit to an audit by an independent certified public accountant selected by the City. The Contractor shall allow the City to inspect, examine and review the records of the Contractor at any and all times during normal business hours during the term of this Agreement.

22.5 The remedies expressly provided in this Agreement to the City shall not be deemed to be exclusive but shall be cumulative and in addition to all other remedies in favor of the City now or later existing at law or in equity.

22.6 Should any part, term or provisions of this Agreement be decided by the courts to be invalid, illegal or in conflict with any state or federal law, the validity of the remaining portion or provision shall not be affected.

22.7 Prohibition Against Contracting With Scrutinized Companies: Subject to *Odebrecht Construction, Inc., v. Prasad*, 876 F.Supp.2d 1305 (S.D. Fla. 2012), *affirmed*, *Odebrecht Construction, Inc., v. Secretary, Florida Department of Transportation*, 715 F.3d 1268 (11th Cir. 2013), with regard to the "Cuba Amendment," the Contractor certifies that it is not on the Scrutinized Companies with Activities in Sudan List or the Scrutinized Companies with Activities in the Iran Petroleum Energy Sector List or the Scrutinized Companies that Boycott Israel List created pursuant to Section 215.4725, Florida Statutes (2018), that it is not engaged in a boycott of Israel, and that it does not have business operations in Cuba or Syria, as provided in section 287.135, Florida Statutes (2018), as may be amended or revised. The City may terminate this Agreement at the City's option if the Contractor is found to have submitted a false certification as provided under subsection (5) of section 287.135, Florida Statutes (2018), as may be amended or revised, or been placed on the Scrutinized Companies with Activities in Sudan List or the Scrutinized Companies with Activities in the Iran Petroleum Energy Sector List or the Scrutinized Companies that Boycott Israel List created pursuant to Section 215.4725, Florida Statutes (2018), or is engaged in a

boycott of Israel or has been engaged in business operations in Cuba or Syria, as defined in Section 287.135, Florida Statutes (2018), as may be amended or revised.

22.8 Public Entity Crimes: In accordance with the Public Crimes Act, Section 287.133, Florida Statutes, a person or affiliate who is a contractor, consultant or other provider, who has been placed on the convicted vendor list following a conviction for a public entity crime may not submit a bid on a contract to provide any goods or services to the City, may not submit a bid on a contract with the City for the construction or repair of a public building or public work, may not submit bids on leases of real property to the City, may not be awarded or perform work as a contractor, supplier, subcontractor, or consultant under a contract with the City, and may not transact any business with the City in excess of the threshold amount provided in Section 287.017, Florida Statutes, for category two purchases for a period of thirty-six (36) months from the date of being placed on the convicted vendor list. Violation of this section by Contractor shall result in cancellation of the City purchase and may result in Contractor debarment.

22.9 Attorney Fees: If CITY or CONSULTANT incurs any expense in enforcing the terms of this Agreement through litigation, the prevailing party in that litigation shall be reimbursed for all such costs and expenses, including but not limited to court costs, and reasonable attorney fees incurred during litigation.

22.10 Public Records

IF THE CONTRACTOR HAS QUESTIONS REGARDING THE APPLICATION OF CHAPTER 119, FLORIDA STATUTES, TO THE CONTRACTOR'S DUTY TO PROVIDE PUBLIC RECORDS RELATING TO THIS CONTRACT, CONTACT THE CUSTODIAN OF PUBLIC RECORDS AT PRRCONTRACT@FORTLAUDERDALE.GOV, 954-828-5002, CITY CLERK'S OFFICE, 100 N. ANDREWS AVENUE, FORT LAUDERDALE, FLORIDA 33301.

Contractor shall:

1. Keep and maintain public records that ordinarily and necessarily would be required by the City in order to perform the service.

2. Upon request from the City's custodian of public records, provide the City with a copy of the requested records or allow the records to be inspected or copied within a reasonable time at a cost that does not exceed the cost provided in Chapter 119, Florida Statutes (2018), as may be amended or revised, or as otherwise provided by law.

3. Ensure that public records that are exempt or confidential and exempt from public records disclosure requirements are not disclosed except as authorized by law for the duration of the contract term and following completion of this contract if the Contractor does not transfer the records to the City.

4. Upon completion of the Contract, transfer, at no cost, to the City all public records in possession of the Contractor or keep and maintain public records required by the City to perform the service. If the Contractor transfers all public records to the City

upon completion of this Contract, the Contractor shall destroy any duplicate public records that are exempt or confidential and exempt from public records disclosure requirements. If the Contractor keeps and maintains public records upon completion of this Contract, the Contractor shall meet all applicable requirements for retaining public records. All records stored electronically must be provided to the City, upon request from the City's custodian of public records, in a format that is compatible with the information technology systems of the City.

Port Condo Large Water Main Improvements
(Contractor)
Project 11080

CITY

IN WITNESS OF THE FOREGOING**,** the parties have set their hands and seals the day and year first written above.

CITY OF FORT LAUDERDALE, a municipal corporation of the State of Florida

By: _____
LEE R. FELDMAN, City Manager

(CORPORATE SEAL)

ATTEST:

By: _____
JEFFREY A. MODARELLI
City Clerk

Approved as to Legal Form:

By:_____
RHONDA MONTOYA HASAN
Assistant City Attorney

CONTRACTOR

WITNESSES:

CONTRACTOR.,
a Florida corporation.

_____

BY:_____

_____
Print Name

_____ _____
PRINT NAME Title

_____

_____
Print Name

(CORPORATE SEAL)

STATE OF FLORIDA:
COUNTY OF BROWARD:

The foregoing instrument was acknowledged before me this _____ day of _____, 2018, by _____ (Name), as _____ (Title) of _____ (CONTRACTOR), a Florida corporation, on behalf of the Corporation.

SEAL

_____
Notary Public, State of Florida

_____
Name of Notary Typed, Printed or Stamped

☐ Personally Known or ☐ Produced Identification:

Type of Identification Produced: _____

GENERAL CONDITIONS

Unless otherwise modified in the projects special conditions, the following General Conditions shall be part of the Contract:

GC - 01 - DEFINITIONS - The following words and expressions, or pronouns used in their stead, shall wherever they appear in the Contract and the Contract Documents, be construed as follows:

"Addendum" or "Addenda" - shall mean the additional Contract provisions issued in writing, by the Engineer, prior to the receipt of bids.

"Bid" – shall mean the offer or proposal of the Bidder submitted on the prescribed form setting forth the prices for the Work to be performed.

"Bidder" – shall mean any person, firm, company, corporation or entity submitting a Bid for the Work.

"Bonds" –shall mean Bid, performance and payment bonds and other instruments of security, furnished by Contractor and his surety in accordance with the Contract Documents.

“City” – shall mean the City of Fort Lauderdale, Florida, a Florida municipal corporation. In the event the City exercises its regulatory authority as a government body, the exercise of such regulatory authority and the enforcement of any rules, regulations, codes, laws and ordinances shall be deemed to have occurred pursuant to City’s authority as a governmental body and shall not be attributable in any manner to the City as a party to this Contract. For the purpose of this Contract, “City” without modification shall mean the City Commission, and/or City Manager or his/her designee(s) as applicable.

“Construction Manager” - shall mean the Public Works Director or his/her designee.

“Construction Project Manager” - shall mean the Public Works Director or his/her designee.

"Consultant" – shall mean a person, firm, company, corporation or other entity employed by the City to perform the professional services for the project.

“Contract Work” - shall mean everything expressed or implied to be required to be furnished and furnished by the Contractor by any one or more of the parts of the Contract Documents referred to in the Contract hereof except Extra Work as hereinafter defined, it being understood that, in case of any inconsistency in or between any part or parts of this Contract, the Public Works Director shall determine which shall prevail.

“Design Documents” – shall mean the construction plans and specifications included as part of a Bid/Proposal Solicitation prepared either by the City or by the Consultant under a separate Agreement with the City.

“Engineer” - shall mean the Public Works Director or his/her designee.

"Extra Work" - shall mean work other than that required by the Contract.

"Inspector" – shall mean an authorized representative of the City assigned to make necessary inspections of materials furnished by Contractor and of the Work performed by Contractor.

"Notice" - shall mean written notice sent by certified United States Mail, return receipt requested, or sent by commercial express carrier with acknowledgement of delivery, or via fax or email, or by hand delivery with a request for a written receipt of acknowledgment of delivery and shall be served upon the Contractor either personally or to its place of business listed in the Bid.

“Owner” - shall mean the City of Fort Lauderdale.

“Project Manager” - shall mean the Public Works Director or his/her designee.

"Public Works Director" –shall mean the Public Works Director of the City of Fort Lauderdale, Florida or his/her designee(s).

"Site" - shall mean the area upon or in which the Contractor's operations are carried out and such other areas adjacent thereto as may be designated as such by the Public Works Director.

"Subcontractor" - shall mean any person, firm, company, corporation or other entity, other than employees of the Contractor, who or which contracts with the contractor, to furnish, or actually furnishes labor and materials, or labor and equipment, or labor, materials and equipment at the site.

"Surety" - shall mean any corporation or entity that executes, as Surety, the Contractor's performance and payment bond securing the performance of this Contract.

GC - 02 - SITE INVESTIGATION AND REPRESENTATION - The Contractor acknowledges that it has satisfied itself as to the nature and location of the Work under the Contract Documents, the general and local conditions of the Site, particularly those bearing upon availability of transportation, disposal, handling and storage of materials, availability of labor, water, electric power, and roads, the conformation and conditions at the ground based on City provided reports, the type of equipment and facilities needed preliminary to and during the prosecution of the Work and all other matters which can in any way affect the Work or the cost thereof under the Contract Documents.

The Contractor acknowledges that it has conducted extensive tests, examinations and investigations and represents and warrants a thorough familiarization with the nature and extent of the Contract Documents, the Work, locality, soil conditions, moisture conditions and all year-round local weather and climate conditions (past and present), and, in reliance on such tests, examination and investigations conducted by Contractor and the Contractor’s experts, has determined that no conditions exist that would in any manner affect the Bid Price and that the project can be completed for the Bid Price submitted.

The Contractor, on its own, has made or caused to be made examinations, investigations, tests and studies of reports and related data in addition to those referred above, as Contractor deemed necessary to perform the Work at the Bid price set by the Contractor, within the contract time and in accordance with the other terms and conditions of the Contract Documents and the Bid made by the Contractor; and no additional examinations, investigations, tests, reports or similar data are, or will be, required by Contractor to assure that the Work can be done at the Bid price set by the Contractor.

The Contractor further acknowledges that it has satisfied itself based on any geotechnical reports the City may provide and inspection of the project Site as to the character, quality, and quantity of surface and subsurface materials to be encountered from inspecting the site and from evaluating information derived from exploratory work that may have been done by the City or included in the

Contract Documents and finds and has further determined that no conditions exist that would in any manner affect the Bid price and that the project can be completed for the Bid price submitted.

Any failure by the Contractor to acquaint itself with all the provided information and information obtained by visiting the project Site will not relieve Contractor from responsibility for properly estimating the difficulty or cost thereof under the Contract Documents. In the event that the actual subsurface conditions vary from the actual City provided reports, the Contractor shall notify the City and the Contract amount may be adjusted depending on the conditions, at the approval of the City.

GC - 03 - SUBSTITUTIONS - If the Contractor desires to use materials and/or products of manufacturer's names different from those specified in the Contract Documents, the Bidder requesting the substitution shall make written application as described herein. The burden of proving the equality of the proposed substitution rests on the Bidder making the request. To be acceptable, the proposed substitution shall meet or exceed all expressed requirements of the Contract Documents and shall be submitted upon the Contractor's letterhead, in addition to the "Contractor's Request for Substitution" form provided by the Public Works Director. The following requirements shall be met in order for the substitution to be considered:

1. Requests for substitution shall reach the Public Works Director no less than ten (10) Working Days prior to the date set for opening of Bids; and

2. Requests for substitution shall be accompanied by such technical data, as the party making the request desires to submit. The Public Works Director will consider reports from reputable independent testing laboratories, verified experience records from previous users and other written information valid in the circumstances; and

3. Requests for substitution shall completely and clearly indicate in what respects the materials and/or products differ from those indicated in the Contract Documents; and

4. Requests for substitution shall be accompanied by the manufacturer's printed recommendations clearly describing the installation, use and care, as applicable, of the proposed substitutions; and

5. Requests for substitution shall be accompanied by a complete schedule of changes in the Contract Documents, if any, which must be made to permit the use of the proposed substitution.

If a proposed substitution is approved by the Public Works Director, an Addendum will be issued to prospective bidders not less than three (3) working days prior to the date set for opening of Bids. Unless substitutions are received and approved as described above, the successful Bidder shall be responsible for furnishing materials and products in strict accordance with the Contract Documents.

GC - 04 - CONTROL OF THE WORK - The Public Works Director shall have full control and direction of the Work in all respects. The Public Works Director and/or his authorized designee(s) shall, at all times, have the right to inspect the Work and materials. The Contractor shall furnish all reasonable facilities for obtaining such information, as the Public Works Director may desire respecting the quality of the Work and materials and the manner of conducting the Work. Should the Contractor be directed or permitted to perform night Work, or to vary the period which work is ordinarily carried on in the daytime, he shall give ample notice to the Public Works Director so that proper and adequate inspection may be provided. Such Work shall be done only under such regulations as are furnished in writing by the Public Works Director, and no extra compensation shall be allowed to the Contractor therefore. In the event of night work, the Contractor shall furnish

such light, satisfactory to the Public Works Director, as will insure proper inspection. Nothing herein contained shall relieve the Contractor from compliance with any and all City ordinances relating to noise or Work during prohibited hours.

The Contractor shall keep the Public Works Director informed, a reasonable time in advance, as to his need for grades and lines in order that the same may be furnished and all necessary measurements made for records and for payment with the minimum of inconvenience to the Public Works Director or of delay to the Contractor. The Contractor shall submit to the Public Works Director or Inspector on the job a written request outlining the streets, etc., for which the Contractor desires lines and grades. It is the intention not to delay the Work for the giving of lines and grades, but when necessary, work operations shall be suspended for such reasonable time as the Public Works Director may require for this purpose. However, such cost increases shall be authorized either by the City Manager and/or designee, or the City Commission based upon the purchasing threshold amounts provided for in Chapter 2 of the City of Fort Lauderdale's Code of Ordinances.

GC - 05 - SUBCONTRACTOR - The Contractor shall not sublet, in whole or any part of the Work without the written consent and approval of the Public Works Director. Within ten (10) days after official notification of starting date, the Contractor must submit in writing, to the Public Works Director, a list of all Subcontractors. No Work shall be done by any Subcontractor until such Subcontractor has been officially approved by the Public Works Director. A subcontractor not appearing on the original list will not be approved without written request submitted to the Public Works Director and approved by the Public Works Director. In all cases, the Contractor shall give his personal attention to the Work of the Subcontractors and the Subcontractor is liable to be discharged by the Contractor, at the direction of the Public Works Director, for neglect of duty, incompetence or misconduct.

Acceptance of any Subcontractor, other person, or organization by the Public Works Director shall not constitute a waiver of any right of Public Works Director to reject defective Work or Work not in conformance with the Contract Documents.

Contractor shall be fully responsible for all acts and omissions of his Subcontractors and of persons and organizations directly or indirectly employed by them and of persons and organizations 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 City and any Subcontractor or other person or organization having a direct contract with Contractor, nor shall it create any obligation on the part of City to pay or to see to the payment of any moneys due to any Subcontractor or other person, or organization, except as may otherwise be required by law.

GC – 06 - **QUANTITIES** - It is mutually agreed that the proposal shows the approximate amounts only along with the Plans and the general location. It is also mutually agreed that no change will be made involving any departure from the general scheme of the Work and that no such change involving a material change in cost, either to the City or Contractor, shall be made, except upon written permission of the City. However, the Public Works Director shall have the right to make minor alternations in the line, grade, plan, form or materials of the Work herein contemplated any time before the completion of the same. That if such alterations shall diminish the quantity of the Work to be done, such alterations shall not constitute a claim for damages or anticipated profits. That if such alterations increase the amount of the Work to be done, such increase shall be paid for according to the quantity actually performed and at the unit price or prices stipulated therefore in the Contract.

The City shall, in all cases of dispute, determine the amount or quantity of the several kinds of Work which are to be paid for under this Contract, and shall decide all questions relative to the execution of the same, and such estimates and decisions shall be final and binding.

Any Work not herein specified, which might be fairly implied as included in the Contract, of which the City shall judge, shall be done by the Contractor without extra charge. However, such cost increases shall be authorized either by the City Manager and/or designee, or the City Commission based upon the purchasing threshold amounts provided for in Chapter 2 of the City of Fort Lauderdale's Code of Ordinances.

GC–07 - NO ORAL CHANGES - Except to the extent expressly set forth in the Contract, no change in or modification, termination or discharge of the Contract in any form whatsoever, shall be valid or enforceable unless it is in writing and signed by the parties charged, therewith or their duly authorized representative.

GC - 08 - PERMITS AND PROTECTION OF PUBLIC – Permits on file with the City and or those permits to be obtained shall be considered directive in nature and will be considered a part of this Contract. A copy of all permits shall be given to the City and become part of the Contract Documents. Terms of permits shall be met prior to acceptance of the Work and release of the final payment.

The Contractor shall be required to observe all the ordinances in relation to obtaining permits for occupying, excavating, or in any way obstructing the streets and alleys. He shall erect and maintain barricades and sufficient safeguards around all excavations, embankments or obstructions; he shall place sufficient warning lights at or near the Work; keep the same burning from sunset to sunrise, employ watchmen, and strictly obey all laws and ordinances controlling or limiting those engaged in similar work.

Where there are telephones, light or power poles, water mains, conduits, pipes 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.

The Contractor shall not be permitted to interfere with public travel and convenience by grading or tearing up streets indiscriminately, but the Work of constructing the various items in this contract shall proceed in an orderly, systematic and progressive manner.

Contractor shall not load nor permit any part of any structure to be loaded with weights that will endanger the structure, nor shall he subject any part of the Work to stresses or pressures that will endanger it.

Where lifting operations involving the use of specialized cranes are required as part of construction, Contractor must make undertake the following investigation and submit the results and documentation to the Engineer prior to commencing any lifting operations: marking a very specific area in the field for the placement of the crane; a drawing showing the limitations of the job operation (i.e. not over adjacent properties or pedestrian and high vehicular traffic areas);underground utility exploration in the vicinity of the crane location, which may include ground penetrating radar to identify voids or old pipe or other subsurface features that could lead to sudden failure; assessment of the underlying soil and roadway materials and a worst case analysis based on entire load being distributed on just one or two outriggers; provision of properly sized pads under the outriggers; loading charts from manufacturer showing allowable configurations/loads; and inspection to make sure crane operation is in accordance with the permit conditions.

GC - 09 - DISEASE REGULATIONS - The Contractor shall enforce all sanitary regulations and take all precautions against infectious diseases as the Public Works Director may deem necessary. Should any infectious or contagious diseases occur among his employees, he shall arrange for the immediate removal of the employee from the Site and isolation of all persons connected with the Work.

GC - 10 - CONTRACTOR TO CHECK PLANS, SPECIFICATIONS, AND DATA - The Contractor shall verify all dimensions, quantities, and details shown on the plans, supplementary drawings, schedules, or other data received from the Public Works Director, and shall notify the Public Works Director of all errors, omissions, conflicts and discrepancies found therein within three (3) working days of discovery. Failure to discover or correct errors, conflictions, or discrepancies shall not relieve the Contractor of full responsibility for unsatisfactory Work, faulty construction, or improper operation resulting there from nor from rectifying such condition at his own expense.

GC - 11 - SUPPLEMENTARY DRAWINGS - When, in the opinion of the Public Works Director, 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 Public Works Director and copies will be given to the Contractor.

The supplementary drawings shall be binding upon the Contractor with the same force as the original Plans. 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 shall be subject to the terms of the Contract.

GC - 12 - MATERIALS AND WORKMANSHIP - All material and workmanship shall, in every respect, be in conformity with approved modern practice and with prevailing standards of performance and quality. In the event of dispute the Public Works Director's decision shall be final. Wherever the Plans, specifications, Contract Documents, or the directions of the Public Works Director are unclear as to what is permissible and/or fail to note the quality of any Work, that interpretation will be made by the Public Works Director, which is in accordance with approved modern practice, to meet the particular requirements of the Contract.

In all cases, new materials shall be used, unless this provision is waived by notice from the City in writing.

GC - 13 - SAFEGUARDING MARKS - 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 same if disturbed, or bear the entire expense of rectifying Work improperly installed due to not maintaining or protecting or for removing without authorization, such established points, stakes and marks. The Contractor shall safeguard all existing and known property corners, monuments and marks not related to the Work and, if required, shall bear the cost of having them re-established by a licensed surveyor if disturbed or destroyed during the course of construction.

GC - 14 - EXISTING UTILITY SERVICE - All existing utility service shall be maintained with a minimum of interruption at the expense of the Contractor.

GC - 15 - JOB DESCRIPTION SIGNS – Contractor, at Contractor's expense, shall furnish, erect, and maintain suitable weatherproof signs on jobs over $100,000 containing the following information:

1. City Seal (in colors)
2. Project or Improvement Number
3. Job Description

4. Estimated Cost
5. Completion Date

Minimum size of sign shall be four feet high, eight feet wide and shall be suitably anchored. The entire sign shall be painted and present a pleasing appearance. Exact location of signs will be determined in the field. Two (2) signs will be required, one at each end of the job. All costs of this work shall be included in other parts of the work.

GC - 16 - FLORIDA EAST COAST RIGHT-OF-WAY - Whenever a City contractor is constructing within the Florida East Coast Railway Company's Right-of-Way, it will be mandatory that the contractor carry separate bodily injury and property damage insurance in the amounts as stated below. This insurance shall be taken out and maintained during the life of the Contract.

Bodily injury insurance in an amount not less than $500,000.00 for injuries, including wrongful death to any one person, and subject to the same limit for each person, in an amount not less than $1,000,000.00 on account of any one occurrence, and

Property damage insurance in an amount not less than $500,000.00 for damages on account of any one occurrence and in an amount not less than $1,000,000.00 for damages on account of all occurrences.

GC - 17 - ACCIDENTS - The Contractor shall provide such equipment and facilities as are necessary and/or required, in the case of accidents, for first aide services to be provided to a person who may be injured during the project duration. The Contractor shall also comply with the OSHA requirements as defined in the United States Labor Code 29 CFR 1926.50.

In addition, the Contractor must report immediately to the Public Works Director every accident to persons or damage to property, and shall furnish in writing full information, including testimony of witnesses regarding any and all accidents.

GC - 18 - SAFETY PRECAUTIONS - Contractor must adhere to the applicable environmental protection guidelines for the duration of a project. If hazardous waste materials are used, detected or generated at any time, the Project Manager must be immediately notified of each and every occurrence. The Contractor shall comply with all codes, ordinances, rules, orders and other legal requirements of public authorities (including OSHA, EPA, DERM, the City, Broward County, State of Florida, and Florida Building Code), which bear on the performance of the Work.

The Contractor shall take the responsibility to ensure that all Work is performed using adequate safeguards, including but not limited to: proper safe rigging, safety nets, fencing, scaffolding, barricades, chain link fencing, railings, barricades, steel plates, safety lights, and ladders that are necessary for the protection of its employees, as well as the public and City employees. All riggings and scaffolding shall be constructed with good sound materials, of adequate dimensions for their intended use, and substantially braced, tied or secured to ensure absolute safety for those required to use it, as well as those in the vicinity. All riggings, scaffolding, platforms, equipment guards, trenching, shoring, ladders and similar actions or equipment shall be OSHA approved, as applicable, and in accordance with all Federal, State and local regulations.

GC - 19 - DUST PREVENTION - The Contractor shall, by means of a water spray, or temporary asphalt pavement, take all necessary precautions to prevent or abate a dust nuisance arising from dry weather or Work in an incomplete stage. All costs of this Work shall be included in cost of other parts of the Work.

Should the Contractor fail to abate a dust nuisance by the above methods, and then he will be required to immediately construct temporary patches per City standards.

GC - 20 - PLACING BARRICADES AND WARNING LIGHTS - The Contractor shall furnish and place, at his own expense, all barricades, warning lights, automatic blinker lights and such devices necessary to properly protect the work and vehicular and pedestrian traffic. Should the Contractor fail to erect or maintain such barricades, warning lights, etc., the Public Works Director may, after 24 hours' notice to the Contractor, proceed to have such barricades and warning lights placed and maintained by City or other forces and all costs incurred thereof charged to the Contractor and may be retained by the City from any monies due, or to become due, to the Contractor.

GC - 21 - TRAFFIC CONTROL - The Contractor shall coordinate all Work and obtain, through the City's Transportation and Mobility Department, Broward County, Florida Department of Transportation, as applicable, any permits required to detour traffic or close any street before starting to work in the road. The following section: Part VI Traffic Controls for Street and Highway Construction and Maintenance Operations, MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, U.S. Department of Transportation Federal Highway Administration, 2009, or current edition, shall be used as a guide for requirement and placement of traffic control devices, signs and barricades. The Public Works Director shall determine requirements for the above. The above publication is available from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. In the event that a Maintenance of Traffic (MOT) Plan is required, the Plan shall be prepared by an A.A.S.T.A. certified technician.

All traffic control devices, flashing lights, signs and barricades shall be maintained in working condition at all times.

GC - 22 - COORDINATION - The Contractor shall notify all utilities, transportation department, etc., in writing, with a copy to the Public Works Director before construction is started and shall coordinate his Work with them. The Contractor shall cooperate with the owners of any underground or overhead utility lines in their removal, construction and rearrangement operations in order that services rendered by these parties will not be unnecessarily interrupted.

The Contractor shall arrange his Work and dispose of his materials so as to not interfere with the operation of other Contractors engaged upon adjacent work and to join his Work to that of others in a proper manner and to perform his Work in the proper sequence in relation to that of other Contractors all as may be directed by the Public Works Director.

Each Contractor shall be responsible for any damage done by him or his agents to the work performed by another Contractor.

The Contractor shall contact the Broward County Transportation Department and the Florida Department of Transportation, as applicable, to verify and obtain location of any and all traffic conduits, loops, and street light underground services.

GC - 23 - WATER - Bulk water used for construction, flushing pipelines, and testing shall be obtained from fire hydrants. Contractor shall make payment for hydrant meter at Treasury Billing Office, 1st Floor, City Hall, 100 N. Andrews Avenue. With the paid receipt, contractor can pick up hydrant meter at the utility location office. No connection shall be made to a fire hydrant without a meter connected.

GC - 24 - PROHIBITION AGAINST CONTRACTING WITH SCRUTINIZED COMPANIES - Subject to *Odebrecht Construction, Inc., v. Prasad*, 876 F.Supp.2d 1305 (S.D. Fla. 2012), *affirmed*, *Odebrecht Construction, Inc., v. Secretary, Florida Department of Transportation*, 715 F.3d 1268 (11th Cir. 2013), with regard to the "Cuba Amendment," the Contractor certifies that it is not on the Scrutinized Companies with Activities in Sudan List or the Scrutinized Companies with Activities in the Iran Petroleum Energy Sector List or the Scrutinized Companies that Boycott Israel List created pursuant to Section 215.4725, Florida Statutes (2018), that it is not engaged in a boycott

of Israel, and that it does not have business operations in Cuba or Syria, as provided in section 287.135, Florida Statutes (2018), as may be amended or revised. The City may terminate this Agreement at the City's option if the Contractor is found to have submitted a false certification as provided under subsection (5) of section 287.135, Florida Statutes (2018), as may be amended or revised, or been placed on the Scrutinized Companies with Activities in Sudan List or the Scrutinized Companies with Activities in the Iran Petroleum Energy Sector List or the Scrutinized Companies that Boycott Israel List created pursuant to Section 215.4725, Florida Statutes (2018), or is engaged in a boycott of Israel or has been engaged in business operations in Cuba or Syria, as defined in Section 287.135, Florida Statutes (2018), as may be amended or revised.

GC - 25 - LOCATION OF UNDERGROUND FACILITIES - If the Proposer, for the purpose of responding to this solicitation, requests the location of underground facilities through the Sunshine State One-Call of Florida, Inc. notification system or through any person or entity providing a facility locating service, and underground facilities are marked with paint, stakes or other markings within the City pursuant to such a request, then the Proposer shall be deemed non-responsive to this solicitation in accordance with Section 2-184(5) of the City of Fort Lauderdale Code of Ordinances.

GC - 26 – USE OF FLORIDA LUMBER TIMBER AND OTHER FOREST PRODUCTS - In accordance with Florida Statute 255.20 (3), The City specifies that lumber, timber, and other forest products used for this project shall be produced and manufactured in the state of Florida if such products are available and their price, fitness, and quality are equal. This requirement does not apply to plywood specified for monolithic concrete forms, if the structural or service requirements for timber for a particular job cannot be supplied by native species, or if the construction is financed in whole or in part from federal funds with the requirement that there be no restrictions as to species or place of manufacture.

The Bidder affirms by submitting a bid response to this solicitation that they will comply with section 255.20 (3) Florida Statutes.

GC – 27 – PUBLIC RECORDS/TRADE SECRETS/COPYRIGHT: The Proposer's response to the Solicitation is a public record pursuant to Florida law, which is subject to disclosure by the City under the State of Florida Public Records Law, Florida Statutes Chapter 119.07 ("Public Records Law"). The City shall permit public access to all documents, papers, letters or other material submitted in connection with this Solicitation and the Contract to be executed for this Solicitation, subject to the provisions of Chapter 119.07 of the Florida Statutes.

Any language contained in the Proposer's response to the Solicitation purporting to require confidentiality of any portion of the Proposer's response to the Solicitation, except to the extent that certain information is in the City's opinion a Trade Secret pursuant to Florida law, shall be void. If a Proposer submits any documents or other information to the City which the Proposer claims is Trade Secret information and exempt from Florida Statutes Chapter 119.07 ("Public Records Laws"), the Proposer shall clearly designate that it is a Trade Secret and that it is asserting that the document or information is exempt. The Proposer must specifically identify the exemption being claimed under Florida Statutes 119.07. The City shall be the final arbiter of whether any information contained in the Proposer's response to the Solicitation constitutes a Trade Secret. The City's determination of whether an exemption applies shall be final, and the proposer agrees to defend, indemnify, and hold harmless the City and the City's officers, employees, and agent, against any loss or damages incurred by any person or entity as a result of the City's treatment of records as public records. Proposals purporting to be subject to copyright protection in full or in part will be rejected.

EXCEPT FOR CLEARLY MARKED PORTIONS THAT ARE BONA FIDE TRADE SECRETS PURSUANT TO FLORIDA LAW, DO NOT MARK YOUR RESPONSE TO THE SOLICITATION AS PROPRIETARY OR CONFIDENTIAL. DO NOT MARK YOUR RESPONSE TO THE SOLICITATION OR ANY PART THEREOF AS COPYRIGHTED.

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

Telephone Number: **(954) 828-5002**

Mailing Address: **City Clerk's Office**
100 N. Andrews Avenue
Fort Lauderdale, FL 33301

E-mail: **prrcontract@fortlauderdale.gov**

Contractor shall:

1. Keep and maintain public records that ordinarily and necessarily would be required by the City in order to perform the service.

2. Upon request from the City's custodian of public records, provide the City with a copy of the requested records or allow the records to be inspected or copied within a reasonable time at a cost that does not exceed the cost provided in Chapter 119, Florida Statutes (2018), as may be amended or revised, or as otherwise provided by law.

3. Ensure that public records that are exempt or confidential and exempt from public records disclosure requirements are not disclosed except as authorized by law for the duration of the contract term and following completion of this contract if the Contractor does not transfer the records to the City.

4. Upon completion of the Contract, transfer, at no cost, to the City all public records in possession of the Contractor or keep and maintain public records required by the City to perform the service. If the Contractor transfers all public records to the City upon completion of this Contract, the Contractor shall destroy any duplicate public records that are exempt or confidential and exempt from public records disclosure requirements. If the Contractor keeps and maintains public records upon completion of this Contract, the Contractor shall meet all applicable requirements for retaining public records. All records stored electronically must be provided to the City, upon request from the City's custodian of public records, in a format that is compatible with the information technology systems of the City.

TECHNICAL SPECIFICATIONS

SECTION 01001
GENERAL REQUIREMENTS

PART 1 PROJECT DESCRIPTION

1.1 GENERAL

A. A brief description of the Work is stated in the NOTICE TO CONTRACTORS. To determine the full scope of the Project or any particular part of the Project, coordinate the applicable information in these Contract Documents.

B. The work under this Contract shall be performed by the CONTRACTOR as required by the OWNER. Work will be authorized in the form of a Notice to Proceed issued to the CONTRACTOR. The CONTRACTOR shall complete all work in the Contract within the number of calendar days stipulated in the Contract unless an extension in the time of completion is granted by the ENGINEER, as stated in the INSTRUCTIONS TO BIDDERS. Upon completion of the Work and compliance with applicable provisions in the Contract Documents, the CONTRACTOR will receive final payment for all work done.

C. The following additional information, though not all inclusive, is given to assist contractors in their evaluation of the work required to meet the project objectives.

D. The CONTRACTOR shall become familiar with the existing operating conditions of the OWNER's water distribution and sewage collection/transmission system and take such into consideration in planning and scheduling work. No extra claims shall be made for work required to achieve conditions beyond those obtainable under normal operation of the existing collection and transmission facilities necessary to accomplish the Work.

1.2 DOT SPECIFICATIONS

A. Portions of The Florida Department of Transportation Standard Specifications for Road and Bridge Construction and their Roadway and Traffic Design Standards, hereinafter referred to as the DOT Standard Specifications, are referred to herein and amended, in part, and the same are hereby made a part of this Contract to the extent of such references and shall be as binding upon the Contract as though reproduced herein. Such reference shall mean the current edition, including all supplements. In case of a conflict in the requirements of the FDOT Specifications and the requirements stated herein, the requirements herein shall prevail.

B. The CONTRACTOR will be required to submit MOTs for work in the county and state highways and City streets. CONTRACTOR shall coordinate with MOTs for nearby or highway work and obtain approval for all traffic control as required by the permits contained elsewhere in this section.

PART 2 SEQUENCE OF OPERATIONS

2.1 SCHEDULING

A. General: Prepare and submit schedule in accordance with the provisions of Section 01320 CONSTRUCTION PROGRESS DOCUMENTATION.

B. Plan the Work and carry it out with minimum interference to the operation of the existing facilities. Prior to starting the work, confer with the ENGINEER and OWNER's representative to develop an approved work schedule which will permit the facilities to function normally as practical. It may be necessary to do certain parts of the construction work outside normal working hours in order to avoid undesirable conditions. The CONTRACTOR shall do this work at such times, and at no additional cost to the OWNER. Do not make connections between existing work and new work until necessary inspection and tests have been completed on the new work and it is found to conform in all respects to the requirements of the Contract Documents.

C. No work shall be started until the CONTRACTOR has received approved shop drawings, established material/delivery dates for all equipment, and received approval of the construction schedule from the ENGINEER or OWNER. The CONTRACTOR shall have sufficient manpower, equipment, and material to complete the project.

D. No work shall commence without express consent of the ENGINEER or OWNER.

E. If a privately owned staging area is required, no work shall commence until approval of the facility is obtained from City Planning and Zoning in accordance with Section 47-19.2 of the Unified Land Development Regulations. Submit a copy of the approval and agreement to the CITY ENGINEER.

2.2 MOBILIZATION AND DEMOBILIZATION

A. The CONTRACTOR shall be responsible for mobilization and demobilization of labor, materials and equipment. Payment for mobilization and demobilization shall be included in the lump sum price indicated in the Proposal for the Project.

2.3 COORDINATION

A. The CONTRACTOR shall cooperate in the coordination of separate activities in a manner that will provide the least interference with the OWNER's operations and other contractors and utility companies working in the area, and in the interfacing and connection of the separate elements of the overall project work.

B. If any difficulty or dispute should arise in the accomplishment of the above, the problem shall be brought immediately to the attention of the PROJECT MANAGER or OWNER.

2.4 SHUTDOWN OF EXISTING OPERATIONS OR UTILITIES

A. Continuous operation of the OWNER's service functions is of critical importance. The CONTRACTOR's work shall not result in the interruption of sewage, water, or solid waste service to any customers.

B. Minimizing conflicts with the ongoing area-wide commercial activities is of critical importance. The CONTRACTOR's work shall minimize the interruption of operations at any facility or business.

C. Connections to existing services or utilities, or other work that requires the temporary shutdown of any existing operations or utilities shall be planned in detail with appropriate scheduling of the work and coordinated with the OWNER or PROJECT MANAGER. Two business days advanced notice shall be given in order that the OWNER or PROJECT MANAGER may witness the shutdown, tie-in, and startup. The temporary shutdown must be approved by the OWNER. All tie-in and bypass operations shall be the responsibility of the CONTRACTOR and are considered incidental to the cost of construction and provided at no additional cost to the OWNER.

D. All materials and equipment (including emergency equipment) necessary to expedite the tie-in shall be on hand prior to the shutdown of existing services or utilities.

2.5 OPERATION OF EXISTING SYSTEM PROHIBITED

A. At no time shall the CONTRACTOR undertake to close off any utility lines or open valves or take any other action which would affect the operation of existing systems. The OWNER’s forces will operate all valves. Provide at least one business day notice to OWNER prior to any operations.

PART 3 SITE CONDITIONS

3.1 SITE INVESTIGATION AND REPRESENTATION

A. The CONTRACTOR acknowledges satisfaction as to the general nature and location of the Work, the general and local conditions, particularly those bearing upon availability of transportation, availability of labor, water, electric power, roads, and uncertainties of weather, river stages, or similar physical conditions, the character of equipment and facilities needed preliminary to and during the prosecution of the Work, and all other matters which can in any way affect the Work or the cost thereof under this Contract.

B. Failure by the CONTRACTOR to become acquainted with the physical conditions and all the available information will not relieve the CONTRACTOR from responsibility for properly estimating the difficulty or cost of successfully performing the Work.

C. The CONTRACTOR warrants that as a result of examination and investigation

of all the aforesaid data, the CONTRACTOR can perform the Work in a good and workmanlike manner and to the satisfaction of the OWNER. The OWNER assumes no responsibility for any representations made by any of its officers or agents during or prior to the execution of this Contract, unless (1) such representations are expressly stated in the Contract, and (2) the Contract expressly provides that the responsibility therefore is assumed by the OWNER.

3.2 INFORMATION ON SITE CONDITIONS

A. General: Information obtained by the OWNER or ENGINEER regarding site conditions, subsurface information, groundwater elevations, existing construction of site facilities as applicable, and similar data will be available for inspection at the office of the OWNER upon request. Such information is offered as supplementary information only. Neither the ENGINEER nor the OWNER assumes any responsibility for the completeness or interpretation of such supplementary information.

3.3 UTILITIES

A. The CONTRACTOR shall be responsible for determining and/or confirming, at his cost, the locations of all utilities within the project area, and shall be responsible for contacting each utility for location and notification prior to commencing work.

B. The CONTRACTOR shall contact potentially affected utilities as provided in Section 01040 COORDINATION.

C. The CONTRACTOR shall contact Sunshine State One Call at 1-800-432-4770 at least two (2) working days prior to any excavation and make arrangements for locating all utilities in the project area.

3.4 CONTRACTOR'S RESPONSIBILITY FOR UTILITY PROPERTIES AND SERVICE

A. Where the CONTRACTOR's operations could cause damage or inconvenience to utilities, telephone, television, power, water, or sewer systems, the operations shall be suspended until all arrangements necessary for the protection of these utilities and services have been made by the CONTRACTOR with the owner of the utility affected.

B. Notify all utility offices which are affected by the construction operation at least two (2) working days in advance. Under no circumstances expose any utility without first obtaining permission from the appropriate agency. Once permission has been granted, locate, expose, and provide temporary support for all existing underground utilities.

C. The CONTRACTOR shall be solely and directly responsible to the OWNER and operators of such properties for any damage, injury, expense, loss, inconvenience, delay, suits, actions, or claims of any character brought because of any injuries or damage which may result from the construction operations under this Contract.

D. Neither the OWNER nor its officers or agents shall be responsible to the CONTRACTOR for damages as a result of the CONTRACTOR's failure to protect utilities encountered in the work.

E. In the event of interruption to domestic water, sewer, storm drain, or other utility services as a result of accidental breakage due to construction operations, promptly notify the proper authority. Cooperate with said authority in restoration of service as promptly as possible and bear all costs of repair. In no case shall interruption of any water or utility service be allowed to exist outside working hours unless prior approval is granted.

F. In the event the CONTRACTOR encounters water service lines that interfere with trenching, he may, by obtaining prior approval of the property owner, the ENGINEER and the OWNER, cut the service, dig through, and restore the service with similar and equal materials at the CONTRACTOR's expense.

G. The CONTRACTOR shall replace, at his own expense, all existing utilities or structures removed or damaged during construction, unless otherwise provided for in these Contract documents or ordered by the ENGINEER.

3.5 INTERFERING STRUCTURES

A. Take necessary precautions to prevent damage to existing structures whether on the surface, aboveground, or underground.

B. Protect underground and aboveground existing structures from damage, whether or not they lie within the limits of the easements obtained by the OWNER. Where such existing fences, gates, sheds, buildings, or any other structure must be removed in order to properly carry out the construction, or are damaged during construction, restore to their original condition to the satisfaction of the property owner involved at the CONTRACTOR's own expense. Notify the PROJECT MANAGER of any damaged underground structure, and make repairs or replacements before backfilling.

C. Without additional compensation, the CONTRACTOR may remove and shall replace in a condition as good as or better than original, such small miscellaneous structures as fences, mailboxes, and signposts that interfere with the CONTRACTOR's operations.

3.6 EASEMENTS

A. Where portions of the work are located on public or private property, easements and permits will be obtained by the OWNER, except as otherwise noted in these Specifications. Easements will provide for the use of property for construction purposes to the extent indicated on the easements. Copies of these easements and permits are available upon request to the OWNER. It shall be the CONTRACTOR's responsibility to determine the adequacy of the easement obtained in every case and to abide by all requirements and provisions of the easement. The CONTRACTOR shall confine his construction operations to within the easement limits or street right-of-way limits or make special arrangements with the property owners or appropriate public agency for

the additional area required. Any damage to property, either inside or outside the limits of the easements provided by the OWNER or street rights-of-way, shall be the responsibility of the CONTRACTOR as specified herein. The CONTRACTOR shall provide immediate notice to the OWNER of any damage to fencing and provide temporary fencing as required to provide a functionally similar level of security. The CONTRACTOR shall remove, protect, and replace all fences or other items encountered on public or private property. Before final payment will be authorized by the PROJECT MANAGER, the CONTRACTOR will be required to furnish the OWNER with written releases from property owners or public agencies where side agreements or special easements have been made by the CONTRACTOR or where the CONTRACTOR's operations, for any reason, have not been kept within the construction right-of-way obtained by the OWNER or the street right-of-way.

B. It is anticipated that the required easements and permits will be obtained before construction is started. However, should the procurement of any easement or permit be delayed, the CONTRACTOR shall schedule and perform the work around these areas until such a time as the easement or permit has been secured.

C. Prior to removing an existing structure or item, provide written notice to the OWNER at least 14 days in advance of the anticipated removal.

PART 4 SAFETY AND CONVENIENCE

4.1 SAFETY AND ACCESS

A. The CONTRACTOR shall do all work necessary to protect the general public from hazards, including, but not limited to, surface irregularities or unramped grade changes in pedestrian sidewalk or walkway, and trenches or excavations in roadway. Barricades, lanterns, and proper signs shall be furnished in sufficient amount to safeguard the public and the Work. All barricades and signs shall be clean and serviceable, in the opinion of the PROJECT MANAGER.

B. During construction, the CONTRACTOR shall construct and at all times maintain satisfactory and substantial temporary chain link fencing, solid fencing, railing, barricades or steel plates, as applicable, at all openings, obstructions, or other hazards in streets, sidewalks, floors, roofs, and walkways. All such barriers shall have adequate warning lights as necessary, or required, for safety. All lights shall be regularly maintained, and in a fully operational state at all times.

C. The CONTRACTOR shall notify all residences and businesses of planned construction at least 5 working days prior to the start of work in the block where they are located. Such notices shall be brochures or door-hangers with sufficient information to describe the extent and duration of the planned work. Notification activities shall be coordinated with the PROJECT MANAGER or ENGINEER.

D. Homeowners and business owners shall be provided reasonable access. The CONTRACTOR shall provide temporary sidewalks, bridges or driveway access, including safe passage over open excavations as required.

4.2 ACCIDENT REPORTS

A. In addition, the CONTRACTOR must promptly report in writing to the ENGINEER all accidents whatsoever arising out of, or in connection with, the performance of the work whether on, or adjacent to, the site, giving full details and statements of witnesses. If death or serious injuries or serious damages are caused, the accident shall be reported immediately by telephone or messenger to the PROJECT MANAGER.

B. If a claim is made by anyone against the contractor or any subcontractor on account of any accident, the CONTRACTOR shall promptly report the facts in writing to the PROJECT MANAGER, giving full details of the claim.

4.3 SAFE ACCESS BY FEDERAL, STATE, AND LOCAL GOVERNMENT OFFICIALS

A. Authorized representatives of the state, federal, or local governmental agencies, shall at all times have safe access to the Work, and the CONTRACTOR shall provide proper facilities for such access and inspection.

4.4 PROTECTION OF PROPERTY

A. Protect stored materials located adjacent to the proposed work. Notify property owners affected by the construction at least two business days in advance of the time construction begins. During construction operations, construct and maintain such facilities as may be required to provide access by all property owners to their property. No person shall be cut off from access to his residence or place of business for a period exceeding 2 hours, unless the CONTRACTOR has made special arrangements with the affected persons.

B. The CONTRACTOR shall identify and isolate his active work zone in such a manner as to exclude all personnel not employed by him, the PROJECT MANAGER, and the OWNER.

4.5 FIRE PREVENTION AND PROTECTION

A. The CONTRACTOR shall perform all work in a fire-safe manner. He shall supply and maintain on the site adequate fire-fighting equipment capable of extinguishing incipient fires. The CONTRACTOR shall comply with applicable federal, state, and local fire-prevention regulations. Where these regulations do not apply, applicable parts of the National Fire Prevention Standard for Safeguarding Building Construction Operations (NFPA No. 241) shall be followed.

4.6 ACCESS FOR POLICE, FIRE, AND POSTAL SERVICE

A. Notify the fire department and police department before closing any street or portion thereof. No closing shall be made without the OWNER's approval of MOT plan. Notify said departments when the streets are again passable for emergency vehicles. Do not block off emergency vehicle access to consecutive arterial crossings or dead-end streets, in excess of 300 linear feet, without special written permission from the fire department. Conduct operations with the least interference to fire equipment access, and at no time prevent such access.

B. The CONTRACTOR shall leave a night emergency telephone number or numbers with the police department, the PROJECT MANAGER, and the OWNER, so that contact may be made easily at all times in case of barricade and flare trouble or other emergencies.

C. Maintain postal service facilities in accordance with the requirements of the U.S. Postal Service. Move mailboxes to temporary locations designated by the U.S. Postal Service, and at the completion of the Work in each area, replace them in their original location and in a condition satisfactory to the U.S. Postal Service.

PART 5 PRESERVATION, RESTORATION, AND CLEANUP

5.1 SITE RESTORATION AND CLEANUP

A. At all times during the Work, keep the premises clean and orderly, and upon completion of the Work, repair all damage caused by equipment and leave the project free of rubbish or excess materials of any kind.

B. Stockpile excavated materials in a manner that will cause the least damage to adjacent lawns, grassed areas, shrubbery, or fences, regardless of whether these are on private property, or on state, county, or city rights-of-way. Remove all excavated materials from grassed and planted areas, and leave these surfaces in a condition equivalent to their original condition. Replace excavated areas as specified in Section 02320 TRENCH BACKFILL, raked and graded to conform to their original contours.

5.2 FINISHING OF SITE, BORROW, AND STORAGE AREAS

A. Upon completion of the project, all areas used by the CONTRACTOR shall be properly cleared of all temporary structures, rubbish, and waste materials and properly graded to drain and blend in with the abutting property. Areas used for the deposit of waste materials shall be finished to properly drain and blend with the surrounding terrain. Grassed areas shall be restored as specified.

PART 6 PERMITS

6.1 GENERAL

A. Permits obtained by the OWNER may include the following:

1. Florida State Department of Transportation: Utility Permit
2. Broward County Department of Health: Water Main Structure

B. Permits to be Obtained by the CONTRACTOR may include, but are not limited to the following:

1. Local and County Building permits.
2. Local, County, and State contracting licenses.
3. Tree removal and trimming permits.
4. BCEPD: Dewatering permit.

C. The CONTRACTOR shall comply with all applicable permit conditions. **For MOT Broward County permit approval the contractor shall ensure that he obtains preapproval from 1) Signal Design (Keith Smith), 2) Systems Communication (Tim Miller), 3) Schools/Traffic Calming (Linda Laskin), and 4) Maintenance of Traffic (Steve Hessler) reviewers**

D. For Broward County MOT permit submittal Contractor shall contact: Mr. Lei Cai, (954) 847-2653 or (954) 847-2600, 2300 W Commercial Boulevard, Fort Lauderdale, Florida 33309.

END OF SECTION

SECTION 01005
INTENT OF DRAWINGS AND SPECIFICATIONS

A. Intent of specifications and drawings is to cover an installation complete in every respect. It is not intended to give every detail on drawings and in specifications. The OWNER will not be responsible for absence of any detail which the CONTRACTOR may require, nor for any special construction which may be found necessary as work progresses. If an item is either indicated or specified, it shall be considered sufficient for inclusion of said item in contract. The CONTRACTOR shall furnish and install materials and equipment usually furnished with such systems, and as needed to complete an operating installation, whether mentioned or not, which are customary to its trade.

B. Incidental accessories not usually shown or specified but which are necessary for the proper installation and operation shall be included in work without additional cost to the OWNER, the same as if herein specified.

C. Any apparatus, appliance, material or work not shown on but mentioned in the specifications, or vice versa, or any incidental accessories necessary to make the work complete and ready for operation, shall be furnished, delivered, and installed by the CONTRACTOR without additional cost to the OWNER.

D. Drawings are diagrammatic and indicate the general arrangement of systems and work indicated (do not scale the drawings). Consult the OWNER or ENGINEER for exact locations of fixtures, appurtenances, etc., where these items are not definitely located on the drawings.

E. The OWNER’s or ENGINEER's interpretation of drawings and specifications shall be final and binding upon Contractor.

F. The CONTRACTOR shall visit site prior to submitting bid, and thoroughly investigate and verify all conditions under which work shall be performed.

END OF SECTION

SECTION 01010
SUMMARY OF WORK

PART 1 GENERAL

1.1 WORK COVERED BY CONTRACT DOCUMENTS

A. The completed improvements of the water and sewer main Work will include, but are not limited to, the following project components:

1. The CONTRACTOR shall provide all materials, labor and equipment to construct a NEW 12" Polyvinyl Chloride Distributed water main by Open-Cut Method including valving, fittings, services and appurtenances, as well as the required interconnection to the existing 24" water main located approximately 250 LF west as indicated on the project plans and in the associated specifications. In addition, new water service lines will be installed to existing water meters and transfer services to the proposed 12" water main. The existing water services and the existing 6' water main will be capped and placed out of service.

2. The CONTRACTOR shall restore sidewalks, curbs, trees, sod, sprinkler, and signs damaged during construction that are outside of the limits of construction, at its own cost. Such restoration is considered incidental to the water and sewer main extension work.

3. The CONTRACTOR shall coordinate with Broward County Traffic the restoration and replacement of Signs and Striping to meet standards at the time the restoration takes place. The CONTRACTOR shall be fully responsible for compliance.

4. The CONTRACTOR shall retain the services of a certified independent soils and materials testing lab to provide all soils, concrete, asphalt, density and materials testing as required. Testing results shall be submitted to the ENGINEER for review and approval at the time the testing results are provided to the CONTRACTOR.

5. The CONTRACTOR shall be responsible for maintaining up-to-date redline as-built drawings, on site, at all times during construction. All as-built information shall be surveyed and verified by a professional land surveyor registered in the State of Florida. The CONTRACTOR shall provide the CITY with a minimum of three (3) sets of signed and sealed record drawings (final as-builts) and a CD of the electronic drawing files created in AutoCAD 2014 or later. All costs associated with survey work required for construction layout and as-built preparation shall be the responsibility of the CONTRACTOR.

6. All project documents shall be submitted via paper copy, email, and/or thumb drive. All formats must be properly labeled with the project number, date and submittal number.

B. Improvements to the water and sewer main systems include, but are not limited to:

1. Traffic control (MOT) and sequencing and re-sequencing of work, as needed, during construction activities.

2. Dewatering to be provided as required due to field conditions. Dewatering plans to be obtained by CONTRACTOR and approved by Broward County DEP, prior to construction.

3. Site restoration to a condition similar to or better than what existed prior to pipe installation, or as indicated on the plans.

4. Compliance with applicable permits including but not limited to provisions under the BCDOH, BCEPGMD (FDEP Permits) and BCHCED.

1.2 WORK NOT COVERED BY CONTRACT DOCUMENTS

A. Any associated work on any water main, sewer main, manhole or service lateral not specifically identified in the contract documents or in writing by ENGINEER or OWNER.

1.3 OWNER-FURNISHED ITEMS

1. Approved permits from BCDOH, BCEPGMD and BCHCED

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.1 SEQUENCE OF WORK

A. To avoid and/or minimize impacts on adjacent property owners, the Work will be constructed in the following sequence:

1. The CONTRACTOR shall produce an approved schedule prior to starting construction.

2. Excavation for pipe installation may proceed for one system at a time to minimize traffic disruption. Trenches for one piping system must be fully restored and temporary pavement completed before the CONTRACTOR starts the other piping system.

3. CONTRACTOR shall not use the right of way for on-site storage of construction materials; the CONTRACTOR shall procure and setup a staging area for storage of equipment and materials away from the public right of way.

4. The CONTRACTOR is directed to carefully review the Project Description, Sequence of Operations, Site Conditions, Safety and

Convenience, Preservation Restoration and Cleanup, and Permits requirements of Section 01001 GENERAL REQUIREMENTS.

5. The CONTRACTOR is directed to carefully review the requirements of SECTION 01500 CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS.

6. CONTRACTOR is directed to obtain MOT approval from the City of Fort Lauderdale as required.

7. The CONTRACTOR is required to identify underground utilities prior to commencing construction activities. Existing service lines to residential water meters are located in the trenching area and are required to stay in continuous service during the installation of the new pipelines.

8. The existing water mains with fire hydrants are required to stay in continuous service during the installation of the new water mains.

9. The CONTRACTOR shall perform all Work associated with extending the indicated water and sewer mains.

10. All Work associated with the water main construction shall be completed, tested and accepted by ENGINEER and OWNER before water main is placed into service.

11. All Work associated with the sewer main construction shall be completed, tested and accepted by ENGINEER and OWNER before sewer main is placed into service.

12. The CONTRACTOR shall perform all Work required for site grading, restoration, and stabilization.

END OF SECTION

SECTION 01025
MEASUREMENT AND PAYMENT

PART 1 GENERAL

1.1 SUBMITTALS

A. Informational:

1. Submit schedule on OWNER's form
2. Application for Payment.
3. Final Application for Payment.

1.2 SCHEDULE

A. Prepare a schedule for the Work in accordance with the requirements of Section 01320 CONSTRUCTION PROGRESS DOCUMENTATION

B. Unit Price Work: Reflect unit price quantity and price breakdown from conformed Bid Form.

C. Lump Sum Work:

1. Reflect schedule format included in conformed Bid Form.
2. List Bonds and insurance premiums, mobilization, demobilization, allowance items and contract closeout separately.
3. Break down by Divisions 2 through 16 with appropriate subdivision of each Specification.

D. An unbalanced or front-end loaded schedule will not be acceptable and may result in delay of payments.

E. Summation of all the Work shall equal the Contract Price.

1.3 APPLICATION FOR PAYMENT

A. Transmittal Summary Form: Attach one Summary Form with each detailed Application for Payment and include Request for Payment of Materials and Equipment on Hand as applicable. Execute certification by authorized officer of CONTRACTOR.

B. Use detailed Application for Payment Form provided by PROJECT MANAGER.

C. Include each portion of Work and the unit price breakdown for the Work to be paid on unit price basis, and a listing of OWNER-selected equipment, if applicable, and allowances, as appropriate.

D. Preparation:

1. Round values to nearest dollar.
2. List each Change Order and Written Amendment executed prior to date of submission as separate line item. Totals to equal those shown on the Transmittal Summary Form.
3. Submit Application for Payment, including a Transmittal Summary Form and detailed Application for Payment Form, a listing of materials on hand as applicable, and such supporting data as may be requested by PROJECT MANAGER.

1.4 MEASUREMENT—GENERAL

A. Weighing, measuring, and metering devices used to measure quantity of materials for Work shall be suitable for purpose intended and conform to tolerances and Specifications as specified in National Institute of Standards and Technology, Handbook 44.

B. Whenever pay quantities of material are determined by weight, material shall be weighed on scales furnished by CONTRACTOR and certified accurate by state agency responsible. Weight or load slip shall be obtained from weigher and delivered to ENGINEER or OWNER's representative at point of delivery of material.

C. If material is shipped by rail, car weights will be accepted provided that actual weight of material only will be paid for and not minimum car weight used for assessing freight tariff, and provided further that car weights will not be acceptable for material to be passed through mixing plants.

D. Vehicles used to haul material being paid for by weight shall be weighed empty daily and at such additional times as required by ENGINEER. Each vehicle shall bear a plainly legible identification mark.

E. Materials that are specified for measurement by the cubic yard measured in the vehicle shall be hauled in vehicles of such type and size that actual contents may be readily and accurately determined. Unless all vehicles are of uniform capacity, each vehicle must bear a plainly legible identification mark indicating its water level capacity. Vehicles shall be loaded to at least their water level capacity. Loads hauled in vehicles not meeting above requirements or loads of a quantity less than the capacity of the vehicle, measured after being leveled off as above provided, will be subject to rejection, and no compensation will be allowed for such material.

F. Where measurement of quantities depends on elevation of existing ground, elevations obtained during construction will be compared with those shown on Drawings. Variations of 1 foot or less will be ignored, and profiles shown on Drawings will be used for determining quantities.

G. Units of measure shown on Bid Form shall be as follows, unless specified otherwise. All methods of measurement shall be approved by the PROJECT MANAGER.

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Item	Method of Measurement
AC	Acre—Field Measure
AL	Allowance
CY	Cubic Yard—Field Measure within limits specified or shown, or measured in vehicle by volume, as specified
EA	Each—Field Count
GAL	Gallon—Field Measure
HR	Hour
LB	Pound(s)—Weight Measure by Scale
LF	Linear Foot—Field Measure
LS	Lump Sum—Unit is one; no measurement required
N/A	Not Applicable
SF	Square Foot
SY	Square Yard
TON	Ton—Weight Measure by Scale (2,000 pounds)

1.5 PAYMENT

A. General:

1. Progress payments will be made monthly.

2. The date for the CONTRACTOR's submission of monthly Application for Payment shall be established at the Preconstruction Conference.

3. The CONTRACTOR shall be solely and directly responsible to the OWNER and operators of utilities, telephone, television, power, water, or sewer systems for any damage, injury, expense, loss, inconvenience, delay, suits, actions, or claims of any character brought because of any injuries or damage which may result from the construction operations under this Contract.

4. Neither the OWNER nor its officers or agents shall be responsible to the CONTRACTOR for damages as a result of the CONTRACTOR's failure to protect utilities encountered in the Work.

5. In the event of interruption to domestic water, sewer, storm drain, or other utility services as a result of accidental breakage due to construction operations, promptly notify the proper authority. Cooperate with said authority in restoration of service as promptly as possible and bear all costs

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of repair. In no case shall interruption of any water or utility service be allowed to exist outside working hours unless prior approval is granted.

6. In the event the CONTRACTOR encounters water service lines or sewer laterals that interfere with trenching, he may, by obtaining prior approval of the property owner, the ENGINEER and the OWNER, cut the service, dig through, and restore the service with similar and equal materials at the CONTRACTOR's expense.

7. The CONTRACTOR shall replace, at his own expense, all existing utilities or structures removed or damaged during construction, unless otherwise provided for in these Contract documents or ordered by the City of Fort Lauderdale.

8. Telephone and communications drops and systems may extend throughout the project area. Properly located cable, conduit, interface equipment, pull or junction boxes and other signal or systems equipment damaged by the CONRACTOR shall be replaced at the CONTRACTOR’s expense. Damaged cable shall be replaced as an entire run, from junction box to junction box.

9. Protect underground and aboveground existing structures from damage, whether or not they lie within the limits of the easements obtained by the OWNER. Where such existing fences, gates, sheds, buildings, or any other structure must be removed in order to properly carry out the construction, or are damaged during construction, restore to their original condition to the satisfaction of the property owner involved at the CONTRACTOR's own expense. Notify the ENGINEER of any damaged underground structure, and make repairs or replacements before backfilling.

10. Without additional compensation, the CONTRACTOR may remove and shall replace in a condition as good as or better than original, such small miscellaneous structures as fences, mailboxes, and signposts that interfere with the CONTRACTOR's operations.

11. Any damage to property, either inside or outside the limits of the easements provided by the OWNER or street rights of way, shall be the responsibility of the CONTRACTOR as specified herein. The CONTRACTOR shall provide immediate notice to the OWNER of any damage to fencing and provide temporary fencing as required to provide a functionally similar level of security. The CONTRACTOR shall remove, protect, and replace all fences or other items encountered on public or private property. Before final payment will be authorized by the PROJECT MANAGER, the CONTRACTOR will be required to furnish the OWNER with written releases from property owners or public agencies where side agreements or special easements have been made by the CONTRACTOR or where the CONTRACTOR's operations, for any reason, have not been kept within the construction right of way obtained by the OWNER or the street right of way.

12. The CONTRACTOR shall be responsible for all damage to private property where work related activities have occurred without proper easement or authorization. The OWNER may withhold payment to the CONTRACTOR pending resolution of any claims by private owners.

B. Payment for Lump Sum Work covers all Work specified or shown for the following items:

(Note: Item numbers in Bid Schedule in the Proposal Section correspond to descriptions in Section 01025 MEASUREMENT AND PAYMENT. Lump Sum prices will be divided by the construction time in months and paid accordingly)

1. **Survey – Control and As-builts:**
Payment for survey conducted for horizontal and vertical control and as-builts will be made in a lump sum.

CONTRACTOR to provide survey control including coordination of the boundary and all proposed above and below ground improvements utilizing electronic "CADD" files provided by the City. CONTRACTOR shall verify the boundary and establish three (3) vertical control (benchmarks) points within the project.

CONTRACTOR to provide As-builts of all proposed water lines and services, top of pipe elevations every 100 feet ; location and elevation of all fittings including bends, tees, gate valves, etc.; all tie ins to existing lines should be as-builts; the ends of all water services at the property line where water services terminates. Upon completion of the work, the CONTRACTOR shall prepare record drawings, "as-builts" on full size 24"x36" drawings. Record drawings shall be signed and sealed by a Florida Registered Professional Land Surveyor. Additionally, electronic copies of these record drawings shall be submitted to the City and the Engineer of Record in AutoCAD version 2017.

Payments will be made on a lump sum price based on percentage of completion as requested in CONTRACTOR monthly invoice and acceptance by OWNER of the progressive as-builts drawings and tables provided by the CONTRACTOR.

2. **Erosion Control (Stormwater Pollution Prevention Control):** Lump Sump
Payment for Erosion Control, including but not limited to preparation of the Stormwater Pollution Prevention Plan, permits, installation of silt fence and inlet protection, filter fabric, filter socks, turbidity barriers, and final cleaning of the affected storm water system will be made at the lump sum price identified for such work.

3. **Bid, Performance, and Payment Bonds** : Lump Sump
Payment for Bid, Performance, and Payment Bonds will be made at the lump sum price identified for such work.

4. **Testing – Densities:** Lump Sump
Payment for density testing of soils, bedding, and backfilling will be made at the lump sum price identified for such work. Monthly payments will be made on a lump sum price based on percentage of completion as requested in CONTRACTOR monthly invoice.

5. **Maintenance of Traffic:** Lump Sump
Payment for traffic control (MOT) will be made at the lump sum price identified for such work. Monthly payments shall be equal to the bid amount divided by the number of months in the contract

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6. **Furnish and Install 12-inch PVC Water Main:** Linear Foot
   Measurement and payment to furnish and install the water main will be based upon the number of linear feet as indicated on the Bid Schedule.

   Payment for furnishing all materials, equipment and labor to install the water main will be made at the unit price, per linear foot of pipe identified in the Bid Schedule and includes but is not limited to saw cutting of asphalt, excavation and disposal of unsuitable material, installation of pipe bedding and backfill, all transportation costs, storage of materials, furnishing and installing all necessary fittings, pipe restraining, leakage testing per Section 02139 PIPING LEAKAGE TESTING, and disinfection per Section 02519 DISINFECTION OF WATER SYSTEMS.

7. **Furnish and Install 6-inch PVC Water Main:** Linear Foot
   Measurement and payment to furnish and install the water main will be based upon the number of linear feet as indicated on the Bid Schedule.

   Payment for furnishing all materials, equipment and labor to install the water main will be made at the unit price, per linear foot of pipe identified in the Bid Schedule and includes but is not limited to saw cutting of asphalt, excavation and disposal of unsuitable material, installation of pipe bedding and backfill, all transportation costs, storage of materials, furnishing and installing all necessary fittings, pipe restraining, leakage testing per Section 02139 PIPING LEAKAGE TESTING, and disinfection per Section 02519 DISINFECTION OF WATER SYSTEMS.

8. **Furnish and Install 4-inch PVC Water Main:** Linear Foot
   Measurement and payment to furnish and install the water main will be based upon the number of linear feet as indicated on the Bid Schedule.

   Payment for furnishing all materials, equipment and labor to install the water main will be made at the unit price, per linear foot of pipe identified in the Bid Schedule and includes but is not limited to saw cutting of asphalt, excavation and disposal of unsuitable material, installation of pipe bedding and backfill, all transportation costs, storage of materials, furnishing and installing all necessary fittings, pipe restraining, leakage testing per Section 02139 PIPING LEAKAGE TESTING, and disinfection per Section 02519 DISINFECTION OF WATER SYSTEMS.

9. **Remove and Dispose of Abandoned 16-inch Forcemain:** Linear Foot
   Measurement and payment to removal and dispose of the 16-inch forcemain which conflicts with the proposed water main will be based upon the number of linear feet removed as indicated on the Bid Schedule and includes all labor, equipment and materials. Disposal tickets must be provided and any recyclable material will be credited to the City.

10. **Furnish and Install 1-1/2 inch Water Service Line:** Linear Foot
    Measurement and payment to install water service laterals and reconnecting existing services to water meters will be based upon the number of laterals required as indicated on the Bid Schedule.

    Payment for furnishing and installing water service laterals and meter boxes will be made at the unit price, per number identified in the Bid Schedule and includes but is not limited to all transportation costs, saw cutting of asphalt, trenching and backfilling storing, and furnishing and installing all necessary fittings, leakage testing per Section 02139 PIPING LEAKAGE TESTING, and disinfection per Section 02519 DISINFECTION OF WATER SYSTEMS.

11. **Furnish and Install Fire Hydrant with Miscellaneous Ductile Iron Fittings and gate valve:** Each

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Measurement and payment to furnish and install fire hydrants will be based upon the number of hydrants required as indicated on the Bid Schedule.

Payment for furnishing and installing hydrants will be made at the unit price, per number identified in the Bid Schedule and includes but is not limited to all transportation costs, storing, restrained joint ductile iron fittings, and furnishing and installing all necessary appurtenances

12. **Furnish and Install 12-inch X 6-inch Ductile Iron Tee:** Each
Measurement and payment to furnishing and installing tees will be based upon the number of tees required as indicated on the Bid Schedule.

Payment for furnishing and installing tees will be made at the unit price, per number identified in the Bid Schedule and includes but is not limited to all transportation costs, storing, and furnishing and installing all necessary appurtenances.

13. **Furnish and Install 12-inch X 6-inch Ductile Iron Tee:** Each
Measurement and payment for furnishing and installing tees will be based upon the number of tees required as indicated on the Bid Schedule.

Payment for furnishing and installing tees will be made at the unit price, per number identified in the Bid Schedule and includes but is not limited to all transportation costs, storing, and furnishing and installing all necessary appurtenances.

14. **Furnish and Install 24-inch X 12-Inch Tapping Sleeve:** Each
Measurement and payment to furnish and install tapping sleeves will be based upon the number of sleeves required as indicated on the Bid Schedule.

Payment for furnishing and installing tapping sleeves will be made at the unit price, per number identified in the Bid Schedule and includes but is not limited to all transportation costs, storing, tapping the main and furnishing and installing all necessary appurtenances.

15. **Furnish and Install 6-inch X 6-Inch Tapping Sleeve:** Each
Measurement and payment to furnish and install tapping valves will be based upon the number of sleeves required as indicated on the Bid Schedule.

Payment for furnishing and installing tapping valves will be made at the unit price, per number identified in the Bid Schedule and includes but is not limited to all transportation costs, storing, tapping the main, and furnishing and installing all necessary appurtenances.

16. **Furnish and Install 12-inch Tapping Valve:** Each
Measurement and payment to furnish and install tapping valves will be based upon the number of valves required as indicated on the Bid Schedule.

Payment for furnishing and installing tapping valves will be made at the unit price, per number identified in the Bid Schedule and includes but is not limited to all transportation costs, storing, and furnishing and installing all necessary appurtenances.

17. **Furnish and Install 6-inch Tapping Valve:** Each

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Measurement and payment to furnish and install tapping valves will be based upon the number of valves required as indicated on the Bid Schedule.

Payment for furnishing and installing tapping valves will be made at the unit price, per number identified in the Bid Schedule and includes but is not limited to all transportation costs, storing, and furnishing and installing all necessary appurtenances.

18. **Furnish and Install 12-inch Gate Valve with Box and Extension:** Each
Measurement and payment to furnish and install gate valves will be based upon the number of valves required as indicated on the Bid Schedule.

Payment for furnishing and installing gate valves will be made at the unit price, per number identified in the Bid Schedule and includes but is not limited to all transportation costs, storing, and furnishing and installing all necessary appurtenances

19. **Furnish and Install 6-inch Gate Valve with Box and Extension:** Each
Measurement and payment to furnish and install gate valves will be based upon the number of valves required as indicated on the Bid Schedule.

Payment for furnishing and installing gate valves will be made at the unit price, per number identified in the Bid Schedule and includes but is not limited to all transportation costs, storing, and furnishing and installing all necessary appurtenances

20. **Furnish and Install 12-inch 45 Degree Bends: Each**
Measurement and payment to furnish and install ductile iron fittings will be based upon the number of fittings required as indicated on the Bid Schedule.

Payment for furnishing and installing ductile iron fittings will be made at the unit price, per number identified in the Bid Schedule and includes but is not limited to all transportation costs, storing, and furnishing and installing all necessary appurtenances.

21. **Furnish and Install 6-inch 45 Degree Bends: Each**
Measurement and payment to furnish and install ductile iron fittings will be based upon the number of fittings required as indicated on the Bid Schedule

Payment for furnishing and installing ductile iron fittings will be made at the unit price, per number identified in the Bid Schedule and includes but is not limited to all transportation costs, storing, and furnishing and installing all necessary appurtenances.

22. **Furnish and Install 2-inch Air Release Valve with Manhole: Each**
Measurement and payment to furnish and install air release valves will be based upon the number of valves and manholes required as indicated on the Bid Schedule

Payment for furnishing and installing air release valves will be made at the unit price, per number identified in the Bid Schedule and includes but is not limited to all transportation costs, storing, and furnishing and installing all necessary appurtenances.

23. **Furnish and Install Sample Points: Each**
Measurement and payment to furnish and install sample points will be based upon the number of points required as indicated on the Bid Schedule

Payment for furnishing and installing sample points will be made at the unit price, per number identified in the Bid Schedule and includes but is not limited to all transportation costs, storing, and

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furnishing and installing all necessary fittings, and disinfection per Section 02519 DISINFECTION OF WATER SYSTEMS.

24. Remove and Restore Concrete Curb and Gutter: Linear Foot

Measurement and payment the removal and restoration of concrete curb and gutter will be based upon the quantity indicated on the Bid Schedule

Payment shall include furnishing and installing all equipment, materials and labor necessary will be made at the unit price, per number identified in the Bid Schedule and includes but is not limited to all transportation costs, storing, and furnishing and all appurtenances required to remove and restore concrete curb and gutter. 25% of payment will be made for removal and disposal and the remaining 75% will be paid when the curb and cutter have been restored.

25. Remove and Restore Concrete Sidewalk: Square Yard

Measurement and payment the removal and restoration of concrete sidewalks will be based upon the quantity indicated on the Bid Schedule

Payment shall include furnishing and installing all equipment, materials and labor necessary will be made at the unit price, per number identified in the Bid Schedule and includes but is not limited to all transportation costs, storing, and furnishing and all appurtenances required to remove and restore concrete sidewalks. 25% of payment will be made for removal and disposal and the remaining 75% will be paid when sidewalks have been restored.

26. Remove and Replace Brick Pavers: Square Yard

Measurement and payment the removal and restoration of concrete sidewalks will be based upon the quantity indicated on the Bid Schedule

Payment shall include furnishing and installing all equipment, materials and labor necessary will be made at the unit price, per number identified in the Bid Schedule and includes but is not limited to all transportation costs, storing, and furnishing and all appurtenances required to remove and replace. 25% of payment will be made for removal and disposal and the remaining 75% will be paid when sidewalks have been restored. Any pavers damaged by the Contractors work are to be replaced with new pavers at no cost to the City.

27. Furnish and install Limerock Base and 2.5" Asphalt for Trench Restoration: Square Yard

Measurement and payment to install limerock base and asphalt will be based upon the area of the road to be restored as required and indicated on the Bid Schedule and details.

Payment for furnishing and installing limerock base and asphalt will be made at the unit price, per number identified in the Bid Schedule, and includes but is not limited to mobilization and demobilization costs, temporary asphalt, provision of equipment, material handling, placing, compacting, and transportation costs.

28. Mill and Resurface 1.5" of Existing Asphalt: Square Yard

Measurement for payment of asphalt mill and overlay will be based upon the paved area to be overlaid as required and indicated on the Bid Schedule and details.

Payment for asphalt overlay of the existing pavement will be made at the unit price, per number identified in the Bid Schedule, and includes but is not limited to mobilization and demobilization costs, provision of equipment, material handling, placing, compacting, transportation costs, and cleanup.

29. Thermoplastic Pavement Markings and Signage Replacement: Lump Sum

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Payment for the restoration of all existing traffic control pavement markings and signage replacement will be made at the lump sum price identified for such work.

30. Bid Alternate 1 - 12-inch HDPE DR11 Water Main (Horizontal Directional Drilling): Lump Sump

Measurement and Payment will be full compensation for all materials, labor, and equipment associated with the installation of 12" HDPE DR11 Water Main by Horizontal Directional Drilling.

Price shall include, but not be limited to: locating by vacuum excavation and protecting all existing utilities, geotechnical testing, repairing or replacing damaged utilities, as needed, excavation, backfilling, compaction, setting up insertion and receiving pits, preparing water service pits, coordinating interruption of service with the Owner and residents, joining HDPE pipe, tracer wires, pre-chlorination of pipe, post-chlorination, hydrostatic testing, bacteriological testing, reconnecting new water main to the existing system, HDPE pipe adapters, removal and disposal of existing pipe, proper containment and disposal of excess drilling mud, removing existing valve boxes and backfill, and restoring the surface disturbed by construction, such as swales, driveways, roadway, pavement markings, signage, and sidewalk.

31. Allowance 1 – Permitting

Payment will be based on the actual permit, license or fee paid directly to the agency, documented by paid receipts, specifically excluding any labor, mark-up, overhead and profit, administration and other costs involved in obtaining permits or licenses or paying fees. The Contractor is responsible for submitting and obtaining all necessary regulatory agency permits other than those provided by the Owner, and the Contractor is responsible for paying for all associated permit fees which are specifically excluded from this allowance and to be included in the various bid items herein. Fees specifically excluded from this allowance, include, but are not limited to, reinspection fees, expired permit fees stand by time, failed test and bacteriological testing fees. Only permit fees substantiated by the Contractor and approved by the Engineer will be paid as part of this Item. Any balance in this Item at the end of the project shall be credited back to the Owner.

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1.6 NONPAYMENT FOR REJECTED OR UNUSED PRODUCTS

A. Payment will not be made for following:

1. Excess quantities determined by the ENGINEER not to be required for installation under the Contract.
2. Loading, hauling, and disposing of rejected material.
3. Quantities of material wasted or disposed of in manner not called for under Contract Documents.
4. Rejected loads of material, including material rejected after it has been placed by reason of failure of the CONTRACTOR to conform to provisions of Contract Documents.
5. Material not unloaded from transporting vehicle.
6. Defective Work not accepted by OWNER.
7. Material remaining on hand after completion of Work.

1.7 PARTIAL PAYMENT FOR STORED MATERIALS AND EQUIPMENT

A. Partial Payment: No partial payments will be made for materials and equipment delivered or stored unless agreed to by the OWNER and the ENGINEER.

B. Final Payment: Will be made only for products incorporated in Work. Remaining products, for which partial payments have been made, shall revert to the CONTRACTOR unless otherwise agreed, and partial payments made for those items will be deducted from final payment

1.8 ALLOWANCES

A. The allowances shall be used only at the discretion of and as ordered by the OWNER for such items as unforeseen conditions, unforeseeable conflicts between existing elements of work and the proposed work, unit price items exceeding estimated quantities, and any associated work requested by the OWNER including all labor, materials, and services for modifications or extra work to complete the Project that was anticipated, but not specifically included in this Contract.

B. Any portion of these allowances that remain after all authorized payments have been made will be withheld from contract payments and will remain with the OWNER.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01040
COORDINATION

PART 1 GENERAL

1.1 SUBMITTALS

A. Informational:

1. Statement of Qualification (SOQ) for land surveyor or civil engineer.
2. Statement of Qualification (SOQ) for professional videographer.
3. Photographs:
   a. Color Prints: Submit two copies, accompanied by negatives or digital files, within 5 days of being taken.
   b. Video Recordings: Submit two copies within 5 days of being taken.

1.2 UTILITY NOTIFICATION AND COORDINATION

A. Coordinate the Work with various utilities within Project limits. Notify applicable utilities prior to commencing Work.

1. Contact the City of Fort Lauderdale Public Services Department at 954-828- 8000 for water and sewer utility locations.
2. Contact Sunshine State One Call at 1-800-432-4770 at least 2 business days prior to any excavation.

B. If damage occurs, or if conflicts or emergencies arise during Work, contact the appropriate utility.

1. Electricity Company: Florida Power and Light.
   a. Contact Person: Trouble Center (or police/fire – 911).
   b. Telephone: 954-797-5000.
2. Telephone Company: BellSouth.
   a. Contact Person: Jason Boschen.
   b. Telephone: 954-316-4005 or 954-605-1121.
3. Water and Sewer Department: Fort Lauderdale Public Services Department.
   a. Contact Person: Emergency Hotline.
   b. Telephone: 954-828-8000.
4. Gas Company: TECO Peoples Gas.
   a. Contact Person: Dispatch.
   b. Telephone: 305-957-3857, ext. 7490 or 1-877-832-6747.
5. Telecom: AT&T – Broadband/Comcast.
   a. Contact: Andy Vaspasiano.
   b. Telephone: 954-266-6589 or 954-444-2833.
6. Telecom: FP&L FiberNet.

a. Contact: Noel R. Reese.
b. Telephone: 305-552-3249 or 305-205-1283.

7. Broward County Traffic Engineering Division (For Traffic Signal Communications Systems Underground Cable):
   a. Contact: Keith Smith.
   b. Telephone: 954-484-9600, ext. 227.

1.3 PROJECT MEETINGS

A. General:

1. ENGINEER: Schedule physical arrangements for meetings throughout progress of Work, prepare meeting agenda with the PROJECT MANAGER's, OWNER's and CONTRACTOR's input and distribute with written notice of each meeting, preside at meetings, record minutes to include significant proceedings and decisions, and reproduce and distribute copies of minutes after each meeting to participants and parties affected by meeting decisions.
2. Representatives of the PROJECT MANAGER, OWNER, CONTRACTOR, and Subcontractors shall attend meetings as needed.

B. Preconstruction Conference:

1. CONTRACTOR shall be prepared to discuss the following subjects, as a minimum:
   a. Required schedules.
   b. Status of bonds and insurance.
   c. Sequence of critical path work items.
   d. Project changes and clarification procedures.
   e. Use of site, access, office and storage areas, security and temporary facilities.
   f. Major project delivery and priorities.
   g. CONTRACTOR's safety plan and representative.
   h. Progress payment procedures.

2. Attendees may include but not be limited to:
   a. OWNER's representatives
   b. PROJECT MANAGER's representatives
   c. CONTRACTOR's office representative
   d. CONTRACTOR's resident superintendent
   e. CONTRACTOR's quality control representative
   f. Subcontractor's representatives whom CONTRACTOR may desire or PROJECT MANAGER may request to attend.
   g. ENGINEER's representatives.
   h. Others as appropriate.

C. Preliminary Schedules Acceptability Review Meeting: As required

to review and finalize Preliminary Schedule.

D. Progress Meetings:

1. PROJECT MANAGER will schedule regular progress meetings at site, conducted weekly to review Work progress, progress schedule, Shop Drawing and Sample submissions schedule, Application for Payment, contract modifications, and other matters needing discussion and resolution.

2. Attendees will include:
   a. OWNER's representatives, as appropriate.
   b. PROJECT MANAGER, as appropriate.
   c. CONTRACTOR, Subcontractors and Suppliers, as appropriate.
   d. ENGINEER's representative(s).
   e. Others as appropriate.
3. On a monthly basis, the PROJECT MANAGER will conduct a meeting to review work completed the previous month versus the Progress Schedule, work planned for upcoming month based on the Progress Schedule, the monthly Application for Payment, and any outstanding issues related to performance of the Work including pending contract modifications, requests for clarification, Shop Drawings, etc. All parties will attend the monthly meeting.

E. Pre-installation Meetings:

1. When required in individual Specification sections or as necessary to coordinate the Work, convene at site prior to commencing Work of that section.
2. Require attendance of entities directly affecting, or affected by, Work of that section.
3. Notify PROJECT MANAGER four (4) days in advance of meeting date.
4. Provide suggested agenda to PROJECT MANAGER to include reviewing conditions of installation, preparation and installation or application procedures, and coordination with related Work and work of others.

F. Other Meetings: In accordance with the Contract Documents and as may be required by the OWNER, PROJECT MANAGER, and ENGINEER.

1.4 FACILITY OPERATIONS

A. Continuous operation of OWNER's facilities is of critical importance. Schedule and conduct activities to enable existing facilities to operate continuously, unless otherwise specified.

B. Perform Work continuously during critical connections and changeovers, and as required to prevent interruption of OWNER's operations.

C. When necessary, plan, design, and provide various temporary services, utilities, connections, temporary piping and heating, access, and similar items to maintain continuous operations of OWNER's facilities.

D. Do not close lines, open or close valves, or take other action which would affect the operation of existing systems, except as specifically required by the Contract Documents and after authorization by OWNER and ENGINEER. Such authorization will be considered within 48 hours after receipt of CONTRACTOR's written request.

E. Provide seven (**7**) days advance written request for approval of need to shut down a process or facility to OWNER and PROJECT MANAGER.

F. Power outages will be considered upon 48 hours written request to the OWNER and the PROJECT MANAGER. Describe the reason, anticipated length of time, and areas affected by the outage. Provide temporary provisions for continuous power supply to critical facility components.

G. Do not proceed with Work affecting a facility's operation without obtaining the OWNER's and PROJECT MANAGER's advance approval of the need for and duration of such Work.

H. Relocation of Existing Facilities:

1. During construction, it is expected that minor relocations of Work will be necessary.
2. Provide complete relocation of existing structures and Underground Facilities, including piping, utilities, equipment, structures, electrical conduit wiring, electrical duct bank, and other necessary items.
3. Use only new materials for relocated facility. Match materials of existing facility, unless otherwise shown or specified.
4. Perform relocations to minimize downtime of existing facilities.
5. Install new portions of existing facilities in their relocated position prior to removal of existing facilities, unless otherwise accepted by PROJECT MANAGER.

1.5 PHYSICAL CONDITIONS

A. Exercise reasonable care to verify locations of existing subsurface structures and underground facilities.

B. Thoroughly check immediate and adjacent areas subject to excavation by visual examination (and by electronic metal and pipe detection equipment, as necessary) for indications of subsurface structures and underground facilities.

C. Make exploratory excavations where existing underground facilities or structures may potentially conflict with proposed underground facilities or structures. Conduct exploratory excavations in presence of the ENGINEER and sufficiently ahead of construction to avoid possible delays to the CONTRACTOR's Work.

1.6 ADJACENT FACILITIES AND PROPERTIES

A. Examination:

1. After Effective Date of the Agreement and before Work at site is started, the CONTRACTOR, PROJECT MANAGER, and affected property owners and utility owners shall make a thorough examination of pre-existing conditions including existing buildings, structures, and other improvements in vicinity of Work, as applicable, which could be damaged by construction operations.
2. Periodic re-examination shall be jointly performed to include, but not be limited to, cracks in structures, settlement, leakage, and similar conditions.

B. Documentation:

1. Record and submit documentation of observations made on examination inspections in accordance with paragraphs Construction Photographs and Audio-Video Recordings.
2. Upon receipt, ENGINEER will review, sign, and return one record copy of documentation to CONTRACTOR to be kept on file in field office.
3. Such documentation shall be used as indisputable evidence in ascertaining whether and to what extent damage occurred as a result of the CONTRACTOR's operations, and is for the protection of adjacent property owners, CONTRACTOR, and OWNER.

1.7 CONSTRUCTION PHOTOGRAPHS

A. Photographically document all unique portions of the construction including tie-ins to existing pipelines or facilities, crossings of existing utilities, buried valve and piping intersections, and other work items that will not otherwise be visible after completion of construction.

B. Film or file handling and development shall be done by a commercial

laboratory.

C. The PROJECT MANAGER and ENGINEER shall have the right to select the subject matter and vantage point from which photographs are to be taken.

D. Construction Progress Photos:

1. Photographically demonstrate progress of construction, showing every aspect of site and adjacent properties as well as interior and exterior of new or impacted structures.
2. Monthly: Take 24 exposures using 35 mm color film or digital photographs of comparable quality, unless otherwise approved by the OWNER or ENGINEER.

E. Color Prints:

1. Minimum Size: 3-inch by 5-inch.
2. Finish: Glossy.
3. Label Each Print:
   a. Project Name.
   b. Date and time photo was taken.
   c. Photographer's name.
   d. Caption (maximum 30 characters).
   e. Location and area designation.
   f. Schedule activity number, as appropriate.
4. Assemble in bound albums in clear plastic sleeves that facilitate viewing both front and back of each photograph.
5. Assemble negatives in their corresponding album in clear plastic sleeves made for the purpose or on recordable CD media organized by project segment.

1.8 AUDIO-VIDEO RECORDINGS

A. Prior to beginning Work on construction site or of a particular area of the Work, and again within 10 days following date of Substantial Completion, videograph construction site and property adjacent to construction site.

B. In the case of preconstruction recording, no Work shall begin in the area prior to the PROJECT MANAGER's review and approval of content and quality of video for that area.

C. Particular emphasis shall be directed to physical condition of existing vegetation, structures, and pavements within pipeline alignment and areas adjacent to and within the right-of-way or easement, and on the CONTRACTOR's storage and staging areas.

D. The PROJECT MANAGER and ENGINEER shall have right to select subject matter and vantage point from which videos are to be taken.

E. Video taping shall be by a professional commercial videographer, experienced in shooting construction videos.

F. Video Format and Quality:

1. VHS or DVD format, with sound.
2. Video:
   a. Produce bright, sharp, and clear images with accurate colors, free of distortion and other forms of picture imperfections.
   b. Electronically, and accurately display the month, day, year, and time of day of the recording.
3. Audio:
   a. Audio documentation shall be done clearly, precisely, and at a moderate pace.
   b. Indicate date, Project name, and a brief description of the location of taping, including:
      1) Facility name;
      2) Street names or easements;
      3) Addresses of private property; and
      4) Direction of coverage, including engineering stationing, if applicable.

G. Documentation:

1. Provide two copies to the Owner.

2. Video Tape or DVD Label:
   a. Tape or disk number (numbered sequentially, beginning with 001).
   b. Project Name.
   c. Name of street(s) or easement(s) included.
   d. Applicable location by engineering stationing.
   e. Date and time of coverage.

3. Project Video Log: Maintain an ongoing log that incorporates above noted label information for videotapes or DVD's on Project.

H. The Following Shall be Included with the Video Documentation:

1. Coverage is required within and adjacent to the rights-of-way, easements, storage, and staging areas where the work is being constructed.
2. Documentation of the conditions of the adjacent properties or any affected structures as a result of the impending construction.
3. Certification as to date work done and by whom.
4. All videos shall be keyed to the construction drawings, provided with an index and a written narrative.

I. Preconstruction and Post-Construction Videos Shall be Submitted as follows:

1. Preconstruction videos shall be presented to the OWNER at the preconstruction conference.
2. Post-construction videos shall be submitted prior to final project closeout. This submittal is contingent to final payment.

J. Payment for the work in this Section will be included as part of the lump sum price for mobilization/demobilization.

1.9 REFERENCE POINTS, SURVEYS, AND RECORD DRAWINGS

A. Location and elevation of benchmarks are shown on Drawings.

B. CONTRACTOR's Responsibilities:

1. Provide additional survey and layout required to layout the Work.
2. Check and establish exact location of existing facilities prior to construction of new facilities and any connections thereto.
3. In event of discrepancy in data or benchmarks, request clarification before proceeding with Work.
4. Retain professional land surveyor or civil engineer registered in State of Florida who shall perform or supervise engineering

surveying necessary for additional construction staking and layout and obtaining record information for as-built and record drawing preparation.

5. Maintain complete accurate log of survey Work as it progresses as a Record Document. The CONTRACTOR is responsible for the quality control of horizontal location and vertical elevations of the installed project.
6. On request of PROJECT MANAGER, submit documentation.
7. Provide competent employee(s), tools, stakes, and other equipment and materials as PROJECT MANAGER may require to:
   a. Establish control points, lines, and easement boundaries.
   b. Check layout, survey, and measurement Work performed by others.
   c. Measure quantities for payment purposes.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.1 CUTTING, FITTING, AND PATCHING

A. Cut, fit, adjust, or patch Work and work of others, including excavation and backfill as required, to make Work complete.

B. Obtain prior written authorization of ENGINEER before commencing Work to cut or otherwise alter:

1. Structural or reinforcing steel, structural column or beam, elevated slab, trusses, or other structural member.
2. Weather- or moisture-resistant elements.
3. Efficiency, maintenance, or safety of element.
4. Work of others.

C. Refinish surfaces to provide an even finish.

1. Refinish continuous surfaces to nearest intersection.
2. Refinish entire assemblies.
3. Finish restored surfaces to such planes, shapes, and textures that no transition between existing work and Work is evident in finished surfaces.

D. Restore existing work, Underground Facilities, and surfaces that are to remain in completed Work including concrete-embedded piping, conduit, and other utilities as specified and as shown.

E. Make restorations with new materials and appropriate methods as

specified for new Work of similar nature; if not specified, use recommended practice of manufacturer or appropriate trade association.

F. Fit Work airtight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces and fill voids.

G. Remove specimens of installed Work for testing when requested by PROJECT MANAGER or ENGINEER.

END OF SECTION

SECTION 01300
SUBMITTALS

PART 1 GENERAL

1.1 DEFINITIONS

A. Action Submittal: Written and graphic information submitted by the CONTRACTOR, that requires ENGINEER's approval.

B. Informational Submittal: Information submitted by the CONTRACTOR, that does not require the PROJECT MANAGER's approval. Submittals not meeting conditions of the Contract will be returned.

1.2 DOCUMENT CONTROL SYSTEM

A. The CONTRACTOR shall use industry standard software applications to manage construction activities and submittals.

B. The CONTRACTOR shall provide document control submittal summaries as part of regular submittals in order to document such information provided to the City.

C. The CONTRACTOR shall use industry standard software applications to properly track and categorize submittals.

D. The CONTRACTOR shall retain on file the original copies of electronic documents through the Warranty period of the project. The original copies shall be made available to the PROJECT MANAGER upon request.

1.3 PROCEDURES

A. The CONTRACTOR shall prepare and submit select construction related correspondence, (transmittal, RFI's, proposals, etc.) to the PROJECT MANAGER. During the preconstruction meeting(s) the CONTRACTOR shall be instructed by the City of Fort Lauderdale Project Construction Manager on the details for submitting correspondence for this Contract.

B. Submittals containing material samples or which require original signature shall be directed to the PROJECT MANAGER at the following address, unless specified otherwise.

1. City of Fort Lauderdale, 100 North Andrews, 4th Floor, Fort Lauderdale, FL 33301, Attn: Daniel Fisher, P.E.

C. Transmittal of Submittal:

1. The CONTRACTOR Shall:
   a. Review each submittal with uniform approval stamp before submitting to the PROJECT MANAGER

1) Stamp to include Project name, submittal number, Specification number, the CONTRACTOR's reviewer name, date of the CONTRACTOR's approval, and statement certifying that submittal has been reviewed, checked, and approved for compliance with Contract Documents.
2) The PROJECT MANAGER and ENGINEER will not review submittals that do not bear CONTRACTOR's approval stamp and will return them without action.

2. Complete, sign, and transmit with each submittal package, one Transmittal of Contractor's Submittal form attached at end of this section.
3. Identify each submittal with the following:
   a. Numbering and Tracking System:
      1) Sequentially number each submittal.
      2) Resubmission of submittal shall have original number with sequential alphabetic suffix.
   b. Specification section and paragraph to which submittal applies.
   c. Project title and Owner's project number.
   d. Date of transmittal
   e. Names of the CONTRACTOR, Subcontractor or Supplier, and manufacturer as appropriate.
4. Identify and describe each deviation or variation from Contract Documents.

D. Format:

1. Do not base Shop Drawings on reproductions of Contract Documents.
2. Package submittal information by individual specification section. Do not combine different specification sections together in submittal package, unless otherwise directed in Specification.
3. Present in a clear and thorough manner and in sufficient detail to show kind, size, arrangement, and function of components, material, and devices, and compliance with Contract Documents.
4. Index with sections labeled and divided in an orderly manner.

E. Timelines: Schedule and submit in accordance with schedule of Shop Drawing and Sample submittals, and requirements of individual Specification sections.

F. Processing Time:

1. Time for review shall commence on the PROJECT MANAGER's receipt of submittal.
2. The PROJECT MANAGER will act upon CONTRACTOR's submittal and transmit response to CONTRACTOR not later than 21 days after receipt, unless otherwise specified.
3. Resubmittal will be subject to same review time.
4. No adjustments of Contract Times of Price will be allowed due to delays in progress of Work caused by rejection and subsequent resubmittals.

G. Resubmittals: Clearly identify each correction or change made.

H. Incomplete Submittals:

1. The PROJECT MANAGER will return entire submittal for the CONTRACTOR's revision if preliminary review deems it incomplete.
2. When any of the following are missing, Submittal will be deemed incomplete:
   a. The CONTRACTOR's review stamp, completed and signed.
   b. Transmittal of Contractor's Submittal, completed and signed.
   c. Insufficient number of copies.

I. Submittals Not Required by Contract Documents:

1. Will not be reviewed and will be returned stamped "Not Subject to Review."
2. The PROJECT MANAGER will keep one copy and return all remaining copies to the CONTRACTOR.

1.4 ACTION SUBMITTALS

A. Prepare and submit Action Submittals required by individual Specification sections.

B. Shop Drawings:

1. Identify and Indicate:
   a. Applicable Contract Drawing and Detail number, products, units, and assemblies, and system or equipment identification or tag numbers.
   b. Equipment and Component Title: Identical to title shown on Drawings.
   c. Critical field dimensions and relationships to other critical features of Work. Note dimensions established by field measurement.
   d. Project-specific information drawn accurately to scale.
2. Manufacturer's Standard Schematic Drawing and Diagrams as follows:
   a. Modify to delete information that is not applicable to the Work.
   b. Supplement standard information to provide information specifically applicable to the Work.
3. Product Date: Provide as specified in individual Specification section
4. Foreign Manufacturers: When proposed, include the following additional information:
   a. Names and addresses of at least 2 companies that maintain technical service representative close to Project.
   b. Complete list of spare parts and accessories for each piece of equipment.

C. Samples:

1. Copies: 3, unless otherwise specified in individual Specification sections.
2. Preparation: Mount, display, or package Samples in manner specified to facilitate review of quality. Attach label on unexposed side that includes the following:

a. Manufacturer name
b. Model number
c. Material
d. Sample Source

3. Manufacturer's Color Chart: Units or sections of units showing full range of colors, textures, and patterns available.

4. Full-size Samples:
   a. Size as indicated in individual Specifications section.
   b. Prepared from same materials to be used for the Work.
   c. Cured and finished in manner specified.
   d. Physically identical with product for proposed use.

D. Action Submittal Dispositions: The ENGINEER will review, mark, and stamp as appropriate, and PROJECT MANAGER will distribute marked-up copies as noted:

1. Approved:
   a. Contractor may incorporate product(s) or implement Work covered by submittal.
2. Approved as Noted:
   a. Contractor may incorporate product(s) or implement Work covered by submittal, in accordance with Engineer's notations.
3. Partial Approval, resubmit as Noted:
   a. Make corrections or obtain missing portions, and resubmit.
   b. Except for portions indicated, Contractor may begin to incorporate product(s) or implement Work covered by submittal, in accordance with Engineer's notations.
4. Revise and Resubmit:
   a. CONTRACTOR may not incorporate product(s) or implement Work covered by submittal.
5. Not subject to Review: Information received is not required by contract.

1.5 INFORMATION SUBMITTALS

A. General:

1. Refer to individual Specification sections for specific submittal requirements.
2. The PROJECT MANAGER will review each submittal. If submittal meets conditions of the Contract, the PROJECT MANAGER will forward copies to appropriate parties. If the PROJECT MANAGER determines submittal does not meet conditions of the Contract and is therefore considered unacceptable, PROJECT MANGAGER will provide review comments to the CONTRACTOR, and require that the submittal be corrected and resubmitted.

B. Application for Payment: In accordance with Section 01025 MEASUREMENT AND PAYMENT.

C. Certificates:

1. General:
   a. Provide notarized statement that includes signature of entity responsible for preparing certification.
   b. Signed by officer or other individual authorized to sign documents on behalf of that entity.
2. Welding: In accordance with individual Specification sections.
3. Installer: Prepare written statements on manufacturer's letterhead certifying that installer complies with requirements as specified in individual Specification sections.
4. Material Test: Prepared by qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements.
5. Certificates of Successful Testing or Inspection: Submit when testing or inspection is required by Laws and Regulations or governing agency or specified in individual Specification section.
6. Manufacturer's Certificate of Compliance: In accordance with Section 01640 MANUFACTURER's SERVICES.
7. Manufacturers Certificate of Proper Installation: In accordance with Section 01640 MANUFACTURER'S SERVICES.

D. Construction photographs and video: In accordance with Section 01040 COORDINATION, and as may otherwise be required in Contract Documents.

E. Contract Closeout Submittals: In accordance with Section 01780 CONTRACT CLOSEOUT.

F. Contractor-Design Data:

1. Written and graphic information.
2. List of assumptions.
3. List of performance and design criteria.
4. Summary of loads of load diagram, if applicable.
5. Calculations.
6. List of applicable codes and regulations.
7. Name and version of software.
8. Information requested in Individual Specification section.

G. Manufacturer's Instructions: Written of published information that documents manufacturer's recommendations, guidelines, and procedures in accordance with individual Specification sections.

H. Schedules:

1. Schedule of Shop Drawing and Sample Submittals: Prepare separately or in combination with Progress Schedule as specified in Section 01320 CONSTRUCTION PROGRESS DOCUMENTATION.
   a. Show for Each, at a Minimum, the Following:
      1) Specification section number.
      2) Identification by numbering and tracking system as specified under Paragraph Transmittal of Submittal.
      3) Estimated date of submission to the PROJECT

MANAGER, including reviewing and processing time.

b. On a monthly basis, submit updated schedule to the PROJECT MANAGER if changes have occurred or resubmittals are required.

2. Schedule of Values: In accordance with section 01025 MEASUREMENT AND PAYMENT.
3. Schedule of Estimated Progress Payments: In accordance with section 01320 CONSTRUCTION PROGRESS DOCUMENTATION.
4. Progress Schedule: In accordance with section 01320 CONSTRUCTION PROGRESS DOCUMENTATION.

I. Special Guarantee: Supplier's written guarantee as required in individual Specifications sections.

J. Statement of Qualification: Evidence of qualification, certification, or registration as required in Contract Documents to verify qualifications of professional land surveyor, engineer, materials testing laboratory, specialty Subcontractor, trade Specialist, consultant, installer, and other professionals.

K. Submittals Required by Laws, Regulations, and Governing Agencies:

1. Submit promptly notifications, reports, certifications, payrolls, and otherwise as may be required, directly to the applicable federal, state, or local governing agency or their representative.
2. Transmit to the PROJECT MANAGER for OWNER's records one copy of correspondence and transmittals (to include enclosures and attachments) between the CONTRACTOR and governing agency.

L. Test and Inspection Reports:

1. General: Shall contain signature of person responsible for test or report.
2. Factory:
   a. Identification of product and Specification section, type of inspection or test with referenced standard or code.
   b. Date of test, Project title and number, and name and signature of authorized person.
   c. Test Results.
   d. If test of inspection deems material or equipment not in compliance with Contract Documents, identify corrective action necessary to bring into compliance.
   e. Provide interpretation of test results, when requested by ENGINEER.
   f. Other items as identified in individual Specification sections.
3. Field: As a minimum, include the following:
   a. Project title and number.
   b. Date and time.
   c. Record of temperature and weather conditions.
   d. Identification of product and Specification section.
   e. Type and location of test, sample, or inspection, including reference standard or code.
   f. Date issued, testing laboratory name, address, and telephone number, and name and signature of laboratory inspector.
   g. If test of inspection deems material or equipment not in

compliance with Contract Documents, identify corrective action necessary to bring into compliance.

h. Provide interpretation of test results, when requested by ENGINEER.

i. Other items as identified in individual Specification sections.

M. Training Date: In accordance with Section 01640 MANUFACTURER'S SERVICES.

1.6 CONTRACTOR CORRESPONDENCE

A. The CONTRACTOR shall submit selected construction related correspondence. During the Pre-construction meeting the CONTRACTOR shall be instructed by the City of Fort Lauderdale Project Construction Manager on the details of processing such documents for this Project.

B. The CONTRACTOR shall be required to track, at a minimum, the following documents.

1. RFI's
2. CCIR's
3. Daily Reports.

1.7 SUPPLEMENTS

A. The Supplement listed below, following "END OF SECTION" is part of this specification.

1. Supplement-1, Transmittal of Contractor's Submittal.

1.8 PROGRESS PAYMENTS/REQUISITIONS FOR PAYMENT

A. The CONTRACTOR is responsible for creating the initial payment requisition. Each requisition shall be produced from updated progress data contained in the schedule and updated progress data. On a monthly basis, the CONTRACTOR shall meet with the PROJECT MANAGER to discuss and agree on the progress of the work. Failure of the CONTRACTOR to maintain record documents and submit project schedule updates may result in a delay in processing monthly or final payment requisitions.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

TO: City of Fort Lauderdale
100 North Andrews, 4th Floor
Fort Lauderdale, FL 33301
Attn: Diana Carrillo, PE, Project Manager

FROM:_____
Contractor

_____

_____

_____

Submittal No.:_____

☐ New Submittal ☐ Resubmittal

Project:_____

Project No.:_____

Specification Section No.:_____
(Cover only one section with each transmittal)

Schedule Date of Submittal:

_____

SUBMITTAL TYPE: ☐ Shop Drawing ☐ Sample ☐ Informational

The following items are hereby submitted:

Number of Copies	Description of Item Submitted (Type, Size, Model Number, Etc.)	Spec. and Para. No.	Drawing or Brochure Number	Contains Variation to Contract	
				No	Yes

Contractor hereby certifies that (i) Contractor has complied with the requirements of Contract Documents in preparation, review, and submission of designated Submittal and (ii) the Submittal is complete and in accordance with the Contract Documents and requirements of laws and regulations and governing agencies.

By:_____
Contractor (Authorized Signature)

SECTION 01320
CONSTRUCTION PROGRESS DOCUMENTATION

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes administrative and procedural requirements for documenting the progress of construction during performance of the Work, including the following:

1. CONTRACTOR's Construction Schedule.
2. Submittals Schedule.
3. Daily construction reports.
4. Field condition reports.

1.2 DEFINITIONS

A. Activity: A discrete part of a project that can be identified for planning, scheduling, monitoring, and controlling the construction project. Activities included in a construction schedule consume time and resources.

1. Critical activities are activities on the critical path. They must start and finish on the planned early start and finish times.
2. Predecessor Activity: An activity that precedes another activity in the network.
3. Successor Activity: An activity that follows another activity in the network.

B. CPM: Critical path method, which is a method of planning and scheduling a construction project where activities are arranged based on activity relationships. Network calculations determine when activities can be performed and the critical path of Project.

C. Critical Path: The longest connected chain of interdependent activities through the network schedule that establishes the minimum overall Project duration and contains no float.

D. Float: The measure of leeway in starting and completing an activity.

1. Float time belongs to the OWNER.

1.3 SUBMITTALS

A. Submittals Schedule: Submit submittal schedule arranging the following information in a tabular format:

1. Scheduled date for first submittal.
2. Submittal category (action or informational).
3. Description of the Work covered.
4. Scheduled date for the OWNER's final release or approval.

B. CONTRACTOR's Construction Schedule: Submit initial schedule large enough to show entire schedule for entire construction period.

C. Daily Construction Reports: Submit copies at weekly intervals.

D. Field Condition Reports: Submit at time of discovery of differing conditions.

1.4 COORDINATION

A. Coordinate preparation and processing of schedules and reports with performance of construction activities and with scheduling and reporting of separate contractors.

B. Coordinate the CONTRACTOR's Construction Schedule with the Schedule of Values, list of Submittals Schedule, progress reports, payment requests, and other required schedules and reports.

1. Secure time commitments for performing critical elements of the Work from parties involved.
2. Coordinate each construction activity in the network with other activities and schedule them in proper sequence.

PART 2 - PRODUCTS

2.1 SUBMITTALS SCHEDULE

A. Preparation: Submit a schedule of submittals, arranged in chronological order by dates required by construction schedule. Include time required for review, resubmittal, ordering, manufacturing, fabrication, and delivery when establishing dates.

1. Coordinate Submittals Schedule with list of subcontracts, the Schedule of Values, and the CONTRACTOR's Construction Schedule.
2. Submit concurrently with the first complete submittal of the CONTRACTOR's Construction Schedule.

2.2 CONTRACTOR'S CONSTRUCTION SCHEDULE, GENERAL

A. Time Frame: Extend schedule from date established for the Notice to Proceed to date of Final Completion.

1. Contract completion date shall not be changed by submission of a schedule that shows an early completion date, unless specifically authorized by Change Order.
2. Submittal Review Time: Include review and resubmittal times indicated in Section 01300 SUBMITTALS in schedule. Coordinate submittal review times in the CONTRACTOR's Construction Schedule with Submittals Schedule.
3. Substantial Completion: Indicate completion in advance of date established for Substantial Completion, and allow time for Architect's administrative procedures necessary for certification of Substantial Completion.

B. Contract Modifications: For each proposed contract modification and concurrent with its submission, prepare a time-impact analysis to demonstrate the effect of the proposed change on the overall project schedule.

2.3 CONTRACTOR'S CONSTRUCTION SCHEDULE (CPM SCHEDULE)

A. CPM Schedule Preparation: Prepare a list of all activities required to complete the Work included in each Work Order. Using the preliminary network diagram, prepare a skeleton network to identify probable critical paths.

1. Activities: Indicate the estimated time duration, sequence requirements, and relationship of each activity in relation to other activities. Include estimated time frames for the following activities:

   a. Preparation and processing of submittals.
   b. Mobilization and demobilization.
   c. Purchase of materials.
   d. Delivery.
   e. Installation.
   f. Work by OWNER that may affect or be affected by CONTRACTOR's activities.

2. Critical Path Activities: Identify critical path activities, including those for interim completion dates. Scheduled start and completion dates shall be consistent with Contract milestone dates.

2.4 REPORTS

A. Daily Construction Reports: Prepare a daily construction report recording the following information concerning events at Project site:

1. Equipment at Project site.
2. Material deliveries.
3. High and low temperatures and general weather conditions.
4. Accidents.
5. Stoppages, delays, shortages, and losses.
6. Meter readings and similar recordings.
7. Orders and requests of authorities having jurisdiction.

B. Field Condition Reports: Immediately on discovery of a difference between field conditions and the Contract Documents, prepare and submit a detailed report. Submit with a request for interpretation. Include a detailed description of the differing conditions, together with recommendations for changing the Contract Documents.

PART 3 - EXECUTION

3.1 CONTRACTOR'S CONSTRUCTION SCHEDULE

A. CONTRACTOR's Construction Schedule Updating: At weekly intervals, update schedule to reflect actual construction progress and activities. Issue schedule one week before each regularly scheduled progress meeting.

1. Revise schedule immediately after each meeting or other activity where revisions have been recognized or made. Issue updated schedule concurrently with the report of each such meeting.
2. Include a report with updated schedule that indicates every change, including, but not limited to, changes in logic, durations, actual starts and finishes, and activity durations.
3. As the Work progresses, indicate Actual Completion percentage for each activity.

B. Distribution: Distribute approved schedule to OWNER, separate contractors, testing and inspecting agencies, and other parties identified by the CONTRACTOR with a need-to-know schedule responsibility.

1. Post copies in Project meeting rooms and temporary field offices.
2. When revisions are made, distribute updated schedules to the same parties and post in the same locations. Delete parties from distribution when they have completed their assigned portion of the Work and are no longer involved in performance of construction activities.

END OF SECTION

SECTION 01500
CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS

PART 1 GENERAL

1.1 SUBMITTALS

A. Informational Submittals:

1. Copies of permits and approvals for construction as required by laws and regulations and governing agencies.
2. Temporary Utility Submittals: Dewatering well locations
3. Temporary Construction Submittals:
   a. Dewatering facilities.
   b. Fencing and protective barrier locations and details.
   c. Staging area location plan.
   d. Maintenance of Traffic (MOT) Plans: As specified herein, and proposed revisions thereto.
   e. Plan for maintenance of existing sanitary sewer services and systems.

1.2 MOBILIZATION

A. Mobilization shall include, but not be limited to, these principal items:

1. Obtaining required permits.
2. Providing onsite sanitary facilities and potable water facilities as specified and as required by Laws and Regulations, and governing agencies.
3. Posting OSHA required notices and establishing safety programs and procedures.
4. Having the CONTRACTOR's superintendent at site full time.

B. The CONTRACTOR is responsible for finding suitable locations for project staging and material storage areas which shall be approved by OWNER. The CONTRACTOR shall be responsible for securing a temporary staging permit from the OWNER and other approval authorities as appropriate.

1.3 PERMITS

A. Permits, Licenses, or Approvals: Obtain in accordance with the OWNER's construction standards and Specifications and as otherwise required for completion of the Work.

1.4 PROTECTION OF WORK AND PROPERTY

A. Comply with OWNER's safety rules while on OWNER's project.

B. Keep OWNER informed of serious onsite accidents and related claims.

1.5 VEHICULAR TRAFFIC

A. Maintenance of Traffic Plans (MOTs):

1. Adhere to MOTs reviewed and accepted by the CITY ENGINEER, and approved by the appropriate agency. Changes to this plan shall be made only by written approval of appropriate public authority and the CITY ENGINEER. Secure approvals for necessary changes so as not to delay progress of the Work.
2. Traffic Routing: In MOT, show sequences of construction affecting use of roadways, time required for each phase of the Work, provisions for decking over excavations and phasing of operations to provide necessary access, and plans for signing, barricading, and striping to provide passages for pedestrians and vehicles.

B. Preparation of MOTs: The CONTRACTOR shall be prepare and submit MOTs where required by federal, state, county, or local agencies having jurisdiction. The CONTRACTOR shall obtain all required approvals and permits associated with the MOTs.

1. Traffic control on all city, county, and state highway rights-of-way shall meet the requirements of the City of Fort Lauderdale, where applicable, and the Florida Department of Transportation Standard Specifications for Road and Bridge Construction, as well as FDOT standard details for maintenance of traffic, in accordance with the Manual for Uniform Traffic Control and Safe Practices.
2. Traffic control on all county rights-of –way shall meet the additional requirements of the Broward County Engineering Department including but not limited to:
   a. Notification of intent to commence work activities in a county right-of-way shall be provided to the CITY ENGINEER no less than ten (10) business days prior to the start of construction.
   b. The use of solid barriers to separate construction from adjacent traffic lanes where the difference in grade is greater than 12 inches.
   c. Plating or backfilling of all non-protected excavations at the close of each working day.
   d. Broward County shall be named as an additional insured on Surety Bonds for any projects requiring work within County rights-of-way.
3. Temporary traffic control on City streets shall utilize barrels in lieu of folding barricades. Contractor is to provide a sample or detail of the proposed barrel to be used as part of the MOT submittal.
4. Traffic control on all FDOT or Broward County highways shall include flagmen during all periods of active construction.
5. CONTRACTOR shall submit copies of all MOT's to the CITY ENGINEER concurrent with submittal to the approving authority.
6. CONTRACTOR shall submit three copies of the agency-approved MOT prior to initiation of construction or as required by specific permits contained herein.
7. All MOTs shall be ATS certified.

1.6 PEDESTRIAN TRAFFIC

A. The "MAINTENANCE OF TRAFFIC" Plan, provided by the CONTRACTOR, shall include provisions for pedestrian and transit vehicular traffic where applicable. The following are minimum requirements:

1. The CONTRACTOR shall be responsible for providing a safe and adequate

walking surface applicable to the Americans with Disabilities Act (ADA) for pedestrians. Safe walk routes for all pedestrians and transit users within the vicinity of the construction zone shall be maintained throughout construction. This includes safe walk routes/access to and from existing bus stops and transit vehicles. If the current walking surface and access to and from transit vehicles at bus stops cannot be maintained, then a temporary road-rock 4-foot walk way shall be created. The safe walk route shall be separated from the construction activity by the 4-foot high orange construction fence for the entire length of the project or the length of the walk route, whichever is less.

2. Pedestrian walkways, bus stops and pedestrian access to transit vehicles should be maintained free of any obstructions and hazards such as holes, debris, mud, construction equipment, stored materials, etc. Any hazards near or adjacent to walkways, bus stops and access to transit vehicles should be clearly delineated.
3. Where street closures do not allow access for scheduled garbage and refuse removal, the CONTRACTOR shall provide for moving residential containers to a suitable collection point on regular pick-up days.
4. Where safe pedestrian access/walkways cannot be provided, pedestrians should be directed to alternative routes by appropriate traffic control devices. Pedestrian, bicycle, and wheelchair traffic shall be guided and maintained (special attention is directed to the existing bus stop location access) using approved warning lights, signing, and channelization devices. Such control devices shall be installed and maintained in accordance with the MUTCD sections on work zone traffic control for pedestrians and Chapter 6D Pedestrian and Worker Safety.
5. Where construction activities involve consecutive bus stops, access to and from all bus stops should be maintained. If access to and from all bus stops cannot be maintained, then a bus stop may be temporarily relocated or removed. However, no two consecutive bus stop shall be affected in this manner. If a stop requires temporary removal or relocation, then the Transit Superintendent at the Broward County Mass Transit Division, (954) 357-8381, should be notified ten (10) days prior to the occurrence so that appropriate notification can be completed by the Mass Transit Division.
6. It shall be the responsibility of the CONTRACTOR to install any necessary pavement, road rock, pavement marking and signage and/or any pedestrian signalization and/or signal modification to accommodate an existing or alternate walk route.

PART 2 PRODUCTS

2.1 PROJECT SIGN

A. Refer to sign detail located in the Supplement at the end of this Section.

B. Two signs required; placement at the direction of the OWNER.

2.2 COMPUTER SOFTWARE, LATEST VERSIONS

A. Software requirements are valid for project use with or without an Engineer's Field Office:
   1. Microsoft Windows 7 Professional.
   2. Microsoft Office Pro – latest version.
   3. Scheduling: Spreadsheet format.

4. Microsoft Outlook.

PART 3 EXECUTION

3.1 TEMPORARY UTILITIES

A. Water:

1. Hydrant Water:
   a. Is available from nearby hydrants. Secure written permission for connection, meter installation, and use from water department and meet requirements for use. Notify fire department before obtaining water from fire hydrants.
   b. Use only special hydrant-operating wrenches to open hydrants. Make certain that hydrant valve is open full, since cracking the valve causes damage to the hydrant. Repair damaged hydrants and notify appropriate agency as quickly as possible. Hydrants shall be completely accessible to fire department at all times.
   c. Include costs to connect and transport water to construction areas in Contract Price. The CONTRACTOR will be invoiced for water obtained from City hydrants.

B. Heating, Cooling, and Ventilating:
   1. Provide as required to maintain adequate environmental conditions to facilitate progress of the Work, to meet specified minimum conditions for installation of materials, and to protect materials, equipment, and finishes from damage due to temperature or humidity.
   2. Provide adequate forced air ventilation of enclosed areas to cure installed materials, to dispense humidity, and to prevent hazardous accumulations of dust, fumes, vapors, or gases.
   3. Pay all costs of installation, maintenance, operation, removal, and fuel consumed.
   4. Provide portable unit heaters, complete with controls, oil or gas fired, and suitably vented to outside as required for protection of health and property.
   5. If permanent natural gas piping is used for temporary heating units, do not modify or reroute gas piping without approval of utility company. Provide separate gas metering as required by utility.

C. Sanitary and Personnel Facilities: Provide and maintain facilities for the CONTRACTOR's employees, sub-contractors and all other on-site staff. Service, clean and maintain all facilities and enclosures.

D. Fire Protection: Furnish and maintain on site adequate firefighting equipment capable of extinguishing incipient fires. Comply with applicable parts of National Fire Prevention Standard for Safeguarding Building Construction Operations (NFPA No. 241).

3.2 PROTECTION OF WORK AND PROPERTY

A. General:

1. Perform Work within right-of-way and easements in a systematic manner that minimizes inconvenience to property owners and the public.

2. No residence or business shall be cut off from vehicular traffic for a period exceeding two (2) hours, unless special arrangements have been made.
3. Maintain in continuous service all existing oil and gas pipelines, underground power, telephone or communication cable, water mains, irrigation lines, sewers, poles and overhead power, and all other utilities encountered along line of the Work, unless other arrangements satisfactory to owners of said utilities have been made.
4. Where completion of the Work requires temporary or permanent removal and/or relocation of existing utility, coordinate all activities with owner of said utility and perform all work to their satisfaction.
5. Protect, shore, brace, support, and maintain underground pipes, conduits, drains, and other underground utility construction uncovered or otherwise affected by construction operations.
6. Keep fire hydrants and water control valves free from obstruction and available for use at all times.
7. In areas where the CONTRACTOR's operations are adjacent to or near a utility, such as gas, telephone, television, electric power, water, sewer, or irrigation system, and such operations may cause damage or inconvenience, suspend operations until arrangements necessary for protection have been made by the CONTRACTOR.
8. Notify property owners and utility offices that may be affected by construction operation at least five (5) working days in advance.
    a. Before exposing a utility, obtain utility owner's permission. Should service of utility be interrupted due to the CONTRACTOR's operation, notify proper authority immediately. Cooperate with said authority in restoring service as promptly as possible and bear costs incurred.
9. Do not impair operation of existing utility systems. Prevent construction material, pavement, concrete, earth, volatile and corrosive wastes, and other debris from entering sewers, storm drains, pump stations, or other sewer structures.
10. Maintain original site drainage wherever possible.

B. Traffic Signal Communications Systems:

1. Maintain in continuous operation all existing traffic signal communication systems located within the Project limits for the duration of the Project. Maintenance of the traffic signal communication systems may entail the use of leased facilities, temporary splices, or the provision of alternate or replacement facilities as proposed by the CONTRACTOR and approved by the Broward County Traffic Engineering Division.
2. In the event of a failure in the continuous operation of the traffic signal communication system, prepare a Remedial Action Plan that has been coordinated with the Broward County Traffic Engineering Division to determine the nature of the failure. The Remedial Action Plan shall be documented in a written report and submitted within one calendar day of the notification of the discontinuous operation of the traffic signal communication system.
3. Complete the implementation of the Remedial Action Plan within two (2) calendar days upon receipt of approval of the Plan by the Broward County Traffic Engineering Division. Reworking of the Plan shall be required if the minimum system communication requirements are not met, as determined by the Broward County Traffic Engineering Division, as a result of a given Remedial Action Plan.

4. In the event that the traffic signal communication systems are damaged, a temporary splice to a damaged copper communications cable shall be accomplished by using approved splice material for connecting the bare wires. For damaged fiber optic communication systems, mechanical splicing of the fiber to achieve a maximum loss of 0.20 dB is acceptable. A junction box shall be installed over the splice on a temporary basis for access, unless a new cable is installed as per specifications.
5. Any material furnished and installed for the replacement of existing traffic communications infrastructure shall meet Broward County standards. Contractors installing or repairing traffic communications infrastructure shall be approved by Broward County.
6. All traffic signal communication systems that were temporarily spliced shall be removed and replaced in kind with new cable, subject to approval by the Broward County Traffic Engineering Division, prior to final acceptance of the Project. Replacement shall be from junction box to junction box with no intermediate splices.

C. Site Security:
1. General – Code Yellow or Less:
   a. All Sites: Provide and maintain temporary security fences as necessary to protect the Work and CONTRACTOR furnished products not yet installed.
   b. Secure sites include, but are not limited to, water treatment plants, wastewater treatment plants, wellfields, water booster pump stations, storage facilities, and master lift stations.
   c. All employees shall have a company or City provided photo identification badge to be worn at all times while on a secure project site.
   d. Visitors shall be required to obtain daily visitor badges and vehicle access.
   e. Obtain approval in writing from the OWNER for work on secure sites outside of normal working hours. Approval must be available for inspection while working on the site after hours.
2. Code Orange Conditions for Work on Secure Sites:
   a. The CONTRACTOR shall provide a list, to be updated weekly or whenever employees are added or removed, of all employees and subcontractor employees to be provided site access. Access for employees or visitors cannot be guaranteed and is subject to the discretion of security personnel.
   b. All employees shall wear badges and sign-in daily.
   c. The CONTRACTOR shall provide advance notice and coordinate with the OWNER for screening and delivery of all materials and supplies, including FedEx, US Postal Service, UPS, and all general delivery items.
      1) All packages shall have the name of a CONTRACTOR's employee stationed at the jobsite.
      2) All delivery drivers shall have suitable photo identification and will be required to go through security procedures.
      3) No delay claims will be allowed for failure to obtain clearance for deliveries or to delays associated with the above processes.

3. Code Red Conditions:

a. Work on secure sites will be stopped for the duration of code red conditions. No access by CONTRACTOR or subcontractor personnel will be permitted until clearance has been granted by the OWNER.

D. Barricade and Lights:

1. Provide as necessary to prevent unauthorized entry to construction areas and affected roads, streets, and alleyways, inside and outside of fenced area, and as required to ensure public safety and the safety of CONTRACTOR's employees, other employer's employees, and others who may be affected by the Work.
2. Provide to protect existing facilities and adjacent properties from potential damage.
3. Locate to enable access by facility operators and property owners.
4. Protect streets, roads, highways, and other public thoroughfares that are closed to traffic by effective barricades with acceptable warning signs.
5. Locate barricades at the nearest intersecting public thoroughfare on each side of the blocked section.

E. Signs and Equipment:

1. Conform to requirements of manual published by the FDOT.
2. Barricades: Provide as required by the FDOT Vehicle Code and in sufficient quantity to safeguard public and Work. Use only approved barrels – collapsible barricades will not be permitted.
3. Portable TOW-AWAY-NO STOPPING Signs: Place where approved by police department and OWNER.
4. Traffic Cones: Provide to delineate traffic lanes to guide and separate traffic movements.
5. High-Level Warning Flag Units: Provide two in advance of traffic approaching the Work, each displaying three flags mounted at a height of 9 feet.
6. ROAD CONSTRUCTION AHEAD Signs: Provide four, size 48 inches by 48 inches. Place in conspicuous locations, approximately 200 feet in advance of the Work, and facing approaching traffic.
7. DETOUR Signs: Provide two, right arrow or left arrow, placed as approved by the CITY ENGINEER.
8. RIGHT or LEFT LANE CLOSED AHEAD Signs: Provide two, place in advance of lane to be closed.
9. Provide at obstructions, such as material piles and equipment.
10. Illuminate barricades and obstructions with warning lights from sunset to sunrise.
11. Use to alert general public of construction hazards, which would include surface irregularities, unramped walkways, grade changes, and trenches or excavations in roadways and in other public access areas.
12. Submit proposed signage to the CITY ENGINEER for prior approval.

F. Existing Structures: Where CONTRACTOR contemplates removal of small structures such as mailboxes, signposts, and culverts that interfere with CONTRACTOR's operations, obtain approval of property owner and CITY ENGINEER. Replace those removed in a condition equal to or better than original.

G. Waterways: Keep ditches, culverts, and natural drainages continuously free of construction materials and debris.

H. Dewatering: Construct, maintain, and operate cofferdams, channels, flume drains, sumps, pumps, or other temporary diversion and protection works. Furnish materials required, install, maintain, and operate necessary pumping and other equipment for the environmentally safe removal and disposal of water from the various parts of the Work. Maintain foundations and parts of the Work free from water.

3.3 TEMPORARY CONTROLS

A. Air Pollution Control:

1. Minimize air pollution from construction operations.
2. Burning: Of waste materials, rubbish, or other debris will not be permitted on or adjacent to site.
3. Conduct operations of dumping rock and of carrying rock away in trucks to cause a minimum of dust. Give unpaved streets, roads, detours, or haul roads used in construction area a dust-preventive treatment or periodically water to prevent dust as needed up to daily, as directed by the OWNER. Strictly adhere to applicable environmental regulations for dust prevention.

B. Noise Control:

1. Provide acoustical barriers so noise emanating from tools or equipment will not exceed legal noise levels.
2. Noise Control Plan: Propose plan to mitigate construction noise and to comply with noise control ordinances, including method of construction, equipment to be used, and acoustical treatments.

C. Water Pollution Control:

1. Divert sanitary sewage and non-storm waste flow interfering with construction and requiring diversion to sanitary sewers. Do not cause or permit action to occur which would cause an overflow to existing waterway.
2. Prior to commencing excavation and construction, obtain ENGINEER's agreement with detailed plans showing procedures intended to handle and dispose of sewage, groundwater, and stormwater flow, including dewatering pump discharges.
3. Comply with procedures outlined in U.S. Environmental Protection Agency manuals entitled, “Guidelines for Erosion and Sedimentation Control Planning,” and “Implementation, Processes, Procedures, and Methods to Control Pollution Resulting from All Construction Activity,” and “Erosion and Sediment Control-Surface Mining in Eastern United States.”
4. Do not dispose of volatile wastes such as mineral spirits, oil, chemicals, or paint thinner in storm or sanitary drains. Disposal of wastes into streams or waterways is prohibited. Provide acceptable containers for collection and disposal of waste materials, debris, and rubbish.

D. Erosion, Sediment, and Flood Control: Provide, maintain, and operate temporary facilities to control erosion and sediment releases, and to protect the Work and existing facilities from flooding during construction period. Meet all local, state, and Federal requirements and obtain necessary permits and approvals as required. Discharges to storm drains, including discharge from dewatering systems, will not

be permitted without the installation of a sediment removal system approved by the OWNER.

3.4 STORAGE YARDS AND BUILDINGS

A. Coordinate requirements with Section 01600 MATERIAL AND EQUIPMENT.

B. Temporary Storage Yards: Construct temporary storage yards for storage of products that are not subject to damage by weather conditions.

C. Temporary Storage Buildings:

1. Provide environmental control systems that meet recommendations of manufacturers of equipment and materials stored.
2. Arrange or partition to provide security of contents and ready access for inspection and inventory.
3. Store combustible materials (paints, solvents, fuels) in a well-ventilated and remote building meeting safety standards.

D. Storage and staging facilities are permitted on private property subject to the review and approval of the Planning and Zoning Department and the issuance of a permit under the provisions of Section 47-19.2 of the Unified Land Development Regulations.

1. Notice to Proceed will not be issued until the final approval is obtained.
2. Staging area sign requirements are provided at the end of this Section.

3.5 ACCESS ROADS AND DETOURS

A. Construct access roads as shown and within easements, rights-of-way, or Project limits. Utilize existing roads where shown. Alignments for new routes must be approved by CITY ENGINEER or OWNER.

B. Maintain drainage ways. Install and maintain culverts to allow water to flow beneath access roads. Provide corrosion-resistant culvert pipe of adequate strength to resist construction loads.

C. Provide gravel, crushed rock, or other stabilization material to permit access by all motor vehicles at all times.

D. Maintain road grade and crown to eliminate potholes, rutting, and other irregularities that restrict access.

E. Coordinate with CITY ENGINEER detours and other operations affecting traffic and access. Provide at least 72 hours' notice to CITY ENGINEER of operations that will alter access to the site and adjacent private properties.

F. Where access road crosses existing fences, install and maintain gates.

G. Upon completion of construction, restore ground surface disturbed by access road construction to original grade. Replace damaged or broken culverts with new culvert pipe of same diameter and material.

3.6 PARKING AREAS

A. Control vehicular parking to preclude interference with public traffic or parking, access by emergency vehicles, OWNER's operations, or construction operations.

B. Provide parking facilities for personnel working on the Project. No employee or equipment parking will be permitted on OWNER's existing paved areas, except as specifically designated for CONTRACTOR's use.

3.7 VEHICULAR TRAFFIC

A. Comply with Laws and Regulations regarding closing or restricting use of public streets or highways. No public or private road shall be closed, except by written permission of proper authority. Assure the least possible obstruction to traffic and normal commercial pursuits.

B. For Project Sections that Pass through a Broward County School Zone:

1. No work is permitted in a school zone while school is in session.
2. The CONTRACTOR shall plan work accordingly – no delay time will be granted to comply with this requirement.

C. Conduct the Work to interfere as little as possible with public travel, whether vehicular or pedestrian.

1. No two adjacent roadways can be under construction at the same time.

D. Whenever it is necessary to cross, close, or obstruct roads, driveways, and walks, whether public or private, provide and maintain suitable and safe bridges, detours, or other temporary expedients for accommodation of public and private travel.

E. Road Closures: Maintain satisfactory means of exit for persons residing or having occasion to transact business along route of the Work. If it is necessary to close off roadway or alley providing sole vehicular access to property for periods greater than two (2) hours, provide written notice to each owner so affected five (5) days prior to such closure. In such cases, closings of up to four (4) hours may be allowed. Closures of up to ten (10) hours may be allowed if a week's written notice is given and undue hardship does not result.

F. The CONTRACTOR will submit MOT forms and/or applications as required by the agency with jurisdiction. The Temporary Modification of Traffic (MOT) Routing Form provided as a supplement to this Section shall be submitted to the CITY ENGINEER for all requested MOT's in accordance with the provisions of this Section. The form is required for MOT's in streets under City jurisdiction.

G. Maintenance of traffic is not required if the CONTRACTOR obtains written permission from the OWNER and tenant of private property, or from authority having jurisdiction over public property involved, to obstruct traffic at designated point.

H. In making street crossings, do not block more than one-half the street at a time. Whenever possible, widen shoulder on opposite side to facilitate traffic flow. Provide temporary surfacing on shoulders as necessary.

I. When flaggers and guards are required by regulation or when deemed necessary for safety, furnish them with approved orange wearing apparel and other regulation traffic control devices.

J. Notify fire department and police department before closing street or portion thereof. Notify said departments when streets are again passable for emergency vehicles. Do not block off emergency vehicle access to consecutive arterial crossings or dead-end streets, in excess of 300 linear feet, without written permission from fire department. Conduct operations with the least interference to fire equipment access, and at no time prevent such access. Furnish the CONTRACTOR's night emergency telephone numbers to police department.

K. Move mailboxes to temporary locations accessible to postal service, and on completion of Work in each area, replace them in their original location and in a condition equal to or better than original.

L. Remove or relocate barricades on designated trash collection days to allow access for trash pickup. If access is completely blocked, the CONTRACTOR shall move the affected trash containers to an accessible location and return them after pickup. Mark each container to ensure return to the proper location.

M. Temporary Bridges:

1. Construct temporary bridges at all points where maintenance of traffic across pipeline construction is necessary.
2. Make bridges over public streets, roads, and highways acceptable to authority having jurisdiction thereover.
3. Bridges erected over private roads and driveways shall be adequate for service to which they will be subjected.
4. Provide substantial guardrails and suitably protected approaches.
5. Provide foot bridges not less than 4 feet wide with handrails and uprights of dressed lumber.
6. Maintain bridges in place as long as conditions of the Work require their use for safety of public, except that when necessary for proper prosecution of the Work in immediate vicinity of bridge. Bridge may be relocated or temporarily removed for such period as the ENGINEER may permit.

N. Detours: Where authority having jurisdiction requires that traffic be maintained over construction work in a public street, road, or highway, and traffic cannot be maintained on original roadbed or pavement, construct and maintain detour around the Work.

O. Coordinate traffic routing with that of others working in same or adjacent areas.

3.8 CLEANUP PROCEDURES FOR HURRICANE WARNINGS AND WATCHES

A. In the event that the National Oceanographic and Atmospheric Administration (NOAA) issues a hurricane watch for the Fort Lauderdale area, the CITY ENGINEER will contact the CONTRACTOR informing him that the watch has been established. Once notified of a hurricane watch, the CONTRACTOR will remove all unnecessary items from the work area and tie down all remaining supplies, barricades, and movable (under 200 pounds) objects. The CITY ENGINEER will determine "necessary" items. If a warning is issued, the CONTRACTOR shall complete the clean-up and evacuate the area the same day. The OWNER shall not be liable for any costs or delays caused as a result of demobilization or remobilization due to the above.

3.9 CLEANING DURING CONSTRUCTION

A. In accordance with General Conditions, as may be specified in Specification sections, and as required herein.

B. Wet down exterior surfaces prior to sweeping to prevent blowing of dust and debris.

C. At least weekly, sweep all floors (basins, tunnels, platforms, walkways, roof surfaces), and pick up all debris and dispose.

D. Provide approved containers for collection and disposal of waste materials, debris, and rubbish. At least at weekly intervals, dispose of such waste materials, debris, and rubbish offsite.

E. Thoroughly clean all spilled dirt, gravel, or other foreign material caused by the construction operations from all streets and roads at the conclusion of each day's operation. Sidewalks, unless under construction, shall be kept clear of material, and available for pedestrian use at all times.

3.10 PROJECT SIGNS

A. Provide two project signs, painted and mounted as shown on the Drawings and in the following section, at locations to be determined by the OWNER or ENGINEER.

3.11 SUPPLEMENTS

A. The supplements listed below, following "END OF SECTION," are part of this Specification.

1. Supplement - 1, Staging Permit Ordinance
2. Supplement - 2, Temporary Modification of Traffic (MOT) Routing Form
3. Supplement - 3, Door Hanger Notification Template

END OF SECTION

STAGING PERMIT ORDINANCE

GG. *Construction staging areas.* The staging of public purpose construction projects including but not limited to the construction of public rights-of-way, utilities and facilities, may be permitted in all zoning districts as a temporary use, in order to allow for the safe, efficient completion of the project with minimal disruption to existing residents, businesses, and traffic, and to ensure that public services and facilities are available. Construction staging shall include the parking, placing and storing of construction materials, vehicles, equipment and support facilities required for the construction of a public project. Construction staging areas shall be permitted subject to the following review processes and conditions:

1. Application.
An application shall, in addition to the requirements provided in *Sec. 47-24*, Development permits and procedures, include the following:

a. A description and sketch dimensioned to scale of the subject property proposed to be used as a construction staging area and a description of the proposed use of the area, including such information as the location and type of construction materials, equipment, support facilities, vehicles, trailers or other construction equipment, storage areas for materials, traffic circulation plan to and from the site, access to the site, location, type of materials and details of any required fencing.

b. A sketch of the proposed site signage, including all contact information; and the proposed location of the sign.

c. The time required to complete the public construction project.

d. **A statement signed by the property owner acknowledging that the property owner consents to the temporary use of the property for construction staging as provided in the temporary construction permit application and that the property owner shall be held responsible for the removal of construction staging materials and debris if the applicant fails to do so upon termination of the temporary public purpose construction staging permit.**

2. *Standards.*
a. A fence of a material, design, and construction that meets building code requirements and precludes visibility through the fence, except for openings necessary for safety, shall be erected around the perimeter of the site. The fence shall have a minimum height of six (6) feet and a maximum height of ten (10) feet; such height to be determined as part of the site plan level I permit based on what height is necessary to protect adjacent properties.

b. The site shall be posted with a sixteen (16) square foot sign clearly visible from a right-of-way identifying the project by name, the name of the contractor, and the engineer responsible for construction management, and a phone number where the applicant or its representative can be contacted on a twenty-four-hour basis.

c. Movement of vehicles, storage materials or other activities at the site shall be limited to the hours of 7:30 a.m. to 5:30 p.m. Monday through Friday, unless otherwise specifically approved as provided in the site plan level I permit.

d. Construction staging at the site shall be limited to the activities approved as part of the site plan level I permit and no other activities shall be permitted except as approved by amendment of the site plan level I permit.

e. Conditions of approval may be imposed if necessary to mitigate the impact on adjacent property such as temporary paving, landscaping, and watering, all in accordance with engineering standards.

f. A termination date for the temporary construction permit shall be established by the department based on the information provided by the applicant, but an extension of such termination date may be granted if good cause is shown by filing an amendment to the site plan level I permit.

3. *Review process.*
a. Approval of a site plan level I permit as described in Sec. 47-24.2.
b. In addition to the review process applicable to a site plan level I permit, the application shall be forwarded to and reviewed by the city's public services department and the property and right-of-way committee.
c. A recommendation from the city's public services department and the property and right-of-way committee shall be forwarded to the department and included as part of the review of the site plan level I application.

4. *Review criteria.* In addition to the review criteria for a site plan level I permit, the following shall apply:
a. The proposed plan meets the standards provided in this Sec. 47-19.2; and
b. The plan includes measures to insure there is minimal disruption to existing residents, businesses and traffic in the area.

5. *Effective date of approval.* The approval of a temporary construction staging area application by the department shall not take effect nor shall a permit be issued any sooner than thirty (30) days after approval and then only if no motion is adopted by the city commission seeking to review the application or no appeal is filed as provided in Sec. 47-26B., Appeals.

6. *Appeal.* If a temporary construction staging permit is denied or is approved with conditions unacceptable to the applicant, the applicant may appeal the decision in accordance with the procedures provided in Sec. 47-26B., Appeals.

7. If, during the course of the construction of the public purpose construction project it is found that activities on the construction staging area site are detrimental to the health, safety and welfare of the public as determined by the city engineer, the applicant shall be given notice of

additional measures that must be taken in order to mitigate the negative impact. If the applicant fails to institute such measures within five (5) calendar days of notice, notice shall be given of a hearing to be held before the city commission and applicant shall be required to address the impacts associated with the staging area site. If the city commission finds that negative impacts exist, it may impose conditions on the construction staging permit. If the applicant fails to demonstrate how the negative impacts will be mitigated or fails to institute the measures within the time required by the city commission, the city commission may terminate the permit.

8. *Termination of permit.* The temporary construction staging permit shall terminate on the date established by the department or the city commission as provided in this subsection GG.

Upon termination of a temporary construction staging permit the site applicant or property owner shall have thirty (30) days from termination to restore the site to a clean and safe condition with all construction staging materials and debris removed.

Port Condo Large Water Main Improvements

TEMPORARY MODIFICATION OF TRAFFIC (MOT) ROUTING FORM

DATE:

CONTRACTOR: PERMIT NO. _____

_____ (ENGINEERING OR BUILDING)

_____

phone: _____
fax: _____ PROJECT NAME:_____
e-mail: _____

This form represents request from the above named contractor for permission to temporarily modify City of Fort Lauderdale's existing traffic circulation to perform work under the above referenced Engineering or Building Permit within the City's right-of-way.

Brief description of work including location of site, reason for requiring a traffic modification, limits of work (description of work zone) shall be provided below. Refer to additional sheets to be attached (if necessary).

_____
_____
_____
_____

Brief description of temporary traffic modifications (include types of traffic control devices, the time duration for work zone placement, and any other special considerations related to this request. Refer to attached additional sheets (if necessary)

_____
_____
_____
_____

ATTACH: MAINTENANCE OF TRAFFIC PLAN PREPARED BY CERTIFIED WORKSITE TRAFFIC TECHNICIAN

It is to be understood that the granting of said permission is for temporary period only and can be rescinded at any time, following reasonable notice,that said permission causes or creates any unforeseen problems. Additional measures, devices, or requests may be presented to the Contractor for placement after receipt of the original approval if unforeseen traffic or pedestrian safety concerns are apparent.

All traffic control associated with construction within the City's right-of-way shall be in accordance with provisions of Part IV of the Manual of Uniform Traffic Control Devices for Streets and Highways. Compliance with the requirements of the approved plan shall be the responsibility of the Engineering Contractor.

_____ _____
(for the Contractor) (Name/Title-Print)

As a consideration for the permission granted herein, _____(Contractor) agrees to indemnify and hold harmless the City of Fort Lauderdale for any damages, claims or injuries that may result from the temporary traffic modification described herein.

_____ By: _____
(Name of Company) (Company Officer, President, or Authorized Agent)

Port Condo Large Water Main Improvements

The Engineering Department – Permits Section will authorize implementation of the traffic modifications only after review and approval by the following parties:

Approved: PROJECT NAME: _____

(Date)	Police Department (Patrol Secy. Office) 1300 West Broward Boulevard Fax to 954-828-5613 or Call for Appointment 954-828-5477
(Date)	Fire-Rescue Department Keith Allen, Deputy Chief - Fire Operations 101 NE 3 Avenue, Suite 500 Fax to 954-828-6843 or Call for Appointment 954-828-6813
(Date)	Broward County Traffic Engineering (BCTE) Steven Hessler Planning and Design Section 2300 W. Commercial Boulevard Fax to 954-497-3640 or call 954-484-9600, Ext. 249 or 251
(Date)	City Engineering Design Manager - TRAFFIC SECTION Helsop Daley Engineering Dept. – Traffic Engineering Section 100 North Andrews Avenue, 4th Floor (City Hall) Fax to 954-828-5074 or call 954-828-5734/5078
(Date)	City Engineering Design Manager – PERMITS SECTION Alex Scheffer P.E., Land Development Manager Engineering Department-Permits Section 700 N.W. 19th Avenue Tel: 954-828-5123/5048 fax: 954-828-4358

Upon execution a copy of this application and attached Maintenance of Traffic Plan is to be maintained on site with other permit documents.

ATTACHMENT: Maintenance of Traffic Plan prepared by Certified Work Site Traffic Technician

Note: This form is to be utilized to coordinate review and approval of traffic modifications required to facilitate construction in conjunction with Building & Engineering Permits. Traffic modifications required in conjunction with City projects should be coordinated by Engineering Inspection, or the Project Manager. Traffic modifications required for other reasons (e.g., special events) should be arranged through the City's Special Events Coordinator: Susan Molnar, 761-5362.

M:/ROWpermitting/MOTform/Rev. 08/15/01)

[CONTRACTOR'S NAME]

[CONTRACTOR'S STREET ADDRESS]

[CONTRACTOR'S CITY, STATE AND ZIP]

[CONTRACTOR'S TELEPHONE NUMBER]

[CONTRACTOR'S FAX NUMBER]

MEMORANDUM

TO: **RESIDENTS OF [LOCATION OF CONSTRUCTION]**

DATE: **[CURRENT DATE]**

RE: **CONSTRUCTION IN YOUR AREA**

FROM: **[CONTRACTOR'S NAME]**

Construction in your area will commence on [date of construction commencement].

The construction area is from [boundary #1] to [boundary #2].

Access to the area will be limited at certain times due to the construction activities. We apologize for any inconvenience and we will do our best to accommodate access to residents.

Thank You,

[Contractor Name]

CITY OF FORT LAUDERDALE

SECTION 01590 – CONSTRUCTION SIGN

PART 1 GENERAL

Contractor shall furnish and install a **4' x 8'** sign (with white painted posts) prior to start of construction. A sample sign template is below but is not specific to the project. The exact style and design of the sign will be provided by the CITY to the Contractor during the preconstruction meeting in PDF format.

END OF SECTION

SECTION 01600
MATERIAL AND EQUIPMENT

PART 1 GENERAL

1.1 DEFINITIONS

A. Products:

1. New items for incorporation in the Work, whether purchased by the CONTRACTOR or OWNER for the Project, or taken from previously purchased stock and may also include existing materials or components required for reuse.
2. Includes the terms material, equipment, machinery, components, subsystem, system, hardware, software, and terms of similar intent and is not intended to change meaning of such other terms used in Contract Documents, as those terms are self-explanatory and have well recognized meanings in the construction industry.
3. Items identified by manufacturer's product name, including make or model designation, indicated in manufacturer's published product literature, that is current as of the date of the Contract Documents.

1.2 DESIGN REQUIREMENTS:

A. Provide systems, equipment, and components, including supports and anchorage in accordance with provisions of latest edition of the Florida Building Code. Wind: 150 mph, with exposure condition and an importance factor of 1.5.

1.3 ENVIRONMENTAL REQUIREMENTS

A. Altitude: Provide materials and equipment suitable for installation and operation under rated conditions at 0 – 25 feet above sea level.

B. Provide equipment and devices installed outdoors or in unheated enclosures capable of continuous operation within an ambient temperature range of 30 degrees F to 110 degrees F.

1.4 PREPARATION FOR SHIPMENT

A. When practical, factory assemble products. Mark or tag separate parts and assemblies to facilitate field assembly. Cover machined and unpainted parts that may be damaged by the elements with strippable protective coating.

B. Package products to facilitate handling and protect from damage during shipping, handling, and storage. Mark or tag outside of each package or crate to indicate its purchase order number, bill of lading number, contents by name, name of Project and CONTRACTOR, equipment number, and approximate weight. Include complete packing list and bill of materials with each shipment.

C. Extra Materials, Special Tools, Test Equipment, and Expendables:

1. Furnish as required by individual Specifications.
2. Schedule:
   a. Ensure that shipment and delivery occurs concurrent with shipment of associated equipment.
   b. Transfer to the OWNER shall occur immediately subsequent to completion of the CONTRACTOR's Work and the OWNER's acceptance of Work.
3. Packaging and Shipment:
   a. Package and ship extra materials and special tools to avoid damage during long term storage in original cartons insofar as possible, or in appropriately sized, hinged-cover, wood, plastic, or metal box.
   b. Prominently Displayed on Each Package, the Following:
      1) Manufacturer's part nomenclature and number.
      2) Applicable equipment description.
      3) Quantity of parts in package.
      4) Equipment manufacturer.
4. Deliver Materials to the Following Address: 900 NE 7th Street, Fort Lauderdale, FL 33304
5. Notify ENGINEER upon arrival.
6. Replace extra materials and special tools found to be damaged or otherwise inoperable at time of transfer to the OWNER.

D. Request a minimum 7-day advance notice of shipment from manufacturer. Upon receipt of manufacturer's advance notice of shipment, promptly notify the ENGINEER of anticipated date and place of arrival.

E. Factory Test Results: Reviewed and accepted by the ENGINEER before product shipment as required in individual Specification sections.

1.5 DELIVERY AND INSPECTION

A. Deliver products in accordance with accepted current progress schedule and coordinate to avoid conflict with the Work and conditions at site.

B. Deliver products in undamaged condition, in manufacturer's original container or packaging, with identifying labels intact and legible. Include on label, date of manufacture and shelf life, where applicable. Include UL labels on products so specified.

C. Unload products in accordance with manufacturer's instructions for unloading or as specified. Record receipt of products at site. Inspect for completeness and evidence of damage during shipment.

D. Remove damaged products from site and expedite delivery of identical new undamaged products, and remedy incomplete or lost products to provide that specified, so as not to delay progress of the Work.

1.6 HANDLING, STORAGE, AND PROTECTION

A. Handle and store products in accordance with manufacturer's written instructions and in a manner to prevent damage. Store in approved storage yards or sheds provided in accordance with Section 01500 CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS. Provide manufacturer's recommended maintenance during storage, installation, and until products are accepted for use by the OWNER.

B. Arrange storage in a manner to provide easy access for inspection. Make periodic inspections of stored products to assure that products are maintained under specified conditions, and free from damage or deterioration. Keep running account of products in storage to facilitate inspection and to estimate progress payments for products delivered, but not installed in the Work.

C. Store fabricated products above ground on blocking or skids, and prevent soiling or staining. Store loose granular materials in well-drained area on solid surface to prevent mixing with foreign matter. Cover products that are subject to deterioration with impervious sheet coverings and provide adequate ventilation to avoid condensation.

D. Store finished products that are ready for installation in dry and well-ventilated areas.

E. Hazardous Materials: Prevent contamination of personnel, storage building, and site. Meet requirements of product specification, codes, and manufacturer's instructions.

PART 2 PRODUCTS

2.1 GENERAL

A. Provide manufacturer's standard materials suitable for service conditions, unless otherwise specified in the individual Specifications.

B. Where product specifications include a named manufacturer, with or without model number, and also include performance requirements, named manufacturer's products must meet the performance specifications.

C. Like items of products furnished and installed in the Work shall be end products of one manufacturer and of the same series or family of models to achieve standardization for appearance, operation and maintenance, spare parts and replacement, and manufacturer's services.

D. Do not use materials and equipment removed from existing premises, except as specifically permitted by Contract Documents.

E. Provide interchangeable components of the same manufacturer, for similar components, unless otherwise specified.

F. Equipment, Components, Systems, and Sub-systems: Design and manufacture with due regard for health and safety of operation, maintenance, and accessibility, durability of parts, and shall comply with applicable OSHA, state, and local health and safety regulations.

G. Regulatory Requirement: Coating materials shall meet federal, state, and local requirements limiting the emission of volatile organic compounds and for worker exposure.

H. Safety Guards: Provide for all belt or chain drives, fan blades, couplings, or other moving or rotary parts. Cover rotating part on all sides. Design for easy installation and removal. Use 16-gauge or heavier; galvanized steel, aluminum coated steel, or galvanized or aluminum coated 1/2-inch mesh expanded steel. Provide galvanized steel accessories and supports, including bolts. For outdoors application, prevent entrance of rain and dripping water.

I. Provide materials and equipment listed by UL wherever standards have been established by that agency.

J. Material Finish:

1. Provide manufacturer's standard finish and color, except where specific color is indicated.
2. If manufacturer has no standard color, provide material with finish as approved by the ENGINEER.

K. Special Tools and Accessories: Furnish to the OWNER, upon acceptance of material, all accessories required to maintain normal operation of the system. These accessory items include, but are not limited to, special tools and other spare parts as required for maintenance.

2.2 FABRICATION AND MANUFACTURE

A. General:

1. Manufacture parts to U.S.A. standard sizes and gauges.
2. Two or more items of the same type shall be identical, by the same manufacturer, and interchangeable.
3. Modify standard products as necessary to meet performance Specifications.
4. Use ¼-inch minimum thickness for steel that will be submerged, wholly or partially, during normal operation.

2.3 SOURCE QUALITY CONTROL

A. Where Specifications call for factory testing to be witnessed by the ENGINEER, notify ENGINEER not less than fourteen (14) days prior to

scheduled test date, unless otherwise specified.

B. Calibration Instruments: Bear the seal of a reputable laboratory certifying instrument has been calibrated within the previous twelve (12) months to a standard endorsed by the National Institute of Standards and Technology (NIST).

C. Factory Tests: Perform in accordance with accepted test procedures and document successful completion.

PART 3 EXECUTION

3.1 INSPECTION

A. Inspect materials and equipment for signs of pitting, rust decay, or other deleterious effects of storage. Do not install material or equipment showing such effects. Remove damaged material or equipment from the site and expedite delivery of identical new material or equipment. Delays to the Work resulting from material or equipment damage that necessitates procurement of new products will be considered delays within the CONTRACTOR's control.

3.2 INSTALLATION

A. Install the Work in accordance with ANSI/AWWA C-600-99 (or current edition), unless otherwise specified.

B. Handle, install, connect, clean, condition, and adjust products in accordance with manufacturer's instructions, and as may be specified. Retain a copy of manufacturers' instruction at site, available for review at all times.

3.3 FIELD FINISHING

A. In accordance with individual Specification sections.

END OF SECTION

SECTION 01640
MANUFACTURERS' SERVICES

PART 1 GENERAL

1.1 DEFINITIONS

A. Person-Day: One person for eight (8) hours within regular CONTRACTOR working hours.

1.2 SUBMITTALS

A. Informational Submittals:

1. Training Schedule: Submit not less than 21 days prior to start of equipment installation and revise as necessary for acceptance.
2. Lesson Plan: Submit proposed lesson plan not less than 21 days prior to scheduled training and revise as necessary for acceptance.

1.3 QUALIFICATION OF MANUFACTURER'S REPRESENTATIVE

A. Authorized representative of the manufacturer, factory trained, and experienced in the technical applications, installation, operation, and maintenance of respective equipment, subsystem, or system, with full authority by the equipment manufacturer to issue the certifications required of the manufacturer. Additional qualifications may be specified elsewhere.

B. Representative subject to acceptance by the OWNER and ENGINEER. No substitute representatives will be allowed unless prior written approval by such has been given.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.1 FULFILLMENT OF SPECIFIED MINIMUM SERVICES

A. Furnish manufacturers' services when required by an individual Specification section, to meet the requirements of this Section.

B. Where time is necessary in excess of that stated in the Specifications for manufacturers' services, or when a minimum time is not specified, the time required to perform the specified services shall be considered incidental.

C. Schedule manufacturer’ services to avoid conflict with other onsite testing or other manufacturers’ onsite services.

D. Determine, before scheduling services, that all conditions necessary to allow successful operations and testing have been met.

E. Only those days of service approved by the ENGINEER will be credited to fulfill the specified minimum services.

F. When specified in individual Specification sections, manufacturer's onsite services shall include:

1. Assistance during product (system, subsystem, or component) installation to include observation, guidance, instruction of the CONTRACTOR's assembly, erection, installation or application procedures.
2. Inspection, checking, and adjustment as required for product (system, subsystem, or component) to function as warranted by manufacturer and necessary to furnish Manufacturer's Certificate of Proper Installation.
3. Providing, on a daily basis, copies of all manufacturer's representatives' field notes and data to the ENGINEER.
4. Revisiting the site as required to correct problems and until installation and operation are acceptable to the ENGINEER.
5. Resolution of assembly or installation problems attributable to, or associated with, respective manufacturer's products and systems.
6. Assistance during functional and performance testing, and facility startup and evaluation.
7. Training of the OWNER's personnel in the operation and maintenance of respective product as required.
8. Additional requirements may be specified elsewhere.

3.2 MANUFACTURER'S CERTIFICATE OF COMPLIANCE

A. When specified in individual Specification section, submit prior to shipment of product or material.

B. The ENGINEER may permit use of certain materials or assemblies prior to sampling and testing if accompanied by accepted certification of compliance.

C. Signed by product manufacturer certifying that product or material specified conforms to or exceeds specification. Attach supporting reference data, affidavits, and certifications as appropriate.

D. May reflect recent or previous test results on material or product, if acceptable to the ENGINEER.

3.3 MANUFACTURER'S CERTIFICATE OF PROPER INSTALLATION

A. When so specified, a Manufacturer's Certificate of Proper Installation form, a copy of which is attached to this Section, shall be completed and signed by the equipment manufacturer's representative.

B. Such form shall certify that the signing party is a duly authorized representative of the manufacturer, is empowered by the manufacturer to inspect, approve, and operate their equipment and is authorized to make recommendations required to assure that the equipment is complete and operational.

3.4 TRAINING

A. General:

1. Furnish manufacturer's representatives for detailed classroom and hands-on training to the OWNER's personnel on operation and maintenance of specified product (system, subsystem, component) and as may be required in applicable Specifications.
2. Furnish trained, articulate personnel to coordinate and expedite training, to be present during training coordination meetings with the OWNER, and familiar with operation and maintenance manual information.
3. Manufacturer's representative shall be familiar with facility operation and maintenance requirements as well as with specified equipment.
4. Furnish complete training materials, to include operation and maintenance data, to be retained by each trainee.

B. Training Schedule:

1. List specified equipment and systems that require training services and show:
   a. Respective manufacturer.
   b. Estimated dates for installation completion.
   c. Estimated training dates.
2. Allow for multiple sessions when several shifts are involved.
3. Adjust schedule to ensure training of appropriate personnel as deemed necessary by OWNER, and to allow full participation by manufacturers' representatives. Adjust schedule for interruptions in operability of equipment.
4. Coordinate with Section 01320 CONSTRUCTION PROGRESS DOCUMENTATION.

C. Lesson Plan: When specified, prepare for each required course, containing the following minimum information:

1. Title and objectives.
2. Recommended types of attendees (e.g., managers, engineers, operators, maintenance).
3. Course description and outline of course content.
4. Format (e.g., lecture, self-study, demonstration, hands-on).
5. Instruction materials and equipment requirements.
6. Resumes of instructors providing the training.

3.5 SUPPLEMENTS

A. The supplement listed below, following "END OF SECTION," is part of this Specification.

1. Supplement 1: Manufacturer's Certificate of Proper Installation.

END OF SECTION

MANUFACTURER'S CERTIFICATE OF PROPER INSTALLATION

OWNER_____ EQPT SERIAL NO:_____

EQPT TAG NO:_____ EQPT/SYSTEM:_____

PROJECT NO:_____ SPEC. SECTION:_____

I hereby certify that the above-referenced equipment/system has been:

(Check Applicable)

- ☐ Installed in accordance with Manufacturer's recommendations.
- ☐ Inspected, checked, and adjusted.
- ☐ Serviced with proper initial lubricants.
- ☐ Electrical and mechanical connections meet quality and safety standards.
- ☐ All applicable safety equipment has been properly installed.
- ☐ Functional tests.
- ☐ System has been performance tested, and meets or exceeds specified performance requirements. (When complete system of one manufacturer)

Note: Attach any performance test documentation from manufacturer.

Comments:_____

_____

_____

_____

_____

_____

I, the undersigned Manufacturer's Representative, hereby certify that I am (i) a duly authorized representative of the manufacturer, (ii) empowered by the manufacturer to inspect, approve, and operate his equipment and (iii) authorized to make recommendations required to assure that the equipment furnished by the manufacturer is complete and operational, except as may be otherwise indicated herein. I further certify that all information contained herein is true and accurate.

Date:_____, 20___

Manufacturer:_____

By Manufacturer's Authorized Representative: _____
(Authorized Signature)

SECTION 01720
PROJECT RECORD DOCUMENTS

PART 1 GENERAL

1.1 DESCRIPTION

A. Scope of Work: The Contractor is responsible for maintaining one record copy of:

1. Record Drawings.
2. Record Specifications.
3. Addenda.
4. Change Orders and other modification to the Contract.
5. Engineer's written orders or instructions.
6. Approved Shop Drawings, Product Data and Samples.
7. Field Test records.
8. Construction photographs.
9. As-built dimensions and elevations as recorded by the Contractor's Florida Registered Land Surveyor.

B. The records listed above are to be made available for the City's review at all times for all projects. All City requirements must be met by the Contractor prior to acceptance of Record Documents by the City.

1.2 MAINTENANCE OF DOCUMENTS AND SAMPLES

A. Maintain documents in a clean dry, legible condition and in good order. Do not use record documents for construction purposes.

1.3 RECORDS

A. During the life of the Contract the Contractor shall retain the services of a Florida Registered Land Surveyor who shall maintain records of the installation, including all deviations from Plans and Specifications.

B. Measure and Record all information for all projects concurrently with construction progress.

C. Submit redlines, partially completed as-built plan sheets and fully complete as-built Plan sheets, all as required by and satisfactory to, the City on a monthly basis or such lesser interval as directed by the City.

D. Label each document "PROJECT RECORD" in neat large printed letters.

1. Do not conceal any work until as-built information is recorded by the Contractor's surveyor and, if so required, by the City surveyor.

2. All locations for future connections or tie-ins shall be left unburied and uncovered until the Contractor's Florida Registered Land Surveyor measures and records the as-built information.

3. Restrained pipe, end line valves, thrust blocks shall be left uncovered for the last complete length. In line valves and tees shall be left exposed for one length on both sides plus the face end. Measure and record the elevation, horizontal and vertical alignment, and inclination for these items.

4. For all projects, the Contractor's Florida Registered Land Surveyor (FRLS) shall maintain exact and extensive records of any deviations from the Plans or Specifications. These records shall be satisfactory to the Engineer, whose decision shall be final, and sufficient to allow the production of accurate as- built Plans which correctly and completely portray the work as constructed.

5. For all projects, the Contractor's Florida Registered Land Surveyor shall record data as follows during the entirety of construction.

a. For facility (eg a water or sewage plant, pumping station, or similar site if so designated by City) projects, record as-built dimensions and elevations every twenty-five feet or portion thereof along the pipeline and at every abrupt change in direction of the new line.

b. For pipeline projects, constructed in the public right-of-way dimensions and elevations every one hundred feet or portion thereof along the pipeline and at every horizontal and vertical change in direction.

c. Identify separations with all horizontal and vertical distances identified between existing utilities and the crossing location of the new utility such that FDEP/DOH requirements are documented as having been met by the Contractor. In all cases record locations and elevations for each valve, fitting, service line, fire hydrant, water sampling point, utility poles adjacent to the proposed line, overhead wires crossing the ditch line (approximate height above grade) and other appurtenances along the pipeline.

d. The identity, dimensions, location and elevation of any existing utility crossing the proposed line and immediately adjacent to the new line as to be exposed by the excavation shall also be recorded. Locate, excavate expose and record the same data for any utility shown in the plans whose proximity to the proposed pipeline could affect the certification requirements of the new installation. Note that in instances of a very wide ditch due to ground conditions the recording of data for adjacent, paralleling, utilities shall only be required for lines which come within three feet of the outside of the pipe being installed unless otherwise ordered by the City who's decision shall be final.

e. Without exception, for all thrust blocks, the top elevation, outer dimensions, thickness of the block, length and location of any sheet piling, if used, shall be recorded by the Contractor's FRLS.

f. Specific locations and elevation of equipment, the buildings and miscellaneous items installed inside them shall be recorded as applicable and as required by the City.

g. Without exception, where the substitution of another piece of equipment for that shown on the Plans has been allowed, the footprint, clearance and elevation dimensions shall be recorded by the Contractor's FRLS and these changes shall be accurately and thoroughly portrayed on the as-built plans.

h. The Contractor's Licensed Surveyor shall prepare from the field data, as-built record drawings showing correctly, completely and accurately the installation, embracing all changes and deviations made during construction, including all construction variances, to reflect the work as it was constructed.

i. Record Drawings shall be prepared as specified hereinafter.

j. If the City or Engineer determines that the Drawings are not acceptable, they will be returned to the Contractor with a cover letter noting the deficiencies and/or reasons for the disapproval. Contractor shall have ten calendar days to correct all exceptions taken by the City and resubmit as-built record drawings to the City for final acceptance.

1.4 DRAWINGS

A. During the life of the Contract, maintain records of all deviations from the Plans and Specifications and prepare therefrom As-Built Record Drawings showing correctly and accurately all changes and deviations made during construction to reflect the work as it was actually constructed.
It is the responsibility of the Contractor to check the As-Built Record Drawings for errors and omissions prior to submittal to the City and certify in writing that the As-Built Record Drawings are correct and accurate, including the actual location of all piping.

B. Legibly Mark to Record Actual Construction: All data as previously specified for all installations by the Contractor's FRLS. For on-site structures and facilities work the Contractor's Florida Registered Land Surveyor shall record:

1. Depths of various elements of foundation in relation to finish first floor and datum plane.

2. All exposed and underground piping and ductwork with elevations and dimensions and locations of valves, pull boxes, etc. Changes in location. Horizontal and vertical locations of underground utilities and appurtenances, measured from permanent reference points, plant survey grids, property lines and similar.

3. Field changes in dimensions, locations and details.

4. Changes made by Engineer's written instructions or by Change Order.

5. Details not on original Plans.

6. Equipment and piping relocations.

7. Major architectural and structural changes in structures, including tanks

8. Record drawings shall be prepared as specified hereinafter.

C. Specifications and Addenda: Legibly mark each section to record the following:

1. Manufacturer, trade name, catalog number and supplier of each product and item of equipment actually installed.

2. Changes made by Engineer's written instructions or by Change Order.

D. Approved Shop Drawings: Provide record copies for system diagrams and drawings together with each element of process equipment, piping, electrical system and instrumentation system.

1.5 SUBMITTALS

A. Accompany submittal with transmittal letter in duplicate, containing:

1. Date.

2. Project title and number.

3. Contractor’s name and address and phone number.

4. Title and number of each Record Document.

5. Signature of Contractor or his authorized representative.

B. Record Drawings with five hard copies which have been signed and sealed by the surveyor shall be submitted to the City for the Engineer's review. City CAD standards should be followed. Drawings shall conform to recognized standards of drafting and the minimum technical standards as set forth by the Board of Professional Surveyors and Mappers, shall be neat, legible and on 24-inch by 36-inch plans.
These materials shall be submitted to the City for the Engineer's review as a prerequisite for payment during the course of construction as previously specified and final, complete sets of documents within ten calendar days following the completion date of successful testing of all mains, equipment and appurtenances under this Contract. Final acceptance will not be made until the set of as-built record drawings and five sets of signed and sealed CAD files and prints have been approved and accepted by the City and the Engineer.

1. In cases where a portion of a pipeline system or parts of a process system are put into service, the above conditions shall apply for the in-service portion and acceptance of work constructed shall be withheld until the as-built drawings are

accepted by the City.

2. As-Built Record Drawings, as prepared by the Contractor's Florida Registered Land Surveyor and submitted by the Contractor, shall comply with following criteria and standards:

   a. Title block must show the Contract or Project Title (as applicable); Contract number; Contractor's name; Engineer of Record's name; Surveyor's name and address; date; location; and where appropriate to the work, size and type (i.e. water main, sanitary gravity main, sanitary force main) of main.

   b. Baselines or centerlines must be tied to section corners, monument line and right-of-way lines.

   c. Pipeline must be tied to baseline or centerline with stations and offsets.

   d. Baselines or centerlines must show bearings or deflection angles, or delta, radius, chord and arc length for curves.

   e. Show all horizontal curve data, including point of curvature (PC) and point of tangency (PT) stations or radial bearing.

   f. Stationing must be the same as shown on construction drawings and must be tied to Section corners, centerline intersections and all other pertinent control points within the Project. All such pertinent points shall have their stationing shown and where there is dual stationing for a point, both stations shall be called out.

   g. Identify all streets by name or number and show stationing at all intersecting streets.

   h. Refer to vertical datum plane and identify the location, elevation and source supplying the bench mark used.

   i. Tie easement lines to survey baseline or platted centerline and right-of-ways.

   j. Show horizontal and vertical locations of all fittings, deflections, or at any significant change of direction, and at a maximum of 100-foot intervals along the pipeline for off-site (eg in the public right-of-way) and at maximum 25-foot intervals for on-site (eg on a facility such as a pump station or plant) work.

   k. On all pipe fittings of 36-inch diameter or over, (i.e. tees, bends, crosses, wyes, increasers/decreases, bevels) elevations must be taken at the end and center points to reflect the true elevation and attitude of the fitting.

   l. Elevations of natural ground or pavement over the pipeline must be shown at each position where the pipe elevation is shown and at intervening high and low points.

m. Manhole rim and valve box rim elevations must be shown.

n. Show all invert and bottom elevations in manholes and valve vaults or boxes. Show all invert and bottom elevations together With pipe size, and where it can be determined, pipe material, for existing structures having pipes which cross the pipeline being constructed.

o. Locations and elevations together with diameter, thickness and material of all casings.

p. Location, top and bottom elevations of all sheeting left in place.

q. Coordinate values used inside plants shall be the local City established coordinate systems referenced to the property boundary.

r. State plane coordinate values for all new valves and manholes; on existing valves and manholes at points of connection or closest to the point of connection and the point of connection itself.

s. All FDEP/DIH separation requirements are to be provided on the as-built plans and to meet FDEP/DOH standards.

3. Certification: The Contractor shall certify on as-built record drawings all other actual constructed details and information as may be required by the City including but not limited to:

a. Valves must be identified by size, type, end condition; and on valves 16-inch or larger, the manufacturer's name and number of turns required to open or close the valve.

b. Show calculated pipeline percent of grade between manholes of gravity systems.

c. Types and sizes of sheeting and piling together with measured and complete; location, dimensional and elevation data on any pile caps, tie backs, anchors, whalers or other appurtenant structures left in place.

Drawings on Magnetic Media: The City and Engineer reserves the right to require submittal of signed and sealed as-built drawings in AutoCAD for Windows Release 14 format or later. Graphical information contained on magnetic media shall be the same as provided on plan sheets.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01780
CONTRACT CLOSEOUT

PART 1 GENERAL

1.1 SUBMITTALS

A. Informational Submittals:

1. Submit prior to application for final payment.
   a. Special Bonds, Special Guarantees, and Service Agreements.
   b. Consent of Surety to Final Payment.
   c. Releases or Waivers of Liens and Claims.
   d. Releases from Agreements.
   e. Final Application for Payment: Submit in accordance with procedures and requirements stated in Section 01025 MEASUREMENT AND PAYMENT.
   f. Extra Materials: As required by individual Specification sections.

B. Subcontractor Identification Form:
   1. Submit form with final pay request.
   2. Submit a separate form for each subcontractor used.
   3. For Capital Improvement Projects, submit form along with final pay request to the PROJECT MANAGER.
   4. Subcontractor Identification Form is attached as a Supplement to this section.

1.2 RELEASES FROM AGREEMENTS

A. Furnish OWNER written releases from property owners or public agencies where side agreements or special easements have been made, or where the CONTRACTOR's operations have not been kept within the OWNER's construction right-of-way.

B. In the Event CONTRACTOR is Unable to Secure Written Releases:

1. Inform ENGINEER of the reasons.
2. The OWNER or its representatives will examine the site, and OWNER will direct the CONTRACTOR to complete the Work that may be necessary to satisfy terms of the side agreement or special easement.
3. Should the CONTRACTOR refuse to perform this Work, the OWNER reserves right to have it done by separate contract and deduct cost of same from Contract Price, or require the CONTRACTOR to furnish a satisfactory Bond in a sum to cover legal claims for damages.
4. When the OWNER is satisfied that the Work has been completed in agreement with Contract Documents and terms of side agreement or special easement, right is reserved to waive requirement for written release if:
   (i) The CONTRACTOR's failure to obtain such statement is due to grantor's refusal to sign, and this refusal is not based upon any

legitimate claims that the CONTRACTOR has failed to fulfill terms of side agreement or special easement, or

(ii) The CONTRACTOR is unable to contact or has had undue hardship in contacting grantor.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.1 FINAL CLEANING

A. At completion of the Work along each pipe segment clean entire site or parts thereof, as applicable.

1. Leave the Work and adjacent areas affected in a cleaned condition satisfactory to the OWNER and ENGINEER.
2. Broom clean affected driveways and parking/roadway areas.
3. Hose clean sidewalks, loading areas, and other areas contiguous with limits of construction.
4. Rake clean all other surfaces.

B. Use only cleaning materials recommended by manufacturer on surfaces to be cleaned.

C. Meet all requirements of Section 02575 SURFACE RESTORATION.

3.2 SUPPLEMENTS

A. The supplement listed below, following “END OF SECTION” is part of this Specification.

1. Supplement-1, Subcontractor Identification Form

END OF SECTION

SUBCONTRACTOR IDENTIFICATION FORM

This form shall be completed by all City of Fort Lauderdale Prime Contractors who subcontracted out any portion of his/her City contract. The form shall be forwarded to the City of Fort Lauderdale's Public Services Department (Engineering and Architectural Services) with the prime contractor's final pay request. A separate form is to be completed and submitted for each subcontractor. Please telephone (954) 761-5057 or 761-5083, if you have any questions regarding this form.

1) CITY OF FORT LAUDERDALE PROJECT NO. _____

2) PROJECT DESCRIPTION _____

3) SUB-CONTRACTOR ____

_____
Business Name

_____
Address

_____
Telephone & Fax Nos.

_____
Email Address/Company Wesbsite (if applicable)

4) SUBCONTRACTOR'S PRINCIPAL OFFICER _

5) CLASSIFICATION OF WORK SUBCONTRACTED OUT __

6) COST OF WORK SUBCONTRACTED OUT __

7) Please check the item(s) which properly identify the ownership status of the subcontractor's firm:

☐ Subcontractor firm is not a MBE or WBE

☐ Subcontractor firm is a MBE, as at least 51 percent is owned and operated by one or more socially and economically-disadvantaged individuals:

☐ American Indian ☐ Asian ☐ Black ☐ Hispanic ☐ White

☐ Subcontractor firm is a WBE, as at least 51 percent is owned and operated by one or more women.

☐ American Indian ☐ Asian ☐ Black ☐ Hispanic ☐ White

8) **PRIME Contractor** _____

_____
NAME & TITLE OF PRIME CONTRACTOR'S REPRESENTATIVE COMPLETING THIS FORM (*Please Print*)

_____
(Telephone No.) *(Fax No.)* *(Email Address)*

SIGNATURE _____ **DATE**_____
Prime Contractor's Representative

SECTION 02080
FIRE HYDRANTS

PART 1 GENERAL

1.1 SUBMITTALS

A. Shop Drawings: Catalog cuts of system components.

B. Quality Control Submittals:

1. Certificate of Compliance: Upon completion of the system installation, verify all fire department hose connections, and check all fire safety devices to ensure their readiness for emergency connection and operation.

PART 2 PRODUCTS

2.1 HYDRANTS

A. Hydrant:

1. Two-part break flange or safety top type.
2. Nominal 5-1/4-inch main valve opening with 6-inch bottom connections.
3. Conform to AWWA C502.
4. Two 2-1/2-inch hose nozzles.
5. One 4-1/2-inch pumper nozzle.
6. Operating Nuts: 1-1/2-inch National Standard pentagon nut.
7. Mechanical joint inlet connection.
8. Rustoleum 1201 Red and Rustoleum 2766 White above ground line.
9. Acceptable Manufacturers and Products:
   a. Mueller Super Centurion 200.
   b. US Pipe Metropolitan 250.
   c. American Darling B-84B
   d. Clow Medallion.

B. Main Valve:

1. See Section 15100 VALVES AND OPERATORS.
2. Valve opens on counterclockwise rotation.

2.2 GRAVEL

A. Washed 3/4-inch crushed rock or graded river gravel. Free of organic matter, sand, loam, clay, and other small particles that will restrict waterflow through gravel.

2.3 FOUNDATION STABILIZATION MATERIAL

A. Furnish when existing trench material or imported pipe base material will not support soft or flooded spots in excavated trench.

B. Maximum 3-inch hard rock free from excessive clay material, but enough fines to bind larger fragments.

2.4 JOINT RESTRAINT

A. See Section 02502 DUCTILE IRON PIPE AND FITTINGS.

1. Manufacturer’s restrained joint.
2. Mechanically restrained joint.
3. Or equal.

PART 3 EXECUTION

3.1 GENERAL

A. Install hydrants in accordance with Sections 3.7 and 3.8 of AWWA C600, unless specified otherwise.

3.2 EXCAVATION

A. Excavate to subgrade. Fill over excavated areas with foundation stabilization material. Tamp to provide firm foundation.

3.3 INSTALLATION OF HYDRANTS

A. Locate hydrants to provide accessibility and to minimize potential damage from vehicles.
   1. Relocate improperly set hydrants.
   2. Depth of Valve Bury: 4 feet (max).
   3. Locate valve as close to hydrant as possible, as shown on the Drawings.
   4. Hydrant Located Behind Curbs: Set barrel so pumper nozzle or hose nozzle caps are a minimum of 18 inches from gutter face of curb.
   5. Hydrant Located Where There is a Sidewalk: Set hydrant in the sidewalk so the back of the barrel is 12 inches inside the property line and the edge of the sidewalk, as shown on the Drawings.
   6. Set hydrants so safety flange is a minimum of 2 inches above finished ground or sidewalk level.

B. Joints shall conform to Section 3.4 of AWWA C600 for ductile iron pipe.

C. Maintain hydrant in a plumb position during subsequent Work.

3.4 GRAVEL FOR SUPPORT

A. Place gravel around hydrant bottom in accordance with Section 3.7 of AWWA C600.

3.5 JOINT RESTRAINT

A. Provide joint restraint as specified and as shown on the Drawings, between main valve and hydrant, water main tee, and main valve.

END OF SECTION

SECTION 02139
PIPING LEAKAGE TESTING

PART 1 GENERAL

1.1 GENERAL

A. This Section pertains to newly installed sewer pipe as well as the existing pipe segment (stub out) to which the new sewer pipe was attached.

1.2 SUBMITTALS

A. Quality Control Submittals:

1. Testing Plan: Submit prior to testing and include at least the information that follows.
    a. Testing dates.
    b. Piping systems and section(s) to be tested.
    c. Test type.
    d. Method of isolation.
    e. Calculation of maximum allowable leakage for piping section(s) to be tested.
2. Certifications of Calibration: Testing equipment.
3. Certified Test Report.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.1 PREPARATION

A. Notify the ENGINEER and/or OWNER in writing five (5) days in advance of testing. Perform testing in presence of ENGINEER.

B. Gravity Piping:

1. Perform testing after service connections, manholes, and backfilling have been completed between stations to be tested.
2. Determine groundwater level at time of testing by exploratory holes or other method acceptable to the ENGINEER and/or OWNER.

3.2 HYDROSTATIC TEST FOR GRAVITY PIPING

A. Testing Equipment Accuracy: Plus or minus 1/2 gallon of water leakage under specified conditions.

B. Maximum Allowable Leakage: 0.16 gallon per hour per inch diameter per 100 feet. Include service connection footage in test section, subjected to minimum head specified.

C. Exfiltration Test:

1. Hydrostatic Head:
   a. At least six (6) feet above maximum estimated groundwater level in section being tested.
   b. No less than six (6) feet above inside top of highest section of pipe in test section, including service connections.
2. Length of Pipe Tested: Limit length such that pressure on invert of lower end of section does not exceed thirty (30) feet of water column.

D. Piping with groundwater infiltration rate greater than allowable leakage rate for exfiltration will be considered *defective* even if pipe previously passed a pressure test.

3.3 LOW PRESSURE AIR TESTING FOR GRAVITY PIPING

A. In accordance with ASTM F-1417.

B. General:

1. Notify ENGINEER in writing 5 days in advance of testing. Perform testing in presence of ENGINEER.

2. Isolate new pipelines that are connected to existing pipelines. Install pipe plugs as required to allow section of new pipe to be pressure tested.

3. Plug wyes, tees, stubs, and service connections with pneumatic plugs. The plug design shall be such that they will hold against the test pressure without external blocking or bracing. Such plugs shall be removable, and their removal shall provide socket suitable for making flexible jointed lateral connection or extension. One of the plugs shall have three (3) air hose connections; one for inflating the plug, one for reading the air pressure and one for introducing air into the sealed line.

4. Furnish testing equipment and perform tests as approved by ENGINEER. Testing equipment shall provide observable and accurate measurement of leakage under specified conditions. Calibrate gauges with standardized test gauge at start of each testing day. Install compressor, air piping manifolds, gauges, and valves at ground surface.

5. Provide pressure release device, such as rupture disc or pressure relief valve, to relieve pressure at eight (8) psig or less.

6. If the groundwater is higher than the top of the pipe, the test pressure shall be increased by 0.43 psi/foot up to five (5) feet above the top of the pipe. For groundwater in excess of five (5) feet above the top of the pipe, infiltration testing shall be conducted.

C. No person shall enter manhole or structure, or occupy area above opening of manhole or structure where pipe is under pressure.

D. Low pressure air shall be slowly introduced into the sealed line until the internal air pressure reaches 4.0 psig greater than the average back pressure resulting from any groundwater above the pipe. At least two (2) minutes shall elapse to allow the pressure to stabilize.

E. The time required for the internal pressure to decrease from 3.5 to 2.5 psig greater than the average back pressure shall not be less than the time shown for a given pipe diameter:

Pipe Diameter (in.)	**Minimum Elapsed Time (min.)**
8	7.5
10	9.25
12	11.25
15	14
18	17

3.4 INFILTRATION TESTING FOR GRAVITY PIPING

A. Groundwater Level: At least five (5) feet above inside top of highest section of pipe in test section, including service connections.

B. Visible infiltration will be considered failure of the test.

3.5 FIELD QUALITY CONTROL

A. Test Report Documentation:

1. Test date.
2. Description and identification of piping tested.
3. Test fluid.
4. Test pressure.
5. Remarks, Including:
    a. Leaks (type, location).
    b. Repair/replacement performed to remedy excessive leakage.
6. Signed by the CONTRACTOR and ENGINEER and/or OWNER to represent that test has been satisfactorily completed.

END OF SECTION

SECTION 02200
SITE PREPARATION

PART 1 GENERAL

1.1 DEFINITIONS

A. Interfering or Objectionable Material: Trash, rubbish, and junk; vegetation and other organic matter, whether alive, dead, or decaying; topsoil.

B. Clearing: Removal of interfering or objectionable material lying on or protruding above ground surface.

C. Scalping: Removal of sod without removing more than upper three (3) inches of topsoil.

D. Project Limits: Areas, as specified, within which Work is to be performed.

1.2 QUALITY ASSURANCE

A. Obtain CITY/ENGINEER's approval of staked clearing, grubbing, and stripping limits prior to commencing clearing, grubbing, and stripping.

1.3 SCHEDULING AND SEQUENCING

A. Prepare site only after adequate erosion and sediment controls are in place. Limit areas exposed uncontrolled to erosion during installation of temporary erosion and sediment controls.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.1 GENERAL

A. Clear and strip areas actually needed for site improvements within limits specified.

B. Property obstructions which are to remain in-place, such as fences, signs, sewers, drains, water or gas pipes, bridges, etc., are to be carefully protected from damage.

C. Do not injure or deface vegetation that is not designated for removal. All branches potentially interfering with construction

operations shall be pruned prior to starting work and following approval of the CITY/ENGINEER and the City of Fort Lauderdale Urban Forester.

3.2 LIMITS

A. As follows, but not to extend beyond project limits.

1. Excavation Including Trenches: Five (5) feet beyond top of cut slopes or shored wall.
2. Other Areas: As shown.

B. Remove rubbish, trash, and junk from entire area within project limits.

3.3 TEMPORARY REMOVAL OF INTERFERING PLANTINGS

A. Remove and store, as specified in Section 02930 TREES, PLANTS, AND GROUND COVERS, shrubs and trees that are not designated for removal but do interfere with construction or could be damaged by construction activities.

B. Photograph and document location, orientation, and condition of each fence prior to its removal. Record sufficient information to uniquely identify each fence removed and to assure accurate replacement.

3.4 SCALPING

A. Do not remove sod until after clearing is completed and resulting debris is removed.

B. Scalp areas within limits specified.

3.5 DISPOSAL

A. Clearing and Grubbing Debris:

1. Woody debris may be chipped. Chips may be sold to CONTRACTOR's benefit. Wood chips SHALL NOT be used onsite for any purpose. Dispose of chips that are unsaleable or unsuitable for landscaping or other uses with unchipped debris.
2. Limit offsite disposal of clearing and grubbing debris to locations that are approved by federal, state, and local authorities, and that will not be visible from Project.

B. Scalpings: As specified for clearing and grubbing debris.

END OF SECTION

SECTION 02220
DEMOLITION

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Removal and disposal of buildings, structures, pavement surfaces, sidewalks, underground obstructions, and other facilities necessary to prepare the area for construction of proposed facilities.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.1 PREPARATION

A. Utilities:

1. Notify OWNER or appropriate utilities to turn off affected services before starting demolition or alterations. Provide not less than 72 hours notice to the OWNER of the utility prior to the shutdown.
2. Remove utility lines exposed by demolition excavation.
3. Remove electric, sanitary, and storm drainage adjacent to buildings to be demolished.
4. Excavate utility lines serving buildings to be demolished and provide a permanent leak-proof closure for water and gas lines.
5. Plug sewer lines at locations shown or at limits of excavation if not shown with concrete length of plug, 5 feet minimum to prevent groundwater infiltrating sewer systems.

B. Removal and Storage of Equipment for Reuse:

1. Do not remove equipment and materials without approval of ENGINEER.
2. Properly store and maintain equipment and materials in same condition as when removed.
3. ENGINEER will determine condition of equipment and materials prior to removal.

3.2 DEMOLITION

A. Additional quantities of new construction or additional work caused by the demolition, beyond the limits, will be performed at the CONTRACTOR’s expense.

B. Drawings define minimum portion of structures to be removed. Unless otherwise shown, rough cuts or breaks may be made exceeding limits of demolition shown. Provide sawcut at limits of all pavement removal. Structures shall be removed in such a way as to leave no obstructions to any proposed new structures of to any waterways.

C. Core drill floor slabs, catch basins, and other concrete improvements to remain in place below ground, or break holes at structure's lowest point to allow water to freely migrate through.

D. Remove piping from areas to be backfilled. Pipe, valves, and fittings adjacent to those to be removed may also be removed as salvage.

E. Remove all materials associated with existing equipment that is to be removed or relocated.

F. Cut off concealed or embedded conduit, boxes, or other materials a minimum of 3/4 inch below final finished surface.

G. Extract existing piling, which conflict with new piles, prior to driving new piles.

3.3 DISPOSAL

A. Dispose of debris and other no salvaged materials offsite in licensed landfills.

3.4 BACKFILLING

A. Demolished Areas: Backfill to existing ground level or foundation level of new construction.

B. Backfill Material and Compaction:

1. Conform to Section 02315, FILL AND BACKFILL.
2. Do not use demolition debris as backfill material.

3.5 SALVAGE

A. Equipment and materials, including piping within the limits of demolition, unless otherwise specified, will become the property of CONTRACTOR unless specifically stated.

B. Any material designated to remain by the OWNER shall be stored in neat piles in a location directed by the OWNER.

C. Fire Hydrants:

1. Salvage for future use by OWNER.
2. Remove and leave for OWNER in location directed by the OWNER.

END OF SECTION

SECTION 02240
DEWATERING

PART 1 GENERAL (NOT USED)

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.1 GENERAL

A. The CONTRACTOR shall be responsible for design, installation, and operation of a dewatering system to dewater specified excavations.

1. The dewatering system shall be designed in accordance with the Best Management Practices (BMP's) adopted by FDEP.
2. Inspection and control of dewatering system operations will be in accordance with the FDEP guidelines established in the Florida Erosion and Sediment Control Inspector's Manual (current edition).

B. Continuously manage and control excavation water recharge in order to facilitate and not impede construction activities at all times, including weekends, holidays, and during periods of work stoppages, and furnish and install, and operate, a contingency backup dewatering system to maintain control of excavation water levels to facilitate construction (i.e.; no construction delays).

3.2 SUBMITTALS

A. Submittals shall be made in accordance with the requirements specified in Section 01300 SUBMITTALS, and the requirements of this Section.

B. Provide name, address, and phone numbers of all subcontractors.

C. The CONTRACTOR shall submit a Dewatering Best Management Practices (BMP) Plan prior to the start of excavation expected to include dewatering operations. The Plan shall provide detailed descriptions of dewatering procedures to be utilized to meet the requirements of this Section. Methodologies to control dewatering discharge contamination include, but are not limited to:

1. Holding tanks of adequate size and volume.
2. Wellpointing systems.
3. Sump pumping systems.
4. Chemical precipitation of particulates.
5. Filter systems and siltation controls.
6. Outfall booms.

D. The CONTRACTOR shall provide a Site Health and Safety Plan and Activity Hazard Analysis (AHA) for contaminated soil as specified in Section 02250 AFFECTED SOIL AND LIQUID DISPOSAL, and/or groundwater as specified in this Section, to include the following:

1. A written description of the proposed method for temporary stockpiling, transportation, and disposal of all wastes.
2. Copy of permits of disposal facilities.
3. Certification of disposal of all wastes.
4. Directions to the nearest hospital and phone number.
5. Emergency contact phone numbers.
6. Laboratory analyses and sampling plan required for transportation and disposal of all wastes in accordance with applicable federal, state, and local requirements.

E. Upon Completion of Remediation Activities, the Following shall be Provided:

1. Copy of manifests for all wastes leaving the site.
2. Copy of the laboratory analyses results from all sampling activities.
3. Copy of closure reports that may be required.

3.3 SURFACE WATER CONTROL

A. Remove surface runoff controls when no longer needed.

B. Seal off or berm catch basins in the area of construction to prevent discharge of untreated dewatering effluent or runoff from unstabilized construction areas into storm drains.

C. All drain inlets or catch basins used for dewatering discharge shall be provided with silt and sediment removal barriers as approved by the ENGINEER.

1. All barriers shall be cleaned regularly to avoid sediment discharge into the storm drain system.
2. Construction activities will be stopped at no cost to the OWNER until sediment controls are properly maintained, installed, and in compliance with the dewatering permit.
3. All barriers shall be removed upon issuance of a hurricane warning.

3.4 DEWATERING SYSTEMS

A. Design, furnish, and install, operate, and maintain a dewatering system of sufficient size and capacity to permit excavation and subsequent construction activities in water-free conditions, and to lower and maintain the excavation area groundwater level a minimum of one (1) foot below the lowest point of excavation. The dewatering system shall be designed and operated such that the system continuously maintains excavations water levels so as to maintain the excavation water level in order to allow for the initiation and completion of excavation backfill compaction and restoration activities.

B. Dewatering systems shall include, but are not limited to, furnishing and installing wells or well points, and or other equipment and appurtenances as may be necessary, including system components or equipment, installed outside the outermost perimeter of the excavation limits, and sufficiently below lowest point of excavation, to maintain the specified or required groundwater elevation.

C. Open trench pumping may be permitted upon the approval of the ENGINEER.

D. Design and Operate Dewatering Systems:

1. To prevent loss of ground as water is removed.
2. To avoid inducing settlement or damage to existing facilities, completed Work, or adjacent property.
3. Avoid surface water pollution or discharge of sediment to storm drain systems or waterways.

E. Provide supplemental ditches and sumps only as necessary to collect water from local seeps. Do not use ditches and sumps as primary means of dewatering. The CONTRACTOR shall not direct any flow of water over pavement surfaces. Discharge of water shall be conducted as approved by the local, state, and federal agencies and the ENGINEER.

F. Provide controls to prevent surface water from entering excavation pits, trenches, or stockpiled materials.

3.5 PIPELINES CONSTRUCTED UNDER WATER

A. In the event that it is found that the water in a trench cannot be lowered by ordinary means, i.e., well points and pumps, an alternate construction method may be proposed by the CONTRACTOR. Complete details, specifications, manufacturer's descriptive literature, installation lists and any other pertinent data regarding the proposed alternate method shall be submitted as an alternate by the CONTRACTOR to the ENGINEER within five (5) calendar days of the time that the CONTRACTOR anticipates using such alternate method.

B. If the ENGINEER approves the alternate method in writing, it may be used, so long as the Work is performed in a manner which, in the opinion of the ENGINEER, conforms to the method and procedure as set forth in the information supplied by the CONTRACTOR in his original application for use of an alternate method. The ENGINEER may revoke approval of the alternate method if at any time, in his opinion, the Work is not conforming to any applicable portion of these Specifications.

C. No pipeline shall be laid under water without approval of the ENGINEER.

D. If the dewatering system is eliminated or the effort reduced, and the pipe is laid underwater, additional pipe zone material will be required as backfill to the water table elevation, or to the level it was reduced to.

3.6 DISPOSAL OF WATER

A. All water generated, pumped, or removed from excavations as a result of excavation dewatering activities shall be collected, containerized, and managed prior to discharge and or treatment at an approved discharge point or facility, in accordance with Broward County Code of Regulation, Sections 27-27, 27-193(a), 27-193(b)(3)a and 27-196. The CONTRACTOR shall secure, obtain, and pay for all necessary local, state, and federal permits, licenses, fees, and or approvals to discharge water or perform onsite or offsite treatment and disposal. Treat water collected by dewatering operations as required by regulatory agencies, prior to discharge.

B. Discharge water as permitted, and in regulatory compliance with the CONTRACTOR obtained discharge permits/licenses.

1. All discharge activities shall be performed so as to prevent silt and sediment discharge and eliminate any soil erosion or flooding, or otherwise damage existing facilities, completed Work, or adjacent property.
2. Maximum allowable turbidity of discharges to surface waters or storm drains will be 10 NTU's.
3. Sump discharges cannot be discharged directly to storm drains or surface waters without treatment.

C. Visible silt plumes emanating from the area around the outfalls will be considered a failure of the silt and sediment removal measures and may result in a Notice of Violation issued by BCDPEP. The CONTRACTOR will be responsible for all fines associated with the violation of the dewatering permit conditions issued to the CONTRACTOR.

D. Failure to control dewatering discharges as described above and as detailed in the Florida Erosion and Sediment Control Inspector's Manual, may result in an order to cease dewatering operations until the discharge problems are corrected. No claims will be accepted for costs or delays associated with unacceptable dewatering discharge practices.

3.7 WELL POINT REMOVAL

A. Well point holes shall be filled with sand which shall be washed into the hole.

B. Well point holes located within asphalt pavement surfaces or concrete pavements, shall be filled with sand to the subgrade. The remaining hole shall be filled with non-shrinking grout.

3.8 CONTAMINATED GROUNDWATER AND DISPOSAL REQUIREMENTS

A. If CONTRACTOR suspects, witnesses, or identifies, groundwater contamination at any time during the performance of the Work, CONTRACTOR shall notify the ENGINEER immediately. Results will be obtained by the onsite mobile laboratory.

B. If analytical testing (by ENGINEER or Engineer-designated laboratory or subcontractor) documents and indicates elevated concentrations above FDEP action levels (Chapter 62-777, Florida Administrative Code) as verified by the ENGINEER, dewatering operations will be suspended until appropriate treatment and or construction measures can be implemented. There shall be no delay or mobilization claim associated with moving to another project area, unless all other Work has been completed. In addition, the local agency will be immediately notified via telephone and in writing by the ENGINEER. Dewatering activities in the area will not proceed until review of the matter with the local agency is resolved and written authorization is issued.

C. Treatment of the groundwater will include three (3) options depending on the magnitude of the contamination in the trench or as determined by the ENGINEER: Granular Activated Carbon (GAC) Treatment Vessels**,** Mobile Air Stripping Units, or Vacuum Truck Removal and Disposal or other method as approved by the ENGINEER. The CONTRACTOR will provide a submittal list of all qualified groundwater remediation subcontractors for GAC vessel treatment/portable air stripping unit and vacuum truck disposal including phone numbers, contact names, and addresses prior to start of construction. The selected groundwater treatment/recycling facility for hauling contaminated groundwater shall also be identified.

D. If contaminated groundwater in the dewatering trench is encountered, the remediation operations will begin once local agency approval is obtained. Contaminated water will be disposed first into a high volume holding (FRAC) tank and then treated through a GAC unit/portable air stripper or recovered into vacuum hauling trucks for disposal.

E. Effluent water from the treatment system will be analyzed by the onsite mobile laboratory to confirm that concentrations are below regulatory limits. Effluent water will then be directed to a pre-approved alternative location as determined by local agency and/or the ENGINEER.

F. A Dewatering Plan describing the dewatering approach, groundwater monitoring, and remediation alternative is <u>not</u> attached, as it is not anticipated that dewatering will produce contaminated groundwater.

END OF SECTION

SECTION 02250
AFFECTED SOIL AND LIQUID DISPOSAL

PART 1 GENERAL

1.1 WORK INCLUDED

A. This Section covers the Work necessary to remove, transport, and properly dispose of the following wastes:

1. Liquid petroleum product.
2. Affected soil.
3. Free petroleum product.

1.2 DEFINITIONS

A. Liquid petroleum (product) is fluid petroleum product partly or entirely composed of diesel fuel or gasoline.

B. Affected soil is defined herein.

C. Free petroleum product is defined as a liquid which forms a separate floating phase distinct from the groundwater.

1.3 SUBMITTALS

A. Submittals shall be made in accordance with the requirements specified in Section 01300 SUBMITTALS, and the requirements of this Section.

B. The CONTRACTOR Shall Provide the Following Submittals:

1. A written description of the proposed method for temporary stockpiling, transportation, and disposal of all wastes.
2. Copy of permits of disposal facilities.
3. Certification of disposal of all wastes.
4. Copy of manifests for all wastes leaving the site.
5. Copy of the laboratory analyses required for transportation and disposal of all wastes in accordance with applicable federal, state, and local requirements.
6. Provide name, address, and phone number of all subcontractors.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.1 LIQUID PETROLEUM PRODUCT

A. Classification of liquid petroleum product shall be made by the ENGINEER.

B. The CONTRACTOR shall remove all liquid petroleum product if discovered in the trench during dewatering operations.

C. If the petroleum product is discovered, the product will be disposed as described herein.

D. If contamination is discovered and it is determined that it must be removed, the CONTRACTOR shall commence remediation activities as determined by the ENGINEER. During the remediation activities, the CONTRACTOR shall move to another location as determined by the ENGINEER to resume normal construction activities. There shall be no delay or mobilization claim associated with moving to another project area, unless all other Work has been completed.

3.2 AFFECTED SOIL

A. Excavation of affected soil shall be accomplished in accordance with Section 02316 EXCAVATION. The soil may be contaminated with petroleum product which may be partly or entirely diesel fuel, gasoline, or chlorinated solvents.

B. Classification of affected soil for disposal purposes will be determined by the Engineer using an Organic Vapor Monitor (OVM) with photo ionization detector or equivalent provided by the ENGINEER. Soils with vapor readings higher than 10 parts per million (ppm) for diesel as defined in Chapter 62-770 of the Florida Administrative Code, are excessively contaminated and will be identified by the ENGINEER for treatment and disposal. Affected soil must be placed on an impermeable barrier when temporarily stockpiled. All stockpile leachate or runoff must be collected for disposal in accordance with applicable federal, state, and local regulations. Soils designated for removal and disposal shall be prepared for shipment, transported, and disposed of in accordance with the requirements of this Section.

C. Affected soils shall be processed by incineration at a state licensed facility. These soils shall be transported and disposed of in accordance with federal, state, and local regulations. The CONTRACTOR shall be responsible for all soil analyses required for transportation and disposal.

D. The CONTRACTOR shall be responsible for testing soil which has been incinerated to certify the treated soil meets applicable federal, state, and local regulations for final disposal.

3.3 FREE PETROLEUM PRODUCT

A. Some free petroleum products which may be partly or entirely diesel fuel or gasoline may be encountered during excavation activities. The CONTRACTOR shall remove free petroleum product, if necessary, when a separate floating phase greater than 0.10-inch thick is present as required by health and safety considerations. The free petroleum product shall be removed by skimming, pumping to an oil/water separator, or other approved methods.

B. Free petroleum products shall be transported and disposed by the CONTRACTOR in accordance with federal, state, and local regulations. The CONTRACTOR is responsible for any laboratory analyses required for disposal of the free petroleum products.

3.4 TRANSPORT AND DISPOSAL

A. Transport Regulations: The CONTRACTOR shall be responsible for the loading, labeling, placarding, marking, weighing, and transporting of all waste materials in accordance with the Florida Department of Transportation Regulations, and U.S. Department of Transportation Regulations. The CONTRACTOR shall use only transporters that are licensed and competent to haul these wastes.

3.5 WASTE CONTAINERS

A. Each transport container of waste shall be visually inspected by the CONTRACTOR for leaks, drips, or container damage prior to being loaded. Containers which are found to be leaking or damaged shall not be loaded until the damage is repaired. The CONTRACTOR shall prepare the transport container to prevent spillage or contamination. The CONTRACTOR shall notify the ENGINEER two (2) hours before any loaded transport leaves the site.

B. All transport containers leaving the site shall be inspected by the CONTRACTOR to ensure that no waste material adheres to the wheels or undercarriage.

C. All vehicles on which waste is adhering shall be cleaned by sweeping tires and undercarriage or by other dry methods prior to leaving the site.

3.6 SHIPPING RECORDS

A. The CONTRACTOR shall prepare accurate shipping records for any wastes leaving the site in accordance with applicable federal and state regulations. The CONTRACTOR shall be responsible for providing copies of the records to the Engineer and shall immediately notify the ENGINEER of any problems in completing shipments and disposal of wastes.

B. The CONTRACTOR shall:

1. Be responsible for appropriate measurement of unit quantity (weight or volume) of waste material removed from the site.
2. Coordinate vehicle inspection and recording of quantities leaving the site with the ENGINEER. These quantities shall be compared to recorded quantities received at the treatment or disposal facilities. The CONTRACTOR shall resolve any discrepancies occurring immediately, determining the probable cause for the discrepancy.
3. Be solely responsible for any and all actions necessary to remedy situations involving waste spilled in transit.

C. The CONTRACTOR shall ensure that a copy of the manifest is returned to the ENGINEER by the designated treatment or disposal facility within fourteen (14) days of receipt of the material to be disposed.

3.7 COORDINATION

A. The CONTRACTOR shall at any time provide the ENGINEER with safe access to the Work whenever it is in preparation or progress for the purposes of conducting inspections or collecting samples. The CONTRACTOR may conduct concurrent sampling and analyses, if desired. Results of any such sampling and analysis shall be furnished to the ENGINEER at no cost.

PART 4 PAYMENT

4.1 GENERAL

A. Payment for work in this Section is included as stated in the Bid Form. The CONTRACTOR shall be responsible for appropriate measurement of unit quantity (volume or weight) of waste material removed from the site, and for verification of those quantities with receipt records from the disposal site.

END OF SECTION

SECTION 02260
EXCAVATION SUPPORT AND PROTECTION

PART 1 GENERAL (NOT USED)

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.1 GENERAL

A. The CONTRACTOR shall be responsible to design, provide, and maintain shoring, sheeting, and bracing as necessary to support the sides of excavations and to prevent detrimental settlement and lateral movement of existing facilities, adjacent property, and completed Work.

B. Consider all available site information when designing the excavation support system.

3.2 REMOVAL OF EXCAVATION SUPPORT

A. Remove excavation support in a manner that will maintain support as excavation is backfilled.

B. Do not begin to remove excavation support until support can be removed without damage to existing facilities, completed Work, or adjacent property.

C. Remove excavation support in a manner that does not leave voids in the backfill.

3.3 TRENCHES

A. For trench excavation exceeding five (5) feet in depth, provide adequate safety system meeting requirements of the Occupational Safety and Health Administration's (OSHA), Trench Safety Standards, 29 C.F.R., S.1926.650, Subpart P, and all subsequent revisions or updates adopted by the Department of Labor and Employment Security.

END OF SECTION

SECTION 02315
FILL AND BACKFILL

PART 1 GENERAL

1.1 DEFINITIONS

A. Prepared Ground Surface: Ground surface after completion of required demolition, clearing and grubbing, scalping of sod, stripping of topsoil, excavation to grade, and subgrade preparation.

B. Completed Course: A course or layer that is ready for next layer or next phase of Work.

C. Lift: Loose (uncompacted) layer of material.

D. Geosynthetics: Geotextiles, geogrids, or geomembranes.

E. Well-Graded:

1. A mixture of particle sizes with no specific concentration or lack thereof of one or more sizes.
2. Does not define numerical value that must be placed on coefficient of uniformity, coefficient of curvature, or other specific grain size distribution parameters.
3. Used to define material type that, when compacted, produces a strong and relatively incompressible soil mass free from detrimental voids.

F. Influence Area: Area within planes sloped downward and outward at 60-degree angle from horizontal measured from:

1. 1-foot outside outermost edge at base of foundations or slabs.
2. 1-foot outside outermost edge at surface of roadways or shoulder.
3. 0.5-foot outside exterior at spring line of pipes or culverts.

G. Borrow Material: Material from required excavations or from designated borrow areas on or near site.

H. Selected Backfill Material: Materials available onsite that ENGINEER determines to be suitable for specific use.

I. Imported Material: Materials obtained from sources offsite, suitable for specified use.

J. Structural Fill: Fill materials as required under structures, pavements, and other facilities.

K. Embankment Material: Fill materials required to raise existing grade in areas other than under structures.

PART 2 PRODUCTS

2.1 EARTHFILL

A. Excavated material from required excavations and designated borrow sites, free from rocks larger than three (3) inches, from roots and other organic matter, ashes, cinders, trash, debris, and other deleterious materials.

B. Material containing more than ten (10) percent gravel, stones, or shale particles is unacceptable.

C. Provide imported material of equivalent quality, if required to accomplish Work.

2.2 GRANULAR FILL

A. Use graded aggregate base material of uniform quality throughout, substantially free from vegetable matter, shale, lumps and clay balls, and having a Limerock Bearing Ratio value of not less than 100.

B. Aggregate is composed of limestone, marble, or dolomite.

C. Use material retained on the No. 10 sieve composed of aggregate meeting the following requirements:

1. Soundness Loss, Sodium, Sulfate: AASHTO T 104, 15 percent.
2. Percent Wear: AASHTO T 96 (Grading A) 45 percent.

Sieve Size	Percent by Weight Passing
2 inch	100
1-1/2 inch	95 to 100
¾ inch	65 to 90
3/8 inch	45 to 75
No. 4	35 to 60
No. 10	25 to 45
No. 50	5 to 25
No. 200	0 to 10

2.3 WATER FOR MOISTURE CONDITIONING

A. Free of hazardous or toxic contaminates, or contaminants deleterious to proper compaction.

2.4 FOUNDATION STABILIZATION ROCK

A. General: Materials may be either Limerock, shell rock, cemented coquina, or shell base sources approved by the Department.

B. Specific Requirements for Limerock: For Limerock, carbonates of calcium and magnesium shall be at least 70 percent. Materials having a plasticity index of more than ten or a liquid limit greater than 40 shall not be used as a stabilizer. The gradation of Limerock shall be such that 97 percent of these materials will pass a 3- 1/2 inch sieve.

C. Crushed Shell: Crushed shell for this use shall be mollusk shell (i.e., oysters, mussels, clams, cemented coquina). Steamed shell will not be permitted.

1. This shell shall Meet the Following Requirements:
   a. Material having a plasticity index of more than ten or a liquid limit greater than 40 shall not be used as a stabilizer.
   b. At least 97 percent by weight of the total material shall pass a 3-1/2 inch sieve and at least 50 percent by weight of the total material shall be retained on the No. 4 sieve.
   c. Not more than 20 percent by weight of the total material shall pass the No. 200 sieve. The determination of the percentage passing the No. 200 sieve shall be by washing only.
   d. In the event that the shell meets the above requirements without
   crushing, crushing will not be required.

PART 3 EXECUTION

3.1 GENERAL

A. Keep placement surfaces free of water, debris, and foreign material during placement and compaction of fill and backfill materials.

B. Place and spread fill and backfill materials in horizontal lifts of uniform thickness, in a manner that avoids segregation, and compact each lift to specified densities prior to placing succeeding lifts. Slope lifts only where necessary to conform to final grades or as necessary to keep placement surfaces drained of water.

C. During filling and backfilling, keep level of fill and backfill around each structure and buried tank even.

D. If Pipe, Conduit, Duct Bank, or Cable is to be Laid Within Fill or Backfill:

1. Fill or backfill to an elevation two (2) feet above top of item to be laid.
2. Excavate trench for installation of item.
3. Install bedding, if applicable, as specified in Section 02320 TRENCH BACKFILL.
4. Install item.
5. Backfill pipe zone and remaining trench, as specified in Section 02320 TRENCH BACKFILL, before resuming filling or backfilling specified in this Section.

E. Tolerances:

1. Final Lines and Grades: Within a tolerance of 0.1 foot, unless dimensions or grades are shown or specified otherwise.

2. Grade to establish and maintain slopes and drainage as shown. Reverse slopes are not permitted.

F. Settlement: Correct and repair any subsequent damage to structures, pavements, curbs, slabs, piping, and other facilities, caused by settlement of fill or backfill material.

3.2 BACKFILL UNDER AND AROUND STRUCTURES

A. Under Facilities: Within influence area beneath structures, slabs, pavements, curbs, piping, conduits, duct banks, and other facilities, backfill with granular fill, unless otherwise shown. Place granular fill in lifts of 6-inch maximum thickness and compact each lift to a density of at least 100 percent of the maximum density as determined by AASHTO T99, Method C.

3.3 FILL

A. Outside Influence Areas Beneath Structures, Pavements, Curbs, Slabs, Piping, and Other Facilities: Unless otherwise shown, place earthfill as follows:

1. Allow for proper thickness of topsoil where required.
2. Maximum 8-inch thick lifts.
3. Place and compact fill across full width of embankment.
4. Compact to a density of at least 80 percent of the maximum density as determined by AASHTO T99, Method C.

5. For the outer layer of all fill where plant growth will be established, DO NOT COMPACT. Leave this layer in a loose condition to a minimum depth of 6 inches.
6. Dress completed embankment with allowance for topsoil, crest surfacing, and slope protection, where applicable.

3.4 SITE TESTING

A. Gradation:

1. One sample from each 1,500 tons of finished product or more often as determined by ENGINEER, if variation in gradation is occurring, or if material appears to depart from Specifications.
2. If test results indicate material does not meet Specification requirements, terminate material placement until corrective measures are taken.
3. Remove material placed in Work that does not meet Specification requirements.

B. In-Place Density Tests: In accordance with AASHTO T99, Method C. During placement of materials, test as follows:

1. Earth fill: One test per 200 feet of pipe run.
2. Granular Fill: One test per 200 feet of pipe run.
3. Foundation Stabilization Rock: One test per lift.

3.5 REPLACING OVEREXCAVATED MATERIAL

A. Replace excavation carried below grade lines shown or established by ENGINEER as follows:

1. Beneath Footings: Granular fill.
2. Beneath Fill or Backfill: Same material as specified for overlying fill or backfill.
3. Beneath Slabs-On-Grade: Granular fill.
4. Trenches:
   a. Unauthorized Over-excavation: Either foundation stabilization rock or granular pipe base material, as specified in Section 02320 TRENCH BACKFILL.
   b. Authorized Over-excavation: Foundation stabilization rock.
5. Permanent Cut Slopes (Where Overlying Area is Not to Receive Fill or Backfill):
   a. Flat to Moderate Steep Slopes (3 to 1, Horizontal Run: Vertical Rise or Flatter): Earth fill.
   b. Steep Slopes (Steeper than 3 to 1):
      1) Correct over-excavation by transitioning between over-cut areas and designed slope adjoining areas, provided such cutting does not extend offsite or outside easements and right-of-ways, or adversely

impacts existing facilities, adjacent property, or completed Work.

2) Backfilling over-excavated area is prohibited unless, in ENGINEER's opinion, backfill will remain stable, and over-excavated material is replaced as compacted earth fill.

END OF SECTION

SECTION 02316
EXCAVATION

PART 1 GENERAL

1.1 QUALITY ASSURANCE

A. Provide adequate survey control to avoid unauthorized over-excavation.

1.2 WEATHER LIMITATIONS

A. Material excavated during inclement weather shall not be used as fill or backfill until after material drains and dries sufficiently for proper compaction.

1.3 SEQUENCING AND SCHEDULING

A. Clearing and Stripping: Complete applicable Work specified in Section 02200 SITE PREPARATION, prior to excavating.

B. CONTRACTOR shall call the utility companies at least two (2) business days before excavation, see Section 01040 COORDINATION for each utility company phone number and contact person.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.1 GENERAL

A. Excavate to lines, grades, and dimensions shown and as necessary to accomplish Work. Excavate to within tolerance of plus or minus 0.1 foot except where dimensions or grades are shown or specified as maximum or minimum. Allow for forms, working space, granular base, topsoil, and similar items, wherever applicable.

B. It shall be the CONTRACTOR's responsibility to notify business establishments and residents not less than 72 hours prior to construction. CONTRACTOR shall, wherever necessary, provide temporary sidewalks and driveway entrances at his own expense, including safe bridges over trenches and fencing around excavations for pedestrian protection.

C. Provide adequate survey control to avoid unauthorized overexcavation. Do not overexcavate without written authorization of ENGINEER. If the CONTRACTOR excavates beyond the limits

shown or specified, the CONTRACTOR shall replace such excavation at his own expense.

D. Where muck, rock, clay, or other material within the limits of excavation is unsuitable in its original position, excavate such material to the cross-sections shown or specified. Backfill with suitable material and shape to the required cross- section.

E. Remove or protect obstructions as shown on the Drawings.

3.2 UNCLASSIFIED EXCAVATION

A. Excavation is unclassified. Complete all excavation regardless of the type, nature, or condition of the materials encountered.

3.3 TRENCH WIDTH

A. Minimum Width of Trenches:

1. Pipe diameter plus 12 inches on each side, where feasible.
2. Increase trench widths by thicknesses of sheeting, if used.
3. The maximum trench width shall not exceed the minimum stated width of the trench unless approved by the ENGINEER. Restoration for excavation beyond the minimum required width shall be at the CONTRACTOR's sole expense.

3.4 EMBANKMENT AND CUT SLOPES

A. Shape, trim, and finish cut slopes to conform to lines, grades, and cross-sections shown, with proper allowance for topsoil or slope protection, where shown.

B. Remove stones and rock that exceed three (3) inches in diameter and that are loose and may roll down slope. Remove exposed roots from cut slopes.

C. Round tops of cut slopes in soil to not less than a six (6) foot radius, provided such rounding does not extend offsite or outside easements and right-of-ways, or adversely impacts existing facilities, adjacent property, or completed Work.

3.5 STOCKPILING EXCAVATED MATERIAL

A. Stockpile excavated material that is suitable for use as fill or backfill until material is needed.

B. Post signs indicating proposed use of material stockpiled. Post signs that are readable from all directions of approach to each stockpile. Signs should be clearly worded and readable by

equipment operators from their normal seated position.

C. Confine stockpiles to within easements, rights-of-way, and approved work areas.
Do not obstruct roads, streets, public thoroughfares, or access to fire hydrants.

D. Do not stockpile excavated material adjacent to trenches and other excavations unless excavation sideslopes and excavation support systems are designed, constructed, and maintained for stockpile loads.

E. Do not stockpile excavated materials near or over existing facilities, adjacent property, or completed Work, if weight of stockpiled material could induce excessive settlement.

3.6 DISPOSAL OF SPOIL

A. Dispose of excavated materials, which are unsuitable or exceed quantity needed for fill or backfill, offsite.

B. Dispose of debris resulting from removal of organic matter, trash, refuse, and junk as specified in Section 02200 SITE PREPARATION, for clearing and grubbing debris.

END OF SECTION

SECTION 02319
SUBGRADE PREPARATION

PART 1 GENERAL

1.1 DEFINITIONS

A. Prepared Ground Surface: Ground surface after completion of clearing and grubbing, scalping of sod, stripping of topsoil, excavation to grade, and scarification and compaction of subgrade.
B. Subgrade: Layer of existing soil after completion of clearing, grubbing, scalping of topsoil prior to placement of fill, roadway structure or base for floor slab.
C. Proof-Rolling: Testing of subgrade by compactive effort to identify areas that will not support the future loading without excessive settlement.

1.2 QUALITY ASSURANCE

A. Notify ENGINEER when subgrade is ready for compaction or proof-rolling or whenever compaction or proof-rolling is resumed after a period of extended inactivity.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.1 GENERAL

A. Keep subgrade free of water, debris, and foreign matter during compaction or proof-rolling.
B. Bring subgrade to proper grade and cross-section and uniformly compact surface.
C. Do not use sections of prepared ground surface as haul roads. Protect prepared subgrade from traffic.
D. Maintain prepared ground surface in finished condition until next course is placed.

3.2 COMPACTION

A. Under Earthfill: Compact upper 6 inches to minimum of 80 percent of the maximum density as determined by AASHTO T99, Method C.
B. Under Pavement, Floor Slabs On Grade, or Granular Fill Under Structures: Compact the upper 6 inches or as shown on the Drawings, to minimum of 100 percent of the maximum dry density as determined by AASHTO T180.

3.3 MOISTURE CONDITIONING

A. Dry Subgrade: Add water, then mix to make moisture content uniform throughout.

B. Wet Subgrade: Aerate material by blading, discing, harrowing, or other methods, to hasten drying process.

3.4 TESTING

A. Proof-roll subgrade with equipment specified in Article COMPACTION to detect soft or loose subgrade or unsuitable material, as determined by ENGINEER.

3.5 CORRECTION

A. Soft or Loose Subgrade:
   1. Adjust moisture content and recompact, or
   2. Over excavate as specified in Section 02316 EXCAVATION, and replace with suitable material from the excavation, as specified in Section 02315 FILL AND BACKFILL.
B. Unsuitable Material: Over excavate as specified in Section 02316 EXCAVATION, and replace with suitable material from the excavation, as specified in Section 02315 FILL AND BACKFILL.

END OF SECTION

SECTION 02320
TRENCH BACKFILL

PART 1 GENERAL

1.1 DEFINITIONS

A. Base Rock: Granular material upon which manhole bases and other structures are placed.

B. Bedding Material: Granular material upon which pipes, conduits, cables, or duct banks are placed.

C. Imported Material: Material obtained by the CONTRACTOR from source(s) offsite.

D. Lift: Loose (uncompacted) layer of material.

E. Pipe Zone: Backfill zone that includes full trench width and extends from prepared trench bottom to an upper limit above top outside surface of pipe, conduit, cable or duct bank.

F. Prepared Trench Bottom: Graded trench bottom after excavation and installation of stabilization material, if required, but before installation of bedding material.

G. Selected Backfill Material: Material available onsite that ENGINEER determines to be suitable for a specific use.

H. Well-Graded: A mixture of particle sizes that has no specific concentration or lack thereof of one or more sizes producing a material type that, when compacted, produces a strong and relatively incompressible soil mass free from detrimental voids. Well-Graded does not define any numerical value that must be placed on the coefficient of uniformity, coefficient of curvature, or other specific grain size distribution parameters.

PART 2 PRODUCTS

2.1 GEOTEXTILE

A. Filter Fabric:

1. Filter fabric, if needed, shall be a medium weight (8 oz/sy) non-woven type geotextile.
2. Manufacturers and Products
   a. US Fabrics, Inc. US 205NW
   b. Approved equal

2.2 MARKING TAPE

A. Plastic:

1. Inert polyethylene, impervious to known alkalis, acids, chemical reagents, and solvents likely to be encountered in soil.
2. Thickness: Minimum 4 mils.
3. Minimum Width: 2 inches.
4. Identifying Lettering: Minimum 1-inch high, permanent black lettering imprinted continuously over entire length.
5. Manufacturers and Products:
   a. Reef Industries; Terra Tape
   b. Allen; Markline

B. Metallic:

1. Solid aluminum foil, visible on unprinted side, encased in a protective high visibility, inert polyethylene plastic jacket.
2. Foil Thickness: Minimum 5.5 mils.
3. Width: 2 inches.
4. Identifying Lettering: Minimum 1-inch high, permanent black lettering imprinted continuously over entire length.
5. Joining Clips: Tin or nickel-coated furnished by tape manufacturer.
6. Manufacturers and Products:
   a. Reef Industries; Terra ”D”.
   b. Allen; Detectatape.

C. Color: In accordance with APWA Uniform Color Code for Temporary Marking of Underground Facilities.

Color[a]	Facility
Red	Electric power lines, cables, conduit, and lightning cables
Orange	Communicating alarm or signal lines, cables, or conduit
Yellow	Gas, oil, steam, petroleum, or gaseous materials
Green	Sewers and drain lines
Blue	Water, irrigation, and slurry lines
[a]As specified in ANSI Z53.1, Safety Color Code.	

2.3 TRENCH STABILIZATION MATERIAL

A. Foundation stabilization rock as specified in Section 02315 FILL AND BACKFILL.

2.4 BEDDING MATERIAL AND PIPE ZONE MATERIAL

A. Granular fill as specified in Section 02315 FILL AND BACKFILL.

2.5 EARTH BACKFILL

A. Earth fill as specified in Section 02315 FILL AND BACKFILL.

PART 3 EXECUTION

3.1 TRENCH PREPARATION

A. Water Control:

1. As specified in Section 02240 DEWATERING.
2. Remove water in a manner that minimizes soil erosion from trench sides and bottom.
3. Provide continuous water control until trench backfill is complete.

B. Remove foreign material and backfill contaminated with foreign material that falls into trench.

C. Where the trench has been dewatered, backfilling must be done before the pumps are shut off so that the pipe will not float. Any pipe which has been displaced because of floatation will be removed and installed correctly at the CONTRACTOR's expense.

3.2 TRENCH BOTTOM

A. Firm Subgrade: Grade with hand tools, remove loose and disturbed material, and trim off high areas and ridges left by excavating bucket teeth. Allow space for bedding material if shown or specified.

B. Soft Subgrade: If subgrade is encountered that may require removal to prevent pipe settlement, notify the ENGINEER. The ENGINEER will determine depth of over excavation, if any, required.

3.3 TRENCH STABILIZATION MATERIAL INSTALLATION

A. Rebuild trench bottom with trench stabilization material as directed by the ENGINEER.

B. Place material over full width of trench in 6-inch lifts to required grade, providing allowance for bedding thickness.

C. Compact each lift so as to provide a firm, unyielding support for the bedding material prior to placing succeeding lifts.

3.4 BEDDING

A. Furnish granular fill or imported bedding material as directed by the ENGINEER.

B. Place over the full width of the prepared trench bottom in two equal lifts when the required depth exceeds 8 inches.

C. Hand grade and compact each lift to provide a firm, unyielding surface.

D. Minimum thickness of bedding material to the bottom of the pipe are as follows, except increase depths listed by 6 inches in areas of rock excavation:

1. Pipe, 15 Inches and Smaller: 8 inches.
2. Pipe, 18 Inches to 36 Inches: 10 inches.
3. Pipe, 42 Inches and Larger: 12 inches.
4. Conduit: 3 inches.
5. Direct-Buried Cable: 3 inches.
6. Duct Banks: 3 inches.

E. Check grade and correct irregularities in bedding material. Loosen top 1 to 2 inches of compacted bedding material with a rake or by other means to provide a cushion before laying each section of pipe.

F. Install to form continuous and uniform support except at bell holes, if applicable, or minor disturbances resulting from removal of lifting tackle.

G. Bell or Coupling Holes: Excavate in bedding at each joint to permit proper assembly and inspection of joint and to provide uniform bearing along barrel of pipe or conduit.

3.5 BACKFILL PIPE ZONE

A. Furnish granular fill as described in Section 02315 FILL AND BACKFILL from pipe springline to 12 inches above the top of the pipe.

B. Upper Limit of Pipe Zone Shall Not Be Less Than Following:

1. Pipes:
   a. Up to 12-inch Diameter: 12 inches above top of pipe.
   b. Greater than 12-Inch Diameter: 15 inches above top of pipe, unless shown otherwise.
2. Conduit: 3 inches, unless shown otherwise.
3. Direct-Buried Cable: 3 inches, unless shown otherwise.
4. Duct Bank: 3 inches, unless shown otherwise.

C. Restrain pipe, conduit, cables, and duct banks as necessary to prevent any movement during backfill operations.

D. Place material simultaneously in lifts on both sides of pipe and, if applicable, between pipes, conduit, cables, and duct banks installed in same trench. Compact to 90 percent density as determined by AASHTO T99.

1. Pipes 10 Inches and Smaller Diameter: First lift less than or equal to 1/2 pipe diameter but not less than three (3) inches.
2. Pipes over 10-inch Diameter: Maximum 6 inch lifts

E. Thoroughly tamp each lift, including area under haunches, with handheld tamping bars supplemented by “walking in” and slicing material under haunches with a shovel to ensure that voids are completely filled before placing each succeeding lift. Compact material in pipe zone to at least 98 percent maximum density as determined by AASHTO T180

F. After the full depth of the pipe zone material has been placed as specified, compact the material by a minimum of three passes with a vibratory plate compactor only over the area between the sides of the pipe and the trench walls. Contractor shall exercise proper care to ensure that no pipe joints will be broken, damaged, or disturbed through the use of any compacting equipment.

G. Do not use power-driven impact compactors to compact pipe zone material.

H. Where approved by the ENGINEER, hydraulic compaction of the pipe zone material and granular trench backfill may be used providing density testing requirements are met. A submittal describing the method of hydraulic compaction will be required.

3.6 MARKING TAPE INSTALLATION

A. Continuously install marking tape along centerline of all buried piping, on top of last lift of pipe zone material. Coordinate with piping installation drawings.

1. Metallic Marking Tape: Install with nonmetallic piping and waterlines.
2. Plastic Marking Tape: Install with metallic piping.

3.7 BACKFILL ABOVE PIPE ZONE

A. General:

1. Process excavated material to meet specified requirements for backfill as described in Section 02315 FILL AND BACKFILL.
2. Adjust moisture content as necessary to obtain specified compaction.
3. Do not allow backfill to free fall into the trench or allow heavy, sharp pieces of material to be placed as backfill until after at least 2 feet of backfill has been provided over the top of pipe.
4. Do not use power driven impact type compactors for compaction.
5. Backfill to grade with proper allowances for topsoil, crushed rock surfacing, and pavement thicknesses, wherever applicable.
6. Backfill around structures with same class backfill as specified for adjacent trench unless otherwise shown or specified.

7. Hydraulic compaction may be allowed based upon approval by the ENGINEER of the CONTRACTOR's detailed compaction and testing procedures.

B. Backfill for Areas in Landscaped Areas:

1. Place in lifts not exceeding 12-inch thickness.
2. Mechanically compact each lift to a minimum of 80 percent of the maximum density as determined by AASHTO Method T-180 prior to placing succeeding lifts.

C. Backfill for Areas Under Facilities and Pavements: Backfill trench above the pipe zone with suitable earthfill in lifts not exceeding twelve (12) inches. Compact each lift to a minimum of 98 percent of the maximum density compaction as determined by AASHTO Method T180, 100% for Broward County rights of way, prior to placing succeeding lifts. If density cannot be achieved with earthfill, suitable granular fill will be required.

3.8 ALTERNATE METHOD OF CONSTRUCTION

A. When high water tables, porous soils or other limitations to dewatering are encountered, the CONTRACTOR may request the approval of the ENGINEER for an alternate method of construction.

B. Use of alternative methods shall not relieve the CONTRACTOR of the work, result in increased costs to the OWNER or reductions in the quality of the work as defined by testing and acceptance requirements.

C. Removal of water requirements will be waived and the pipe and appurtenances will be permitted to be installed underwater.

D. Excavation shall be performed in accordance with Section 02316 EXCAVATION, to the specified limits. The excavation shall be cleared of silt and other fines.

E. Pipe bedding shall be placed from the bottom of the excavation to 6 inches above the top of the pipe. The bedding shall be granular fill as indicated on Plans.

F. Select backfill material shall be used to backfill the trench from the top of the bedding to a level 1 foot above the standing water level in the trench. Select material shall be granular fill as described in Section 02315 FILL AND BACKFILL, and approved by the ENGINEER. This lift shall be compacted to a minimum of 95 percent of the maximum density compaction as determined by AASHTO Method T180, after which the remainder of the backfill can proceed as normal.

G. If the above described method is used, all backfill material used below the water table shall not be released into the trench until the bucket or container is less than 1 foot above the water level. Pipe bedding and pipe zone material as defined above shall not be dumped or pushed into the trench.

3.9 MAINTENANCE OF TRENCH BACKFILL

A. After each section of trench is backfilled, maintain the surface of the backfilled trench even with the adjacent ground surface until final surface restoration is completed.

B. Other Areas: Add excavated material where applicable and keep the surface of the backfilled trench level with the adjacent ground surface.

C. Water shall be applied to the unstabilized trench backfill to control dust as directed by the ENGINEER.

D. Placement of lime rock base course and prime coat shall occur no longer than 5 days following trench backfill or as soon there after as record information is available to verify that pipe inverts and slopes are acceptable.

3.10 SETTLEMENT OF BACKFILL

A. Settlement of trench backfill, or of fill or facilities constructed over trench backfill within the warranty period for the project will be considered a result of defective compaction of trench backfill.

END OF SECTION

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SECTION 02341

HORIZONTAL DIRECTIONAL DRILLING (HDD) WITH (HDPE) PIPE

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Furnish all labor, materials and equipment required to install HDPE pipe using directional drilling method of installation, all in accordance with the requirements of the Contract Documents. The pipe size, type and length shall be as specified in the Drawings. Work included shall include and not be limited to proper installation, testing, restoration of underground utilities and environmental protection and restoration.

B. The directional drill shall be accomplished by first drilling a pilot hole then enlarging the pilot hole to sufficient size to accommodate the specified HDPE pipe and finally pulling the pipe back through the enlarged hole. All drilling shall be performed to proper industry standards.

1.02 RELATED SECTIONS

A. Section 01001 – General Requirements

B. Section 01300 – Submittals

C. Section 01720 – Project Record Documents.

D. Section 15060 – HDPE Pipe

E. Other Sections as applicable.

1.03 REFERENCES

A. ASTM F 1962 – Use of Maxi-Horizontal Directional Drilling for Placement of Polyethylene Pipe or Conduit Under Obstacles, Including River Crossings.

B. Plastic Pipe Institute (PPI) – TR-46 – Guidelines for the Use of Mini-Horizontal Directional Drilling for Placement of High Density Polyethylene Pipe.

1.04 SUBMITTALS

A. Shop Drawings: Submit shop drawings in accordance with the requirements of Section 01300 - Submittals and the following supplemental requirements:

1. Directional drilling Contractor's qualifications and experience.

2. Work Plan: Prior to beginning work, the CONTRACTOR must submit to the ENGINEER for approval a work plan detailing the procedure, schedule and location of entry and exit pits to be used to execute the project. The work plan must include:

a. Description of all equipment to be used, down-hole tools, list of personnel and their qualifications and experience (including backup personnel in the event that an individual is unavailable), list of Sub Contractors, schedule of work activity, safety plan (including MSDS of any potentially hazardous substances to be used), an environmental protection plan,

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b. Contingency plans for possible problems.

c. Drilling operations addressing:

1) Procedures for pilot hole drilling and reaming. Procedures for tracking and controlling the drilling head location.
2) Procedures for preparing as-builts.
3) Drilling fluid management plan.
4) Spoils handling and disposal plan.
5) Pipe storage and handling, addressing means and methods for protecting pipe and ensuring temperature control in accordance with the Contractor's installation calculations.
6) Pipeline assembly and installation, addressing: Procedures for pipe joining, pipeline pullback, and pullback monitoring.
7) Prevention of inadvertent fluid losses and spills, and contingencies for rapid containment and cleanup, addressing: Measures to mitigate risk of inadvertent fluid returns to surface. Procedures for monitoring and controlling drilling fluid flows and pressures. Equipment, resources, and procedures for identifying, containing, and cleaning up fluid losses and spills.
8) Quality control and testing procedures.

d. Traffic control plans for entry and exit pit sites, prepared by a Florida Registered Engineer, ready for submittal by CONTRACTOR for procurement of City and/or County Maintenance of Traffic/Right of way permit.

e. Plans for mitigating the potential for inadvertent drilling fluid losses to surface, and for rapidly identifying and cleaning up spills near the investigation borings located along the project alignment. Investigation boreholes along the alignment have been backfilled as reported in the Geotechnical Report. The Contractor's work plans shall address the risk that all investigation boreholes may contribute to the risk of drill fluid loss.

f. Contingency plan for rapidly identifying, locating, and containing any drilling fluid returns.

g. The Contractor shall submit a contingency plan to address procedures to be employed in the event any of the listed items occur.

1) Utility strike, obstruction, or inability to advance drill pipe.
2) Excessive deviation from proposed line and grade, as described within this Section.
3) Inability to move pipe through borehole during pullback.
4) Settlement or heave of roadways and structures within 50 feet of the alignment.
5) Hurricane warning.

3. Work plan should be comprehensive, realistic and based on actual working conditions for this particular project. Plan should document the thoughtful planning required to successfully complete the project.

4. Material: Specifications on material to be used shall be submitted to ENGINEER. Material shall include the pipe, fittings and any other item which

is to be an installed component of the project.

5. Equipment: Submit specifications on directional drilling equipment to be used to ensure that the equipment will be adequate to complete the project. Equipment shall include but not be limited to: drilling rig, mud system, mud motors (if applicable), down-hole tools, guidance system, and rig safety systems. Calibration records for guidance equipment shall be included. Specifications for any drilling fluid additives that CONTRACTOR intends to use or might use shall be submitted.

1.05 QUALITY ASSURANCE

A. All directional drilling operations shall be done by a qualified directional drilling Underground Licensed CONTRACTOR or SUBCONTRACTOR who has self-performed using own forces for a minimum of five (5) horizontal directional drilling projects in the last three (3) years involving work of a similar nature and scope to the work required of this project.

B. Notify ENGINEER and OWNER a minimum of seven (7) days in advance of the start of work contained in this Section.

C. All work shall be performed in the presence of the OWNER , ENGINEER or designated representative.

PART 2 - PRODUCTS

2.01 HIGH DENSITY POLYETHYLENE (HDPE) PIPE

A. Section 15060 – HDPE Pipe

2.02 DIRECTIONAL DRILLING EQUIPMENT REQUIREMENTS

A. General: The directional drilling equipment shall consist of a directional drilling rig of sufficient capacity to perform the bore and pull back the pipe, a drilling fluid mixing and delivery system of sufficient capacity to successfully complete the installation, an optional drilling fluid recycling system to remove solids from the drilling fluid so that the fluid can be reused, a magnetic guidance system or walk over system to accurately guide boring operations, a vacuum truck of sufficient capacity to handle the drilling fluid volume, trained and competent personnel to operate the system. All equipment shall be in good, safe operating condition with sufficient supplies, materials and spare parts on hand to maintain the system in good working order for the duration of this project.

B. Drilling Rig: The directional drilling machine shall consist of a hydraulically powered system to rotate, push and pull hollow drill pipe into the ground at a variable angle while delivering a pressurized fluid mixture to a guidable drill (bore) head. The machine shall be anchored to the ground to withstand the pulling, pushing and rotating pressure required to complete the installation. The hydraulic power system shall be self-contained with sufficient pressure and volume to power drilling operations. Hydraulic system shall be free of leaks. Rig shall have a system to monitor maximum pull-back pressure during pull-back operations. There shall be a system to detect electrical current from the drill string and an audible alarm which automatically sounds when an electrical current is detected.

C. Drill Head: The drill head shall be steerable by changing its rotation and shall provide the necessary cutting surfaces and drilling fluid jets.

D. Mud Motors (if required): Mud motors shall be of adequate power to turn the required drilling tools.

E. Drill Pipe: Shall be constructed of high quality 4130 seamless tubing, grade D or better, with threaded box and pins. Tool joints should be hardened to 32-36 RC.

2.03 GUIDANCE SYSTEM

A. General: A Magnetic Guidance System (MGS) probe or proven gyroscopic probe and interface shall be used to provide a continuous and accurate determination of the location of the drill head during the drilling operation. The guidance shall be capable of tracking at all depths up to one hundred feet and in any soil condition, including hard rock. It shall enable the driller to guide the drill head by providing immediate information on the tool face, azimuth (horizontal direction), and inclination (vertical direction). The guidance system shall be accurate to and calibrate to manufactures specifications of the vertical depth of the borehole at sensing position at depths up to ten feet and accurate to 2-feet horizontally.

B. Components: The CONTRACTOR shall supply all components and materials to install, operate, and maintain the guidance system.

C. The Guidance System shall be of a proven type such as Share Well TruTracker MGS, or other proven guidance system, and shall be set up and operated by personnel trained and experienced with this system with a minimum of 3 years of experience. The operator shall be aware of any geo-magnetic anomalies and shall consider such influences in the operation of the guidance system.

2.04 DRILLING FLUID (MUD) SYSTEM

A. Mixing System: A self-contained, closed, drilling fluid mixing system shall be of sufficient size to mix and deliver drilling fluid composed of bentonite clay, potable water and appropriate additives. Mixing system shall be able to “molecularly shear” individual bentonite particles from the dry powder to avoid clumping and ensure thorough mixing. The drilling fluid reservoir tank shall be a minimum of 500 gallons. Mixing system shall continually agitate the drilling fluid during drilling operations.

B. Drilling Fluids: Drilling fluid shall be composed of clean water and bentonite clay. The water shall be from an authorized source with a pH of 8.5 - 10. Water of a lower pH or with excessive calcium shall be treated with the appropriate amount of sodium carbonate or equal. No additional material may be used in drilling fluid without prior approval from ENGINEER. The bentonite mixture used shall have the minimum viscosities as measured by a March Funnel. The following viscosities are provided as a guide; these are to be adjusted to conditions found in the geotechnical report:

1. Rock, Clay - 60 sec.
2. Hard Clay - 40 sec.
3. Soft Clay - 45 sec.
4. Sandy Clay - 90 sec.
5. Stable Sand - 80 sec.
6. Loose Sand - 110 sec.

7. Wet Sand - 110 sec.

8. These viscosities may be varied to best fit the soil conditions encountered, as approved by the ENGINEER.

C. Delivery System: The mud pumping system shall have a capacity capable of delivering the drilling fluid at a constant minimum pressure. The delivery system shall have filters in-line to prevent solids from being pumped into the drill pipe. Connections between the pump and drill pipe shall be relatively leak-free. Used drilling fluid and drilling fluid spilled during drilling operations shall be contained and conveyed to the drilling fluid recycling system or shall be removed by vacuum trucks or other methods acceptable to ENGINEER. A berm or other suitable means of containment, minimum of 12 inches high, shall be maintained around drill rigs, drilling fluid mixing system, entry and exit pits and drilling fluid recycling system to prevent spills into the surrounding environment. Pumps and or vacuum truck(s) of sufficient size shall be in place to convey excess drilling fluid from containment areas to storage and recycling facilities or disposal.

D. Drilling Fluid Recycling System: The drilling fluid recycling system, if used, shall separate sand, dirt and other solids from the drilling fluid and render the drilling fluid reusable. Spoil separated from the drilling fluid will be stockpiled for later use or disposal.

2.05 OTHER EQUIPMENT

A. Pipe Rollers: Pipe rollers shall be of sufficient size to fully support the weight of the pipe while being hydrostaticlly tested and during pullback operations. Sufficient number of rollers shall be used to prevent excess sagging of pipe.

B. Pipe Rammers: Hydraulic or pneumatic pipe rammers may only be used if necessary and with the authorization of ENGINEER.

C. Restrictions: Other devices or utility placement systems for providing horizontal thrust other than those previously defined in the preceding sections shall not be used unless approved by the ENGINEER prior to commencement of the work. Consideration for approval will be made on an individual basis for each specified location. The proposed device or system will be evaluated prior to, approval or rejection on its potential ability to complete the utility placement satisfactorily without undue stoppage and to maintain line and grade within the tolerances prescribed by the particular conditions of the project.

2.06 PERSONNEL REQUIREMENTS

A. All personnel shall be fully trained in their respective duties as part of the directional drilling crew and in safety. Each person must have at least two years directional drilling experience. The Owner shall have sole authority to determine the adequacy of representative projects.

B. A competent and experienced supervisor representing the CONTRACTOR and Drilling SUBCONTRACTOR shall be present at all times during the actual drilling operations. A responsible representative who is thoroughly familiar with the equipment and type work to be performed must be in direct charge and control of the operation at all times. In all cases, the supervisor must be continually present at the job site during the actual Directional Bore operation. The CONTRACTOR and SUBCONTRACTOR shall have a sufficient number of competent workers on the job at all times to insure the Directional Bore is made in a timely and satisfactory

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manner.

C. Personnel who are unqualified, incompetent or otherwise not suitable for the performance of this project shall be removed from the jobsite and replaced with a suitable person.

D. All HDPE fusion equipment operators shall be qualified to perform pipe joining using the means, methods and equipment employed by the Contractor. Fusion equipment operators shall have current, formal training on all fusion equipment employed the project. Training received more than two years prior to operation of the fusion equipment shall not be considered current. The Contractor shall submit written certification of training provided by the fusion equipment manufacturer.

PART 3 - EXECUTION

3.01 GENERAL REQUIREMENTS

A. The ENGINEER and City must be notified 48 hours in advance of starting work. The Directional Bore shall not begin until the ENGINEER, City or designated representative is present at the job site and agrees that proper preparations for the operation have been made. The ENGINEER approval for beginning the installation shall in no way relieve the CONTRACTOR of the ultimate responsibility for the satisfactory completion of the work as authorized under the Contract. It shall be the responsibility of ENGINEER, City or designated resprentative to provide inspection personnel at such times as appropriate without causing undue hardship by reason of delay to the CONTRACTOR.

B. All work under this specification affecting the Broward County Engineering Department (BCED), the South Florida Water Management District (SFWMD), Indian Trace Development District (ITDD), or the Florida Department of Transportation (FDOT) property, right-of-way, or facilities shall be carried out to the full satisfaction of the BCED, the SFWMD, ITDD or FDOT authorized representative. The CONTRACTOR shall fully inform himself of all requirements of the ITDD, SFWMD or FDOT as pertains to the specific project and shall coordinate with these representatives and conduct all his work accordingly.

C. All equipment used by the CONTRACTOR on Owner's property and rights-of-way may be inspected by the OWNER or the Owner's Representatives and shall not be used if considered unsatisfactory by OWNER or Owner's Representatives.

D. The Contractor shall be fully responsible for all damages arising from his failure to comply with the regulations and the requirements of these Specifications.

3.02 DIRECTIONAL DRILLING OPERATION

A. The CONTRACTOR shall provide all material, equipment, and facilities required for directional drilling. Proper alignment and elevation of the bore hole shall be consistently maintained throughout the directional drilling operation. The method used to make the directional drilling shall conform to the requirements of all applicable permits. Copies of all permits will be supplied to the CONTRACTOR by the OWNER.

B. Entire drill path shall be accurately surveyed with entry and exit stakes placed in the appropriate locations within the areas indicated on drawings. If CONTRACTOR is using a magnetic guidance system, drill path must be surveyed prior to construction for any surface magnetic variations or anomalies by which may interfere with the

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CONTRACTOR prior to commencement guidance system. This pre-construction magnetic interference survey shall be submitted for Engineers review. The cost of alternative guidance systems shall not be considered as additional cost to the bid.

C. The Contractor shall coordinate utilities locations with Sunshine State One-Call of Florida, Inc., (#811 or web site www.callsunshine.com). Once the locate service has field marked all utilities, the Contractor shall verify each utility (including any service laterals, i.e. water, sewer, cable, gas, electric, phone, etc.) and those within each paved area. Verification may be performed utilizing Ground Penetrating Radar, hand dig, or vacuum excavation. Prior to initiating drilling, the Contractor shall record on the drawings both the horizontal and vertical location of the utilities off of a predetermined baseline. The Contractor shall utilize the Ground Penetrating Radar over the projected bore path whether utilities are located in the horizontal drill pathway or not, in order to reduce the opportunity of conflicting with any unforeseen obstructions.

D. CONTRACTOR shall place silt fence between all drilling operations and any drainage, wetland, waterway or other area designated for such protection by contract documents, state, federal and local regulations. Additional environmental protection necessary to contain any hydraulic or drilling fluid spills shall be put in place, including berms, liners, turbidity curtains and other measures. CONTRACTOR shall adhere to all applicable environmental regulations. Fuel may not be stored in bulk containers within 200 feet of any water body or wetland.

E. Readings shall be recorded after advancement of each successive drill pipe, and the readings plotted on a scaled drawing of 1-inch=20-feet, both vertical and horizontal. Access to all recorded readings and plan and profile information shall be made available to the ENGINEER, or field representative, at all times.

F. A complete list of all drilling fluid additives and mixtures to be used in the directional operation will be submitted to the ENGINEER, along with their respective Material Safety Data Sheets. All drilling fluids and loose cuttings shall be contained in pits or holding tanks for recycling or disposal, no fluids shall be allowed to enter any unapproved areas or natural waterways. Upon completion of the directional drill project, the drilling mud and cuttings shall be disposed of by the CONTRACTOR in accordance with applicable regulations.

G. HDPE pipe shall be installed with a minimum of 36 inches of cover and at the separation distances indicated by the drawings. Upon Engineer's approval, the Contractor will be allowed to exceed 36 inches of cover.

H. Pilot hole shall be drilled on bore path with no deviations greater than 5% of depth over a length of 100 feet. In the event that pilot does deviate from bore path more than 5% of depth in 100 feet, CONTRACTOR will notify ENGINEER and ENGINEER may require CONTRACTOR to pull-back and re-drill from the location along bore path before the deviation. In the event that a drilling fluid fracture, inadvertent returns or returns loss occurs during pilot hole drilling operations, CONTRACTOR shall cease drilling, wait at least 30 minutes, inject a quantity of drilling fluid with a viscosity exceeding 120 seconds as measured by a March funnel and the wait another 30 minutes. If mud fracture or returns loss continues, CONTRACTOR will cease operations and notify ENGINEER. ENGINEER and CONTRACTOR will discuss additional options and work will then proceed accordingly.

I. Upon completion of the pilot hole phase of the operation, a complete set of as-built records shall be submitted in duplicate to the OWNER. These records shall include

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copies of the plan and profile drawing, as well as directional survey reports as recorded during the drilling operation.

J. Upon approval of the pilot hole location the hole opening or enlarging phase of the installation shall begin. The bore holed diameter shall be increased to accommodate the pullback operation of the required size of HDPE pipe. The type of hole opener or back reamer to be utilized in this phase shall be determined by the types of subsurface soil conditions that have been encountered during the pilot hole drilling operation. Reaming operations shall be conducted to enlarge the pilot hole after the acceptance of the pilot bore. The Contractor must ream bore hole to a size at least 25% greater than the pipe diameter, and must not attempt to ream at one time, more than what the equipment is designed to safely handle.

K. The open borehole may be stabilized by means of bentonite drilling slurry being pumped through the inside diameter of the drill pipe and through openings in the reamer. The slurry will also serve as an agent to carry the loose cuttings to the surface through the annulus of the borehole. These cuttings and bentonite slurry are to be contained at the exit or entry side of the directional bore in pits or holding tanks. The slurry may be recycled at this time for reuse in the hole opening operation, or it shall be disposed of by the Contractor in accordance with applicable regulations.

L. The HDPE pipe shall be joined together according to manufacturer's specifications and be supported over roadways and other obstacles as required, by the use of pipe rollers or comparable equipment, in preparation of pullback through the enlarged borehole. A pulling eye will be attached to the product pipe which in turn will be attached to a swivel on the end of the drill pipe. This will allow for a straight, smooth pull of the product pipe as it enters and passes through the borehole toward the drill rig and original entrance hole of the directional bore. The product pipe will be elevated to the approximate angle of exit and supported by means of a sideboom with roller arm, or similar equipment, to allow for a "free stress" situation as the pipe is pulled into the exit hole toward the drill rig. The product pullback phase of the-directional operation shall be carried out in a continuous manner until the pipe reaches the original entry side of the bore.

3.03 PIPE HANDLING

A. Care shall be taken during transportation of the pipe such that it will not be cut, kinked or otherwise damaged.

B. Ropes, fabric or rubber protected slings and straps shall be used when handling pipes. 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 onto rocky or unprepared ground.

C. Pipes shall be stored on level ground, preferably turf or sand, free of sharp objects which could damage the pipe. Stacking of the pipe shall be limited to a height that will not cause excessive deformation of the bottom layers of pipes under anticipated temperature conditions. Where necessary due to ground conditions the pipe shall be stored on wooden sleepers, spaced suitably and of such width as not to allow deformation of the pipe at the point of contact with the sleeper or between supports.

D. The handling of the joined pipe line shall be in such a manner that the pipe is not damaged by dragging it over sharp and cutting objects. Slings for handling the

pipeline shall not be positioned at butt fused joints. Sections of the pipes with deep cuts and gouges shall be removed and the ends of the pipeline rejoined.

E. Pipe shall be welded/fused together in one length, if space permits. Pipe may be placed on pipe rollers before pulling into bore hole to minimize damage to the pipe. It is critical that all original oxidized pipe surfaces be removed in order for fusion to take place. The scraping process requires that approximately .10" of the outer "skin" be removed in order to penetrate the oxidation and contamination barrier. Oxidized pipe surface simply will not bond.

F. ACCEPTABILITY OF DAMAGED PIPE: Cuts or gouges that reduce the wall thickness by more than 10% is not acceptable and must be cut out and discarded.

G. BUTT FUSION LOG: Each butt fusion shall be recorded and logged by an electronic monitoring device (McElroy Datalogger or approved equal is required) affixed to the fusion machine. Joint data shall be submitted as part of the As-Recorded information, in accordance with this specification.

H. BUTT FUSION TESTING: When requested by an inspector, butt fusion testing will be performed. The test fusion shall be allowed to cool completely, and then fusion test coupons shall be cut out.

I. MECHANICAL JOINING: Polyethylene pipe and fittings may be joined to other materials by means of flanged connections (flange adapters, electrofused couplings, and back-up rings) or mechanical couplings designed for joining polyethylene pipe or for joining polyethylene pipe to another material. Mechanical couplings shall be fully pressure rated and fully thrust restrained such that when installed in accordance with manufacturer's recommendations, a longitudinal load applied to the mechanical coupling will cause the pipe to yield before the mechanical coupling disjoins. External joint restraints shall not be used in lieu of fully restrained mechanical couplings.

J. Contractor shall have the ability to electrofuse couplings to the pipe at an 11.25 deg angle in the pit to allow installation of the 11.25 deg elbows on the end of the pipe.

3.04 TESTING PIPE

A. Cleaning and flushing are to be done by the CONTRACTOR in accordance with AWWA/ANSI C651.

B. Directional drilled pipe shall be tested by CONTRACTOR prior to and after pullback. This testing is to be included in the contract price. The pressure shall be maintained at 150 psi for at least two hours. The test pump and water supply shall be arranged to allow accurate measurement of the water required to maintain the test pressure. Any material showing seepage or the slightest leakage shall be replaced as directed by the OWNER at no additional expense to the OWNER.

C. The manufacturer's recommendations on pipe stretch allowances, allowable make-up water, and duration of test pressure shall be observed.

D. Pipeline shall be tested in sections, end to end or 1,800 feet whichever distance is smaller.

3.05 SITE RESTORATION

A. Following drilling operations, CONTRACTOR will de-mobilize equipment and restore the work site to original conditions. All excavations will be backfilled and

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compacted in accordance with the plans.

B. Surface restoration shall be completed in accordance with the Specifications.

C. Contractor shall be responsible for complete restoration of the pit area to the original condition including all fill, sub-base, limerock base, asphalt, concrete, landscaping, etc.

D. 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, or local environmental regulations. The bentonite drilling slurry may be recycled for reuse in the hole opening operation, or shall be hauled by the Contractor to an approved location or landfill for proper disposal. Contractor shall thoroughly clean entire area of any fluid residue upon completion of installation, and replace any and all plants and sod damaged, discolored or stained by drilling fluids.

3.06 RECORD KEEPING AND AS-BUILTS

A. CONTRACTOR shall maintain a daily project log of drilling operations and a guidance system log with a copy given to ENGINEER at completion of project.

B. The MGS data shall be recorded every 25 feet during the actual crossing operation. The CONTRACTOR shall furnish "As-Built" plan and profile drawings based on these recordings showing the actual location horizontally and vertically of the installation, and all utility facilities found during the installation. The MGS data shall be certified accurate by the CONTRACTOR to the capability of the MGS System.

C. As-built drawings shall be completed by a professional surveyor.

PART 4 - ENVIRONMENTAL AND SAFETY CONCERNS

4.01 GENERAL REQUIREMENTS

A. The horizontal directional drilling operation is to be operated in a manner to eliminate the discharge of water, drilling mud and cuttings to the adjacent waterbodies, storm drains or land areas involved during the construction process. The Contractor shall provide equipment and procedures to maximize the recirculation or reuse of drilling mud to minimize waste. All excavated pits used in the drilling operations shall be lined by the Contractor with heavy duty plastic sheeting with sealed joints to prevent the migration of drilling fluids and/or ground water.

B. The Contractor shall visit the site and must be aware of all structures and site limitations at the directional drill crossing and provide the Engineer with a drilling plan outlining procedures to prevent drilling fluid from adversely affecting the surrounding area.

C. The general work areas on the entry and exit sides of the crossing shall be enclosed by a berm to contain unplanned spills or discharge.

D. Waste cuttings and drilling mud shall be processed through a solids control plant comprised as a minimum of sumps, pumps, tanks, de-salter/de-sander, centrifuges, material handlers, and haulers all in a quantity sufficient to perform the cleaning/separating operation without interference with the drilling program. The cuttings and excess drilling fluids shall be dewatered and dried by the Contractor to the extent necessary for disposal in offsite landfills. Water from the dewatering process shall be treated by the Contractor to meet permit requirements and

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disposed of locally. The cuttings and water for disposal are subject to being sampled and tested. The construction site and adjacent areas will be checked frequently for signs of unplanned leaks or seeps.

E. Equipment (graders, shovels, etc.) and materials (such as groundsheets, hay bales, booms, and absorbent pads) for cleanup and contingencies shall be provided in sufficient quantities by the Contractor and maintained at all sites for use in the event of inadvertent leaks, seeps, or spills.

F. Waste drilling mud and cuttings shall be dewatered, dried, and stock piled such that it can be loaded by a front-end loader, transferred to a truck and hauled offsite to a suitable legal disposal site. The maximum allowed water content of these solids is 50% of weight.

G. Due to a limited storage space at the worksites, dewatering and disposal work shall be concurrent with drilling operations. Treatment of water shall satisfy regulatory agencies before it is discharged.

H. Contractor shall place silt fence between all drilling operations and any drainage, wetland, waterway, or other areas designated for such protection by contract documents, state, federal, and local regulations. Additional environmental protection necessary to contain any hydraulic or drilling fluid spills shall be put in place, including berms, liners, turbidity curtains and other measures. Contractor shall adhere to all applicable environmental regulations. Fuel or oil may not be stored in bulk containers within 200' of any water body or wetland.

I. Contractor shall adhere to all applicable state, federal, and local safety regulations and all operations shall be conducted in a safe manner. Safety meetings shall be conducted at least weekly with a written record of attendance and topic submitted to the Engineer.

END OF SECTION

SECTION 02481
TREE RELOCATION AND PROTECTION

PART 1 GENERAL

1.01 WORK TO BE PERFORMED AND WORK INCLUDED

A. Provide the Following:

1. Prepare and relocate trees and palms designated for relocation within the project boundaries, to include all aspects of preparation, relocation, protection, and maintenance.
2. Protection and care of existing trees and palms to remain within the project boundaries, to include all aspects of protection, pruning, fertilization, and watering.
3. Watering by water truck.
4. Follow up maintenance as required by these Specifications.
5. Labor, materials, equipment, and services to complete all preparation, relocations and protection work as shown on the Drawings, as specified herein, or both.

1.02 RELATED WORK

A. Section 02315 FILL AND BACKFILL

B. Section 02911 SOIL PREPARATION

C. Section 02920 SODDING

D. Section 02930 TREES, PLANTS, AND GROUND COVERS

1.03 SUBMITTALS

A. Submit the Following:

1. Verification of Qualifications: The CONTRACTOR shall provide a list of references and project list of a minimum of five (5) projects that the CONTRACTOR has successfully completed that are similar in scope and nature.
2. List of all equipment to be utilized during tree preparation and transplanting.
3. Literature on specified wetting agents, fertilizers, and soil conditioners.

1.04 APPLICABLE STANDARDS AND SPECIFICATIONS

A. Comply with the following standards and specifications for all materials, methods, and workmanship unless otherwise noted:

1. Codes and Standards of the American Association of Nurserymen.
2. Codes and Standards of the National Arborists Association.
3. Codes and Standards of the International Society of Arboriculture.

1.05 PERMITS

A. The CONTRACTOR shall secure and pay for any permits, including tree relocation permits, required in order to complete the work under this Section.

1.06 DESCRIPTION

A. Trees to be relocated within the project area will be specifically designated in the field as project work progresses.

B. Existing trees to be relocated shall be crown pruned and be treated with soil amendments prior to relocation.

C. Existing trees to be relocated or to remain shall be protected with barricades during construction. Trees or shrubs to remain which are scarred or destroyed shall be replaced at the direction of the City Forester with the same species, size, and quality at no cost to the City.

D. Tree pits resulting from relocated material shall be backfilled with clean fill and brought flush with surrounding grade.

1.07 GUARANTEES

A. The CONTRACTOR Shall Guarantee His Work in the Following Way:

1. Any tree or palm that dies or is deemed in unacceptable condition for one (1) year following final project acceptance shall be removed by the CONTRACTOR, including root ball, and backfilling of pit, at no cost to the OWNER.
2. The CONTRACTOR shall provide a comparable specimen at no additional cost to the City.
3. The guarantee shall be enforced if it is deemed by the City Forester that tree mortality or decline is a product of negligence by the CONTRACTOR.

PART 2 PRODUCTS

2.01 SOIL AMENDMENTS

A. Root stimulant shall be Roots Biostimulant, concentrate or powder, as manufactured by LISA Products Corp., (305) 797-6801, or City-approved equal. Stimulant shall be applied either as a wash, or by injection, mixed per manufacturer's recommendation.

B. Soil conditioner shall be Lesco Wet, as manufactured by Lesco, Inc. or NoburN, as manufactured by Roots, or City approved equal.

C. Minor element liquid fertilizer mix shall be Micro Mix liquid as produced by Lesco, Inc., or equal; to be diluted at a rate of 1 gallon per 100 gallons of water and applied at a rate of 50 gallons per 1,000 square feet of canopy, or Iron Roots, applied per manufacturer's instructions, or City approved equal.

D. Time Release Fertilizer tablets shall be Agriform, 15 grams, designation 8-8-8; or approved equal.

2.02 EQUIPMENT

A. Soil amendments shall be injected into the soil by means of a spray apparatus utilizing mechanical agitation to keep powdered amendments suspended.

B. Root pruning equipment shall be designed for this task, and shall produce clean cuts of roots without damage to the resulting root ball.

C. Relocation equipment shall be capable of lifting and transporting trees without damage.

2.03 SOIL

A. Soil to be placed once trees or palms are transplanted shall meet the requirements specified in Section 02911 SOIL PREPARATION.

2.04 WATER

A. Water shall be clean and potable, from municipal Fort Lauderdale source, or from onsite wells.

2.05 MULCH

A. Grade A Eucalyptus mulch as supplied by Action Nursery Products, Inc., Fort Myers, Florida, 1-800-433-2050, or approved equal, and shall be free of viable weed seeds.

2.06 BRACING AND STAKES

A. All bracing and stakes shall be pressure treated pine. Compression bands shall be stainless steel.

PART 3 EXECUTION

3.01 EXCAVATING NEAR EXISTING TREES

A. Maintain a minimum 6-foot clearance from all tree trunks except palm trees.

B. Use a 24-inch minimum depth saw cut in pavement or dirt/gravel roadway before start of excavation in areas where there are large trees close to the construction area. No coating application is required after saw cutting roots.

3.02 PREPARATION FOR RELOCATION OF TREES AND PALMS WITHIN THE PROJECT BOUNDARIES

A. Crown Pruning: All trees and palms shall be crown pruned prior to relocation.

1. Broadleaf Trees:
   a. All trees are to be trimmed by thinning the crown only, and not by reducing crown dimensions. Trim to conform to NAA Standards, including removal of dead wood.
   b. Repair any existing injuries to trees including cavities and machinery marks.

2. Palms:
   a. Remove all fruits and seed pods, and all but the seven (7) youngest fronds.
   b. Tie all remaining fronds with untreated cotton twine or burlap straps.

B. Fertilization and Watering:

1. Preparation: Clear the root ball area of all foreign material, trash, etc., to expose undisturbed soil.
2. Application/Schedule:
   a. Trees shall be deep injection fertilized a minimum of fourteen (14) days prior to relocation. Specified liquid fertilizer shall be used and applied at the concentration and application rates stated herein.
   b. Mix wetting agent, biostimulant, and minor element mix to produce a single fluid with each component included at the specified concentration. Inject into the root zone within the limits of proposed root ball at the rate of 50 gallons fluid per 1,000 square feet of tree canopy, using only approved spray equipment.
   c. Form an earth berm six (6) inches high outside the proposed root ball prior to watering. Water application shall saturate the root ball to its entire depth.

C. Root Pruning:

1. Technique:
   a. All trees shall be excavated by digging a trench a minimum of 36 inches deep by 6 inches wide, either by hand or with a trenching machine designed for this purpose. Provide continuous trenching around the tree or palm at a minimum distance of 30 inches from the trunk. Hand cut broadleaf tree roots after trenching to produce clean cuts with no splits or tears.
   b. Barricades: Barricade all root pruned trees and palms at outside of soil berm with minimum 4-foot chain link fence or other barricade approved by the City.
   c. Timing:
      1) All oaks to be relocated shall be maintained for a minimum of 10 weeks after root pruning prior to relocation.
      2) Palms shall be maintained a minimum of four (4) weeks prior to relocation.

3.03 RELOCATION OF TREES AND PALMS

A. General:

1. Trees to be relocated shall be as directed by the ENGINEER.
2. Trees range in size from 4 inches to 8 inches in diameter.
3. Trees are primarily Palms and Oaks.

B. Preparation:

1. Trees and palms shall be injected with soil amendments a minimum of fourteen (14) days prior to relocation. Apply at manufacturer's recommended concentration and application rates.
2. Trees and palms shall be thoroughly soaked to the full depth of the root ball daily for seven (7) consecutive days prior to relocation.
3. Accurately locate position and elevation where all trees are intended to be planted, for verification by City Forester. Verify that no overhead or underground utilities, existing or proposed, conflict with proposed locations.
4. Ascertain that all proposed paths for machinery are clear of utilities and other obstructions.

C. Excavation of Tree Pits: Dig all pits with vertical sides and flat bottom. Existing soil may be utilized as backfill as directed by the City Forester.

D. Digging and Handling - Broadleaf Trees:

1. Notify City two (2) business days in advance of each relocation to allow for observation of procedures.
2. Determine line of previous root pruning and excavate around root mass to leave area 12 inches out from line of root pruning undisturbed. Digging shall be accomplished so as to produce clean cuts on all roots without tearing or splitting. Trenching shall be a minimum of 36 inches deep.
3. Trees are to be handled in such a way as to avoid damage to bark and limbs subject to support cables or chains. Attach padded support cables or chains at multiple points where possible. Alternatively, tree trunks may be drilled and doweled for broadleaf trees. The City Forester reserves the right to require doweling in lieu of lifting by straps.
4. Root balls are to be undercut prior to lifting. Do not force tree from ground prior to undercutting. Ball depth to be determined upon assessing conditions at time of trenching, to keep intact the entire root ball.
5. Trees shall be properly wrapped during moving so trunks will not be scarred and damaged and to avoid broken limbs. Broken limbs or scarred trunks shall cause tree to be unacceptable and rejected at the City's option. Broken limbs and wounds which do not (in the judgment of the City Forester) cause the tree to be rejected shall be cleanly cut.
6. Transport plant material on vehicles of adequate size to prevent overcrowding, broken limbs, foliage damage or root ball damage.
7. Root balls and foliage shall be kept moist during all phases of relocation.
8. Partially backfill tree pits with 12 inches of approved planting soil prior to setting tree. This layer of soil to be thoroughly drenched prior to relocation to achieve a stable platform at the correct elevation so that the top of rootball is 1 inch above proposed grade.
9. Rotate tree prior to setting to achieve best positioning relative to adjacent trees and viewing angles.

E. Backfilling:

1. Flood bottom soil layer to settle tree into best position and to remove air pockets.

2. Continue to flood root ball as planting soil is deposited to ensure removal of all air pockets.
3. Create a saucer to retain water.

F. Bracing:

1. Support tree with machinery until bracing is complete.
2. Buttresses may support separate trunks on multiple trunk trees.
3. Maintain braces until completion of project. Removal of braces shall be by others.

G. Watering: Relocated trees shall by watered using water-truck. Watering schedule shall be: once per day for first 6 weeks; followed by 3 times per week for following 6 weeks.

END OF SECTION

SECTION 02500
CONVEYANCE PIPING - GENERAL

PART 1 GENERAL

1.1 DELIVERY, STORAGE, AND HANDLING

A. In accordance with manufacturer's recommendations and as specified in the individual Specification(s) following this Section.

B. Marking at Plant: Mark each pipe and fitting at plant. Include date of manufacture, manufacturer's identification, specification standard, diameter of pipe, pipe class, and other information required for type of pipe.

C. Pipe, specials, and fittings received at Project site in damaged condition will not be accepted.

D. Gasket Storage: Store rubber gaskets in cool, well ventilated place and do not expose to direct rays of sun. Do not allow contact with oils, fuels, petroleum, or solvents.

E. Handling:

1. Heavy canvas, or nylon slings of suitable strength shall be used for lifting and supporting materials. Do not use chains or cables.
2. Lifting pipe during unloading or lifting into trench shall be done using two slings placed at quarter point of pipe section. Pipe may be lifted using one sling near center of pipe, provided pipe is guided to prevent uncontrolled swinging and no damage will result to pipe or harm to workmen. Slings shall bear uniformly against pipe.
3. Pipe and fittings shall not be stored on rocks or gravel, or other hard material that might damage pipe. This includes storage area and along pipe trench.

PART 2 PRODUCTS

2.1 PIPE

A. As specified in the individual Specification(s) following this Section and as shown on the Drawings.

B. Color Coding for Water Mains:

1. All pipe used for water main applications shall be color-coded blue.
2. Continuous blue stripes, parallel to the axis of the pipe, shall be applied using tape or paint applied to the dry pipe exterior surface.
3. Pipe striped during manufacture shall have stripes applied at 90-degree intervals around the pipe that remain intact following installation of the pipe.
4. Pipe striped during installation shall be in a continuous line along the top of the pipe. Pipes 24 inches and greater shall have two additional stripes on each side.
5. Aboveground water main piping shall be color-coded or marked similar to underground piping.

2.2 JOINTS

A. As specified in the individual Specification(s) following this Section.

2.3 COUPLINGS

A. General:

1. Coupling linings for use in potable water systems shall be in conformance with NSF 61B. Linings for wastewater piping shall be in accordance with the provisions of Section 02502 DUCTILE IRON PIPE AND FITTINGS.
2. Couplings shall be rated for appropriate operating pressure and hydrostatic test pressure.
3. Exposed, bolted, sleeve-type couplings shall be lined and coated with fusion bonded epoxy in accordance with AWWA C213.
4. Buried, bolted, sleeve-type couplings shall be lined and coated with fusion bonded epoxy in accordance with AWWA C213.

B. For Pipe with Plain Ends:

1. Bolted, sleeve-type couplings, in accordance with AWWA C219.
2. Fabricated steel, mechanical slip-type expansion joints, in accordance with AWWA C221.

C. Unless thrust restraint is provided by other means, bolted, sleeve-type couplings shall be harnessed. Harness details shall be in accordance with requirements of appropriate reference standard or as shown on Drawings.

D. For Pipe with Grooved Ends:

1. Grooved couplings, in accordance with AWWA C606. System shall provide for flexible or rigid joints as shown on Drawings.
2. Exposed couplings shall be lined and coated with fusion bonded epoxy in accordance with AWWA C213.
3. Buried couplings shall be lined and coated with fusion bonded epoxy in accordance with AWWA C213.

E. For Pipe with Flanged Ends:

1. Flanged coupling adapters, in accordance with AWWA C219.
2. Dismantling joints for connecting flanged pipe shall be AWWA C219 compliant. Studs and nuts provided to seal gasket shall be separate and independent from tie-bar restraint system.

F. Bolting Materials: As recommended by coupling manufacturer for specified conditions.

2.4 SLEEVES

A. Sleeves shall be long or short pattern as appropriate to the application conforming to AWWA C110.

B. Sleeves shall be mechanical joint with restraint if required, provided by external mechanical joint restraints.

C. Sleeves shall have a minimum pressure rating of 250 psi.

D. Linings and coatings ductile iron sleeves shall be in accordance with the provisions of Section 02502 DUCTILE IRON PIPE AND FITTINGS.

2.5 TAPPING SLEEVES – DUCTILE IRON

A. Ductile iron tapping sleeves are preferred for force main and water main taps.

B. Tapping sleeves shall meet ASTM A536 Grade 65-45-12.

C. Side flange seals shall be O-ring type with round, oval, or rectangular cross section.

D. CONTRACTOR shall inspect and/or verify diameter of the pipe to be tapped and order the correct sleeve.

E. Sleeves shall be coated in accordance with the provisions of this Specification.

F. Tapping sleeve and tapping valve shall be of the same or compatible manufacturer to assure proper fit of the aligning ring on the valve and the recess on the sleeve. No post factory modifications to either the sleeve or valve will be permitted.

G. Tapping sleeve shall be American Flow Control Series 1004 or 2800, US Pipe T-9, Clow F-5205; or equal.

H. Tapping machine and cutter shall provide the full-size of the tapped connection.

I. The coupon removed from the pipe shall be given to the OWNER or ENGINEER.

2.6 TAPPING SLEEVES - STEEL

A. Steel tapping sleeves are acceptable for use where ductile iron sleeves are not practical and as approved by the ENGINEER.

B. Tapping sleeve composed of two halves of heavy welded steel, bolting together on the pipe and sealing against a concave Buna-N wedge gasket around the nozzle opening. Both halves of the sleeve are fabricated to accurately conform to the outside diameter of the ductile iron host pipe and to provide reinforcement without the use of shims or pads.

C. The sleeve half opposite the nozzle shall be solid and shall not consist of straps or U-bolts. Sleeve and nozzle shall be fabricated from ASTM 285, Grade C, carbon steel. Branch leg flange shall conform to AWWA, Class D, Schedule C-207, 150-pound drilling to match tapping valve. The flange face shall be recessed to accommodate the tapping valve in accordance with MSS-SP60. All steel shall meet the requirements of ASTM A36, as a minimum. All weldments shall be braced and stress relieved.

D. The ferrous metal parts of the fitting shall receive a factory applied fusion-bonded, epoxy coating, 12-mil minimum dry film thickness in accordance with AWWA C213.

E. Minimum wall thickness of the sleeve shall be 0.375 inch.

F. Tapping sleeve shall be pressure rated to 150 psi, minimum.

G. Tapping sleeve shall be Mueller H615, Dresser Style 630, JCM Series 412; or equal.

H. Tapping machine and cutter shall provide the full-size of the tapped connection.

I. The coupon removed from the pipe shall be given to the OWNER or ENGINEER.

2.7 SERVICE SADDLES

A. Service saddles shall be ductile iron with double stainless steel straps conforming to AWWA C-111/A.21.11-00.

2.8 SLAB, FLOOR, WALL, AND ROOF PENETRATIONS

A. Modular Mechanical Seal:

1. Type: Interconnected synthetic rubber links shaped and sized to continuously fill annular space between pipe and wall sleeve opening.
2. Assemble interconnected rubber links with Type 316 stainless steel bolts, nuts, and pressure plates.
3. Size modular mechanical seals according to manufacturer's instructions for the size of pipes shown to provide a watertight seal between pipe and wall sleeve opening.
4. Manufacturers and Products:
   a. Thunderline/LinkSeal, Div. Of PSI, Houston, TX; Link Seal.
   b. Calpico, Inc., South San Francisco, California; Sealing Linx.
   c. Advance Products and Systems, Lafayette, Louisiana; Innerlynx.

B. Wall Sleeves:

1. Diameter, ends, and length shall be as shown on Drawings.
2. Shall include integral seep ring to minimize seepage between metal sleeve and concrete.

C. Wall Couplings:

1. Diameter, ends, and length shall be as shown on Drawings.
2. Wall couplings shall provide flexible mechanical joint.
3. Body and end rings shall be coated with fusion bonded epoxy.
4. Body shall include integral seep ring.
5. Shall comply with AWWA C219.

D. If core drilling is required for penetrations of existing concrete walls or slabs, locations of drilling shall be determined by radiograph to avoid damage to reinforcing steel and conduits.

2.9 FLANGES, FLANGE GASKETS, AND BOLTING MATERIALS

A. As specified in individual Specifications following this Section.

B. Flanges, bolting materials, and flange gaskets for steel flanges shall conform to AWWA C207.

C. Flanges, bolting materials, and flange gaskets for ductile iron flanges shall conform to AWWA C110 and C115.

2.10 INSULATING FLANGES AND COUPLINGS

A. Dielectric Flange Manufacturers:

1. Pipeline Seal and Insulator, Inc.; Houston, Texas.
2. Central Plastics Co.; Shawnee, Oklahoma.
3. Calpico, Inc.; South San Francisco, California.

B. Insulating Flanges:

1. Bolt holes sized as required.
2. Manufacturers and Products:
   a. Dresser Industries; Style 39.
   b. Baker Coupling Company, Inc.; Series 216.

2.11 PIPE LOCATING TAPE

A. As specified in Section 02320 TRENCH BACKFILL.

2.12 PIPE BEDDING AND PIPE ZONE MATERIAL

A. Granular fill as specified in Section 02315 FILL AND BACKFILL.

2.13 TRENCH STABILIZATION MATERIAL

A. Foundation stabilization rock as specified in Section 02315 FILL AND BACKFILL.

PART 3 EXECUTION

3.1 GENERAL

A. Notify ENGINEER at least 2 weeks prior to field fabrication of pipe or fittings.

B. Furnish feeler gauges of proper size, type, and shape for use during installation for each type of pipe furnished.

C. Distributing Materials: Place materials along trench only as will be used each day, unless otherwise approved by ENGINEER. Placement of materials shall not be hazardous to traffic or to general public, obstruct access to adjacent property, or obstruct others working in area.

3.2 EXAMINATION

A. Verify size, material, joint types, elevation, and horizontal location of existing pipeline to be connected to new pipeline or new equipment.

B. Inspect size and location of structure penetrations to verify adequacy of wall pipes, sleeves, and other openings.

C. Damaged Coatings and Linings: Repair using coating and lining materials in accordance with manufacturer's instructions.

3.3 PREPARATION

A. Prepare trench as specified in Section 02316 EXCAVATION.

B. Unless otherwise permitted by ENGINEER, maximum length of open trench shall not exceed 400 feet.

C. Trench Grade:

1. Grade bottom of trench by hand to specified line and grade, with proper allowance for pipe thickness and pipe base, when specified. Trench bottom shall form a continuous and uniform bearing and support for pipe between bell holes.
2. Before laying each section of pipe, check grade and correct irregularities found. Grade may be disturbed for removal of lifting tackle.

D. Pipe Bedding: Place and compact pipe bedding material as follows:

1. Install to full width of trench, from the following depths below bottom of pipe, and to springline of pipe:
   a. For Pipe 15-Inch Diameter and smaller: 8 inches.
   b. For Pipe Larger than 15-Inch Diameter: 10 to 12 inches.
2. Compact to at least 98 percent of its maximum density as determined by AASHTO T180.
3. Ensure that no unfilled or uncompacted areas occur beneath pipe.

E. Bell (Joint) Holes: At each joint, dig bell holes of ample dimensions in bottom of trench, and at sides where necessary, to permit joint to be made properly and to permit easy visual inspection of entire joint.

3.4 INSTALLATION

A. General:

1. Provide and use proper implements, tools, and facilities for safe and proper prosecution of Work.
2. Lower pipe, fittings, and appurtenances into trench, piece by piece, by means of a crane, slings, or other suitable tools and equipment, in such a manner as to prevent damage to pipe materials, protective coatings and linings.
3. Do not drop or dump pipe materials into trench.
4. Join pipe and fittings in accordance with manufacturer's instructions, unless otherwise shown or specified.
5. Install individual pipe lengths in according to approved lay diagram. Misplaced pipe shall be removed and replaced.
6. Inspect pipe and fittings before installation, clean ends thoroughly, remove foreign matter and dirt from inside.
7. Flanged Joints:
   a. Install perpendicular to pipe centerline.
   b. Bolt Holes: Straddle vertical centerline, aligned with connecting equipment flanges or as shown on Drawings.
   c. Use torque-limiting wrenches to provide uniform bearing and proper bolt tightness.
   d. Flange Type: Use flat-faced flange when joining with flat-faced ductile or cast iron flange.

8. Couplings:
    a. Install in accordance with manufacturer's written instructions.
    b. Before coupling, clean pipe holdback area of oil, scale, rust, and dirt.
    c. Do not remove pipe coating. If damaged, repair before joint is made.
    d. Clean and lubricate gaskets before installation.
    e. Tighten coupling bolts progressively, drawing up bolts on opposite sides gradually until bolts have uniform tightness.

B. Cleaning Pipe and Fittings:

1. Remove lumps, blisters, and excess coating from bell and spigot ends of each pipe. Wire brush outside of spigot and inside of bell and wipe clean, dry, and free from oil and grease before pipe is laid.
2. Wipe ends of mechanical joint pipe and fittings and of rubber gasket joint pipe and fittings clean of dirt, grease, and foreign matter.

C. Laying Pipe:

1. Direction of Laying: Lay pipe with bell end facing in direction of laying. For lines on an appreciable slope, face bells upgrade at discretion of ENGINEER.
2. Mechanical Joint, Push-On Joint, and Restrained Joint Pipe: After first length of pipe is installed in trench, secure pipe in-place with approved backfill material tamped under and along sides to prevent movement. Keep ends clear of backfill. After each section is jointed, place backfill as specified to prevent movement.
3. Take precautions necessary to prevent floating of pipe prior to completion of backfill operation.
4. When using movable trench shield, take necessary precautions to prevent pipe joints from pulling apart when moving shield ahead.
5. Do not allow foreign material to enter pipe while it is being placed in trench.
6. Close and block open end of last laid section of pipe to prevent entry of foreign material or creep of gasketed joints when laying operations are not in progress, at close of day's work, or whenever workers are absent from job.
7. Pipe shall be installed in a straight alignment and deflections made as required after the joint has been completed.

D. Joining Push-On Joint Pipe and Mechanical Joint Fittings:

1. Join pipe with push-on joints and mechanical joint fittings in strict accordance with manufacturer's recommendations.
2. Provide special tools and devices, such as, special jacks, chokers, and similar items required for installation.
3. Lubricate all pipe gaskets and pipe ends using lubricant furnished by pipe manufacturer. No substitutes will be permitted.
4. Clean ends of fittings of dirt, mud, and foreign matter by washing with water and scrubbing with a wire brush, after which, slip gland and gasket on plain end of pipe. Lubricate end of pipe to facilitate sliding gasket in place, then guide fitting onto spigot of pipe previously laid.

E. Cutting Pipe:

1. General: Cut pipe for inserting valves, fittings, or closure pieces in a neat and workmanlike manner without damaging pipe or lining and so as to leave a smooth end, at right angles to axis of pipe.
2. Pipe: Cut pipe with milling type cutter or saw. Do not flame cut.
3. Dressing Cut Ends: Dress cut end of mechanical joint pipe to remove sharp edges or projections, which may damage rubber gasket. Dress cut ends of push-on joint pipe by beveling, as recommended by manufacturer.

F. Buried Pressure Pipe:

1. Concrete Encased or Embedded Pipe: Do not encase joints in concrete unless specifically shown on Drawings.
2. Placement:
   a. Keep trench dry until pipe laying and joining is completed. If the excavation cannot be effectively dewatered the CONTRACTOR shall propose alternate pipe installation methodology for approval by the ENGINEER prior to proceeding. All requirements of Section 02320 TRENCH BACKFILL, will remain in effect.
   b. Exercise care when lowering pipe into trench to prevent twisting or damage to pipe.
   c. Measure for grade at pipe invert, not at top of pipe.
   d. Excavate trench bottom and sides of ample dimensions to permit proper joining, welding, visual inspection, and testing of entire joint.
   e. Prevent foreign material from entering pipe during placement.
   f. Close and block open end of last laid pipe section when placement operations are not in progress and at close of day's work.
   g. In general, lay pipe upgrade with bell ends pointing in direction of laying.
   h. Deflect pipe at joints for pipelines laid on a curve using unsymmetrical closure of spigot into bell. If joint deflection of standard pipe lengths will not accommodate horizontal or vertical curves in alignment, provide:
      1) Shorter pipe lengths.
      2) Special mitered joints.
      3) Standard or special fabricated bends.
   i. Check gasket position with feeler gauge to assure proper seating.
   j. After joint has been made, check pipe alignment and grade.
   k. Place sufficient pipe zone material to secure pipe from movement before next joint is installed.
   l. Prevent uplift and floating of pipe prior to backfilling.
3. Tolerances:
   a. Deflection From Horizontal Line: Maximum 2 inches.
   b. Deflection From Vertical Line: Maximum 1 inch.
   c. Joint Deflection: Maximum of 75 percent of manufacturer's recommendation.
   d. Horizontal position of pipe centerline on alignment around curves maximum variation of 1 foot from position shown.
4. Cover Over Top of Pipe: Minimum 3 feet, unless otherwise shown.
5. Disposal of Excess Excavated Material: As specified in Section 02316 EXCAVATION.

G. Line and Grade:

1. No high points will be allowed between air valves on pressure piping.
2. Maintain pipe grade between invert elevations to provide minimum clearance at air valve locations from existing ground surface to top of pipe.
3. Install air valves as shown on the Drawings and as verified in the field and field verify intervening low points. When field conditions warrant, exceptions may be made upon approval of ENGINEER.
4. Deviations exceeding 1/2 inch from specified line or 1/4 inch from specified grade will not be allowed without express approval of ENGINEER.
5. Pipeline sections that are not installed to elevations shown or installed as approved by ENGINEER shall be reinstalled to proper elevation.

3.5 THRUST RESTRAINT

A. Location: At pipeline tees, plugs, valves, caps, bends, and locations where unbalanced forces exist, and as shown on the Drawings.

B. All pressure pipe will be restrained at all valves and fittings. Provide additional restraint as shown on the Drawings.

C. Use of thrust blocks is not permitted.

3.6 CORROSION PROTECTION

A. Buried Pipe: As specified in the individual Specifications following this Section.

B. Notify ENGINEER at least 3 days prior to start of surface preparation, coating application, and corrosion protection work.

3.7 PLACEMENT OF PIPE LOCATING TAPE

A. Place pipe locating tape in accordance with Section 02320 TRENCH BACKFILL.

3.8 PIPE BEDDING AND PIPE ZONE MATERIAL

A. Place pipe bedding and pipe zone material in accordance with Section 02320 TRENCH BACKFILL.

3.9 FIELD QUALITY CONTROL – INSPECTION AND TESTING

A. General:

1. Notify ENGINEER in writing at least 15 days in advance of testing. Perform testing in presence of ENGINEER.
2. Using water as test medium, all newly installed pipelines shall successfully pass hydrostatic leakage test prior to acceptance.
3. Conduct field hydrostatic test on buried piping after trench has been completely backfilled. Testing may, as approved by ENGINEER, be done prior to placement of asphaltic concrete or roadway structural section.

4. CONTRACTOR may, if field conditions permit and as approved by ENGINEER, partially backfill trench and leave joints open for inspection and conduct initial service leak test. Final field hydrostatic test shall not, however, be conducted until backfilling has been completed as specified above.
5. Supply of Temporary Water: In accordance with Section 01500, CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS.
6. Install restraint as necessary to prevent movement of pipe and protect adjacent piping or equipment. Make necessary taps in piping prior to testing.
7. Prior to test, remove or suitably isolate appurtenant instruments or devices that could be damaged by pressure testing.
8. New Piping Connected to Existing Piping: Isolate new piping with grooved-end pipe caps, blind flanges, or other means as acceptable to ENGINEER.
9. Service connections for water mains are to be installed to the angle stop prior to disinfection and testing of the installed main.
10. Fire hydrant leads are to be installed to the shut-off valve prior to disinfection and testing of the installed main.

B. Tapping Sleeve and Valve:

1. Install mechanically restrained test plug with relief port.
2. Test tapping sleeve and valve prior to performing tap.
   a. Test at 150 psi for 15 minutes.
   b. Successful test will be no visible leakage.
3. Test sleeve and valve together with valve open.

C. Hydrostatic Testing Procedure:

1. Furnish testing equipment, as approved by ENGINEER, which provides observable and accurate measurements of leakage under specified conditions.
2. Maximum Filling Velocity: 0.25 foot per second calculated based on full area of pipe.
3. Expel air from piping system during filling.
4. Test Pressure: 150 psi as measured at low point of pipeline.
5. Apply and maintain specified test pressure with hydraulic force pump. Valve off piping system when test pressure is reached.
6. Maintain hydrostatic test pressure continuously for 2 hours minimum, adding makeup water only as necessary to restore test pressure.
7. Determine actual leakage by measuring quantity of water necessary to maintain specified test pressure for duration of test.

D. Maximum Allowable Leakage:

$$L = \frac{ND(P)^{1/2}}{7400}$$

where:

L = Allowable leakage, in gallons per hour.
N = Number of joints in tested line.
D = Nominal diameter of pipe, in inches.

P = Average test pressure during leakage test, in pounds per square inch.

3.10 CLEANING AND DISINFECTION

A. Pipelines shall be kept clean during installation. Following assembly and testing, and prior to disinfection and final acceptance, flush pipelines with water at 2.5 fps minimum flushing velocity until foreign matter is removed.

B. Water shall be obtained from a potable, City source and shall be metered. The City shall be notified at least 2 working days prior to the intended use such that the meter can be installed. The CONTRACTOR shall pay the City for all water used. Water cost shall be incidental to the related pipeline installation work items.

C. Flushing shall be accomplished by partially opening and closing valves several times under expected line pressures with velocities adequate to remove foreign materials from the pipe, valves, and hydrants.

D. If impractical to flush large diameter pipe at 2.5 fps, clean pipe by use of pipe pig as approved by ENGINEER. Multiple passes of pipe pig may be required to adequately clean line.

E. Remove accumulated debris through blowoffs 2 inches and larger or by removing spools and valves from piping. If hydrants are used, they must be adequately flushed and cleaned prior to being put into service.

F. Disinfection of Water Mains: As specified in Section 02519 DISINFECTION OF WATER SYSTEMS.

3.11 ABANDONMENT OF WATER MAINS

A. Water mains, 8 inches and less, being replaced shall be abandoned in-place.

B. When new mains have been tested, approved, and services relocated, cut, cap, and restrain any connections to remaining pressurized mains.

3.12 REPAIR OF DAMAGED PIPING

A. All existing piping damaged by the CONTRACTOR as a result of construction activities shall be repaired by the CONTRACTOR.

1. The Utilities Department shall be notified of all water main and force main damage and for all control valve operation.
2. Damage to unmarked mains shall be considered additional work or will be repaired by the OWNER.
3. Damage to marked mains shall be repaired at no additional cost to the OWNER.

B. Cleaning and disinfection of water main repairs shall be in accordance with the provisions of Section 02519 DISINFECTION OF WATER SYSTEMS.

C. If the OWNER is required to make repairs for damaged mains that are the responsibility of the CONTRACTOR, the cost of the work will be charged to the CONTRACTOR.

END OF SECTION

SECTION 02502
DUCTILE IRON PIPE AND FITTINGS

PART 1 GENERAL

1.1 SUBMITTALS

A. Quality Control Submittals:

1. Manufacturer's Certificate of Compliance, in accordance with Section 01640 MANUFACTURERS' SERVICES, stating that inspections and specified tests have been made and that results thereby comply with requirements of Article SOURCE QUALITY CONTROL.
2. Field Hydrostatic Testing Plan: Submit at least 15 days prior to testing and at minimum, include the following:
   a. Testing dates.
   b. Piping systems and section(s) to be tested.
   c. Method of isolation.
   d. Method of conveying water from source to system being tested.
   e. Calculation of maximum allowable leakage for piping section(s) to be tested.
3. Certifications of Calibration: Approved testing laboratory certificate if pressure gauge for hydrostatic test has been previously used. If pressure gauge is new, no certificate is required.
4. Test documentation form and results.

PART 2 PRODUCTS

2.1 MATERIALS

A. Pipe:

1. General:
   a. Centrifugally cast, grade 60-42-10 iron, minimum 350 psi working pressure for pipes 12 inches and less, minimum 250 psi working pressure for pipes 14 inches and greater.
   b. Meet requirements of AWWA C151, C110, C153, and C111.
   c. Lined and coated as specified.
2. Pressure rating of pipe to be specified according to the particular requirements of the Project.
3. Pipe wall thickness of threaded pipe for a flanged pipe end shall be minimum special thickness Class 53 from 4-inch to 54-inch and/or minimum pressure Class 350 for 60-inch to 64-inch diameter pipe in accordance with AWWA C115.
4. Grooved end pipe, for all pipe diameters, shall be minimum Special Class 53.
5. Pipe shall be new and recently manufactured. Refurbished pipe shall not be provided.

B. Joints:

1. Push-On Joint: Rated at minimum working pressure equal to pipe material design.
2. Restrained Joint:
   a. Manufactured proprietary joint that mechanically restrains pipe to adjoining pipe.
   b. Manufacturers and Products:
      1) U.S. Pipe; TR Flex, Restrained Tyton, and Field-Lok.
      2) American Cast Iron Pipe; Flex-Ring, Lok-Ring, and Fast-Grip.
      3) One bolt fittings as manufactured by One Bolt, Inc., for restrained fittings 12 inches in diameter and less.
   c. Use of restraining gaskets for planned joint restraint is restricted to pipes 12 inches in diameter or less.
3. Mechanical Wedge Action Type Joint: Use only in areas where adjoining to fixed points where laying length is determined in field. Prior to purchase and installation, type and application of this joint shall be approved by ENGINEER. Use of mechanical joint restraint or field-restraining type gaskets in excess of 12 inches shall not be allowed, unless an unexpected field condition requires cutting the pipe and installation of a field applied restraint. Use of set screws to provide restraint of any kind is not permitted.
   a. Manufacturers and Products:
      1) Meg-a-lug, as manufactured by EBBA Iron.
      2) Stargrip, as manufactured by Star Pipe Products.
      3) Grip-ring, as manufactured by Romac.
4. Flanged Joint: Threaded 250 psi working pressure ductile iron flanges conforming to AWWA C115.
5. Grooved Joint:
   a. Rigid and/or Flexible type radius cut grooved, conforming to AWWA C606, depending on the particular application.
   b. As manufactured by Victaulic Company of America.

C. Fittings:

1. Ductile Iron, Push-On, Flanged or Restrained Joint: In accordance with AWWA C110 or C153; 350 psi minimum working pressure for 4- to 24-inch fittings and 250 psi minimum working pressure for 24- to 64-inch fittings and AWWA C111.
2. Mechanical Joint Fittings: In accordance with AWWA C111.
3. Grooved End Fittings:
   a. Radius cut grooved, rigid and/or flexible type conforming to AWWA C110 and/or AWWA C153 as above.
   b. Manufacturers:
      1) Victaulic Company of America.
      2) Gustin-Bacon.
4. Fittings shall be new and recently manufactured. Refurbished fittings will not be accepted.

D. Welded Outlet: Only weld to pipe in manufacturer's shop – may be used in lieu of a tee where economical and where subject to manufacturer's limitations.

E. Lining:

1. Pipe and fittings for clean water applications shall be cement lined and asphaltic seal coated in accordance with AWWA C104.
2. Pipe and fittings for wastewater applications shall be lined with 40-mils Protecto 401 ceramic epoxy, or equivalent.

F. Coating:

1. Buried Pipe: Asphaltic coating, 1 mil thick, in accordance with AWWA C151, C115, C110, and C153.
2. Exposed Pipe: Coal-tar epoxy, 2 coats, 16 mils thick, primed in accordance with the manufacturers recommendations and surface prepared to SP 5-91 (SSPC standards).

G. Polyethylene Encasement:

1. All buried ductile iron pipe and fittings shall be encased, unless otherwise indicated.
2. Virgin polyethylene raw material conforming to requirements of ASTM D4976.
3. Elongation: 800 percent, minimum in machine and transverse direction (ASTM D882).
4. Tensile Strength: 3,600 psi, minimum.
5. Dielectric Strength: 800V/mil-thickness, minimum.
6. Propagation Tear Resistance: 2,550 gf, minimum in machine and transverse direction (ASTM 1922).
7. Tube form, conforming to AWWA C105.
8. Film shall have minimum in thickness of 0.008 in (8 mil).

H. Bolting:

1. Bolts for flanged connections shall be carbon steel, ASTM A307, Grade A hex bolts and ASTM A563, Grade A hex head nuts.
2. Bolts for grooved end connections shall be manufacturer's standard.

I. Gaskets:

1. Gaskets for flat faced 150 and 250 psi working pressure flanges shall be 1/8-inch thick, red rubber (SBR), hardness 80 (Shore A), rated to 200 degrees F, conforming to ANSI B16.21, AWWA C207, and ASTM D1330, Grades 1 and 2.
2. Gaskets for grooved end joints shall be Halogenated butyl, conforming to ASTM D2000 and AWWA C606.
3. Tor-seal or equal gaskets shall be used for exposed flanged joints.

J. Pressure Test Gauges:

1. Heavy duty industrial quality gauges.
2. Oil-filled.

2.2 SOURCE QUALITY CONTROL

A. Factory Tests: In accordance with AWWA C104, C105, C110, C111, C115, C150, C151, C153, or C606, as required by the particular Project application.

PART 3 EXECUTION

3.1 EXAMINATION

A. Inspect pipe and fittings to ensure no cracked, broken, or otherwise defective materials are being used.

3.2 INSTALLATION

A. In accordance with AWWA C605, ASTM D2321, and AWWA Manual 23, Section 02500 CONVEYANCE PIPING – GENERAL, and Section 02320 TRENCH BACKFILL.

B. Field Welding:

1. Use of field welded outlets will not be allowed. Welding for outlets shall be performed only in pipe manufacturer's shop.
2. Field installed outlets may be installed with saddle approved by ENGINEER. Opening in pipe shall be machined cut and not with cutting torch.
3. Field welding of bars for restrained joint systems will not be allowed. All welding shall be performed in pipe manufacturer's shop.

C. Polyethylene Encasement:

1. Encase pipe, fittings, and valves where specified in accordance with AWWA C105, Method A.
2. Cut polyethylene tube approximately 2 feet longer than pipe length.
3. Slip tube around pipe, centering to provide 1-foot overlap on each adjacent section.
4. Pull encasement to take out slack and wrap snug around pipe.
5. Secure overlap in place and fold at quarter points of pipe length.
6. Wrap and tape encasement snug around fittings and valves.

3.3 TESTING AND INSPECTION

A. In accordance with the provisions of Section 02500 CONVEYANCE PIPING-GENERAL.

END OF SECTION

SECTION 02509
POLYVINYL CHLORIDE (PVC) PRESSURE PIPE AND FITTINGS

PART 1 GENERAL

1.1 DELIVERY, STORAGE, AND HANDLING

A. Solvent Cement: Store in accordance with ASTM D2855.

PART 2 PRODUCTS

2.1 MATERIALS

A. Pipe:

1. All PVC pressure pipe shall be C-900, minimum SDR-18 with a minimum pressure rating of 150 psi, conforming to requirements of AWWA C900 and AWWA C905.
2. Dimension Ratio (DR) shall be in accordance with the particular application and as shown on Drawings.
3. Pipe to be used for potable water conveyance shall be manufactured from National Sanitation Foundation (NSF) approved compounds.
4. Pipe to be used for force mains shall be the color green, and pipes to be used for water mains shall be the color blue.
5. All PVC pipe shall have a No. 6, single strand, copper wire placed on top of the pipe. The wire shall be electrically continuous over the length of the pipe and fastened every 10 feet with a No.12 copper wire.

B. Joints:

1. Rubber gasketed.
2. Conform to AWWA C900, AWWA C905, and ASTM D3139.

C. Fittings: PVC, as recommended by pipe manufacturer.

D. Service Saddles:

1. Double strap type with minimum strap width of 2 inches.
2. Straps shall be Type 304 stainless steel. Saddles shall be ductile iron, epoxy-coated, 10 mils minimum thickness.

E. Restrained Joints: Pipe restraint, where indicated on Drawings, shall be provided by system using wedges or gripping teeth. System shall be specifically recommended for use on PVC pipe. Systems with set screws shall not be used.

1. Manufacturer and Products:
   a. EBBA Meg-a lug.
   b. Romac Grip-Ring.
   c. Certainteed style restrained joints where available for size of pipe.
   d. Solvent welded joints as appropriate and as shown on the Drawings.
   e. Or approved equal.

PART 3 EXECUTION

3.1 INSTALLATION

A. In accordance with AWWA C605, ASTM D2321, and AWWA Manual 23, the Uni-Bell Plastic Pipe Association PVC Pipe Manual, Section 02500 CONVEYANCE PIPING – GENERAL, and Section 02320 TRENCH BACKFILL.

B. Solvent cement used for joints as recommended by pipe manufacturer.

C. Joints:

1. Rubber Gasketed: In accordance with manufacturer's written instructions.
2. Solvent Cemented: In accordance with ASTM D2855.
3. Restrained Joint Systems: In accordance with manufacturer's written instructions.

D. Pipe Bending for Horizontal or Vertical Curves:

1. Radius of curves shall not exceed 75 percent of manufacturer's recommended values.
2. Use blocks or braces at pipe joints to ensure axial deflection in gasketed or mechanical joints does not exceed allowable deflection.

E. Maximum Joint Deflection: 75 percent of manufacturer's recommended values.

3.2 INSPECTION AND HYDROSTATIC TESTING

A. In accordance with the provisions of Section 2500 CONVEYANCE PIPING - GENERAL.

END OF SECTION

SECTION 02518
WATER SERVICE CONNECTIONS

PART 1 GENERAL

1.01 REFERENCES

A. The following is a list of standards which may be referenced in this Section:

1. American Society for Testing and Materials (ASTM):
   a. A120, Pipe, Steel, Black and Hot-Dipped Zinc-Coated (Galvanized) Welded and Seamless for Ordinary Uses.
   b. B32, Standard Specification for Solder Metal.
   c. B88, Standard Specification for Seamless Copper Water Tube.
   d. D3350, Standard Specification for Polyethylene Plastics Pipe and Fittings Material.
2. Federal Specification (FS):
   a. WW-P-406, Pipe, Steel (Seamless and Welded For Ordinary Use).
   b. WW-V-54D, Valve, Gauge, Bronze (125, 150, and 200 Pounds, Screwed Flanged, Soldered End, for Land Use).
3. American Water Works Association (AWWA): C800, Underground Service Line Valves and Fittings.

PART 2 PRODUCTS

2.01 SERVICE CONNECTION

A. Furnish components same size as nominal designation of service pipe. For example, a 2-inch connection may consist of, but may not be limited to:

1. Two-inch corporation stop.
2. Two-inch angle valve.
3. Two-inch tees, bends, and adapters.
4. Two-inch ball valve.
5. Two-inch meter couplings.

B. Single and double service connections shall be 1-½ inch diameter tubing, reducing to 1 inch at the meter stop. Larger diameters shall be as shown on the Drawings. Unless shown on the Drawings, all meter stops shall be 1 inch with outlet size based on meter size.

C. All fittings and components to be provided with Mueller 110 compression joint, Ford Quick joint, or approved equal.

2.02 SERVICE SADDLES

Mainline Material	Characteristics	Manufacturer
DI or PVC Pressure Pipe	Double-strap; Mueller tap; neoprene gaskets; double stainless steel straps, epoxy coated	Ford Type FC-202; or equal specific to mainline material

2.03 CORPORATION STOPS

Service Size	Characteristics	Manufacturer & Model
2 inch	Brass AWWA I.P thread at inlet and conductive compression connection for CTS OD tubing including the stainless steel liner Mueller No. 506141	Mueller No. B-25028; or equal
1-½ inch	Brass AWWA I.P thread at inlet and conductive compression connection for CTS OD tubing including the stainless steel liner Mueller No. 506139	Mueller No. B-25028; or equal
1 inch	Brass AWWA I.P thread at inlet and conductive compression connection for CTS OD tubing including the stainless steel liner Mueller No. 504385	Mueller No. B-25028; or equal

2.04 COUPLINGS

Service Size	Characteristics	Manufacturer & Model
All Sizes	Three-part union; copper-to-copper for connecting new copper service pipe to existing copper service pipe; other coupling as required to connect new copper service to existing other-than-copper pipe; compression connection outlet	Mueller or Ford compression connection or equal

2.05 FLEXIBLE COUPLINGS

A. Characteristics: Straight cast couplings.

B. Manufacturer: Smith-Blair; Model No. 441.

2.06 UNIONS

A. Characteristics: Copper-to-copper union.

B. Manufacturers:

1. Mueller Co.; Model H-15400.
2. Hays Manufacturing Co.; Model 5615.

2.07 MISCELLANEOUS FITTINGS

A. Characteristics: Miscellaneous fittings, reducers, and adapters all with Mueller No. 110 compression connection, Ford Quick Joint; or equal.

B. Manufacturers:

1. Mueller Co.:
   a. H-15381 Service Tee.
   b. H-15343 Y Branch.
   c. H-15526 Quarter Bend.

2. Hays Manufacturing Co.

2.08 ANGLE METER STOPS

Service Size	Characteristics	Manufacturer & Model
2 inch	Ground key angle meter stop, conductive compression for CTS OD tubing, including the stainless steel liner Mueller No. 506141, and Mueller No. 110 compression connection	Mueller No. H-14277; or equal
1-1/2 inch	Ground key angle meter stop, conductive compression for CTS OD tubing, including the stainless steel liner Mueller No. 506139, and Mueller No. 110 compression connection	Mueller No. H-14277; or equal
1 inch	Ground key angle meter stop, conductive compression for CTS OD tubing, including the stainless steel liner Mueller No. 504385, and Mueller No. 110 compression connection	Mueller No. H-14259; or equal

2.09 BALL VALVES

Service Size	Characteristics	Manufacturer & Model
3 inches or less	Bronze body, quarter turn	B-25209 Mueller 300 Ball Curb Valve with 110 compression connection; or equal

2.10 PRESSURE REDUCING VALVES

A. Manufacturer shall be Mueller Co.; Model H-9300, No. 2, 2 inches with strainer, or equal where shown on the Drawings.

2.11 METER BOXES, VAULTS, AND COVERS

Service Size	Characteristics	Manufacturer & Model
All Services	Straight-wall HDPE with cast iron reading lid; 17 inches by 30 inches minimum for 1.5- and 2-inch services 13 inches by 24 inches for all smaller services	Carson Plastic, 1324BCF-12/MC1324-4R and 1730BCF-12/MC1730-5R; Okie Dokie

2.12 METERS

Service Size	Characteristics	Manufacturer & Model
All Services	Meters to be supplied by OWNER	—

2.13 COPPER TUBING

A. Size: 3/4-inch and 1-inch service connections.

B. Characteristics:

1. Type K, soft, seamless.
2. Conform to ASTM B88.
3. Commercially pure wrought copper solder joint fittings.
4. Joints:
   a. 95-5 coreless wire solder.
   b. Conform to ASTM B32, Grade 95 TA.

2.14 POLYETHYLENE PLASTIC PIPE

A. Size: ¾-, 1-, 1-½-, and 2-inch services.

B. Characteristics:

1. Manufactured from ultra-high molecular weight, high density polyethylene 3408.
2. Conforming to ASTM 2737.
3. Working Pressure: 200 psi.
4. Standard dimension ratio of 9.

C. Manufacturer shall be Phillips Products Co.; Driscopipe 5100; or equal.

D. All PE tubing shall have a No. 12-gauge, single-strand, coated, copper wire wrapped around the pipe - or - a No. 6-gauge, single-strand, coated, copper wire on top of the pipe, either option fastened with a No. 12-gauge coated, copper wire every 10 feet.

PART 3 EXECUTION

3.01 GENERAL

A. Install service connections, excluding meters, during or after construction of the main.

B. Install complete service with angle stop installed in the meter box with meter end plugged.

C. Water Meters: Installed by others.

D. Depth of cover over the service pipe shall be minimum 30 inches.

E. No connection shall be made to the main until pressure and bacteriological tests have been conducted and approved by the OWNER.

3.02 CONNECTION TO MAIN

A. Clean exterior of main of dirt and other foreign matter that may impair the quality of the completed connection. Disinfect all fittings in chlorine solution prior to assembly. See Section 02519 DISINFECTION OF WATER MAINS, for disinfection requirements.

B. Place service clamp at desired location.

C. Clamp by tightening alternate nuts progressively.

D. Do not place service clamp within 1 foot of pipe joint, or another clamp.

E. Make taps with adapters for the size main being tapped.

F. All connections to mains shall be made under the direction of the OWNER.

G. All meter service connections shall be bronze from a plug valve. No gate valves shall be used on services 2 inches or less.

H. For Existing Services:

1. Remove and dispose of old meter boxes where directed, fill and restore area to match surroundings. Abandon the old service and properly terminate open ends. The Contractor shall be compensated for removal and replacement of meter boxes under the appropriate Bid items.
2. Where the existing meter and box are to be maintained, connect the new services with appropriate fittings to the existing meter.

I. Test for leaks and flush new piping to remove debris.

3.03 UNDERCROSSING OF HARD SURFACE ROADS

A. Bore or jack undercrossings, except where new water mains and other work is being performed.

B. PE service tubing shall be installed in a Schedule 40 PVC or SDR PE casing under all roadways to a distance of one foot beyond the edge of pavement.

3.04 COPPER TUBING

A. Cut square ends, ream clean, flare, and makeup tightly.

B. Prevent the tube from kinking or buckling on short radius bends. If tube should kink or buckle, cut out kinked or buckled sections and splice with brass fitting.

3.05 POLYETHYLENE PLASTIC PIPE

A. Install in conformance with manufacturer's recommendations.

3.06 METER BOXES

A. Installation:

1. Construct enclosures plumb, and flush with existing ground surface unless shown otherwise.
2. Use standard extension sections to adjust to grade.
3. Meter boxes to be installed in sidewalk or 2-½ feet from the right-of-way line.
4. Place lightly compacted earth backfill inside meter box to depth shown.
5. Backfill around meter vaults as specified in Section 02320, Trench Backfill.
6. Install piping such that the meter can be installed in a horizontal position with dial at required depth below cover.
7. Meters will be installed by the OWNER.
8. Corporation Stops: OPEN position.
9. Angle Stops: CLOSED position.

3.07 TESTING

A. Inspect service connections for leakage under normal system pressure and in conjunction with the testing of new water mains. Joints shall be watertight before acceptance.

B. Test Duration: As specified in Section 02500 CONVEYANCE PIPING - GENERAL.

C. Inspect for leaks and repair before backfilling and final testing.

3.08 DISINFECTION OF SERVICE CONNECTIONS

A. Disinfection of water service connections will be performed in conjunction with the disinfection of the water main in accordance with the provisions of Section 02519 DISINFECTION OF WATER MAINS.

B. Flush new tubing before connecting to existing tubing or meter stop, by opening corporation stop, allowing water to run for 2 minutes.

C. Extra chlorine will be put into the system by Owner during service connection transfers to provide adequate disinfection capacity when above procedures are executed.

END OF SECTION

SECTION 02519
DISINFECTION OF WATER SYSTEMS

PART 1 GENERAL

1.01 GENERAL

A. All work under this Section to be done in the presence of the OWNER's Representatives.

B. Existing valves and connections to the water system are to be operated by the OWNER's staff only.

PART 2 PRODUCTS

2.01 WATER FOR DISINFECTION AND TESTING

A. Clean, uncontaminated, and potable.

B. OWNER will supply potable quality water. CONTRACTOR shall convey water in disinfected pipelines or containers.

2.02 CONTRACTOR'S EQUIPMENT

A. Furnish chemicals and equipment, such as pumps and hoses, to accomplish disinfection.

B. Provide protection as required by AWWA Standards C651, C652, C653, and/or C654 against cross-connections.

PART 3 EXECUTION

3.01 GENERAL

A. Disinfection procedures shall conform to AWWA Standards C651, C652, C653, and/or C654 and this Specification.

B. Disinfect the following items installed or modified under this Project, intended to hold, transport, or otherwise contact potable water:

1. Pumps.
2. Tanks.
3. Wells.
4. Filters.
5. Pipelines: Disinfect new pipelines that connect to existing pipelines up to point of connection.
6. Disinfect surfaces of materials that will contact finished water, both during and following construction, using one of the methods described in AWWA C652 and C653. Disinfect prior to contact with finished water. Take care to avoid recontamination following disinfection.

C. Prior to application of disinfectants, clean pump, tank, filters, wellhead works and pipelines of loose and suspended material. Flush pipelines until clear of suspended solids and color. Use water suitable for flushing and disinfecting.

D. Conform to AWWA C651 for pipes and pipelines, C652 for tanks and reservoirs, C653 for water treatment plants and filters, and C654 for wells, except as modified in these Specifications. AWWA Specification requirements will be made available to the CONTRACTOR upon request.

E. Allow freshwater and disinfectant solution to flow into pipe or vessel at a measured rate so that chlorine-water solution is at specified strength. Do not place concentrated commercial disinfectant in pipeline or other facilities to be disinfected before it is filled with water.

3.02 SEQUENCING AND SCHEDULING

A. Commence Initial Disinfection After Completion of Following:

1. Installation of water services, valves, and hydrant leads.
2. Completion and acceptance of internal painting of system(s).
3. Hydrostatic and pneumatic testing, pressure testing, functional and performance testing and acceptance of pipelines, pumping systems, structures, and equipment.
4. Disinfection of:
   a. Pumps and associated system piping.
   b. Treatment plant basins and processes used to supply water to system.

B. Provide 48 hours notice to OWNER's Representative for scheduling of valve operation, sampling, or laboratory testing.

3.03 PIPING AND PIPELINES

A. Flushing:

1. Before disinfecting, flush and/or pig as required all foreign matter from pipe in accordance with AWWA C651. Provide hoses, temporary pipes, ditches, and other conduits as needed to dispose of flushing water without damage to adjacent properties.
2. Flush service connections and hydrants. Flush distribution lines prior to flushing hydrants and service connections.
3. Flush pipe through flushing branches and remove branches after flushing is completed.
4. Operate new valves during flushing process at least twice during each flush.

B. Disinfecting Procedure: In accordance with AWWA C651. The piping and appurtenances shall be sterilized by introducing the sterilizing agent into the water which is being pumped into the system in such a manner that the entire system involved will be filled with water containing a minimum chlorine concentration of 50 ppm at any point. The water shall be allowed to remain in the system for a minimum contact period of 24 hours before the system is flushed out.

C. Pipelines larger than 36 inches in diameter may be disinfected by spraying in accordance with the method described in AWWA C652.

D. Sampling Points: Provide sampling points on all water mains at the end of each water main and at a maximum spacing of 1,200 feet.

E. Water mains can be put into service when the chlorine concentration is less than 0.1 ppm free chlorine and 3.0 ppm total chlorine.

3.04 DAMAGED WATER MAINS

A. All pipe and fittings used to repair a damaged water main or service shall be swabbed or sprayed with hypochlorite as specified above.

1. Hypochlorite concentration shall range from 4 to 12 percent.
2. Hypochlorite solution must remain in contact with all pipe and fittings for a minimum of 10 minutes.

3.05 PUMPS

A. Disinfecting Solutions: Minimum free chlorine concentration of 100 ppm.

B. Application:

1. Inject disinfecting solution into pump and associated piping and circulate for a minimum 3 hour period of time. At end of 3 hour period, solution shall have a strength of at least 50 ppm free chlorine.
2. Operate valves and pump appurtenances during disinfection to ensure that disinfecting solution is dispersed into all parts of pump and lines.
3. If disinfecting solution contained in pump has a residual free chlorine concentration less than 50 ppm after the 3 hour retention period, reclean pump, reapply disinfecting solution, and retest until a satisfactory test result is obtained.
4. After chlorination, flush water from pump until water through the unit is chemically and bacteriologically equal to permanent source of supply.

3.06 TANKS AND RESERVOIRS

A. Cleaning:

1. Clean interior surfaces using water under pressure before sterilizing. Isolate tank and/or reservoir from system to prevent contaminating materials from entering the distribution system. Cleaning shall:
   a. Remove all deposits of foreign nature.
   b. Remove all biological growths.
   c. Clean the slopes, walls, top, and bottom.
   d. Avoid damage to the structure.
   e. Avoid pollution or oil deposits by workers and equipment.
2. Dispose of water used in cleaning in accordance with applicable regulations before adding disinfecting solution to tank and/or reservoir.

B. Disinfecting Procedure: In accordance with AWWA C652, unless herein modified. Parts of structures, such as ceilings or overflows that cannot be immersed, shall be spray or brush disinfected.

3.07 FILTERS

A. Prior to disinfection, remove foreign material from filtration structures. Clean using fire hoses and tools suitable for adequate scrubbing and cleaning. Pump or drain scrub water from structures.

B. Disinfection Procedure: In accordance with AWWA C653, unless herein modified.

C. Disinfect the Following Components:

1. Influent pipes and channels.
2. Filter structure.
3. Filter media and underdrains.
4. Filter effluent pumping.
5. Backwash supply piping.
6. Finished water piping.
7. Potable water piping.

D. Clean other new facilities designed to hold or transport process water prior to disinfection of filter system including:

1. Raw water piping.
2. Flocculation and sedimentation basins.

3.08 WELLS

A. Disinfection Procedures: In accordance with AWWA C654, unless herein modified.

1. After well has been completed and tested, it shall be cleaned of all foreign substances. Swab the inner lining using alkalis, if necessary, to remove oil, grease, or other extraneous matter.
2. Use chlorine solution of a volume and strength so that a concentration of at least 50 ppm of free chlorine is contained in well.
3. Chlorine solution shall be poured into well and well surged for at least 5 minutes. After 4 hours, well shall be pumped or bailed until chlorine concentration is less than 5 ppm.
4. Tack weld capping plate to casing after well has been disinfected and pumped out.
5. Take care to prevent the entrance into well of dirt or other contamination while installing pump.
6. Before being placed into the well thoroughly wash pump bowl, column, and air line, first with clear water and then with chlorinated solution in accordance with AWWA C654.
7. Chlorinate well in accordance with AWWA C654 and applicable State standards. In case of a discrepancy between AWWA and State standard, the strictest requirement shall apply.

3.09 DISPOSAL OF HEAVILY CHLORINATED WATER

A. Do not allow flow into a waterway without neutralizing disinfectant residual.

B. See the appendix of AWWA C651, C652, C653, and/or C654 for acceptable neutralization methods.

3.10 TESTING

A. After tanks, reservoirs, filters, pumps, channels, and pipelines have been cleaned, disinfected, and refilled with potable water, OWNER will take water samples and have them analyzed for conformance to bacterial limitations for public drinking water supplies.

B. Sampling and testing shall be in accordance with AWWA C-651 and FAC 62-555.340. Any main installed, tested and put into service shall pass all required testing as a single unit. If any single sampling point on the main fails, all testing shall be repeated (at no additional cost) until all sampling points pass.

C. Bacteriological samples must be collected on two consecutive days. The CONTRACTOR will coordinate and provide a means of sampling for City personnel to collect the samples. Samples will be analyzed by the City's laboratory. Failure to provide adequate notice and any subsequent delay in sampling will not be considered grounds for project delay.

D. If minimum samples required above are bacterially positive, disinfecting procedures and bacteriological testing shall be repeated until bacterial limits are met at no additional cost.

END OF SECTION

SECTION 02560
INTERLOCKING CONCRETE PAVERS

PART 1 GENERAL

1.01 LISTING OF PAVER MANUFACTURERS & INSTALLERS

A. The proposer shall list the Paver manufacturer and the paver installation sub-contractor (if used) at the pre-construction conference. No Substitutions will be allowed without approval of the City .

1.02 REFERENCES

A. American Society of testing Materials (ASTM):

1. C 33-90 Specification for concrete aggregates
2. C 136-84a Method for sieve analysis for fine and coarse aggregate
3. C 140-94 Method of sampling and testing concrete masonry units
4. C 144-89 Standard specification for aggregate for masonry mortar
5. C 418-90 Standard method for abrasion resistance of concrete by sandblasting
6. C 936-88 Specification for solid interlocking paver.
7. C 979-86 Specification for pigments for integrally colored concrete

1.03 QUALITY ASSURANCE

A. Paver Manufacturer shall supply the project City with:

1. Evidence of membership in the Interlocking Concrete Pavement Institute (ICPI) and manufacturing to ICPI Standards.
2. Type, name and age of manufacturing equipment, location and production capacity capable of supplying Miami location.
3. Evidence of Pavers are to be manufactured on single pallet type machine that meet ICPI Standards for interlockin9 paver manufacturing.

B. At the “pre-construction conference", the installation ~ contractor shall supply the City with:

1. A photocopy of the current valid Dade County Certificate of Competency for one or more of the following for installation of pavers:

   a. State of Florida General Contractor registered with Dade County in category 04.
   b. General engineering category 01. c. Paving Contractor category 07.
   d. Concrete Work category 08.
   e. Building Unit Masonry category TJ

2. Evidence of paver installation jobs of a similar nature. A list of completed projects with project names, addresses, phone numbers, names of City s, owners, and dates of construction shall be provided.

3. Evidence of membership in the Interlocking Concrete Pavement Institute (ICPI)

1.04 SUBMITTALS: The following shall be submitted to the City for approval:

A. Manufacturer's printed product literature for the following:

1. Concrete pavers
2. Sealers
3. Geotextile

B. Full-size samples of concrete paving unit to indicate color and shape selections. There shall be three (3) custom colors of pavers to be selected and a minimum of two (2) shapes to be selected by the City .

C. Results of sieve analysis of bedding and joint sand to be used on the job prior to delivery to the jobsite.

D. Results of bedding sand degradation tests on sand to be used on the job prior to delivery to the jobsite.

E. Test results from an independent testing laboratory for compliance of paving unit requirements with ASTM C 936 prior to the initial Delivery of pavers to jobsite and for every 40,000 square feet manufactured for this project.

F. Compaction test results for soil sub grade and base materials per Florida DOT requirements.

1.05 MOCK-UPS

A. Install a 10' x 10' min. size mock-up sample paver area of described in Section 3.03 of these Technical Special Provisions. This area will be used to determine surcharge of the bedding sand layer, joint, sizes, laying pattern(s) (venetian symmetry and symmetry squares), Color TBD by City , and texture of the job. After approval, this area shall be the standard from which the work shall be judged. The design pattern for the mock-ups will be designated by the City .

1. Locate mock-ups on project site at a location and a final size as directed by City .
2. Notify City in advance of dates when mock-up(s) will be erected.
3. Obtain City 's acceptance of Mock-up before start of job.
4. Retain and maintain mock-up(s) during construction in undisturbed condition as a standard for judging work.
5. Accepted mock-up(s) in undisturbed condition at time of substantial completion may become part of completed unit of work.

1.06 DELIVERY, STORAGE AND HANDLING

A. Deliver concrete pavers to project site in steel-banded, plastic-banded, or plastic-wrapped cubes capable of transfer by forklift or clamp lift. Unload pavers at project

site without damage to pavers or existing construction.

B. Protect unit pavers from damage during delivery, storage and construction.

C. Sand shall be covered with waterproof covering to prevent exposure to rainfall or removal by wind. covering shall be secured in place.

1.07 Environmental Conditions

A. Do not install sand or pavers during heavy rainfall.

PART 2 PRODUCTS

2.01 CONCRETE PAVERS

A. Manufactured by a member of Interlocking Concrete Pavement Institute (ICPI)

B. The concrete unit pavers indicated in this Technical Special Provision are based on product manufactured by Paver Module Co., 1590 North Andrews Avenue Ext., Pompano Beach, FL 33069, (Tel. 1-800-273-7084). Similar concrete unit pavers manufactured by a member of the ICPI to the same ICPI standards or higher unit will be acceptable, subject to the requirements herein.

C. All concrete pavers shall have integral spacer bars or 1/16" min. mechanical spacers to allow joint sand to fill and lock paver joints.

D. All pavers shall be manufactured with integral iron oxide pigment integrally colored and mixed throughout each unit. Iron oxide pigment in pavers shall conform to ASTM C 979. The color of the Paver units shall conform to the colors and color intensity selected and approved by the City .

E. Face Color: To achieve a stronger color and eliminate the large aggregate discolorations, use a face mix of pigment, cement, and sand for the top surface.

F. Use 2-3/8 inches thick "Uni-Stone" or "Uni-Stone II" in sidewalk area and use 3-1/8 inches thick "Uni-Anchorlock" units in areas subject to vehicular traffic or use approved equals concrete unit pavers of similar size.

G. Concrete pavers shall conform to all requirement of ASTM C 936-88.

1. Minimum average Compressive strength 8000 PSI (55 MPA) per C 140. Sample and test three pavers prior to delivery to the jobsite and every 40,000 square feet manufactured.
2. Maximum average absorption: Five percent per ASTM C 140. Sample and test three pavers prior to delivery to the jobsite and for every 40,000 square feet.
3. Maximum abrasion loss: 0.915 cubic inches per 7.75 square inches (15 cubic centimeters per 50 square centimeters), per ASTM C 418. Sample and test eight (8) paver$ of each color prior to delivery of pavers to the jobsite.

H. Aggregate

1. Lime rock aggregate used in the manufacture of pavers shall conform to ASTM C 33-90.

2. As an alternate, aggregate used in the manufacture of pavers shall conform to ASTM C 33-90 and shall he of a color that will minimize color contrast when the paver surface wears.

2.02 BEDDING AND JOINT SAND

A. Gradation of bedding sand shall be per ASTM C 33 as shown in table 1 below and joint sand per ASTM C 144 as shown in table 2 below:

TABLE 1
Grading requirements for bedding sand:

SIEVE SIZE	PERCENT PASSING
3/8 in. (9.Smm)	100
No.4 (4.75 mm)	95 to 100
No.8 (2.36 mm}	90 to 100
No.16 (1.18 mm)	50 to 95
No.30 (600 urn)	25 to 60
No. 50 (300 urn)	10 to 30
No. 100 (150 mm)	2 to 10

TABLE 2
Grading requirements for joint sand:

NATURAL SAND OR MANUFACTERED SAND, SIEVE SIZE, AND PERCENT PASSING.

SIEVE SIZE	PERCENT PASSING	
No.4 (4.75mm)	100	
No.8 (2.36mm)	95 to 100	
No.16 (1.18mm)	70 to 100	70 to 100
No.30 (600um)	40 to 75	40 to 75
No. 50 (300um)	10 to 35	20 to 40
No. 100 (150um)	2 to 15	20 to 25
No.200 (7Sum)	0	0 to 10

B. Bedding sand shall be naturally occurring hard silica sand. Grading shall not vary from the high limit on one sieve to the low limit on the next larger sieve. Do not use manufactured and or sand made from crushed aggregate.

C. Bedding sand shall pass the following degradation test when placed under pavers subject to vehicular traffic. Sample bedding sand every 15,000 sq. ft. (1,500 square meters) of vehicular pavement area and provide results to City . Obtain 3 lb. (1.3kg) sand sample and dry for 24 hours at 240-250 degrees F. Obtain three sub- samples

each weighing 0.5 lbs. (0.2kg) by passing the main sample several times through a riffle box. carry out a sieve analysis test on each sub-sample according to ASTM C 136. Remix each sub-sample and place in a nominal quart/liter capacity porcelain jar with two - 1/2 inch (13mm) dia. steel ball bearing each weighing 75 grams. Rotate each jar at 50 rpm for six hours.

D. Repeat the sieve analysis. Record the individual and average sieve analysis. The sand shall be deemed to comply with thi8 test if the maximum average increase in the percentages passing each-sieve and the maximum individual percent passing shall be:

SIEVE	SIZE	MAX .INCRBASE	MAX .PASSING
No.200	(75mm)	2%	2%
No. 100	(l50mm)	5%	15%
No.50	(300um)	5%	35%

2.03 GEOTEXTILE (AS REQUIRED)

A. Geotextile for use under the bedding sand At curbs and other edge restraints shall be "Mirafi 500X" as manufactured by Mirafi, P.O. Box 240967, Charlotte, NC 28224, Phone (800)234-0484 or "Trevira Spunbond" manufactured by Hoechst Celanese Corp., Spartanburq, SC, Phone (800)945-7597, or approved equal.

2.04 SEALERS

A. Sealers "Paver Seal-SB" as manufactured by Addiment, Inc., 6555 Button Gwinnet Drive, Doraville, GA Phone (404)446- 6250, or "Euco-Guard 5-40" as manufactured by the Euclid Chemical Co., 19218 Redwood Road, Cleveland, OH 44110, Phone (216)531-9222 or approved equal.

2.05 ADHESIVES

A. Adhesive to bond concrete paver units to recessed (submerged) concrete curbing (headers, bands, etc.) shall be "Paver Bond- Powerseal Adhesive" Manufactured by Surebond Inc., 500. Reminqton Road, Schaumburq, 1160173, Phone (708)843-1819 or "Sikaflex llFC" Elastomeric Adhe8ive manufactured by Sika, 3778 La Vista Road, Suite 300, Tucker, GA 30094, Phone (404)315-0337 or approved equal.

2.06 EDGE RESTRAI1ITS

A. Restraints for sidewalks:
   1. New or existing curb and gutter or submerged concrete curb/collars shall be as indicated on the plans.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine areas to receive unit pavers for compliance with required dimensional and installation tolerances. Verify that all surfaces to receive pavers are in proper condition, and that no condition exist which may adversely affect progress or quality

of work.

1. Concrete paver installation contractor shall be present at time of inspection.
2. Verify that asphalt and aggregate base5 are dry and ready to support geotexti1e, bedding material, pavers and imposed loads.
3. Verify base grades and elevations.
4. Verify location, type, installation and elevations of adjacent edge restraints.
5. Start of paver installation Ihal1 constitute acceptance and approval by paver contractor of the area to receive pavers.
6. The concrete paver layouts shall be strictly in accordance with the designs in the drawings. Any deviations or changes in the layouts shall be approved by the City prior to installation. Non-conforming work shall be removed and re- installed as directed by the City .

3.02 GEOTEXTILE

A. Place Geotextile accordin9 to location and overlap shown on drawings. Minimum overlap shall be six inches (150mm).

3.03 BEDDING SAND AND CONCRETE PAVERS

A. Place sand for setting bed and screed to thickness of one inch (25mm), not exceeding 1.5" (40nun). Do not disturb the screeded bedding sand to fill depressions in the base surface.

B. Do not use concrete pavers with excessive chips, cracks, voids, stains, or other defects that might be visible in the finished work. Defective concrete pavers shall be replaced with new units.

C. Use full units without cutting where possible. All cut pavers used shall have at least one-third (1/3) of original area remaining.

D. Ensure that pavers are free of foreign materials before installation.

E. Lay sodding sand so that elevation of top surface of pavers shall be 1/8 inch (3mm) min. to 1/4 inch (6 mm) max. above adjacent drainage inlets, concrete collars, channels or other pavements after compaction.

F. Place pavers hand tight against spacer bars. Use string lines to keep straight lines. Select units from three or more cubes to blend color and texture variations. Fill gaps at edge restraints that Exceed 3/8 inch (l0 mm) with pieces cut to fit from full size unit payers.

G. Cut vertical faces on unit pavers with motor-driven masonry saw to provide clean, sharp, unchipped edges. Hammer cutting or cutting with a splitter is not acceptable. No cut segments shall be smaller than one- third of a unit in traffic area6.

H. Vibrate pavers and compact bedding sand with a low amplitude (75-90 HZ) plate compactor capable of at least 5,000 pound (22kn) compaction force. Do not vibrate

I. Spread dry joint sand and fill joints immediately after vibrating an area of pavers into bedding sand. Brush and vibrate sand into joints by sweeping and with a plate compactor until they are completely filled. Remove surplus sand.

J. All work within 3 feet (lm) of the laying face shall have sand-filled joints and be fully compacted at the end of each day. Cover any unfinished edges within 3 feet (lm) of the laying face with plastic sheets so that the bedding sand does not get saturated from rainfall.

K. The final surface elevation for the pavers sha11 not deviate more than 1/4 inch (6mm) under a 10 feet (3m) straight edge.

L. On completion of the initial vibration and joint filling with sand, the entire area subject to vehicular traffic shall be static rolled with an 8-10 ton pneumatic rubber-tired roller having tire pressure of 90 lbs/sq. in. (620 kpa/sq. meter).

M. Bond concrete paver units to recessed or submerged concrete curbing with specified adhesive in accordance with manufacturer’s requirements. Any loose pavers shall be cleaned and re-bonded.

3.04 SEALER APPLICATION

A. Wash or sweep clean the surface of the pavers prior to applying the sealer. If the surface is washed, be sure it is dried before applying the sealer. Apply a liquid urethane joint sand stabilizer directly from the container and spread evenly on the paving by brush or squeegee. Washing or sweeping the surface sealer shall not be applied from previously opened containers. The sealer shall be worked into the joints to ensure maximum penetration. Surplus sealer on the surface shall be moved by squeegee to an unsealed area. Remove excess sealer by squeegee. Do not allow any sealer into catch basins.

B. Follow manufacturer's recommendation on application rate and cure time. Apply one coat only.

C. Permit no traffic on the pavement until sealer is dry.

END OF SECTION

SECTION 02575
SURFACE RESTORATION

PART 1 GENERAL

1.1 STANDARD SPECIFICATIONS

A. When referenced in this Section, shall mean Florida Department of Transportation, Standard Specifications for Road and Bridge Construction, current edition.

1.2 INTENT

A. Specific surface restoration requirements are detailed in this and other sections.

B. For pipeline projects, the intent of these Specifications and the criteria of Section 01025 MEASUREMENT AND PAYMENT, is that the roadway, adjacent right-of-way, and properties affected by construction activity shall be returned to their pre-existing condition, unless otherwise indicated by these Contract Documents.

1. For pipelines constructed in the right-of-way behind the sidewalk and edge of pavement, the ground surface will be graded per the Drawings and stabilized with sod.
   a. Argentine Bahia sod will be used for areas without irrigation systems, except where St. Augustine turf existed previously.
   b. St. Augustine “Floritam” sod will be used for areas with irrigation systems and in locations with similar, existing turf.
2. Driveways and sidewalks will be replaced in kind, using similar materials of construction.
3. Trees, shrubs, and personal property (e.g. mail boxes, fences) located in the construction area shall be relocated or replaced in kind, in accordance with the provisions of these Specifications.

C. For work areas disturbed by the CONTRACTOR for convenience, the area affected shall be restored in kind.

1. The costs of this restoration shall be incidental to the cost of the Work.
2. Restoration costs outside the limits of work shall be at the CONTRACTOR’s sole expense.

1.3 WORK INCLUDED

A. This Section covers the Work necessary to replace all pavement, curbs, sidewalks, rock surfacing, and other street features damaged either directly or indirectly by the operations incidental to the construction described in other sections of these Specifications.

B. Where the materials, construction procedures, degree of compaction of materials, and the method of control and testing, as required in these Specifications differ from the Standard Specifications requirements, the more stringent requirements shall apply.

C. Provide finished gradation and grassing for all areas directly or indirectly disturbed by construction activities.

1.4 OPTIMUM MOISTURE CONTENT

A. "Optimum moisture content" shall be determined by the ASTM standard specified to determine the maximum dry density for relative compaction. Field moisture content shall be determined on the basis of the fraction passing the 3/4-inch sieve.

1.5 TEMPORARY TRENCH REPAIR OR STABILIZATION

A. Following pipe installation and prior to permanent trench repair or asphalt replacement, temporary trench repair will be defined as one of the following:

1. Installation of flowable fill as described in this Section and Section 02772 ASPHALT CONCRETE PAVEMENT.
2. Installation of the compacted base course and an asphalt prime coat as described in this Section and Section 02772 ASPHALT CONCRETE PAVEMENT.

B. Temporary trench repair shall be maintained in accordance with the requirements of this Section and Section 02772 ASPHALT CONCRETE PAVEMENT until the final trench repair or asphalt surface is installed to provide a dust-free, drivable, and safe roadway surface.

PART 2 PRODUCTS

2.1 GENERAL

A. All materials for replacement of existing base course and asphalt surfacing shall conform to the Standard Specifications except as modified herein.

B. The CONTRACTOR will be responsible for furnishing satisfactory materials that meet the Specifications and shall provide such tests during the course of the work as are necessary to assure that the quality of the material used meets the Specifications.

2.2 LIME ROCK BASE COURSE

A. Aggregate quality and gradation shall meet the requirements of Section 911 of the Standard Specifications.

2.3 BITUMINOUS PRIME AND TACK COAT

A. Prime Coat: Material shall be cutback asphalt, Grade RC-70 or RC-250 meeting the requirements of Section 916-2 of the Standard Specifications, or approved equal.

B. Tack Coat: Material shall be emulsified asphalt, Grade RS-2, SS-1, or SS-1H meeting the requirements of Section 916-4 of the Standard Specifications.

C. Tack coats used for temporary trench stabilization shall be sanded to prevent damage to vehicles.

2.4 ASPHALT CONCRETE

A. The asphalt concrete for trench leveling, restoration and overlay shall be Type S-III or SP-9.5 (coarse), meeting the requirements of Section 334 of the Standard Specifications.

B. Aggregate: The aggregate shall meet the requirements of Section 334 of the Standard Specifications.

C. Submit test results from commercial testing laboratories to the ENGINEER to show that the materials meet the quality and gradation requirements.

2.5 FLOWABLE FILL

A. Provide flowable fill with a mix design meeting the requirements of Section 121 of the (FDOT) Standard Specifications for excavatable, flowable fill. Flowable fill may be allowed as a substitute for compacted base upon approval of the ENGINEER, at no additional cost.

2.6 CONCRETE

A. Concrete shall be 3,000 psi minimum concrete meeting the requirements of Section 346 of the Standard Specifications.

B. Concrete Forms: All forms for curbs and sidewalks shall be either 2-inch dimensioned lumber, plywood, or metal forms. Forms on the face of the curb shall have no horizontal form joints within 7 inches of the top of the curb.

C. Curing Compound: Meeting the requirements of Section 925 of the Standard Specifications.

D. Reinforcing Steel: Conform to ASTM A615, Grade 60.

2.7 TRAFFIC MARKINGS

A. All traffic striping markings (i.e., lane, edge of pavement, directional, informational, etc.) damaged by the CONTRACTOR during construction shall be replaced with new painted items in meeting the requirements of Section 971 of the Standard Specifications.

B. Raised reflective pavement markers (rpm's) damaged by the CONTRACTOR during construction shall be replaced with new rpm's meeting the requirements of Section 706 of the Standard Specifications.

C. The CONTRACTOR shall place and maintain temporary striping markings throughout the course of the work until the permanent striping marking is placed on the final roadway surface.

D. The CONTRACTOR shall provide painted traffic striping at all intersections including stop bars and crosswalks as required whether they are currently stripped or not. It shall be the CONTRACTOR's responsibility to take a complete inventory and provide the appropriate permanent stripping after the completion of the work.

2.8 SWALE STABILIZATION

A. Materials used for stabilization of swale areas as indicated on the Drawings shall consist of suitable excess existing base material removed from trenching operations, if approved by the Engineer, crushed limerock, rock screenings, or other suitable material as approved by the Engineer.

1. Materials having a plasticity index of more than 10, or a liquid limit greater than 40 shall not be used.
2. Maximum dimension shall not exceed 1.5 inches.

PART 3 EXECUTION

3.1 CONSTRUCTION PROCEDURE

A. The ENGINEER reserves the right to vary the type of resurfacing as best serves the interest of the OWNER. Trench backfill shall be as specified in Section 02320 TRENCH BACKFILL.

B. Replace all bituminous and concrete roadway pavement damaged or removed under this Contract with asphalt concrete regardless of original type. Pavement thickness shall be in accordance with the Drawings and approved by the CITY/ENGINEER.

C. In addition to the requirements set forth herein, the work shall conform to the applicable workmanship requirements of the state and county highway or municipal specifications.

D. Water to control dust shall be used as directed by the ENGINEER until the trench repair has been stabilized.

E. Base course and prime coat shall be installed to provide temporary trench stabilization within 5 working days of trench backfill or as soon thereafter as the as-built conditions and pipe slopes have been verified.

F. Final, permanent trench repair, and paving shall be installed within 3 weeks of pipe verification and temporary trench stabilization, unless flowable fill is used for temporary trench repair, in accordance with the provisions of this Section.

3.2 REMOVAL OF PAVEMENT, SIDEWALK, CURBS, AND GUTTERS

A. Removal of all pavement, sidewalks, curbs, and gutters shall conform to Section 02220 DEMOLITION, and payment for removal shall be included in that section. Payment for removal is incidental to the cost of pipe installation except where required for water and sewer service installation.

3.3 CUTTING EXISTING PAVEMENT

A. Where new pavement abuts existing pavement, the old pavement shall be trimmed by saw cutting to a straight line. Any pavement which has been damaged or which is broken and unsound shall be removed to provide a smooth, sound edge for joining new pavement.

3.4 STREET MAINTENANCE

A. Maintain all trenches as specified under Section 02316 EXCAVATION.

3.5 CONSTRUCTION OF BASE COURSE

A. Base course shall be constructed in accordance with Section 200 of the Standard Specifications.

B. Compact base materials to a minimum of 98 percent of the maximum density as determined by AASHTO T180. Corrections for oversize material may be applied to either the as-compacted field dry density or the maximum dry density, as determined by the ENGINEER. Where the base is constructed in more than one course, the density shall be obtained in each lift.

C. Alternately, at no additional cost and with the approval of the ENGINEER, the CONTRACTOR shall provide a minimum 10 inches of 250 psi flowable fill. The flowable fill shall be placed up to 1 ½ inches from the top of the existing pavement. Flowable fill installed in accordance with this provision shall comply with temporary pavement restoration provisions.

3.6 MILLING OR GRINDING OF EXISTING ASPHALT PAVEMENT

A. Milling of existing asphalt pavement shall meet the requirements of Section 327 of the Standard Specifications.

B. Milling shall be used to lower the grade of adjacent existing asphalt prior to any required asphalt repairs.

C. Milled and ground asphalt can be mixed for use with the limerock base course material.

3.7 BITUMINOUS PRIME AND TACK COAT

A. The bituminous prime coat shall be applied to the lime rock base immediately following the placement of the compacted base course. The prime coat shall be maintained with additional coats as determined by the ENGINEER as temporary restoration until the final asphalt surface is installed. Additional prime coats will be provided at no cost to the OWNER.

B. The lime rock base shall be hard planed with a blade grader immediately prior to the application of the prime coat.

C. The rate of application of the bituminous prime coat shall meet the requirements of Sections 300 and 916-2 of the Standard Specifications.

D. The bituminous tack coat shall be applied to existing asphalt surfaces prior to the placement of new asphalt, between layers of asphalt concrete surface courses, surfaces of concrete footings that will come in contact with the asphalt concrete pavement, and vertical faces of all longitudinal and transverse joints that have become compacted or cooled.

E. The rate of application of the bituminous tack coat shall meet the requirements of Sections 300 and 916-4 of the Standard Specifications.

3.8 ASPHALT CONCRETE PAVEMENT REPLACEMENT

A. Preparation for Paving:

1. A prime coat shall be applied over the full length of the roadway, and asphalt concrete pavement shall not be placed until the prime coat has cured per the manufacturer's recommendations.
2. Should any holes, breaks, or irregularities develop in the roadway surface after the prime coat has been applied, they shall be patched with asphalt concrete immediately in advance of placing the asphalt concrete.
3. After the maintenance, patching, or repair work has been completed and immediately prior to placing the asphalt concrete pavement, the surface of the prime coat shall be swept clean of all dirt, dust, or other foreign matter.

B. The proposed pavement reconstruction schedule consists of immediately paving over trenches as soon as possible after it has been determined that subbase and base have achieved required compactions. The base course will be brought up to the elevations indicated on the Drawings and asphalt placed to bring grade up to match existing pavement elevations as shown on the Drawings.

C. For deep excavations where the pavement repair constitutes a full lane or roadway, workmanship shall conform to the standards and details of new road way construction.

1. Existing pavement less than 2-foot wide shall be removed or milled for base material
2. Full lane or width roadways shall have a consistent cross-section and straight edge of pavement delineation's.

3.9 CONSTRUCTION OF ASPHALT CONCRETE PAVEMENT OVERLAY – IF REQUIRED

A. The CONTRACTOR shall place a layer of tack coat at a rate of 0.05 to 0.12 gallon per square yard over all areas to receive asphalt concrete.

B. Lay asphalt concrete over all areas designated to be resurfaced. The asphalt concrete pavement overlay shall be placed in two ¾-inch lifts to a compacted depth of 1-1/2 inches or as shown on the Drawings. The method of proportioning, mixing, transporting, laying, processing, rolling the material, and the standards of workmanship shall meet the applicable requirements of Sections 320, 330, and 331 of the Standard Specifications. At no time shall the coarse aggregate segregated from the mix either from hand spreading or raking of joints be scattered across the paved mat. Such material shall be collected and disposed of.

C. The ENGINEER will examine the prepared roadway before the paving is begun and bring any deficiencies to the CONTRACTOR's attention to be corrected before the paving is started. Roll each lift of the asphalt concrete until roller marks are eliminated and compacted to 100 percent of the laboratory compacted mixture. The grade, line, and cross section of the finished surface shall match the existing conditions. Asphalt or asphalt strains which are noticeable upon surfaces of concrete or materials which will be exposed to view shall be promptly and completely removed.

3.10 ASPHALT CONCRETE PAVEMENT

A. Workmanship in producing, hauling, placing, compacting, and finishing asphalt concrete shall meet the applicable portions of the Standard Specifications.

3.11 CONNECTIONS WITH EXISTING FACILITIES

A. Where the bituminous pavement is to be connected with an existing roadway

surface or other facility, the CONTRACTOR will be required to modify the existing roadway profile in such a manner as to produce a smooth riding connection to the existing facility. The CONTRACTOR shall meet existing neat lines where required.

B. Where it is necessary to remove existing asphalt surfaces or oil mat surfaces to provide proper meet lines and riding surfaces, the CONTRACTOR shall sawcut the existing surface so that there will be sufficient depth to provide a minimum of 1 inch of asphalt concrete, and the waste material shall be disposed of to the satisfaction of the ENGINEER. Prior to placing the asphalt concrete, these areas shall be tacked. Meet lines shall be straight and the edges vertical. The edges of meet line cuts shall be painted with liquid asphalt or emulsified asphalt prior to placing asphalt concrete. After placing the asphalt concrete, the meet line shall be sealed by painting with a liquid asphalt or emulsified asphalt and immediately covered with clean, dry sand.

3.12 CONSTRUCTION OF COURSES

A. The asphalt concrete pavement shall be constructed in one or more courses as directed by the CITY/ENGINEER.

1. Rolling shall continue until all roller marks are eliminated and compacted to 100 percent of the laboratory compacted mixture has been obtained.

3.13 SURFACE TOLERANCE

A. Tests for conformity with the specified grade shall be made by the CONTRACTOR immediately after initial compression. Any variation shall be immediately corrected by the removal or addition of materials and by continuous rolling.

B. The completed surface of the pavement shall be of uniform texture, smooth, uniform as to grade, and free from defects of all kinds. The completed surface shall not vary more than 1/8 inch from the lower edge of a 12-foot straightedge placed on the surface along the centerline or across the repair area.

C. After completion of the final rolling, the smoothness and grade of the surface shall again be tested by the CONTRACTOR.

D. When deviations in excess of the above tolerances are found, the pavement surface shall be corrected as stated in Section 330-12.4 of the Standard Specifications.

E. All areas in which the surface of the completed pavement deviates more than twice the allowable tolerances described above shall be removed and replaced to the satisfaction of the ENGINEER.

F. All costs involved in making the corrections of defects described above shall be borne by the CONTRACTOR with no additional compensation for this work.

3.14 SAMPLES

A. If directed by the ENGINEER, the CONTRACTOR shall without additional charge, provide the ENGINEER with test results of samples of asphalt concrete cut from the completed pavement or the individual courses thereof for each occurrence. Provide a minimum of three test cores located as directed by the ENGINEER. He shall also provide the ENGINEER with test results of samples of the uncompressed asphalt concrete mixtures and all materials incorporated in the work.

3.15 WEATHER CONDITIONS

A. Asphalt shall not be applied to wet material or surfaces. Asphalt shall not be applied during rainfall or any imminent storms that might adversely affect the construction. The ENGINEER will determine when surfaces and materials are dry enough to proceed with construction. Asphalt concrete shall not be placed during heavy rainfall or when the surface upon which it is to be placed is wet.

3.16 PROTECTION OF STRUCTURES AND ADJUSTMENT OF APPURTENANCES

A. Provide whatever protective coverings may be necessary to protect the exposed portions of bridges, culverts, curbs, gutters, posts, guard fences, road signs, and any other structures from splashing oil and asphalt from the paving operations. Remove any oil, asphalt, dirt, or any other undesirable matter that may come upon these structures by reason of the paving operations.

B. Where water valve boxes, manholes, catch basins, or other underground utility appurtenances are within the area to be surfaced, the CONTRACTOR shall adjust the tops of these facilities to conform with the proposed surface elevations. The CONTRACTOR shall notify the proper authority and either raise or lower the appurtenances or make arrangements with that authority for having the facilities altered at the CONTRACTOR's expense before proceeding with the resurfacing. The CONTRACTOR will be responsible for making certain that appurtenances are brought to proper grade to conform to finished surface elevations and any delays experienced from such obstructions will be considered as incidental to the paving operation. No additional payment will be made. Protect all covers during asphalt application. All adjustments shall be made in accordance with the requirements of the respective utility.

3.17 EXCESS MATERIALS

A. Dispose of all excess materials. Make arrangements for the disposal and bear all costs or retain any profit incidental to such disposal.

3.18 CONTRACTOR'S RESPONSIBILITY

A. Settlement of replaced pavement over trenches within the warranty period shall be considered the result of improper or inadequate compaction of the

subbase or base materials. The CONTRACTOR shall promptly repair all pavement deficiencies noted during the warranty period at the CONTRACTOR's sole expense.

3.19 SIDEWALKS AND CURBS

A. Replace concrete sidewalks and curbs to the same section width, depth, line, and grade as that removed or damaged or as shown on the Drawings. The minimum thickness of sidewalks shall be four (4) inches and six (6) inches in driveways. Cut ends of existing curb to a vertical plane. Prior to replacing the sections, properly backfill and compact the trench to prevent subsequent settlement.

B. Replace concrete sidewalks at scored joints and make replacement in a manner that will avoid a patched appearance. Provide a minimum 2-inch thick compacted leveling course of clean sand or gravel of quality hereinbefore specified. Finish concrete surface similar to the adjacent sidewalks.

3.20 DRIVEWAYS AND WALKS

A. Replace asphalt driveways and walks in accordance with Article ASPHALT CONCRETE PAVEMENT REPLACEMENT.

B. Replace concrete and paver driveways in kind, using similar materials of construction. Concrete driveways shall consist of a reinforced, 6-inch section.

3.21 PAINTING TRAFFIC STRIPES

A. All areas having traffic stripes prior to paving shall be repainted. Temporary traffic painting shall be applied immediately after asphalt pavement has been placed. Permanent traffic painting may be applied only after the proper curing time for the asphalt. Painting traffic stripes (temporary and permanent) shall meet the requirements of Section 710 of the Standard Specifications.

3.22 INSTALLATION OF RAISED REFLECTIVE PAVEMENT MARKERS

A. All areas having raised reflective pavement markers prior to paving shall be replaced. Temporary pavement markers shall be applied immediately after asphalt pavement has been placed. Permanent pavement markers may be applied only after the proper curing time for the asphalt. Pavement markers and adhesive (temporary and permanent) shall meet the requirements of Section 706 of the Standard Specifications.

B. Spacing: As shown in the Roadway and Traffic Design Standards for Design, Construction, Maintenance and Utility operations on the State Highway System by the State of Florida, Department of Transportation, current edition.

3.23 PAVEMENT REPAIR

A. All damage to pavement as a result of work under this Contract shall be repaired in a manner satisfactory to the ENGINEER and at no additional cost to the OWNER. The repair shall include preparation of the subgrade, placing and compaction of the lime rock base and placement of the final asphalt surface as described in this Section.

B. The width of all repairs shall extend at least 12 inches beyond the limit of the damage with the edge of pavement left saw cut to a true edge with no irregularities. For county roads and city streets recently constructed or overlaid, the repair may be required to be full-lane width as determined by the CITY/ENGINEER.

END OF SECTION

SECTION 02710
LIMEROCK BASE

PART 1 GENERAL

1.1 DEFINITIONS

A. Completed Course: Compacted, unyielding, free from irregularities, with smooth, tight, even surface, true to grade, line, and cross section.

B. Completed Lift: Compacted with uniform surface reasonably true to cross-section.

PART 2 PRODUCTS

2.1 LIMEROCK BASE ROCK

A. The material used in limerock base shall be material classified as Miami Oolite Formation.

B. The minimum of carbonates of calcium and magnesium in the limerock shall be 70 percent. The maximum percentage of water-sensitive clay material shall be 3.

C. Limerock material shall be uniform in color and not contain cherty or other extremely hard pieces, or lumps, balls, or pockets of sand or clay size material in sufficient quantities as to be detrimental to the proper bonding, finishing, or strength of the limerock base.

D. The limerock base shall be uniformly graded from coarse to fine with 97 percent passing a 3-1/2-inch sieve, 80 percent passing a 2-inch sieve. The fine material shall consist entirely of dust of fracture. All crushing or breaking up, which might be necessary in order to meet such size requirements, shall be done before the material is placed on the road.

E. Physical Qualities:

1. Liquid Limit, AASHTO T89: Maximum 35 percent.
2. Nonplastic.
3. Limerock material shall have an average limerock bearing ratio (LBR) value of not less than 100.

2.2 SOURCE QUALITY CONTROL

A. CONTRACTOR: Perform tests necessary to locate acceptable source of materials meeting specified requirements.

B. Final approval of aggregate material will be based on materials' test results on installed materials.

C. Should separation of coarse from fine materials occur during processing or stockpiling, immediately change methods of handling materials to correct uniformity in grading.

PART 3 EXECUTION

3.1 SUBGRADE PREPARATION

A. As specified in Section 02319 SUBGRADE PREPARATION.

B. Obtain ENGINEER's acceptance of subgrade before placement of limerock base material.

C. Do not place base materials on soft, muddy subgrade.

3.2 EQUIPMENT

A. Use mechanical rock spreaders, equipped with a device that strikes off the rock uniformly to laying thickness, capable of producing even distribution. For areas where the use of a mechanical spreader is not practicable, the CONTRACTOR may spread the rock using bulldozers or blade graders.

3.3 HAULING AND SPREADING

A. Hauling Materials:

1. The limerock shall be transported to the point where it is to be used and dumped on the end of the preceding spread.
2. Do not haul over surfacing in process of construction.
3. Loads: Of uniform capacity.
4. Maintain consistent gradation of material delivered; loads of widely varying gradations will be cause for rejection.

B. Spreading Materials:

1. Distribute material to provide required density, depth, grade and dimensions with allowance for subsequent lifts.
2. Produce even distribution of material upon roadway without segregation.
3. Should segregation of coarse from fine materials occur during placing, immediately change methods of handling materials to correct uniformity in grading.

3.4 CONSTRUCTION OF COURSES

A. General: Complete each lift in advance of laying succeeding lift to provide required results and adequate inspection.

B. Limerock Base:

1. Maximum Completed Lift Thickness: 6 inches or equal thickness.
2. Completed Course Total Thickness: As shown.
3. Spread lift on preceding course to required cross-section.
4. Lightly blade and roll surface until thoroughly compacted.
5. Blade or broom surface to maintain true line, grade, and cross-section.

C. Gravel Surfacing:

1. Maximum Completed Lift Thickness: 6 inches or equal thickness.
2. Completed Course Total Thickness: As shown.
3. Spread on preceding course in accordance with cross-section shown.
4. Blade lightly and roll surface until material is thoroughly compacted.

3.5 ROLLING AND COMPACTION

A. Commence compaction of each layer of base after spreading operations and continue until density of 98 percent of maximum density has been achieved as determined by AASHTO T 180.

B. Roll each course of surfacing until material shall not creep under roller before succeeding course of surfacing material is applied.

C. Commence rolling at outer edges of surfacing and continue toward center; do not roll center of road first.

D. When the material does not have the proper moisture content to ensure the required density, wet or dry, as required. When adding water, uniformly mix it in by disking to the full depth of the course that is being compacted. During wetting or drying operations, manipulate as a unit, the entire width and depth of the course that is being compacted.

E. Place and compact each lift to required density before succeeding lift is placed.

F. Bind up preceding course before placing leveling course. Remove floating or loose stone from surface.

G. Blade or otherwise work surfacing as necessary to maintain grade and cross-section at all times, and to keep surface smooth and thoroughly compacted.

H. Surface Defects: Remedy surface defects by loosening and rerolling. Reroll entire area, including surrounding surface, until thoroughly compacted.

1. Finished Surface: True to grade and crown before proceeding with surfacing.

3.6 SURFACE TOLERANCES

A. Finished Surface of Base Course and Leveling Course: Within plus or minus 0.04-foot of grade shown at any individual point.

B. Compacted Surface of Leveling Course: Within 0.04-foot from lower edge of 10-foot straightedge placed on finished surface, parallel to centerline.

C. Overall Average: Within plus or minus 0.01-foot from crown and grade specified.

3.7 DRIVEWAY RESURFACING

A. Replace gravel surfacing on driveways which were gravel surfaced prior to construction.

B. Provide compacted gravel surfacing to depth equal to original, but not less than 4 inches.

C. Leave each driveway in as good or better condition as it was before start of construction.

3.8 FIELD QUALITY CONTROL

A. In-Place Density Tests:

1. Construct base course so areas shall be ready for testing.
2. Allow reasonable length of time for ENGINEER to perform tests and obtain results during normal working hours.

3.9 CLEANING

A. Remove excess material; clean stockpile areas of aggregate.

END OF SECTION

SECTION 02761
PAVEMENT MARKING

PART 1 GENERAL

1.1 STANDARD SPECIFICATIONS

A. When referenced in this section, shall mean Florida Department of Transportation, Standard Specifications for Road and Bridge Construction, current edition.

1.2 DELIVER, STORAGE, AND PROTECTION

A. Packaging and Labeling: All coatings and traffic marking materials shall be shipped in strong containers plainly marked with the weight in pounds per gallon, the volume of coatings and traffic marking materials content in gallons, the color, user information, date of manufacture, LOT, batch and DOT code number. Each batch manufactured shall have a unique number. A true statement of the percentage composition of the pigment, the proportion of pigment to vehicle, and the name and address of the manufacturer, also shall be shown. The label shall warn the user of any special handling or precautions of the material, as recommended by the manufacturer. Any package not so marked will not be accepted for use under these Specifications.

B. Storage: Any coatings and traffic marking materials which, although inspected and approved at the point of manufacture, hardens or livers in the containers so that it cannot be readily broken up with a paddle to a smooth, uniform painting consistency, will be rejected. All materials shall have a container storage life of one year from date of manufacture. Any coatings and traffic marking materials not acceptable for proper application will be rejected, even though it conforms to these Specifications in all other respects.

C. Mixing: All paints except aluminum shall be delivered to the project completely mixed, and ready to be used without additional oil or thinner. Gasoline shall not be used for thinner under any circumstances.

PART 2 PRODUCTS

2.1 PAINT

A. Color: White, yellow, or blue traffic paint meeting the requirements of Section 971 of the Standard Specifications.

B. Homogeneous, easily stirred to smooth consistency, with no hard settlement or other objectionable characteristics during a storage period of 6 months.

2.2 THERMOPLASTIC STRIPING

A. White or yellow thermoplastic striping material meeting the requirements of Section 711 of the Standard Specifications.

2.3 RAISED REFLECTIVE MARKERS

A. Metallic or nonmetallic, or prismatic reflector type, of permanent colors retaining color and brightness under action of traffic.

B. Rounded surfaces presenting a smooth contour to traffic. The minimum area of each reflective face shall be 2-1/2 inches squared.

C. Marker and adhesive epoxy in accordance with ASTM D4280.

2.4 GLASS SPHERES

A. Glass spheres shall be of a composition designed to be highly resistant to traffic wear and to the effects of weathering.

B. In accordance with AASHTO M247, Type I with moisture resistant coating or a formulation specified by the traffic striping material manufacturer.

PART 3 EXECUTION

3.1 SURFACE PREPARATION

A. Cleaning:

1. Thoroughly clean surfaces to be marked before application of pavement marking material.
2. Remove dust, dirt, and other granular surface deposits by sweeping, blowing with compressed air, rinsing with water or a combination of these methods.
3. Completely remove rubber deposits, surface laitance, existing paint markings, and other coatings adhering to pavement with scrapers, wire brushes, sandblasting, approved chemicals, or mechanical abrasion.
4. Scrub areas of old pavement affected with oil or grease with several applications of trisodium phosphate solution or other approved detergent or degreaser, and rinse thoroughly after each application.
5. Surfaces shall be completely free of dry dirt and ice, and dry of water at the time of application of any of the materials specified herein.
6. Oil-Soaked Areas: After cleaning, seal with cut shellac to prevent bleeding through the new paint.
7. Reclean surfaces when Work has been stopped due to rain.
8. Existing Pavement Markings:
   a. Remove existing pavement markings that may interfere or conflict with newly applied marking patterns, or that may result in a misleading or confusing traffic pattern.

b. Do not apply thermoplastic markings over existing preformed or thermoplastic markings.
c. Perform grinding, scraping, sandblasting or other operations so finished pavement surface is not damaged.

B. Pretreatment for Early Painting: Where early painting is required on rigid pavements, pretreat with an aqueous solution containing 3 percent phosphoric acid and 2 percent zinc chloride.

C. New Concrete Pavement:

1. Allow a minimum cure time of 30 days before cleaning and marking.
2. Clean by either sandblasting or water blasting to the following results:
   a. No visible evidence of curing compound on peaks of textured concrete surface.
   b. No heavy puddled deposits of curing compound in valleys of textured concrete surface.
   c. Remaining curing compound is intact, with loose and flaking material completely removed.
   d. Peaks of textured pavement surface are rounded in profile and free of sharp edges and irregularities.
3. Allow a minimum drying time of 24 hours after water blasting before applying thermoplastic markings.

3.2 ALIGNMENT FOR MARKINGS

A. The CONTRACTOR shall be responsible for all measurements, reference points and marks, string lining, and any other steps required in establishing pavement marking locations and alignment. On tangents and on curves up to 1 degree, the alignment of the marking shall not deviate from the string line by more than 1 inch. On curves exceeding 1 degree, the maximum permissible deviation shall be 2 inches. All alignment width and location shall conform to the details shown on the Drawings.

3.3 PAINT APPLICATION

A. General:

1. Thoroughly mix pigment and vehicle together prior to application, and keep thoroughly agitated during application.
2. Do not add thinner.
3. Apply only when air and pavement temperatures are above 40 degrees F and less than 95 degrees F. Maintain paint temperature within these same limits.
4. Apply only when surface is dry.
5. Do not apply when conditions are windy to the point of causing overspray or fuzzy line edges.

6. New Asphalt Pavement: Allow a minimum pavement cure time as recommended by the manufacturer before applying paint.
7. Provide guide lines and templates to control paint application.
8. Take special precautions in marking numbers, letters, and symbols.
9. Sharply outline edges of markings and apply without running or spattering.

B. Rate of Application:

1. Reflective Markings:
   a. Paint: Apply evenly, 105 plus or minus 5 square feet per gallon.
   b. Glass Beads: Apply uniformly, 6 plus or minus 0.5 pounds of glass spheres per gallon of paint.
2. Nonreflective Markings: Apply paint evenly to pavement surface at a rate of 105 plus or minus 5 square feet per gallon.
3. On new pavement or new asphalt surface treatments, apply two coats of paint at a uniform rate of 210 square feet per gallon.

C. Drying:

1. Provide maximum drying time to prevent undue softening of bitumen and pickup, displacement, or discoloration by traffic.
2. If drying is abnormally slow, discontinue painting operations until cause is determined and corrected.

3.4 THERMOPLASTIC MARKING APPLICATION

A. Following specified surface preparation, prime and apply marking and glass beads to provide a reflectorized strip as shown on Drawings.

B. The material shall be applied to the pavement by the extrusion method only, wherein one side of extrusion shaping die is the pavement and the other sides are formed by suitable equipment for heating and controlling the flow of the material.

C. Application Temperatures:

1. Pavement Surface: Minimum 40 degrees F and rising.
2. Thermoplastic: Minimum 375 degrees F, maximum 425 degrees F.

D. Primer:

1. On portland cement concrete and existing asphalt pavements, apply epoxy resin primer/sealer according to the thermoplastic manufacturer's recommendations.
2. All primer/sealer to dry prior to applying thermoplastic.

E. Thermoplastic Marking:

1. Extrude in a molten state, free of dirt or tint. at a minimum thickness of 0.90 inch for lane lines and 0.125 inch; maximum thickness of 0.190 inch.
2. Apply centerline, skipline, edgeline, and other longitudinal type markings with a mobile applicator.
3. Apply special markings, crosswalks, stop bars, legends, arrows, and similar patterns with a portable, extrusion-type applicator.

F. Glass Bead Application:

1. Immediately after marker application, mechanically apply such that the beads are held by and imbedded in the surface of the molten material.
2. Application Rate: One pound per 20 square feet of compound.

G. Cool completed marking to ambient temperature prior to allowing vehicular traffic.

3.5 INSTALLATION OF RAISED REFLECTIVE MARKERS

A. Apply markers to the bonding surface using bituminous adhesives only.

B. Apply the adhesive to the binding surface (not the marker) so that 100 percent of the bonding area of the marker will be covered.

C. Align markers carefully, projecting no more than 3/4-inch above level of pavement. Reflective face of the marker shall be perpendicular to a line parallel to the roadway centerline. Do not install markers over longitudinal or transverse joints of the bonding surface.

D. Spacing: As shown on the Drawings.

E. Immediately remove excess adhesive from the bonding surface and exposed surface of the marker.

F. Use only a mineral spirits meeting Federal Specifications TT-T-291 to remove adhesive from exposed faces of markers.

3.6 GLASS BEAD APPLICATION

A. Apply immediately following application of paint.

B. Use evenly distributed, drop-on application method.

C. Rate: 10 pounds per gallon of paint.

3.7 PROTECTION

A. The CONTRACTOR shall erect adequate warning signs and/or provide sufficient number of flagmen, and take all necessary precautions for the protection of the materials and safety of the public.

B. Protect surfaces from disfiguration by paint spatters, splashes, spills, or drips.

3.8 CLEANUP

A. Remove paint spatters, splashes, spills, or drips from Work and staging areas and areas outside of the immediate Work area where spills occur.

END OF SECTION

SECTION 02771
CONCRETE CURBS AND SIDEWALKS

PART 1 GENERAL (NOT USED)

PART 2 PRODUCTS

2.1 EXPANSION JOINT FILLER

A. 1/2-inch thick, preformed asphalt-impregnated, expansion joint material meeting AASHTO M153 Type I, II, or III, or AASHTO M213, or cellulose fiber types meeting the requirements of AASHTO M213, except the asphalt content is acceptable provided they contain minimum of 0.2 percent copper pentachlorophenate as a preservative and 1 percent water proofing wax.

2.2 CONCRETE

A. Ready-mixed meeting ASTM C94, Option A, with compressive strength of 3,000 psi at 28 days.

B. Maximum Aggregate Size: 1-1/2 inch.

C. Slump: 2 to 4 inches.

2.3 CURING COMPOUND

A. Liquid membrane-forming, clear or translucent, suitable for spray application and meeting ASTM C309, Type 1.

PART 3 EXECUTION

3.1 FORMWORK

A. Lumber Materials:

1. 2-inch dressed dimension lumber, or metal of equal strength, straight, free from defects that would impair appearance or structural quality of completed curb and sidewalk.
2. 1-inch dressed lumber or plywood may be used where short-radius forms are required.

B. Metals: Steel in new undamaged condition.

C. Setting Forms:

1. Construct forms to shape, lines, grades, and dimensions.
2. Stake securely in place.

D. Bracing:

1. Brace forms to prevent change of shape or movement resulting from placement.
2. Construct short-radius curved forms to exact radius.

E. Tolerances:

1. Do not vary tops of forms from gradeline more than 1/8 inch when checked with 10-foot straightedge.
2. Do not vary alignment of straight sections more than 1/8 inch in 10 feet.

3.2 PLACING CONCRETE

A. Excavate to the required depth, place and compact limerock base rock as specified in Section 02710, LIMEROCK BASE. Compact directly under the area and 1 foot beyond each side of the sidewalk and curb.

B. Prior to placing concrete, remove water from excavation and debris and foreign material from forms.

C. Place concrete as soon as possible, and within 1-1/2 hours after adding cement to mix without segregation or loss of ingredients, and without splashing.

D. Place, process, finish, and cure concrete in accordance with applicable requirements of ACI 304, and this section. Wherever requirements differ, the more stringent shall govern.

E. To compact, vibrate until concrete becomes uniformly plastic.

F. All edges shall be smooth and rounded.

3.3 CURB CONSTRUCTION

A. Construct ramps at pedestrian crossings.

B. Expansion Joints: Place at maximum 20-foot intervals and at the beginning and end of curved portions of curb, and at connections to existing curbs. Install expansion joint filler at each joint.

C. Curb Facing: Do not allow horizontal joints within 7 inches from top of curb.

D. Contraction Joints:

1. Maximum 10-foot intervals in curb.
2. Provide open joint type by inserting thin, oiled steel sheet vertically in fresh concrete to force coarse aggregate away from joint.
3. Insert steel sheet to full depth of curb.

4. Remove steel sheet with sawing motion after initial set has occurred in concrete and prior to removing front curb form.
5. Finish top of curb with steel trowel and finish edges with steel edging tool.

E. Front Face:

1. Remove front form and finish exposed surfaces when concrete has set sufficiently to support its own weight.
2. Finish formed face by rubbing with burlap sack or similar device to produce uniformly textured surface, free of form marks, honeycomb, and other defects.
3. Remove and replace *defective* concrete.
4. Apply curing compound to exposed surfaces of curb upon completion of finishing.
5. Continue curing for minimum of 5 days.

F. Backfill curb with earth upon completion of curing period, but not before 7 days has elapsed since placing concrete.

1. Backfill shall be free from rocks 2 inches and larger and other foreign material.
2. Compact backfill firmly.

3.4 SIDEWALK CONSTRUCTION

A. Thickness:

1. 4 inches in walk areas.
2. 6 inches in driveway and commercial areas.

B. Connection to Existing Sidewalk:

1. Remove old concrete back to an existing contraction joint.
2. Clean the surface.
3. Apply a neat cement paste immediately prior to placing new sidewalk.

C. Expansion Joints: Place at maximum 20-foot intervals, at adjacent curb expansion joint, where sidewalk ends at curb, and around posts, poles, or other objects penetrating sidewalk. Install expansion joint filler at each joint.

D. Contraction Joints:

1. Provide transversely to walks at locations opposite contraction joints in curb.
2. Dimensions: 3/16-inch by 1-inch weakened plane joints.
3. Construct straight and at right angles to surface of walk.

E. Finish:

1. Broom surface with fine-hair broom at right angles to length of walk and tool at edges, joints, and markings.
2. Ensure that the surface variations are not more than ¼ inch under a 10-foot straightedge, or more than 1/8 inch on a 5-foot transverse section.
3. Mark walks transversely at 5-foot intervals, or in pattern shown on Drawings, with jointing tool; finish edges with rounded steel edging tool.
4. Apply curing compound to exposed surfaces upon completion of finishing.
5. Protect sidewalk from damage and allow to cure for at least 7 days.

END OF SECTION

SECTION 02772
ASPHALT CONCRETE PAVING

PART 1 - GENERAL

1.1 STANDARD SPECIFICATIONS

A. When referenced in this section shall mean Florida Department of Transportation, Standard Specifications for Road and Bridge Construction, current edition.

1.2 QUALITY ASSURANCE

A. Qualifications

1. Independent Testing Laboratory: In accordance with ASTM E329.
2. Asphalt concrete mix formula shall be prepared by an approved certified independent laboratory under the supervision of a certified asphalt technician.

1.3 ENVIRONMENTAL REQUIREMENTS

A. Temperature: Do not apply asphalt materials or place asphalt mixes when ground temperature is lower than 10 degrees C (50 degrees F), or air temperature is lower than 4 degrees C (40 degrees F). Measure ground and air temperature in shaded areas away from heat sources or wet surfaces.

B. Moisture: Do not apply asphalt materials or place asphalt mixes when application surface is wet.

PART 2 PRODUCTS

2.1 MATERIALS

A. Prime Coat: Cut-back ashpalt, Grades RC-70 or RC-250 meeting the requirements of Section 916-2 of the Standard Specifications.

B. Tack Coat: Emulsified asphalt, Grade RS-2, SS-1, or SS-1H meeting the requirements of Section 916-4 of the Standard Specifications. The bituminous material shall be heated to a suitable consistency as directed by the ENGINEER.

C. Sand (Blotter Material): Clean, dry, with 100 percent passing a 4.75 mm (No. 4) sieve, and a maximum of 10 percent passing a 75 mm (No. 200) sieve.

2.2 ASPHALT CONCRETE MIX

A. General:

1. Mix formula shall not be modified except with written approval from ENGINEER.

2. Source Changes:
   a. Should material source(s) change, establish a new asphalt concrete mix formula before the new material(s) is used.
   b. Perform check tests of properties of the plant-mix bituminous materials on the first day of production and as requested by Engineer to confirm that properties are in compliance with design criteria.
   c. Make adjustments in gradation or asphalt content as necessary to meet design criteria.

B. Asphalt Concrete Type S-III or SP-9.5 (course) meeting the requirements in Section 334 of the Standard Specifications.
   1. Mineral Filler shall meet the requirements of Section 917 of the Standard Specifications.

C. Composition: Hot-Plant mix of aggregate, mineral filler, and paving grade asphalt cement. The several aggregate fractions shall be sized, uniformly graded, and combined in such proportions that the resulting mixture meets the grading requirements of the mix formula.

D. Aggregate:

   1. The aggregate shall meet the requirements in Section 334 of the Standard Specifications.

   2. Mineral Filler shall meet the requirements of the Section 917 of the Standard Specifications.

E. Asphalt Cement: Paving Grade AC-30 meeting the requirements of Section 916 of the Standard Specifications.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Proof-roll subgrade below pavements with heavy pneumatic-tired equipment to identify soft pockets and areas of excess yielding. Do not proof-roll wet or saturated subgrades.

B. Proceed with paving only after unsatisfactory conditions have been corrected.

3.2 COLD MILLING

A. Clean existing pavement surface of loose and deleterious material immediately before cold milling. Remove existing asphalt pavement by cold milling to grades and cross sections indicated.

   1. Mill to a depth of 2 inches (50 mm)

3.3 PATCHING

A. Hot-Mix Asphalt Pavement: Saw cut perimeter of patch and excavate existing

pavement section to sound base. Excavate rectangular or trapezoidal patches, extending 12 inches (300 mm) into adjacent sound pavement, unless otherwise indicated. Cut excavation faces vertically. Remove excavated material. Re-compact existing unbound-aggregate base course to form new subgrade.

B. Portland Cement Concrete Pavement: Break cracked slabs and roll as required to reseat concrete pieces firmly.

1. Remove disintegrated or badly cracked pavement. Excavate rectangular or trapezoidal patches, extending into adjacent sound pavement, unless otherwise indicated. Cut excavation faces vertically. Re-compact existing unbound-aggregate base course to form new subgrade.

C. Tack Coat: Apply uniformly to vertical surfaces abutting or projecting into new, hot-mix asphalt paving at a rate of 0.05 to 0.15 gal./sq. yd. (0.2 to 0.7 L/sq. m).

1. Allow tack coat to cure undisturbed before applying hot-mix asphalt paving.
2. Avoid smearing or staining adjoining surfaces, appurtenances, and surroundings.
   Remove spillages and clean affected surfaces.

D. Patching: Fill excavated pavements with hot-mix asphalt base mix for full thickness of patch and, while still hot, compact flush with adjacent surface.

3.4 SURFACE PREPARATION

A. General: Immediately before placing asphalt materials, remove loose and deleterious material from substrate surfaces. Ensure that prepared subgrade is ready to receive paving.

B. Herbicide Treatment: Apply herbicide according to manufacturer's recommended rates and written application instructions. Apply to dry, prepared subgrade or surface of compacted- aggregate base before applying paving materials.

C. Tack Coat: Apply uniformly to surfaces of existing pavement at a rate of 0.05 to 0.15 gal./sq. yd. (0.2 to 0.7 L/sq. m).

1. Allow tack coat to cure undisturbed before applying hot-mix asphalt paving.
2. Avoid smearing or staining adjoining surfaces, appurtenances, and surroundings.
   Remove spillages and clean affected surfaces.

3.5 HOT-MIX ASPHALT PLACING

A. Machine place hot-mix asphalt on prepared surface, spread uniformly, and strike off. Place asphalt mix by hand to areas inaccessible to equipment in a manner that prevents segregation of mix. Place each course to required grade, cross section, and thickness when compacted.

1. Spread mix at minimum temperature of 250 deg F (121 deg C).
2. Regulate paver machine speed to obtain smooth, continuous surface free of pulls and tears in asphalt-paving mat.

B. Place paving in consecutive strips not less than 10 feet (3 m) wide unless infill edge strips of a lesser width are required.

C. Promptly correct surface irregularities in paving course behind paver. Use suitable hand tools to remove excess material forming high spots. Fill depressions with hot-mix asphalt to prevent segregation of mix; use suitable hand tools to smooth surface.

3.6 JOINTS

A. Construct joints to ensure a continuous bond between adjoining paving sections. Construct joints free of depressions, with same texture and smoothness as other sections of hot-mix asphalt course.

1. Clean contact surfaces and apply tack coat to joints.
2. Offset longitudinal joints, in successive courses, a minimum of 6 inches (150 mm).
3. Offset transverse joints, in successive courses, a minimum of 24 inches (600 mm).
4. Construct transverse joints at each point where paver ends a day's work and resumes work at a subsequent time. Construct these joints using either "bulkhead" or "papered" method according to AI MS-22, for both "Ending a Lane" and "Resumption of Paving Operations."

3.7 COMPACTION

A. General: Begin compaction as soon as placed hot-mix paving will bear roller weight without excessive displacement. Compact hot-mix paving with hot, hand tampers or with vibratory- plate compactors in areas inaccessible to rollers.

1. Complete compaction before mix temperature cools to 185 deg F (85 deg C).

B. Breakdown Rolling: Complete breakdown or initial rolling immediately after rolling joints and outside edge. Examine surface immediately after breakdown rolling for indicated crown, grade, and smoothness. Correct laydown and rolling operations to comply with requirements.

C. Intermediate Rolling: Begin intermediate rolling immediately after breakdown rolling while hot-mix asphalt is still hot enough to achieve specified density. Continue rolling until hot-mix asphalt course has been uniformly compacted to the following density:

1. Average Density: 92 percent of reference maximum theoretical density according to ASTM D 2041, but not less than 90 percent nor greater than 96 percent.

D. Finish Rolling: Finish roll paved surfaces to remove roller marks while hot-mix asphalt is still warm.

E. Edge Shaping: While surface is being compacted and finished, trim edges of pavement to proper alignment. Bevel edges while asphalt is still hot; compact thoroughly.

F. Protection: After final rolling, do not permit vehicular traffic on pavement until it has cooled and hardened.

G. Erect barricades to protect paving from traffic until mixture has cooled enough not to become marked.

3.8 ASPHALT CURBS

A. Construct hot-mix asphalt curbs over compacted pavement surfaces. Apply a light tack coat unless pavement surface is still tacky and free from dust. Spread mix at minimum temperature of 250 deg F (121 deg C).

1. Asphalt Mix: Same as pavement surface-course mix.

B. Place hot-mix asphalt to curb cross section indicated or, if not indicated, to local standard shapes, by machine or by hand in wood or metal forms. Tamp hand-placed materials and screed to smooth finish. Remove forms after hot-mix asphalt has cooled.

3.9 INSTALLATION TOLERANCES

A. Pavement Thickness: Compact each course to produce the thickness indicated within the following tolerances:

1. Base Course: Plus or minus 1/2 inch (13 mm).
2. Surface Course: Plus 1/4 inch (6 mm), no minus.

B. Pavement Surface Smoothness: Compact each course to produce a surface smoothness within the following tolerances as determined by using a 10-foot (3-m) straightedge applied transversely or longitudinally to paved areas:

1. Base Course: [1/4 inch (6 mm)]
2. Surface Course: [1/8 inch (3 mm)] .
3. Crowned Surfaces: Test with crowned template centered and at right angle to crown.
   Maximum allowable variance from template is 1/4 inch (6 mm).

3.10 PAVEMENT MARKING

A. Do not apply pavement-marking paint until layout, colors, and placement have been verified with Architect.

B. Allow paving to age for **30** days before starting pavement marking.

C. Sweep and clean surface to eliminate loose material and dust.

D. Apply paint with mechanical equipment to produce pavement markings, of dimensions indicated, with uniform, straight edges. Apply at manufacturer's recommended rates to provide a minimum wet film thickness of 15 mils (0.4 mm).

1. Broadcast glass beads uniformly into wet pavement markings at a rate of 6 lb/gal. (0.72 kg/L).

3.11 WHEEL STOPS

A. Install wheel stops in bed of adhesive as recommended by manufacturer.

B. Securely attach wheel stops to pavement with not less than two galvanized-steel dowels embedded at one-quarter to one-third points. Securely install dowels into pavement and bond to wheel stop. Recess head of dowel beneath top of wheel stop.

3.12 FIELD QUALITY CONTROL

A. Testing Agency: OWNER will engage a qualified testing agency to perform tests and inspections.

B. Replace and compact hot-mix asphalt where core tests were taken.

C. Remove and replace or install additional hot-mix asphalt where test results or measurements indicate that it does not comply with specified requirements.

3.13 DISPOSAL

A. Except for material indicated to be recycled, remove excavated materials from Project site and legally dispose of them in an EPA-approved landfill.

END OF SECTION

SECTION 02911
SOIL
PREPARATION

PART 1 GENERAL

1.1 SEQUENCING AND SCHEDULING

A. Rough grade areas to be planted or seeded prior to performing Work specified under this Section.

PART 2 PRODUCTS

2.1 TOPSOIL

A. General: Uniform mixture of 50 percent sand and 50 percent muck in a loose friable condition, free from objects larger than 1-1/2 inches maximum dimension, and free of subsoil, roots, grass, other foreign matter, hazardous or toxic substances, and deleterious material that may be harmful to plant growth or may hinder grading, planting, or maintenance.

B. Textural Amendments: Amend as necessary to conform to required composition.

C. Source: Import topsoil if onsite material fails to meet specified requirements or is insufficient in quantity.

2.2 SOURCE QUALITY CONTROL

A. Topsoil Analysis/Testing: Performed by county or state soil testing service or approved certified independent testing laboratory.

B. Should soil tests prove the topsoil to be alkaline or above the accepted minimum for salt content, the topsoil shall be removed and replaced by acceptable material at the CONTRACTOR's expense.

PART 3 EXECUTION

3.1 SUBGRADE PREPARATION

A. The subgrade shall be four (4) inches lower than finished grade with two (2) inches of topsoil added to sod areas.

B. Scarify subgrade to minimum depth of six (6) inches where topsoil is to be placed.

C. Remove stones over 2-1/2 inches in any dimension, sticks, roots, rubbish, and other extraneous material.

D. Limit preparation to areas which will receive topsoil within two (2) days after preparation.

3.2 TOPSOIL PLACEMENT

A. Topsoil Thickness:

1. Sodded Areas: 2-3 inches.
2. Planting Beds: 6 inches.

B. Do not place topsoil when subsoil or topsoil is excessively wet or otherwise detrimental to the Work.

C. Mix soil amendments with topsoil before placement or spread on topsoil surface and mix thoroughly into entire depth of topsoil before planting or seeding.

D. Uniformly distribute to within 1/2-inch of final grades. Fine grade topsoil eliminating rough or low areas and maintaining levels, profiles, and contours of subgrade.

E. Remove stones exceeding 1-1/2 inches in any dimension, roots, sticks, debris, and foreign matter during and after topsoil placement.

F. Remove surplus subsoil and topsoil from site. Grade stockpile area as necessary and place in condition acceptable for planting or seeding.

END OF SECTION

SECTION 02920
SODDING

PART 1 GENERAL

1.1 DEFINITIONS

A. Maintenance Period: Begin maintenance immediately after each area is planted (sod) and continue for a period of eight (8) weeks after all planting under this Section is completed.

B. Satisfactory Stand: Grass or section of grass that has:

1. No bare spots larger than thirty-six (36) square inches.
2. Not more than five (5) percent of total area with bare spots larger than eighteen (18) square inches.

1.2 DELIVERY, STORAGE, AND PROTECTION

A. Sod:

1. Do not harvest if sod is excessively dry or wet to the extent survival may be adversely affected.
2. Harvest and deliver sod only after laying bed is prepared for sodding.
3. Roll or stack to prevent yellowing.
4. Deliver and lay within twenty-four (24) hours of harvesting.
5. Keep moist and covered to protect from drying from time of harvesting until laid.

1.3 WEATHER RESTRICTIONS

A. Perform Work under favorable weather and soil moisture conditions as determined by accepted local practice.

1.4 SEQUENCING AND SCHEDULING

A. Prepare topsoil as specified in Section 02911 SOIL PREPARATION, before starting Work of this Section.

B. Complete Work under this Section within five (5) days following completion of soil preparation.

C. Notify ENGINEER at least three (3) days in advance of:

1. Each material delivery.
2. Start of planting activity.

D. Planting Season: Those times of year that are normal for such Work as determined by accepted local practice.

1.5 MAINTENANCE SERVICE

A. CONTRACTOR: Perform maintenance operations during maintenance period to include:

1. Watering: Keep surface moist.
2. Washouts: Repair by filling with topsoil, and replace sodded areas.
3. Mowing: Mow to two (2) inches after grass height reaches three (3) inches, and mow to maintain grass height from exceeding 3 1/2 inches.
4. Resod unsatisfactory areas or portions thereof immediately at the end of the maintenance period if a satisfactory stand has not been produced.
5. Resod during next planting season if scheduled end of maintenance period falls after September 15, if a satisfactory stand has not been produced.
6. Resod entire area if satisfactory stand does not develop by July 1 of the following year.

PART 2 PRODUCTS

2.1 FERTILIZER

A. Commercial, uniform in composition, free-flowing, suitable for application with equipment designed for that purpose. Minimum percentage of plant food by weight.

B. Mix:

1. Nitrogen: Sixteen.
2. Phosphoric Acid: Four.
3. Potash: Eight.

2.2 SOD

A. Unless a particular type of sod is called for, sod may be of either Bahia grass, or Bermuda grass at the CONTRACTOR’s option.

B. Strongly rooted pads, capable of supporting own weight and retaining size and shape when suspended vertically from a firm grasp on upper 10 percent of pad.

1. Grass Height: Normal.
2. Strip Size: Supplier's standard, commercial size rectangles.
3. Soil Thickness: Uniform; 1-inch plus or minus 1/4-inch at time of cutting.
4. Age: Not less than ten (10) months or more than thirty (30) months.
5. Condition: Healthy, green, moist; free of diseases, nematodes and insects, and of undesirable grassy and broadleaf weeds. Yellow sod, or broken pads, or torn or uneven ends will not be accepted
6. Any netting contained within the sod shall be certified by the manufacturer to be bio-degradable within a period of three (3) months from installation.

PART 3 EXECUTION

3.1 PREPARATION

A. Grade Areas to Smooth, Even Surface with Loose, Uniformly Fine Texture:

1. Roll and rake, remove ridges, fill depressions to meet finish grades.
2. Limit such Work to areas to be planted within immediate future.
3. Remove debris, and stones larger than 1 1/2 inches diameter, and other objects that may interfere with planting and maintenance operations.

B. Moisten prepared areas before planting if soil is dry. Water thoroughly and allow surface to dry off before seeding. Do not create muddy soil.

C. Restore prepared areas to specified condition if eroded or otherwise disturbed after preparation and before planting.

D. Limit preparation to those areas that can be sodded within 72 hours after preparation.

3.2 FERTILIZER

A. Apply evenly over area in accordance with manufacturer's instructions. Mix into top two (2) inches of top soil.

B. Application Rate: 20 pounds per 1,000 square feet (1,000 pounds per acre).

3.3 SODDING

A. Do not plant dormant sod, or when soil conditions are unsuitable for proper results.

B. Pre-wet the area prior to placing sod. Lay sod to form solid mass with tightly fitted joints; butt ends and sides, do not overlap:

1. Stagger strips to offset joints in adjacent courses.
2. Work from boards to avoid damage to subgrade or sod.
3. Tamp or roll lightly to ensure contact with subgrade; work sifted soil into minor cracks between pieces of sod, remove excess to avoid smothering adjacent grass.
4. Complete sod surface true to finished grade, even, and firm.

C. Fasten sod on slopes to prevent slippage with wooden pins six (6) inches long driven through sod into subgrade, until flush with top of sod. Install at sufficiently close intervals to securely hold sod.

D. Water sod with fine spray immediately after planting. During first month, water daily or as required to maintain moist soil to depth of four (4) inches.

3.4 FIELD QUALITY CONTROL

A. Eight (8) weeks after sodding is complete and on written notice from CONTRACTOR, ENGINEER will, within fifteen (15) days of receipt, determine if the sod has been satisfactorily established.

B. If the sod is not satisfactorily established, CONTRACTOR shall replace the sod and repeat the requirements of this Section.

END OF SECTION

SECTION 02930
TREES, PLANTS, AND GROUND COVERS

PART 1 GENERAL

1.1 DEFINITIONS

A. Measurement:

1. In size grading Balled and Burlapped (B & B) caliper takes precedence over height.
2. Take trunk caliper six (6) inches above the ground level (up to and including 4-inch caliper size) and twelve (12) inches above the ground level for larger trees.
3. Measure size of container-grown stock by height and width of plant.
4. Measure herbaceous perennials pot size, not top growth.

1.2 DELIVERY, STORAGE, AND HANDLING

A. Cover plants during shipment with a tarpaulin or other suitable covering to minimize drying.

B. Balled and Burlapped Plants: Wrap each ball firmly with burlap and securely bind with twine, cord, or wire for shipment and handling. Drum-lace balls with a diameter of thirty (30) inches or more.

C. As specified herein for transplanting.

1.3 MAINTENANCE

A. Commence to maintain plant life immediately after planting and maintain for a minimum of one growing season, and until plants are well established and exhibit a vigorous growing condition.

B. In Accordance with Accepted Submittal on Care and Maintenance of Plants and as Follows:

1. Maintain by watering, pruning, cultivating, and weeding as required for healthy growth. Restore planting saucers.
2. Tighten and repair stake and guy supports and reset trees and shrubs to proper grades or vertical position as required.
3. Restore or replace damaged wrappings. Spray as required to keep trees and shrubs free of insects and disease.
4. Remove guys, stakes, and other supports at end of maintenance service.
5. Maintenance includes temporary protection fences, barriers, and signs as required for protection.
6. Coordinate watering to provide deep root watering to newly installed trees.

1.4 SCHEDULING AND SEQUENCING

A. Plant Deliveries: Notify ENGINEER at least three (3) days in advance of each delivery.

B. Planting Season: Conduct planting during times of year that are normal for such

work as determined by accepted local practice.

C. Plant trees and shrubs after final grades are established and before planting of lawns or grasses.

PART 2 PRODUCTS

2.1 PLANT MATERIALS

A. Provide quantity, size, genus, species, and variety of trees and shrubs indicated; comply with applicable requirements of ANSI Z60.1.

B. Nomenclature (Names of Plants): In accordance with “Hortus Third”.

C. Quality and Size:

1. Nursery-grown, habit of growth normal for species.
2. Sound, healthy, vigorous, and free from insects, diseases, and injuries.
3. Equal to or exceeding measurements specified in plant list. Measure plants before pruning with branches in normal position.
4. Root System of Container-Grown Plants: Well developed and well distributed throughout the container, such that the roots visibly extend to the inside face of the growing container.
5. Perform necessary pruning at time of planting.
6. Sizes: Dimensional relationship requirements of ANSI Z60.1 for kind and type of plants required.
7. Balled and Burlapped Plants: Firm, intact ball of earth encompassing enough of the fibrous and feeding root system to enable full plant recovery.
   a. Ball Size: ANSI Z60.1.
8. Container-Grown Plants: Self-established root systems, sufficient to hold earth together after removal from container, without being rootbound.
   a. Stock: Grown in delivery containers for at least 6 months, but not over 2 years.
9. Label each tree and shrub of each variety with securely attached waterproof tag, bearing legible designation of botanical and common name.
10. All trees must have a fully developed fibrous root system, be heavily branched, or in palms, heavily leafed, free from all insects, fungus, and other diseases.
11. Palms: Wrap the roots of all plants of the palm species before transporting, except if they are container grown plants and ensure that they have an adequate root ball structure, and mass for healthy transplantation as defined in “Florida Grades and Standards for Nursery Plants.”

12. The ENGINEER will not require burlapping if the palm is carefully dug from marl or heavy soil that adheres to the roots and retains its shape without crumbling. During transporting and after arrival, carefully protect root balls of palms from wind and exposure to the sun. Muck grown palms are not allowed. After delivery to the job site, if not planting the palm within 24 hours, cover the root ball with a moist material. Plant all palms within 48 hours of delivery to the site.

13. Move Sabal and Coconut palms in accordance with the “Florida Grades and Standards for Nursery Plants.”

D. Replacement Shrubs and Trees: Same species, size, and quality as specified for plant being replaced, except existing trees larger than 4-inch caliper, may be replaced with 4-inch caliper trees.

2.2 ANTI-DESICCANT

A. Provide transpiration retarding material to be used where any plant material is moved during the growing season.

2.3 GUYING, STAKING, AND WRAPPING MATERIALS

A. Wood Stake: 2 inches by 2 inches by 8 feet.

B. Guy Wires: Galvanized, 12-gauge, ductile steel.

C. Flags:

1. Wood: 1/2-inch by 3 inches by 12 inches, with 3/8-inch hole centered 1-1/2 inches from each end, painted white.
2. Sheet Metal: 1-1/2-inch with clipped corners and both ends punched, painted white.

D. Hose: Two-ply, reinforced rubber garden hose, not less than 1/2-inch diameter, new or used.

E. Wrapping Material:

1. Burlap: Of first quality, minimum 8 ounces in weight, not less than 6 inches nor more than 10 inches in width.

2.4 MULCH

A. Free from noxious weed seed and foreign material harmful to plant growth.

B. Barkdust: Medium grind, pine; maximum 3/4-inch particle size.

2.5 PLANTING SOIL MIX

A. Proportion by Weight: 3/4 approved top soil with 1/4 approved organic matter.

PART 3 EXECUTION

3.1 TRANSPLANTING

A. Remove existing plantings identified for transplant prior to beginning Work in area in accordance with standard nursery practices and as specified herein.

B. Non-dormant Plants: Prior to digging, spray foliage with anti-desiccant, as recommended by manufacturer.

C. Cover balls and containers of plants that cannot be planted immediately, with moist soil or mulch.

D. Water plants as often as necessary to prevent drying until planted.

E. Do not remove container-grown stock from containers before time of planting.

F. Bare-Root Plants:

1. Dig up with least possible injury to fibrous root system.
2. Immediately upon removal from ground, cover roots with thick coating of mud or wrap in wet straw, moss, or other suitable packing material for protection from drying until planted.
3. Plant or heel-in immediately upon relocation to temporary storage. Open and separate bundles of bare-root plants, and eliminate air pockets among roots as they are covered.

G. Replant each temporarily removed tree, shrub, or other plant only after construction activities are completed and applicable grading and topsoil replacement is completed in its vicinity. Replant trees, shrubs, and other plants in their original positions unless otherwise shown or approved. Plant as specified for new plants.

H. Maintain transplanted materials in same manner as new trees and shrubs.

3.2 LOCATION OF PLANTS

A. Locate new planting or stake positions as shown unless obstructions are encountered, in which case notify the ENGINEER.

B. Locate no planting, except ground cover, closer than eighteen (18) inches to pavements, pedestrian pathways, and structures.

C. Request ENGINEER observe locations, and adjust as necessary before planting begins.

3.3 PREPARATION

A. Subsoil Drainage: Furnish for plant pits and beds.

B. Planting Soil: Delay mixing of amendments and fertilizer if planting will not follow preparation of planting soil within two (2) days. For pit and trench type backfill, mix planting soil prior to backfilling and stockpile at site.

C. Plants: Place on undisturbed existing soil or well-compacted backfill.

D. Trees and Shrubs:

1. Pits, Beds, and Trenches: Excavate with vertical and scarified sides.
2. B & B Trees and Shrubs: Make excavations at least twice as wide as root ball.

3. Container-Grown Stock: Excavate as specified for B & B stock, adjust for size of container width and depth.
4. Bare-Root Trees: Excavate pits to a width to just accommodate roots fully extended and depth to allow uppermost roots to be below original grade.
5. Fill excavations with water and allow to percolate out prior to planting.

E. Ground Cover Beds:

1. Mix amendments and fertilizer with top soil prior to placing or apply on surface of top soil and mix thoroughly before planting.
2. Scarify top soil to a depth of 4 to 6 inches.
3. Establish finish grading of soil. Rake areas to smooth and create uniform texture and fill depressions.
4. Moisten.

3.4 PLANTING

A. Plant trees before planting surrounding smaller shrubs and ground covers. Adjust plants with most desirable side facing toward the prominent view (sidewalk, building, or street).

B. B & B Plants: Place in pit by lifting and carrying by its ball (do not lift by branches or trunk). Lower into pit. Set straight and in pit center with tip of rootball 1 to 2 inches above adjacent finish grade.

C. Bare-Root Plants: Spread roots and set stock on cushion of planting soil mixture. Set straight in the pit center so that roots, when fully extended, will not touch walls of the planting pit and the uppermost root is just below finish grade. Cover roots of bare-root plants to the crown.

D. Container-Grown Plants: Remove containers, slash edges of rootballs from top to bottom at least 1-inch deep. Plant as for B & B plants.

E. Ground Covers: Dig planting holes through mulch with one of the following: hand trowel, shovel, bulb planter, or hoe. Split biodegradable pots or remove non-biodegradable pots. Root systems of all potted plants shall be split or crumbled. Plant so roots are surrounded by soil below the mulch. Set potted plants so pot top is even with existing grade.

3.5 BACKFILLING

A. Backfill with planting soil, except where existing soil is suitable according to top soil analysis.

B. B & B Plants:

1. Partially backfill pit to support plant. Remove burlap and binding from sides and tops of B & B plants, do not pull burlap from under balls.
2. When excavation is approximately 2/3 full, water thoroughly before placing remainder of backfill to eliminate air pockets even if it is raining. Finish backfilling pit sides.

3. Never cover top of rootball with soil. Form a saucer above existing grade, completely around the outer rim of the plant pit.

C. Bare-Root Plants:

1. Plumb before backfilling and maintain plumb while working backfill around roots and placing layers above roots.
2. Set original soil line of plant 1-inch to 2 inches above adjacent finish landscape grades. Spread out roots without tangling or turning up to surface. Cut injured roots cleanly; do not break.
3. Carefully work backfill around roots by hand; puddle with water until backfill layers are completely saturated.

3.6 GUYING AND STAKING

A. Support trees immediately after planting to maintain plumb position.

B. Guying: Support all trees over 4 inches in caliper with 3 guys equally.

C. Special Requirements for Palm Trees: Brace palms which are to be staked with three 2-inch by 4-inch wood braces, toe-nailed to cleats which are securely banded at two points to the palm, at a point one third the height of the trunk. Pad the trunk with five layers of burlap under the cleats. Place braces approximately 120 degrees apart and secure them underground by 2- by 4- by 12-inch stake pads.

3.7 MULCHING

A. Cover planting beds and area of saucer around each plant with 3-inch thick layer of mulch within 2 days after planting. Saturate planting area with water.

3.8 PRUNING AND REPAIR

A. Prune only after planting and in accordance with standard horticultural practice to preserve natural character of the plant. Perform in presence of ENGINEER or OWNER’s representative. Remove all dead wood, suckers, and broken or badly bruised branches. Use only clean, sharp tools. Do not cut lead shoot.

B. For Existing Trees Impacted by Construction Activities:

1. Maintain a minimum 6-foot clearance from all trees except palm trees.
2. Where roots of trees are encountered in the excavation area, use a 24-inch deep saw cut prior to excavation. Roots shall not be torn by excavating equipment. Cut roots do not require coating.
3. Overhead branches not trimmed prior to construction and interfering with construction activities will be pruned and cut as approved by the City Forester and not torn or broken off with excavating equipment.

3.9 WEED CONTROL

A. Maintain a weed-free condition within planting areas. Apply pre-emergent selective herbicide to mulched beds at manufacturer's recommended rate of application.

3.10 PROTECTION OF INSTALLED WORK

A. Protect planting areas and plants against damage for duration of maintenance period.

END OF SECTION

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SECTION 15060

HIGH DENSITY POLYETHYLENE (HDPE) PIPE AND FITTINGS

PART 1 - GENERAL

1.01 DESCRIPTION

A. Furnish all labor, materials, equipment and incidentals required to install HDPE pressure pipe, fittings, and appurtenances as shown on the Drawings and specified herein. The products and materials specified herein are intended to be standard types of HDPE Pressure Mains (AWWA C901 and C905) and ductile iron fittings.

1.02 RELATED SECTIONS

A. Section 02320 – Trench Backfill

B. Section 15100 – Valves and Operators

C. Other Sections as applicable

1.03 REFERENCES

A. AWWA C901 Polyethylene (PE) Pressure Pipe & Tubing – ½ Inch Through 3 Inch for Water Service

B. AWWA C906 Polyethylene (PE) Pressure Pipe & Fittings – 4 Inch Through 63 Inch for Water Distribution

C. ASTM D1238 Melt Flow Index

D. ASTM D1505 Density of Plastics

E. ASTM D2837 Hydrostatic Design Basis

F. ASTM D3035 Standard Spec for PE Pipe (DR-PR) Based on Controlled Outside Diameter

G. ASTM D3261 Butt Heat Fusion PE Fittings for PE Pipe & Tubing

H. ASTM D3350 Standard Specification for PE Pipe & Fittings Materials

I. NSF/ANSI STD. #61 Drinking Water Components

J. NSF/ANSI STD. #14 Plastic Piping Components & Related Materials

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1.04 QUALIFICATIONS

A. All of the HDPE pipe and ductile-iron fittings shall be furnished by manufacturers who are fully experienced, reputable, and qualified in the manufacture of the materials to be furnished. The pipe and fittings shall be designed, constructed, and installed in accordance with AWWA Standards for HDPE Pipe and using the best practices and methods as specified herein. The pipe manufacturer shall supply a one year warranty from date of shipment of their products. All pipes and fittings shall have NSF product certification and be U.L. product certified.

1.05 SUBMITTALS

A. Submit to the Engineer within ten (10) calendar days after execution of the Contract a list of materials to be furnished, the names of the suppliers, and the date of delivery of materials to the site.

B. All HDPE pipe and ductile-iron fittings to be installed under this Contract shall be inspected and tested at the foundry as required by the standard specifications to which the material is manufactured. Furnish to the Engineer in duplicate sworn certificates of such tests and their results. In addition, all HDPE pipe and ductile iron fittings to be installed under this Contract may be inspected at the foundry for compliance with these Specifications by an independent testing laboratory selected by the Owner. The manufacturer's cooperation shall be required in these inspections. The cost of foundry inspection requested by the Owner of all pipe approved for this contract will be borne by the Owner.

C. Shop Drawings shall be submitted to the Engineer for approval and shall include dimensioning, methods and locations of supports an all pertinent technical specifications for all piping to be furnished. Shop drawings shall be prepared by the pipe manufacturer.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Materials used for the manufacture of polyethylene pipe and fittings shall be made from a PE 4710 high density polyethylene resin compound meeting cell classification 345434C per ASTM D3350; and meeting Type III, Class C, Category 5, Grade P34 per ASTM D1238.

B. High Density Polyethylene (HDPE) pipe shall comply with AWWA Specifications C901 or 906 as applicable.

C. 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.

D. Dimensions and workmanship shall be as specified by ASTM F714. HDPE fittings and transitions shall meet ASTM D3261. HDPE pipe shall have a minimum density

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of 0.955 grams per cubic centimeter. All HDPE pipe and fittings shall have a Hydrostatic Design Basis (HDB) of 1,600 psi.

E. HDPE pipe and accessories shall have a Standard Dimension Ration (SDR) as indicated in the bid tab and measurement and payment or as shown on the plans.

F. The pipe manufacturer must certify compliance with the above requirements.

2.02 FITTINGS

A. All fittings shall be ductile iron pipe (DIP) unless otherwise indicated on the Drawings.

B. HDPE fittings:

1. All molded fittings and fabricated fittings shall be fully pressure rated to match the pipe SDR pressure rating to which they are made. All fittings shall be molded or fabricated by the manufacturer. No Contractor fabricated fittings shall be used unless approved by the Engineer.

2. The manufacturer of the HDPE pipe shall supply all HDPE fittings and accessories as well as any adapters and/or specials required to perform the work as shown on the Drawings and specified herein.

3. All fittings shall be installed using butt-fused fittings, thermo-fused fittings/couplings, or flanged adapters and must be approved by the Engineer. No size on size wet taps shall be permitted.

C. All transition from HDPE pipe to ductile iron or PVC shall be made per the approval of Engineer and per the HDPE pipe manufacturer's recommendations. A molded flange connector adapter within a carbon steel back-up ring assembly shall be used for pipe type transitions. Ductile iron back-up rings shall mate with cast iron flanges per ANSI B16.1. A 316 stainless steel back-up ring shall mate with a 316 stainless steel flange per ANSI B16.1

1. Transition from HDPE to ductile iron fittings and valves shall be approved by Engineer before installation.

2. No solid sleeves shall be allowed between such material transitions.

2.03 PIPE IDENTIFICATION

A. The following shall be continuously indent printed on the pipe or spaced at intervals not exceeding 5 feet:

1. Name and/or trademark of the pipe manufacturer.

2. Nominal pipe size.

3. Dimension ratio.

4. The letters PE followed by the polyethylene grade in accordance with ASTM D1248 followed by the hydrostatic design basis in 160's of psi, e.g., PE 3408.

5. Manufacturing standard reference, e.g., ASTM F714 or D3035, as required.

6. A production code from which the date and place of manufacture can be determined.

7. Color identification, either stripped by co-extruding longitudinal identifiable color markings or shall be solid in color and as follows:

   a. BLUE – Potable Water

   b. GREEN – Sanitary Sewer

   c. LAVENDAR – IQ Cover All

   d. BLACK – Drainage

PART 3 - EXECUTION

3.01 JOINTING METHOD

A. The pipe shall be joined with butt, heat fusion joints as outlined in ASTM D3261. All joints shall be made in strict compliance with the manufacturer's recommendations. A factory qualified joining technician as designated by the pipe manufacturer or an experienced, trained technician shall perform all heat fusion joints in the presence of the inspector.

B. Lengths of pipe shall be assembled into suitable installation lengths by the butt-fusion process. All pipes so joined shall be made from the same class and type of raw material made by the same raw material supplier. Pipe shall be furnished in standard laying lengths not to exceed 50 feet and no shorter than 20 feet.

C. On days butt fusions are to be made, the first fusion shall be a trail fusion in the presence of an inspector. The following shall apply:

   1. Heating plates shall be inspected for cuts and scrapes. The plate temperature shall be measured at various locations to ensure proper heating/melting per manufacturer's recommendations and approval by inspector.

   2. The fusion or test section shall be cut out after cooling completely for inspection.

   3. The test section shall be 12" or 30 times (minimum) the wall thickness in length and 1" or 1.5 times the wall thickness in width (minimum).

   4. The joint shall be visually inspected as to continuity of "beads" from the melted material, and for assurance of "cold joint" prevention (i.e. joint shall have visible molded material between walls of pipe). Joint spacing between the walls of the two ends shall be a minimum of 1/16" to a maximum 3/16".

D. The polyethylene flange adapters at pipe material transitions shall be backed up by

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stainless steel flanges conforming to ANSI B16.1 and shaped as necessary to suit the outside dimensions of the pipe. The flange adapter assemblies shall be connected with corrosion resisting bolts and nuts of Type 316 Stainless Steel. All bolts shall be tightened to the manufacturer's specified torques. Bolts shall be tightened alternatively and evenly. After installation apply a bitumastic coating to bolts and nuts.

3.02 INSTALLATION

A. High Density Polyethylene (HDPE) pipe shall be installed in accordance with the instruction of the manufacturer, as shown on the drawings and as specified herein. A factory qualified joining technician as designated by the pipe manufacturer shall perform all heat fusion joints.

B. HDPE shall be installed either by Open Trench Construction or Directional Bore Method as outlined in Section 3.02 – Installation, Item Q – Open Trench Installation or Item R – Directional Bore Installation.

C. Care shall be taken in loading, transporting, and unloading to prevent injury to the pipe. Pipe or fitting shall not be dropped. All pipe or fitting shall be examined before installation, and no piece shall be installed which is found to be defective. Any damage to the pipe shall be repaired as directed by the Engineer. If any defective pipe is discovered after it has been installed, it shall be removed and replaced with a sound pipe in a satisfactory manner by the contractor, at his own expense.

D. Under no circumstances shall the pipe or accessories be dropped into the trench or forced through a directional bore upon "pull-back".

E. Care shall be taken during transportation of the pipe such that it will not be cut, kinked, or other damaged.

F. Ropes, fabric, or rubber protected slings and straps shall be used when handling pipes. 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.

G. Pipes shall be stored on level ground, preferable turf or sand, free of sharp objects, which could damage the pipe. Stacking of the polyethylene pipe shall be limited to a height that will not cause excessive deformation of the bottom layers of pipes under anticipated temperature conditions. Where necessary due to ground conditions, the pipe shall be stored on wooden sleepers, spaced suitably and of such width as not to allow deformation of the pipe at the point of contact with the sleeper or between supports.

H. Pipe shall be stored on clean level ground to prevent undue scratching or gouging. The handling of the pipe shall be in such a manner that the pipe is not damaged by dragging it over sharp and cutting objects. The maximum allowable depth of cuts, scratches, or gouges on the exterior of the pipe is 5 percent of wall thickness. The interior pipe surface shall be free of cuts, gouges, or scratches.

I. Pipe shall be laid to lines and grade shown on the drawings with bedding and backfill as shown on the drawings.

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J. When laying is not in progress, including lunchtime, the open ends of the pipe shall be closed by fabricated plugs, or by other approved means.

K. Sections of pipe with cuts, scratches, or gouges exceeding 5 percent of the pipe wall thickness shall be removed completely and the ends of the pipeline rejoined.

L. The pipe shall be joined by the method of thermal butt fusion, as outlined in Part 3 – Execution, Section 3.1 Joining Method. All joints shall be made in strict compliance with the manufacturer's recommendations.

M. Mechanical connections of the polyethylene pipe to auxiliary equipment such as valves, pumps, and tanks shall be through flanged connections which shall consist of the following:

1. A polyethylene flange shall be thermally butt-fused to the stub end of the pipe.

2. A 316 stainless steel back up ring shall mate with a 316 stainless steel flange.

3. 316 stainless steel bolts and nuts shall be used.

N. Flange connections shall be provided with a full-face neoprene gasket.

O. All HDPE pipe must be at the temperature of the surrounding soil at the time of backfilling and compaction.

P. If a defective pipe is discovered after it has been installed, it shall be removed and replaced with a sound pipe in a satisfactory manner at no additional cost to the Owner. All pipe and fittings shall be thoroughly cleaned before installation, shall be kept clean until they are used in the work and when laid, shall conform to the lines and grades required.

Q. Open Trench Installation:

1. Specification, Section 02320 – Trench Backfill, shall apply in its entirety.

2. The centerline of the pipe shall not deviate from a straight line drawn between the centers of the openings at the ends of the pipe by more than 1/16 inch per foot of length. If a piece of pipe fails to meet this requirement check for straightness, it shall be rejected and removed from the site. Laying instructions of the manufacturer shall be explicitly followed.

3. Good alignment shall be preserved during installation. Deflection of the pipe shall occur only at those places on design drawings and as approved by the Engineer. Fittings, in addition to those shown on the drawings, shall be used only if necessary or required by the Engineer.

4. Each length of the pipe shall have the assembly mark aligned with the pipe previously laid and held securely until enough backfill has been placed to hold the pipe in place. Joints shall not be "pulled" or "cramped".

5. Precautions shall be taken to prevent flotation of the pipe in the trench.

6. When moveable trench bracing such as trench boxes, moveable sheeting, shoring or plates are used to support the sides of the trench, care shall be taken in placing and moving the boxes or supporting bracing to prevent movement of the pipe, or disturbance of the pipe bedding and the backfill. Trench boxes, moveable sheeting, shoring, or plates shall not be allowed to extend below top of the pipe. As trench boxes, moveable sheeting, shoring, or plates are moved, pipe bedding shall be placed to fill any voids created and the backfill shall be re-compacted to provide uniform side support for the pipe.

7. Restrained joints shall be installed where shown on the drawings or as directed by the Engineer.

R. Directional Bore Installation

1. Refer to Specification 02341 – Horizontal Directional Drilling in its entirety.

3.03 PRESSURE AND LEAKAGE TESTS OF UNDERGROUND PRESSURE PIPING

A. Hydrostatic pressure and leakage test shall conform to ASTM F2164-13.

B. The pressure required for the field hydrostatic pressure test shall be 150 psi. The Contractor shall provide temporary plugs and blocking necessary to maintain the required test pressure. Corporation cocks at least 3/4 inches in diameter, pipe riser and angle globe valves shall be provided at each pipe dead-end in order to bleed air from the line. Duration of pressure test shall be at least two hours. The cost of these items shall be included as a part of testing.

C. The leakage test shall be a concurrent test at the maximum operating pressure as determined by the Engineer with the pressure test and shall be of not less than 2 hours duration. All leaks evident at the surface shall be repaired and leakage eliminated regardless of total leakage as shown by test. Lines which 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. The pipelines shall be tested in such sections as may be directed by the Engineer by shutting valves or installing temporary plugs as required. The line shall be filled with water and all air removed and the test pressure shall be maintained in the pipe for the entire period by means of a force pump to be furnished by the Contractor. Accurate means shall be provided for measuring the water required to maintain this pressure. The amount of water required is a measure of the leakage.

D. The amount of leakage which will be permitted shall be in accordance with ASTM F2164-13.

E. The Contractor must submit his plans for testing to the Engineer for review at least ten (10) days before starting the test. The Contractor shall remove and adequately dispose of all blocking material and equipment after completion and acceptance of the field hydrostatic test, unless otherwise directed by the Engineer. Any damage to the pipe coating shall be repaired by the Contractor. Lines shall be totally free and clean prior to final acceptance.

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3.04 CLEANING AND FLUSHING

A. The pipe shall be thoroughly cleaned of all foreign matter before installation. It is the responsibility to insure cleanliness of the pipe during installation and backfilling. At the conclusion of the work, the Contractor shall thoroughly clean all of the pipe, if necessary, by flushing with water or other materials which may have entered during the construction period. Debris cleaned from the lines shall be removed from the lowest outlet. If pipe is cleaned and if the groundwater level is above the pipe, or following a heavy rain the Engineer will examine the pipe for leaks. If defective pipes or joints are discovered at this time, they shall be repaired by the Contractor.

END OF SECTION

SECTION 15100
VALVES AND OPERATORS

PART 1 GENERAL

2.01 SUBMITTALS

A. Shop Drawings:

1. Product data sheets for make and model.
2. Complete catalog information, descriptive literature, Specifications, and identification of materials of construction.

PART 2 PRODUCTS

3.01 GENERAL

A. Valve to include operator, actuator, handwheel, chain wheel, extension stem, floor stand, worm and gear operator, operating nut, chain, wrench, and accessories as appropriate and as shown on the Drawings for a complete operation.

B. Valve to be suitable for intended service. Renewable parts not to be of a lower quality than specified.

C. Valve same size as adjoining pipe.

D. Valve ends to suit adjacent piping.

E. Size operator to operate valve for the full range of pressures and velocities.

F. Valve to open by turning counterclockwise.

G. Factory mount operator, actuator, and accessories.

3.02 MATERIALS

A. Brass and bronze valve components and accessories that have surfaces in contact with water to be alloys containing less than 16 percent zinc and 2 percent aluminum.

B. Approved Alloys Are of the Following ASTM Designations:

1. B61, B62, B98 (Alloy UNS No. C65100, C65500, or C66100), B139 (Alloy UNS No. C51000), B584 (Alloy UNS No. C90300 or C94700), B164, B194, and B127.
2. Stainless steel Alloy 18-8 may be substituted for bronze.

3.03 FACTORY FINISHING

A. Epoxy Lining and Coating: In accordance with manufacturer's instructions for on-site soil and groundwater conditions and Section 02502, Ductile Iron Pipe and Fittings.

B. Exposed Valves:

1. In accordance with manufacturer's instructions for onsite soil and groundwater conditions.
2. Safety isolation valves and lockout valves with handles, handwheels, or chain wheels "safety yellow."

3.04 VALVES

A. Gate Valves:

1. All valves, unless otherwise specified, shall be the product of one manufacturer.
2. Gate valves shall be resilient seat gate valves for 150 psi minimum working pressure, conforming to AWWA C515 or C509.
   a. The gate valves shall have a high strength, bronze, nonrising stem.
   b. Valves shall have neoprene, Buna-N or equal, but not natural rubber, O-ring stem seals and be of a design that allows replacement of the O-rings while the valve is in service under pressure.
   c. Operating nuts shall be AWWA 2-inch square with skirts and open by turning the nut counter clockwise.
   d. Valve body, bonnet, and gate shall be ductile iron conforming to ASTM A536. Shell thickness of body and bonnet components shall conform to Table 2, Section 4.4 of AWWA C509 or C515.
3. Valve body and bonnet shall be coated on all interior and exterior surfaces with a two-part epoxy conforming to the requirements of AWWA C550. Coating shall be suitable for potable water service.
4. Gates shall be covered with rubber over all interior and exterior ferrous surfaces. Rubber shall be securely bonded to the gate body including the part that houses the stem nut.
5. Direct-buried gate valves shall be polyethylene encased and shall have Type 304 stainless steel bonnet bolts.
6. Gate valves shall be as manufactured by American Flow Control Series 2500, Mueller Series 2360 and 2361; or Clow/Kennedy.
7. Tapping valves shall conform to these Specifications. Tapping sleeves shall be in accordance with the provisions of Section 02500, Conveyance Piping – General. Tapping valves shall be mounted in a horizontal position. Tapping valves shall be compatible with the tapping sleeve – no field grinding will be permitted.

B. Ball Valves:

1. Ball Valve 2 Inches and Smaller for General Water and Air Service: All-bronze, three-piece body type, screwed ends, full bore ports, Teflon seat, blowout-proof stem, hand lever operator, rated 150 psi SWP, 400-pound WOG minimum.
   a. Manufacturers and Products:
      1) Nibco, Inc.; T-595-Y.
      2) Grinnell Supply Sales Co.; Figure 3810.

C. Plug Valves:

1. All valves, unless otherwise specified, shall be the product of one manufacturer.
2. Eccentric Valve 3 Inches through 12 Inches:
   a. Nonlubricated type rated 175 psig CWP.
   b. Drip-tight shutoff with pressure from either direction. Valves will be rejected if they are delivered to the site with no indication that they meet this requirement.
   c. Cast iron body with flanged ends or grooved ends in accordance with AWWA C606 for rigid joints, mechanical joint ends for buried valve.
   d. Plug shall be cast iron with round or rectangular port or no less than 80 percent of the connecting pipe area and coated with Buna-N or Hycar.
   e. Seats shall be welded nickel.
   f. Stem bearing shall be self-lubricating stainless steel, bronze or reinforced Teflon.
   g. Stem seal shall consist of multiple V-rings, U-cups, or O-rings of nitrile rubber with grit seals on stem.
   h. For buried service, provide external epoxy coating.
   i. For wastewater service, valves shall be lined with a two-part epoxy in accordance with AWWA C550.
   j. Valve 3 through 4 inches with wrench lever manual operator.
   k. Valve 6 through 12 inches with totally enclosed, geared, manual operator with handwheel, 2-inch nut, or chain wheel.
      1) Size operator for 1.5 times the maximum operating shutoff pressure differential for direct or reverse pressure, whichever is greater.
      2) For buried service, provide completely sealed operator filled with heavy lubricant.
   l. Manufacturer and Products: DeZurik; Series PEC, Milliken Millcentric Figure No. 600/601, Clow, or Val-matic Camcentric.
3. Eccentric Valve 14 Inches through 20 Inches:
   a. Nonlubricated type rated 150 psig CWP.
   b. Driptight shutoff with pressure from either direction. Valves will be rejected if they are delivered to the site with no indication that they meet this requirement.

c. Cast iron body with flanged ends or grooved ends in accordance with AWWA C606 for rigid joints, mechanical joint ends for buried valve.
d. Plug shall be cast iron with round or rectangular port or no less than 80 percent of the connecting pipe area and coated with Buna-N or Hycar.
e. Seats shall be welded nickel.
f. Stem bearing shall be self-lubricating stainless steel, bronze, or reinforced Teflon.
g. Stem seal shall consist of multiple V-rings, U-cups, or O-rings of nitrile rubber with grit seals on stem.
h. For buried service, provide external epoxy coating.
i. For wastewater service, valves shall be lined with a two-part epoxy in accordance with AWWA C550.
j. Totally enclosed, geared, manual operator with handwheel, 2-inch nut, or chain wheel.
    1) Size operator for 1.5 times the maximum operating shutoff pressure differential for direct or reverse pressure, whichever is greater.
    2) For buried service, provide completely sealed operator filled with heavy lubricant.
k. Manufacturer and Products: DeZurik; Series PEC, Milliken Millcentric Figure No. 600/601, Clow, or Val-matic Camcentric.

4. Eccentric Valve 24 Inches through 48 Inches:
    a. Nonlubricated type rated 150 psig CWP.
    b. Driptight shutoff with pressure from either direction. Valves will be rejected if they are delivered to the site with no indication that they meet this requirement.
    c. Cast iron body with flanged ends or grooved ends in accordance with AWWA C606 for rigid joints, mechanical joint ends for buried valve.
    d. Plug shall be cast iron with round or rectangular port or no less than 80 percent of the connecting pipe area and coated with Buna-N or Hycar.
    e. Seats shall be welded nickel.
    f. Stem bearing shall be self-lubricating stainless steel, bronze or reinforced Teflon.
    g. Stem seal shall consist of multiple V-rings, U-cups, or O-rings of nitrile rubber with grit seals on stem.
    h. For buried service, provide external epoxy coating.
    i. For wastewater service, valves shall be lined with a two-part epoxy in accordance with AWWA C550.
    j. Totally enclosed, geared, manual operator with handwheel, 2-inch nut, or chain wheel.
        1) Size operator for 1.5 times the maximum operating shutoff pressure differential for direct or reverse pressure, whichever is greater.
        2) For buried service, provide completely sealed operator filled with heavy lubricant.

k. Manufacturer and Products: DeZurik; Series PEC, Pratt Ballmatic, Milliken Millcentric Figure No. 600/601, Clow, or Val-matic Camcentric.

D. Butterfly Valves:

1. General:
   a. All valves, unless otherwise specified, shall be the product of one manufacturer.
   b. Valves shall meet the requirements or AWWA C504 except as modified herein.
   c. Valves shall be Class 150B.
   d. Valves shall be flanged, short-body design for exposed service and mechanical joint design for buried service with joints as described in Section 02500, Conveyance Piping - General.
   e. Actual port diameter shall not be less than 1 inch smaller than the nominal pipe size.
   f. Valves shall be equipped with an adjustable, mechanical limiting device in the operator to prevent over travel of the disc in the open and closed position. Disc position stops in the valve body are not permitted.
   g. Valves shall be lined with a two-part epoxy in accordance with AWWA C550. Coating shall be suitable for potable water service.
2. Valve bodies shall be constructed of ASTM B126 Class B cast iron and shall have two integrally cast trunnions for shaft bearings.
3. Valve Seats:
   a. Shall be field adjustable around the full circumference of the body without interruption of flow for all valves 24 inches and larger.
   b. Seats may be incorporated into the valve body or valve disc.
   c. Seats shall be replaceable without dismantling the operator, disc or shaft and without removing the valve from the line.
   d. Valve seats shall be Buna-N unless otherwise specified.
   e. Seats bond shall be tested at 75 pounds in accordance with ASTM D429, Method B for valves 20 inches and smaller. For valves larger than 20 inches, seats shall be retained in the body by mechanical means without retaining rings, segments, screws or hardware of any kind protruding into the flow stream.
4. Bearings:
   a. Valve bearings shall be the sleeve type.
      1) 100 percent nylon or Teflon for valves 20 inches and smaller.
      2) Bearings shall be Teflon with fiberglass backing for valves 24 inches and larger.
   b. Bearings shall be self-lubricating and bearing load shall not exceed 1/5 of the compressive strength of the bearing or shaft material.

5. Valve Discs:
   a. Discs shall operate through a 90-degree angle from fully closed to fully open.
   b. Valve discs shall be cast iron alloy ASTM A436 Type 1, ASTM A48 or ASTM A126 for valves 20 inches and smaller and ASTM A48 cast iron or ASTM A536 ductile iron for valves 24 inches and larger.
   c. Valve discs shall have a Type 316 stainless steel seating edge and shall not have any hollow chambers.
6. Shafts and Seals:
   a. Valve shafts shall be Type 316 stainless steel meeting the minimum requirements of AWWA C504.
   b. Valve shafts shall be one piece for valves 20 inches and smaller and two piece for valves 24 inches and larger.
   c. Shaft seals shall be self-compensating, split V type and shall be adjustable and replaceable without removing the operator and/or the shaft, except for buried applications.
   d. Shaft seals shall be Buna-N unless otherwise specified.
7. Valves for buried service shall be totally enclosed, fully gasketed, grease packed and designed to operate indefinitely when submerged under a minimum 20 feet of water.
8. Manufacturers: Valmatic – American BFV, Mueller Lineseal III, Pratt - Groundhog, or Dezurik – BAW.

E. Check Valves:

1. Swing Check Valve 2-1/2 Inches through 12 Inches: Flanged end, cast iron body, bronze mounted swing type, solid bronze hinges, stainless steel hinge shaft, outside lever and spring, rated 125-pound SWP, 200-pound WOG. Check valves shall meet requirements of AWWA C508.
   a. Manufacturers and Products:
      1) GA Series 250 Swing Check
      2) Milliken Swing Check.
      3) American Flow Control Series 50SC or 600
   b. Valves shall be lined with a two-part epoxy in accordance with AWWA C550.
2. Resilient Seat Check Valve 2-1/2 Inches through 16 Inches: Flanged end, cast iron body and bonnet, rubber-encapsulated, DI or steel disc, rated 125-pound SWP, 200 pound WOG. Check valves shall meet requirements of AWWA C508.
   a. Manufacturers and Products:
      1) American Flow Control Series 2100.
      2) Milliken Flex Check.
      3) Val-Matic Swingflex.
   b. Valves shall be lined with a two-part epoxy in accordance with AWWA C550
3. Type V642 Reduced Pressure Backflow Preventer: Two check valves, independent relief between the valves; testing cock, in accordance with AWWA C511, rated 175-pound CWP, meets requirements of USC Cross Connection Control Laboratory.

a. Manufacturers and Products:
   1) FEBCO; Model 825Y, 825YD.
   2) Hersey; Model FRP II, 6CM.

F. Self-Contained Automatic Valves:

1. Sewage Air and Vacuum Release Valve:
   a. Combination valve, suitable for sewer service, automatically exhausts air during the filling of a system and allows air to re-enter during draining or when vacuum occurs.
   b. Rated 150 psi working pressure and built with a special short body, and have cast iron, ductile iron, or semi-steel body, covers with stainless steel float and trim.
   c. Sewage air and vacuum valve to be fitted with blowoff valve, quick disconnect couplings, and a minimum 6 feet of hose to permit backflushing after installation without dismantling valve.
   d. Provide with service saddle on main and ball corporation stop (Ford FB500 style; or equal).
   e. Size as shown on the Drawings or 2 inches minimum.
   f. Manufacturers and Products:
      1) International Valve Marketing, Inc., (Vent-O-Mat - Series RGX).
      2) APCO Valve and Primer Corp – 440 Series; or equal.
      3) Val-Matic Series 301A-308.
2. Water Air and Vacuum Release Valve:
   a. Single body, combination valve suitable for water service, automatically exhausts air during the filling of a system and allows air to re-enter during draining or when vacuum occurs.
   b. Rated 150 psi working pressure and built with a special short body, and have cast iron, ductile iron, or semi-steel body, covers with stainless steel float and trim.
   c. Provide with service saddle on main and ball corporation stop (Ford FB500 style; or equal).
   d. Size as shown on the Drawings, or 2 inches minimum.
   e. Manufacturers and Products:
      1) International Valve Marketing, Inc., (Vent-O-Mat - Series RBX).
      2) APCO Valve and Primer Corp. - 140C Series; or equal.
      3) Val-Matic Series 100S-170.

3.05 OPERATORS

A. Manual Operator:

1. General:
   a. Operator force not to exceed 40 pounds under any operating condition, including initial breakaway. Gear reduction operator when force exceeds 40 pounds.

b. Operator self-locking type or equipped with self-locking device.
c. Position indicator on quarter-turn valves.
d. Worm and gear operators one-piece design worm-gears of gear bronze material. Worm hardened alloy steel with thread ground and polished. Traveling nut type operators threader steel reach rods with internally threaded bronze or ductile iron nut.

2. Exposed Operator:
   a. Galvanized and painted handwheels.
   b. Lever operators allowed on quarter-turn valves 8 inches and smaller.
   c. Cranks on gear type operators.
   d. Valve handles to take a padlock, and wheels a chain and padlock.
3. Buried Operator:
   a. Buried service operators on valves larger than 2-1/2 inches shall have a 2-inch AWWA operating nut. Buried operators on valves 2 inches and smaller shall have cross handle for operation by forked key. Enclose moving parts of valve and operator in housing to prevent contact with the soil.
   b. Design buried service operators for quarter-turn valves to withstand 450 foot-pounds of input torque at the FULLY OPEN or FULLY CLOSED positions, grease packed and gasketed to withstand a submersion in water to 10 psi.
   c. Buried valves shall have extension stems, bonnets, and valve boxes.

3.06 ACCESSORIES

A. Cast Iron Valve Box: Designed for traffic loads, sliding type, with minimum of 6-inch ID shaft.

1. Box: Cast iron with minimum depth of 9 inches.
2. Lid: Cast iron.
   a. Minimum depth 3 inches.
   b. Marked SEWER or WATER, as appropriate.
   c. Turn to retain with locking bolt.
3. Extensions: cast iron.
   a. O-ring seal between sections.
   b. Self-centering alignment ring.
4. American Flow Control Trench Adaptor or equal.

B. Provide service saddles and fittings in accordance with Section 02518, Water Connections, for ARV’s.

PART 3 EXECUTION

4.01 INSTALLATION

A. Flange Ends:

1. Flanged valve boltholes shall straddle vertical centerline of pipe.
2. Clean flanged faces, insert gasket and bolts, and tighten nuts progressively and uniformly.

B. Screwed Ends:

1. Clean threads by wire brushing or swabbing.
2. Apply joint compound.

C. Valve Orientation:

1. Install operating stem vertical when valve is installed in horizontal runs of pipe having centerline elevations 4 feet 6 inches or less above finished floor, unless otherwise shown.
2. Install operating stem horizontal in horizontal runs of pipe having centerline elevations between 4 feet 6 inches and 6 feet 9 inches above finish floor, unless otherwise shown.
3. Orient butterfly valve shaft so that unbalanced flows or eddies are equally divided to each half of the disc, i.e., shaft is in the plane of rotation of the eddy.
4. If no plug valve seat position is shown, locate as follows:
   a. Horizontal Flow: The flow shall produce an “unseating” pressure, and the plug shall open into the top half of valve.
   b. Vertical Flow: Install seat in the highest portion of the valve.

D. Install a line size ball valve and union upstream of each solenoid valve, in-line flow switch, or other in-line electrical device, excluding magnetic flowmeters, for isolation during maintenance.

E. Locate valve to provide accessibility for control and maintenance. Install access doors in finished walls and plaster ceilings for valve access.

F. Extension Stem for Operator: Where the depth of the valve is such that its centerline is more than 3 feet below grade, furnish an operating extension stem with 2-inch operating nut to bring the operating nut to a point 6 inches below the surface of the ground and/or box cover.

G. Torque Tube: Where operator for quarter-turn valve is located on floor stand, furnish extension stem torque tube of a type properly sized for maximum torque capacity of the valve.

4.02 TESTS AND INSPECTION

A. Valve may be either tested while testing pipelines, or as a separate step.

B. Test that valves open and close smoothly with operating pressure on one side and atmospheric pressure on the other, in both directions for two-way valve and applications.

C. Inspect air and vacuum valves as pipe is being filled to verify venting and seating is fully functional.

D. Count and record number of turns to open and close valve; account for any discrepancies with manufacturer's data.

E. Set, verify, and record set pressures for all relief and regulating valves.

F. Test hydrostatic relief valve seating; record leakage. Adjust and retest to maximum leakage of 0.1 gpm per foot of seat periphery.

END OF SECTION

FLORIDA DEPARTMENT OF TRANSPORTATION SPECIFICATIONS

SECTION 160
STABILIZING

160-1 Description.

Stabilize designated portions of the roadbed to provide a firm and unyielding subgrade, having the required bearing value specified in the Plans.

160-2 Materials.

160-2.1 Commercial Material: Meet the requirements of Section 914-2.1.

160-2.2 Local Material: Meet the requirements of Section 914.Test material from each source, or if authorized by the Engineer, test blended materials. Submit test results to the Engineer at least 14 days prior to the stabilization operation.

160-2.2.1 Reclaimed Asphalt Pavement (RAP) (Same Project): The Engineer may allow the use of RAP material from the same project that is free of contaminants without testing the source.

160-2.2.2 Reclaimed Asphalt Pavement (RAP) (Different Project) or RAP Blended Material: When RAP is obtained from another project, the Engineer will determine the acceptability of the material.

160-2.3 Existing Base: When the material from an existing base is used as all, or a portion, of the stabilizing additives, no further testing is required unless directed by the Engineer.

160-2.4 Granular Subbase: The Engineer may allow, at no additional cost to the Department, the substitution of 6 inches of granular subbase meeting the requirements of 290-2 and 290-3, when 12 inches of stabilization requiring a limerock bearing ratio (LBR) value of 40 is specified.

160-3 Construction Methods.

160-3.1 General: Prior to the beginning of stabilizing operations, construct the area to be stabilized to an elevation such that, upon completion of stabilizing operations, the completed stabilized subgrade will conform to the lines, grades, and cross-section shown in the Plans. Prior to spreading any additive stabilizing material, bring the surface of the roadbed to a plane approximately parallel to the plane of the proposed finished surface.

Construct mainline pavement lanes, turn lanes, ramps, parking lots, concrete box culverts and retaining wall systems meeting the requirements of 120-8.1, except replace “embankment” with “subgrade”.

Construct shoulder-only areas, sidewalk, and shared use path areas meeting the requirements of 120-8.1 except replace “embankment” with “subgrade” and meet the acceptance criteria of 160-4.2.

Isolated mixing operations will be considered as separate LOTs. Curb pads and shoulders compacted separately shall be considered separate LOTs. Isolated compaction operations will be considered as separate LOTs. For multiple phase construction, a LOT shall not extend beyond the limits of the phase.

160-3.2 Application and Acceptance of Stabilizing Material: After completing the roadbed grading operations, determine the type and quantity (if any) of stabilizing material necessary for compliance with the bearing value requirements. Before using any Fossil Fuel Combustion Products (FFCPs), provide documentation, at the preconstruction meeting or no later than 30 days prior to delivery of FFCP’s to the project, signed and sealed by the Specialty

Engineer that these materials meet the requirements of 403.7047 F.S. Notify the Engineer of the approximate quantity to be added before spreading. When additive stabilizing materials are required, spread the material uniformly over the area to be stabilized.

160-3.2.1 Sampling and Testing of Local Material before Mixing: When local materials are used for stabilizing, randomly select locations for sampling using a random number generator approved by the Engineer in accordance with the sampling procedure described in FM 1-T 267. Test at the minimum frequency listed in the table below before mixing. The Engineer may waive these testing requirements if the additive stabilizing material is RAP or RAP blended materials.

The Engineer will reject the material for failing quality control (QC) test results. The Engineer will sample for Verification and Resolution testing at the minimum frequency listed in the table below. The Engineer will perform Verification tests at the minimum frequency listed in the table below.

Test Name	Quality Control	Verification	Resolution
Liquid Limit (LL), Plastic Index (PI), and Organic Content	One per two LOTs	One per eight LOTs	One per eight LOTs

160-3.2.1.1 Verification Comparison Criteria and Resolution Procedures of Stabilizing Materials: If the QC and the Department's Verification tests meet the requirements of Section 914 then the Engineer will accept the corresponding LOTs. Otherwise, the Engineer will submit the Resolution sample to the State Materials Office (SMO) or an AASHTO accredited laboratory designated by SMO to perform Resolution testing.

If the Resolution Test results meet the requirements of Section 914 then the Engineer will accept the LOTs in question. Otherwise remove the material and apply new material meeting the requirements of Section 914 and retest in accordance with 160-3.2.

160-3.3 Mixing: Perform mixing using rotary tillers, a plant or other equipment meeting the approval of the Engineer. The subgrade may be mixed in one course if the equipment and method of construction provides the uniformity, particle size limitation, compaction and other desired results of 160-4. Thoroughly mix the area to be stabilized throughout the entire depth and width of the stabilizing limits.

Perform the mixing operations, as specified, (either in place or in a plant) regardless of whether the existing soil, or any select soils placed within the limits of the stabilized sections, have the required bearing value without the addition of stabilizing materials.

160-3.4 Mixed Material Requirements: At the completion of the mixing, ensure the following requirements are met:

Criteria	Test Method
Average Organic Content ≤ 2.5%	FM 1-T267
Individual Organic Content Result ≤ 4.0%	FM 1-T267
Liquid Limit ≤ 30	AASHTO T89
Plastic Index ≤ 8	AASHTO T90
Asphalt Content ≤ 4.0%	FM 5-563 (excluding Gradation Analysis)

Ensure the gradation of the material within the limits of the area being stabilized is such that 97% will pass a 3 1/2 inch sieve. Break down or remove from the stabilized area materials, including clay lumps or lumps made of clay-size particles (any particle size 2 microns or less), not meeting the gradation requirements. Remove any lumps of clay or clay-sized particles greater than one inch that do not meet the requirements of 160-3.2. Remove any materials not meeting the requirements of this Section from the stabilized area.

160-3.4.1 Bearing Value: Meet the bearing value requirements for the subgrade in accordance with 160-4.

160-3.4.2 Compaction: After completing the mixing operations and satisfying the requirements for bearing value, uniformity, and particle size. Compact the materials at a moisture content permitting the specified compaction in 160-4.2.3. If the moisture content of the material is improper for attaining the specified density, either add water or allow the material to dry until reaching the proper moisture content for the specified compaction.

160-3.4.3 Finish Grading: Shape the completed stabilized subgrade to conform with the finished lines, grades, and cross-section indicated in the Plans. Check the subgrade using elevation stakes or other means approved by the Engineer.

160-3.4.4 Condition of Completed Subgrade: After completing the stabilizing and compacting operations, ensure that the subgrade is firm and substantially unyielding to the extent that it will support construction equipment and will have the bearing value required by the Plans.

Remove all soft and yielding material, and any other portions of the subgrade which will not compact readily, and replace it with suitable material so that the whole subgrade is brought to line and grade, with proper allowance for subsequent compaction.

160-3.4.5 Maintenance of Completed Subgrade: After completing the subgrade as specified above, maintain it free from ruts, depressions, and any damage resulting from the hauling or handling of materials, equipment, tools, etc. The Contractor is responsible for maintaining the required density until the subsequent base or pavement is in place including any repairs, replacement, etc., of curb and gutter, sidewalk, etc., which might become necessary in order to recompact the subgrade in the event of underwash or other damage occurring to the previously compacted subgrade. Perform any such recompaction at no expense to the Department. Construct and maintain ditches and drains along the completed subgrade section.

160-4 Acceptance Program for Mixed Materials.

160-4.1 General Requirements: Meet the requirements of 120-10, except use 160-4.2 instead of 120-10.2, 160-4.3 instead of 120-10.3, and 160-4.4 instead of 120-10.4.

160-4.2 Acceptance Criteria:

160-4.2.1 Bearing Value Requirements:

160-4.2.1.1 General: Within the entire limits of the width and depth of the areas to be stabilized, obtain the required minimum bearing value for each LOT. For any area where the bearing value obtained is deficient from the value indicated in the Plans, in excess of the tolerances established herein, spread and mix additional stabilizing material in accordance with 160-3.3. Perform this reprocessing for the full width of the roadway being stabilized and longitudinally for a distance of 50 feet beyond the limits of the area in which the bearing value is deficient.

Determine the quantity of additional stabilizing material to be used in reprocessing.

160-4.2.1.2 Under-tolerances in Bearing Value Requirements: The under-tolerances are allowed for the following specified Bearing Values:

Specified Bearing Value	Under-tolerance
LBR 40	5.0
LBR 35	4.0
LBR 30 (and under)	2.5

The following unsoaked bearing value requirement is based on tests performed on samples obtained after completing mixing operations:

Specified Bearing Value	Unsoaked Bearing Value Required	Under-tolerance
LBR 40	LBR 43	0.0

160-4.2.2 Mixing Depth Requirements: Do not exceed individual plan depth thickness by more than 2 inches or exceed LOT-average depth thickness by more than 1 inch measured to the nearest 0.25 inch. No undertolerance of mixing depth is allowed.

As an exception to the above mixing requirements, where the subgrade is of rock, the Engineer may waive the mixing operations (and the work of stabilizing), and the Department will not pay for stabilization for such sections of the roadway.

160-4.2.3 Density Requirements:

160-4.2.3.1 General: Within the entire limits of the width and depth of the areas to be stabilized, other than as provided in 160-4.2.3.2, obtain a minimum density at any location of 98% of the Modified Proctor maximum density as determined by FM 1-T 180, Method D.

160-4.2.3.2 Exceptions to Density Requirements: The Contractor need not obtain the minimum density specified in 160-4.2.3.1 if within the following limits:

1. The width and depth of areas which are to be subsequently incorporated into a base course under the same contract.
2. The upper 6 inches of areas to be grassed under the same contract. Compact these areas to a reasonably firm condition as directed by the Engineer.

160-4.2.4 Frequency: Conduct QC sampling and testing at a minimum frequency listed in the table below. The Engineer will perform Verification sampling and tests at a minimum frequency listed in the table below.

Test Name	Quality Control	Verification	Verification for Shoulder-Only, Shared Use Path and Sidewalk Construction
Modified Proctor Maximum Density	One per two consecutive LOTs	One per eight consecutive LOTs	One per four LOTs
Density	One per LOT	One per four LOTs	One per two LOTs
Stabilizing Mixing Depth	Three per 500 feet	Witness one per LOT	Witness one per LOT
LBR	One per two consecutive LOTs	One per eight consecutive LOTs	One per four LOTs

160-4.2.4.1 Local Materials: When local materials are tested in accordance with 160-3.2.1 and meet the requirements of 160-2.2, the Engineer will sample and test at a minimum frequency listed in the table below.

Test Name	Quality Control	Verification	Verification for Shoulder-Only, Shared Use Path and Sidewalk Construction
Organic Content, Gradation, LL/PI, and Soil Classification	Not required	One per eight consecutive LOTs	One per four LOTs

160-4.2.4.2 RAP or RAP Blended Materials: When RAP or RAP blended materials are used for stabilizing that are not tested in accordance with 160-3.2.1, conduct QC sampling and testing at a minimum frequency listed in the table below. The Engineer will sample and test at a minimum frequency listed in the table below.

Test Name	Quality Control	Verification	Verification for Shoulder-Only, Shared Use Path and Sidewalk Construction
Asphalt Content, Gradation, LL/PI, and Soil Classification	One per two consecutive LOTs	One per eight consecutive LOTs	One per four LOTs

160-4.3 Additional Requirements:

160-4.3.1 Quality Control Testing:

160-4.3.1.1 Bearing Values: Test the stabilized subgrade sample collected in 160-4.3.1.3. Determine the LBR in accordance with FM 5-515 and 160-4.2.4.

160-4.3.1.1.1 Unsoaked LBR: If unsoaked LBR is desired, submit request for approval to the Engineer. Upon approval by the Engineer to consider the use of unsoaked LBR, randomly sample and test from three locations in the initial Lot for both soaked and unsoaked LBR in accordance with FM 5-515. Ensure all of the tests demonstrate the material achieves the LBR values in 160-4.2.1.2. Continue testing unsoaked LBR at the frequency shown in 160-4.2.4. Discontinue unsoaked LBR testing if any unsatisfactory QC LBR test result is obtained or resolution determines an unsatisfactory LBR.

160-4.3.1.2 Mixing Depths: Meet required plan mixing-depths by measuring from the proposed final grade line. Determine test locations, including stations and offsets, using the Random Number generator approved by the Department. Notify the Engineer a minimum of 24 hours before checking mixing depths. Record results on forms supplied by the Department.

160-4.3.1.3 Modified Proctor Maximum Density Requirement: Collect enough material to split and create three separate samples. Determine test locations, including stations and offsets, using the Random Number generator approved by the Department for the

two LOTs under consideration. Retain the Verification and Resolution samples for the Department until the Engineer accepts the LOTs represented by the samples.

160-4.3.1.4 Asphalt Content and Soil Classification: Where RAP or RAP Blended material has been approved for stabilizing, collect enough material to split and create three separate samples. Determine test locations, including stations and offsets, using the Random Number generator approved by the Department for the two LOTs under consideration. Retain the Verification and Resolution samples for the Department until the Engineer accepts the LOTs represented by the samples. Test the sample in accordance with FM 5-563 (excluding gradation analysis), AASHTO T88, AASHTO T89, AASHTO T90 and AASHTO M145. Determine compliance with the requirements of 160-3.4 and embankment utilization requirements.

160-4.3.2 Department Verification Tests:

160-4.3.2.1 Bearing Value & Soil Classification: The Engineer will collect a sample at a location other than the location where the sample was collected in 160-4.3.1.3, and test the stabilized subgrade for determination of the LBR in accordance with FM 5-515. The Engineer will select test locations, including stations and offsets, using a Random Number generator, based on the LOTs under consideration.

If local material is used for stabilizing, and tested in accordance with 160-2.2 and 160.3.2, the Engineer will independently verify compliance with embankment utilization requirements and 160-3.4 by testing and classifying the stabilized subgrade in accordance with AASHTO T88 and AASHTO M 145 at the frequency shown in 160-4.2.4.

When RAP or RAP Blended Material is used, the Engineer will randomly select one of the retained split samples from 160-4.3.1.4 and test in accordance with FM 5-563 (excluding gradation analysis), AASHTO T88, AASHTO T89, AASHTO T90 and AASHTO M145 at the frequency shown in 160-4.2.4.

160-4.3.2.1.1 Unsoaked LBR: The Engineer will sample and test the initial LOT for one soaked and one unsoaked LBR if consideration of the unsoaked LBR has been approved.

160-4.3.2.2 Mixing Depth: The Engineer will witness the Contractor's mixing depth checks to ensure compliance with 160-4.2.2. The Engineer will select test locations, including stations and offsets, using a Random Number generator.

160-4.3.2.3 Modified Proctor Maximum Density: The Engineer will randomly select one of the retained split samples and test in accordance with FM 1-T 180, Method D.

160-4.4 Verification Comparison Criteria and Resolution Procedures:

160-4.4.1 Bearing Value & Soil Classification: If the Department's Verification test meets the requirements of 160-4.2.1 and embankment utilization requirements, the Engineer will accept the corresponding LOTs. Otherwise, the Engineer will collect an additional sample in the same LOT the Verification sample was obtained. SMO or an AASHTO accredited laboratory designated by SMO will perform Resolution testing on the additional sample. The material will be sampled and tested in accordance with FM 5-515. If local material is used for stabilization, the sample will be tested in accordance with AASHTO T-88, and AASHTO M-145.

If the Resolution Testing results meet the requirements of 160-4.2.1 and embankment utilization requirements then the Engineer will accept the LOTs in question. Otherwise reprocess the corresponding LOTs in accordance with 160-3 and retest in accordance with 160-4.3.1.1.

If RAP or RAP Blended material is approved for use in the subgrade and the Department's Verification tests meet the requirements of 160-3.4 and embankment utilization requirements, the Engineer will accept the corresponding LOTs. Otherwise, the Engineer will test the split sample collected in 160-4.3.1.4. The material will be tested in accordance with FM 5-563 (excluding gradation analysis), AASHTO T88, AASHTO T89, AASHTO T90, and AASHTO M145. If the Resolution Testing results meet the requirements of 160-3.4 and embankment utilization requirements, then the Engineer will accept the LOTs in question. Otherwise, reprocess the corresponding LOTs in accordance with 160-3 and retest in accordance with 160-4.

160-4.4.2 Mixing Depth Thickness: The Department will witness the mixing depth checks.

1. If the depth checks meet the requirements of 160-4.2.2 the Engineer will accept that 500-foot section.

2. If the depth checks confirm shallow depth, re-mix the 500-foot section to an appropriate depth and re-measure in accordance with 160-4.3.1.2. The Engineer will repeat the witness process.

3. If the depth checks confirm extra deep mixing, conduct an additional QC density test after compaction for the bottom 12 inches of the subgrade for that 500-foot section in addition to a QC density test for the top 12 inches. The additional density test must meet the requirements of 160-4.2.3.

160-4.4.3 Modified Proctor Maximum Density Determination: The Engineer will compare the Verification test results of 160-4.3.2.3 to the corresponding QC test results. If the test result is within 4.5 lb/ft^3 of the QC test result, the LOTs will be verified. Otherwise, the Engineer will collect the Resolution split sample corresponding to the Verification sample tested. SMO or an AASHTO accredited laboratory designated by SMO will perform Resolution testing. The material will be sampled and tested in accordance with FM 1-T 180, Method D.

The Engineer will compare the Resolution Test results with the QC test results. If the Resolution Test result is within 4.5 lb/ft^3 of the corresponding QC test result, the Engineer will use the QC test results for material acceptance purposes for each corresponding pair of LOTs. If the Resolution test result is not within 4.5 lb/ft^3 of the corresponding QC test, the Engineer will collect the remaining Verification split samples for testing. Verification Test results will be used for material acceptance purposes for the LOTs in question**.**

160-4.4.4 Density: When a Verification or Independent Verification density test does not meet 160-4.2.3 (Acceptance Criteria), retest at a site within a 5 feet radius of the Verification test location and observe the following:

1. If the QC retest meets the Acceptance Criteria and compares favorably with the Verification or Independent Verification test, the Engineer will accept the LOTs in question.

2. If the QC retest does not meet the Acceptance Criteria and compares favorably with the Verification or Independent Verification test, rework and retest the material in that LOT. The Engineer will re-verify the LOTs in question.

3. If the QC retest and the Verification or Independent Verification test do not compare favorably, complete a new equipment-comparison analysis as defined in 120-10.1.2. Once acceptable comparison is achieved, retest the LOTs. The Engineer will perform new verification testing. Acceptance testing will not begin on a new LOT until the Contractor has a gauge that meets the comparison requirements.

160-5 Method of Measurement.

The quantity to be paid for will be the plan quantity, in square yards, completed and accepted.

160-6 Basis of Payment.

Price and payment will constitute full compensation for all work and materials specified in this Section, including furnishing, spreading and mixing of all stabilizing material required and any reprocessing of stabilization areas necessary to attain the specified bearing value. The Department will make full payment for any areas where the existing subgrade materials meet the design bearing value requirements without the addition of stabilizing additives, as well as areas where the Contractor may elect to place select high-bearing materials from other sources within the limits of the stabilizing.

If the item of borrow excavation is included in the Contract, any stabilizing materials obtained from designated borrow areas will be included in the pay quantity for borrow excavation.

Payment will be made under:

Item No. 160- 4- Stabilization - per square yard.

SECTION 285
OPTIONAL BASE COURSE

285-1 Description.

Construct a base course composed of one of the optional materials shown on the typical cross-sections.

285-2 Materials.

Meet the material requirements as specified in the Section covering the particular type of base to be constructed.

Graded Aggregate ..... Section 204
Asphalt ..... Section 234
Limerock ..... Section 911
Shell Base ..... Section 911
Shell-Rock ..... Section 911
Cemented Coquina ..... Section 911
Recycled Concrete Aggregate (RCA)* ..... Section 911
*Do not use on interstate roadways.

285-3 Selection of Base Option.

The Plans will include typical cross-sections indicating the various types of base construction (material and thickness) allowable.

Select one base option as allowed for each typical cross-section shown in the Plans. Only one base option is permitted for each typical cross-section.

Notify the Engineer in writing of the base option selected for each typical cross-section at least 45 calendar days prior to beginning placement of base material.

285-4 Construction Requirements.

Construct the base in accordance with the Section covering the particular type of base to be constructed.

Graded Aggregate ..... Section 204
Asphalt ..... Section 234
Limerock ..... Section 200
Shell Base ..... Section 200
Shell Rock ..... Section 200
Cemented Coquina ..... Section 200
Recycled Concrete Aggregate (RCA)* ..... Section 200
*Do not use on interstate roadways.

285-5 Variation in Earthwork Quantities.

The Plans will identify the optional materials used by the Department for determining the earthwork quantities (Roadway Excavation, Borrow Excavation, Subsoil Excavation, Subsoil Earthwork, or Embankment). The Department will not revise the quantities, for those items having final pay based on plan quantity, to reflect any volumetric change caused by the Contractor's selection of a different optional material.

285-6 Thickness Requirements.

285-6.1 Measurements: For non-asphalt bases, meet the requirements of 200-7.3.1.2.

For subbases, meet the thickness requirements of 290-4.

The Engineer will determine the thickness of asphalt base courses in accordance with 234-8.1.

285-6.2 Correction of Deficient Areas: For non-asphalt bases, correct all areas of the completed base having a deficiency in thickness in excess of 1/2 inch by scarifying and adding additional base material. As an exception, if authorized by the Engineer, such areas may be left in place without correction and with no payment.

For asphalt bases, correct all areas of deficient thickness in accordance with 234-8.

285-7 Calculation of Average Thickness of Base.

For bases that are not mixed in place, the Engineer will determine the average thickness from the measurements specified in 285-6.1, calculated as follows:

1. When the measured thickness is more than 1/2 inch greater than the design thickness shown on the typical cross-section in the Plans, it will be considered as the design thickness plus 1/2 inch.
2. Average thickness will be calculated per typical cross-section for the entire job as a unit.
3. Any areas of base left in place with no payment will not be included in the calculations.
4. Where it is not possible through borings to distinguish the base materials from the underlying materials, the thickness of the base used in the measurement will be the design thickness.
5. For Superpave asphalt base course, the average spread rate of each course shall be constructed in compliance with 234-8.

285-8 Method of Measurement.

The quantity to be paid for will be the plan quantity area in square yards, omitting any areas where under-thickness is in excess of the allowable tolerance as specified in 285-6. The pay area will be the surface area, determined as provided above, adjusted in accordance with the following formula:

$$Pay\ Area = Surface\ Area\ \left(\frac{Calculated\ \ Average\ Thickness\ \ per\ 285\text{-}7}{Plan\ Thickness}\right)$$

The pay area shall not exceed 105% of the surface area.

There will be no adjustment of the pay area on the basis of thickness for base courses constructed utilizing mixed-in-place operations.

For Superpave asphalt base course, the quantity to be paid for will be the plan quantity.

285-9 Basis of Payment.

Price and payment will be full compensation for all work specified in this Section, including tack coat between base layers, prime coat, cover material for prime coat, bituminous

material used in bituminous plant mix, and cement used in soil-cement.

Where the Plans include a typical cross-section which requires the construction of an asphalt base only, price adjustments for bituminous material provided for in 9-2.1.2 will apply to that typical cross-section. For typical cross-sections which permit the use of asphalt or other materials for construction of an optional base, price adjustments for bituminous material provided for in 9-2.1.2 will not apply.

Payment will be made under:

Item No. 285- 7- Optional Base - per square yard.

SECTION 334
SUPERPAVE ASPHALT CONCRETE

334-1 Description.

334-1.1 General: Construct a Superpave Asphalt Concrete pavement with the type of mixture specified in the Contract Documents, or when offered as alternates, as selected. Superpave mixes are identified as Type SP-9.5, Type SP-12.5 or Type SP-19.0.

Obtain Superpave Asphalt Concrete from a plant that is currently on the Department's Production Facility Listing. Producers seeking inclusion on the list shall meet the requirements of Section 105. Producers must meet the requirements of Section 320 for plant and equipment and the general construction requirements of Section 330.

334-1.2 Traffic Levels: The requirements for Type SP Asphalt Concrete mixtures are based on the design traffic level of the project, expressed in 18,000 pound Equivalent Single Axle Loads (ESAL's). The five traffic levels are as shown in Table 334-1.

Table 334-1
Superpave Traffic Levels

Traffic Level	Traffic Level ($1x10^6$ ESAL's)
A	<0.3
B	0.3 to <3
C	3 to <10
D	10 to <30
E	≥30

The traffic levels for the project are as specified in the Contract Documents. A Type SP mix one traffic level higher than the traffic level specified in the Contract Documents may be substituted, at no cost to the Department (i.e., Traffic Level B may be substituted for Traffic Level A, etc.).

334-1.3 Gradation Classification: The Superpave mixes are classified as fine and are defined in 334-3.2.2.

The equivalent AASHTO nominal maximum aggregate size Superpave mixes are as follows:

Type SP-9.5..... 9.5 mm
Type SP-12.5..... 12.5 mm
Type SP-19.0..... 19.0 mm

334-1.4 Thickness: The total thickness of the Type SP asphalt layers will be the plan thickness as shown in the Contract Documents. Before paving, propose a thickness for each individual layer meeting the requirements of this specification, which when combined with other layers (as applicable) will equal the plan thickness. For construction purposes, the plan thickness and individual layer thickness will be converted to spread rate based on the maximum specific gravity of the asphalt mix being used, as well as the minimum density level, as shown in the following equation:

$$\text{Spread rate (lbs/yd}^2) = t \times G_{mm} \times 43.3$$

Where: t = Thickness (in.) (plan thickness or individual layer thickness)

G_{mm} = Maximum specific gravity from the verified mix design

The weight of the mixture shall be determined as provided in 320-3.2. For target purposes only, spread rate calculations should be rounded to the nearest whole number.

Note: Plan quantities are based on a G_{mm} of 2.540, corresponding to a spread rate of 110 lbs/yd^2-in. Pay quantities will be based on the actual maximum specific gravity of the mix being used.

334-1.4.1 Layer Thicknesses: The allowable layer thicknesses for Type SP Asphalt Concrete mixtures are as follows:

Type SP-9.5.....1 to 1-1/2 inches
Type SP-12.5..... 1-1/2 to 2-1/2 inches
Type SP-19.0..... 2 to 4 inches

In addition to the minimum and maximum thickness requirements, the following restrictions are placed on mixes when used as a structural course:

Type SP-9.5 - Limited to the top two structural layers, two layers maximum.

Type SP-9.5 – May not be used on Traffic Level D and E applications.

Type SP-19.0 - May not be used in the final (top) structural layer below FC-5 mixtures. Type SP-19.0 mixtures are permissible in the layer directly below FC-9.5 and FC-12.5 mixtures.

334-1.4.2 Additional Requirements: The following requirements also apply to Type SP Asphalt Concrete mixtures:

1. A minimum 1-1/2 inch initial lift is required over an Asphalt Rubber Membrane Interlayer (ARMI).

2. When construction includes the paving of adjacent shoulders (less than or equal to 5 feet wide), the layer thickness for the upper pavement layer and shoulder must be the same and paved in a single pass, unless called for differently in the Contract Documents.

3. All overbuild layers must be Type SP Asphalt Concrete designed at the traffic level as stated in the Contract Documents. Use the minimum and maximum layer thicknesses as specified above unless called for differently in the Contract Documents. On variable thickness overbuild layers, the minimum and maximum allowable thicknesses will be as specified below, unless called for differently in the Contract Documents.

Type SP-9.5..... 3/8 to 2 inches
Type SP-12.5..... 1/2 to 3 inches
Type SP-19.0.....1-1/2 to 4 inches

4. Variable thickness overbuild layers constructed using a Type SP-9.5 or SP-12.5 mixtures may be tapered to zero thickness provided the contract documents require a minimum of 1-1/2 inches of dense-graded mix placed over the variable thickness overbuild layer.

334-2 Materials.

334-2.1 General Requirements: Meet the material requirements specified in Division III. Specific references are as follows:

Superpave PG Asphalt Binder .....Section 916
Coarse Aggregate.....Section 901
Fine Aggregate.....Section 902

334-2.2 Superpave Asphalt Binder: Unless specified otherwise in the Contract Documents, use a PG 67-22 asphalt binder. In addition, meet the requirements of 334-2.3.

334-2.3 Reclaimed Asphalt Pavement (RAP) Material:

334-2.3.1 General requirements: RAP may be used as a component of the asphalt mixture subject to the following requirements:

1. When using a PG 76-22 (PMA), or PG 76-22 (ARB), or PG 82-22 (PMA) asphalt binder, limit the amount of RAP material used in the mix to a maximum of 20% by weight of total aggregate. As an exception, amounts greater than 20% RAP by weight of total aggregate can be used if no more than 20% by weight of the total asphalt binder comes from the RAP material.

2. Assume full responsibility for the design, production and construction of asphalt mixes which incorporate RAP as a component material.

3. Use RAP from a Department approved stockpile or millings from a Department project.

4. Provide stockpiled RAP material that is reasonably consistent in characteristics and contains no aggregate particles which are soft or conglomerates of fines.

5. Provide RAP material having a minimum average asphalt binder content of 4.0% by weight of RAP. As an exception, when using fractionated RAP, the minimum average asphalt binder content for the coarse portion of the RAP shall be 2.5% by weight of the coarse portion of the RAP. The coarse portion of the RAP shall be the portion of the RAP retained on the No. 4 sieve. The Engineer may sample the stockpiles to verify that this requirement is met.

334-2.3.2 Material Characterization for Mix Design: Assume responsibility for establishing the asphalt binder content, gradation, and bulk specific gravity (G_{sb}) of the RAP material based on a representative sampling of the material by roadway cores or stockpile samples. For roadway core samples, assume responsibility for the degradation that will occur during the milling operation.

334-2.3.3 RAP Stockpile Approval: Prior to the incorporation of RAP into the asphalt mixture, stockpile the RAP material and obtain approval for the stockpile by one of the following methods:

1. Continuous stockpile: When RAP is obtained from one or multiple sources and is either processed, blended, or fractionated, and stockpiled in a continuous manner, assure an adequate number of test results are obtained for stockpile approval. Test the RAP material for gradation and asphalt content at a minimum frequency of one sample per 1000 tons with a minimum of six test results. Test the RAP material for G_{mm} (for G_{sb} determination) at a minimum frequency of one sample per 5000 tons with a minimum of two test results. Based on visual inspection and a review of the test data, the Engineer will determine the suitability of the stockpiled material. In addition, address the details and specifics of the processing, sampling, testing and actions to be taken in the Producer Quality Control (QC) Plan.

2. Non-continuous single stockpile: When an individual stockpile is being constructed, obtain representative samples at random locations and test the RAP material for gradation and asphalt content at a minimum frequency of one sample per 1000 tons with a minimum of six test results. Test the RAP material for G_{mm} (for G_{sb} determination) at a minimum frequency of one sample per 5000 tons with a minimum of two test results. Based on visual inspection and a review of the test data, the Engineer will determine the suitability of the

stockpiled material. Once the RAP stockpile has been approved, do not add additional material without prior approval of the Engineer.

Determine the asphalt binder content and gradation of the RAP material in accordance with FM 5-563 and FM 1-T 030, respectively. Establish the G_{sb} of the RAP material by using one of the following methods:

a. Calculate the G_{sb} value based upon the effective specific gravity (G_{se}) of the RAP material, determined on the basis of the asphalt binder content and maximum specific gravity (G_{mm}) of the RAP material. The Engineer will approve the estimated asphalt binder absorption value used in the calculation.

b. Measure the G_{sb} of the RAP aggregate, in accordance with FM 1-T 084 and FM 1-T 085. Obtain the aggregate by using a solvent extraction method.

334-2.3.4 Pavement Coring Report: When the Contract includes milling of the existing asphalt pavement, the Pavement Coring Report may be available on the Department's website.

334-2.3.5 Asphalt Binder for Mixes with RAP: Select the appropriate asphalt binder grade based on Table 334-2. Obtain a sample of the mixture for the Engineer within the first 1,000 tons of production and at a continuing frequency of one sample per 4,000 tons of mix. The Engineer reserves the right to change the asphalt binder grade at design based on the characteristics of the RAP asphalt binder, and reserves the right to make changes during production.

Table 334-2
Asphalt Binder Grade for Mixes Containing RAP

Percent RAP	Asphalt Binder Grade
0 - 15	PG 67-22
16 - 30	PG 58-22
>30	PG 52-28

334-2.4 Recycled Crushed Glass: Recycled crushed glass may be used as a component of the asphalt mixture subject to the following requirements:

1. Consider the recycled crushed glass a local material and meet all requirements specified in 902-6.
2. Limit the amount of recycled crushed glass to a maximum of 15% by weight of total aggregate.
3. Use an asphalt binder that contains a minimum of 0.5% anti-stripping agent by weight of binder. The anti-strip additive shall be one of the products listed on the Approved Product List (APL). The anti-strip additive shall be introduced into the asphalt binder by the supplier during loading.
4. Do not use recycled crushed glass in friction course mixtures or in structural course mixtures which are to be used as the final wearing surface.

334-3 General Composition of Mixture.

334-3.1 General: Compose the asphalt mixture using a combination of aggregate (coarse, fine or mixtures thereof), mineral filler, if required, and asphalt binder material. Size, grade and combine the aggregate fractions to meet the grading and physical properties of the mix design. Aggregates from various sources may be combined.

334-3.2 Mix Design:

334-3.2.1 General: Design the asphalt mixture in accordance with AASHTO R 35-12, except as noted herein. Prior to the production of any asphalt mixture, submit the proposed mix design with supporting test data indicating compliance with all mix design criteria to the Engineer. For Traffic Level B through E mix designs, include representative samples of all component materials, including asphalt binder. Allow the State Materials Engineer a maximum of four weeks to either conditionally verify or reject the mix as designed.

Do not use more than four mix designs per nominal maximum aggregate size per traffic level per binder grade per year, where the year starts at the Notice to Proceed. Exceeding this limitation will result in a maximum Composite Pay Factor (CPF) of 1.00 as defined in 334-8.2 for all designs used beyond this limit.

Warm mix technologies (additives, foaming techniques, etc.) listed on the Department's website may be used in the production of the mix. The URL for obtaining this information, if available, is:
http://www.dot.state.fl.us/statematerialsoffice/quality/programs/warmmixasphalt/index.shtm.

The Engineer will consider any marked variations from original test data for a mix design or any evidence of inadequate field performance of a mix design as sufficient evidence that the properties of the mix design have changed, and the Engineer will no longer allow the use of the mix design.

334-3.2.2 Mixture Gradation Requirements: Combine the coarse and fine aggregate in proportions that will produce an asphalt mixture meeting all of the requirements defined in this specification and conform to the gradation requirements at design as defined in AASHTO M 323-12, Table 3. Aggregates from various sources may be combined.

334-3.2.2.1 Mixture Gradation Classification: Plot the combined mixture gradation on an FHWA 0.45 Power Gradation Chart. Include the Control Points from AASHTO M 323-12, Table-3, as well as the Primary Control Sieve (PCS) Control Point from AASHTO M 323-12, Table 4. Fine mixes are defined as having a gradation that passes above the primary control sieve control point and above the maximum density line for all sieve sizes smaller than the primary control sieve and larger than the No. 100 sieve.

334-3.2.3 Aggregate Consensus Properties: For Traffic Level C through E mixtures, meet the following consensus properties at design for the aggregate blend. Aggregate consensus properties do not apply to Traffic Level A and B mixtures.

334-3.2.3.1 Coarse Aggregate Angularity: When tested in accordance with ASTM D 5821-01 (2006), meet the percentage of fractured faces requirements specified in AASHTO M 323-12, Table 5.

334-3.2.3.2 Fine Aggregate Angularity: When tested in accordance with AASHTO T 304-11, Method A, meet the uncompacted void content of fine aggregate specified in AASHTO M 323-12, Table 5.

334-3.2.3.3 Flat and Elongated Particles: When tested in accordance with ASTM D 4791-10, (with the exception that the material passing the 3/8 inch sieve and retained on the No. 4 sieve shall be included), meet the requirements specified in AASHTO M 323-12, Table 5. Measure the aggregate using the ratio of 5:1, comparing the length (longest dimension) to the thickness (shortest dimension) of the aggregate particles.

334-3.2.3.4 Sand Equivalent: When tested in accordance with AASHTO T 176-08, meet the sand equivalent requirements specified in AASHTO M 323-12, Table 5.

334-3.2.4 Gyratory Compaction: Compact the design mixture in accordance with AASHTO T 312-12, with the following exception: use the number of gyrations at N_{design} as defined in Table 334-3. Measure the inside diameter of gyratory molds in accordance with AASHTO T 312-12.

Table 334-3 Gyratory Compaction Requirements	
Traffic Level	N_{design} Number of Gyrations
A	50
B	65
C	75
D	100
E	100

334-3.2.5 Design Criteria: Meet the requirements for nominal maximum aggregate size as defined in AASHTO M 323-12, as well as for relative density, VMA, VFA, and dust-to-binder ratio as specified in AASHTO M 323-12, Table 6. $N_{initial}$ and $N_{maximum}$ requirements are not applicable.

334-3.2.6 Moisture Susceptibility:

1. For Traffic Level A and B mixtures, use a liquid anti-strip additive, at a rate of 0.5% by weight of the asphalt binder. The anti-strip additive must be listed on the APL. Other rates of anti-strip additive may be used upon approval of the Engineer.

2. For Traffic Level C through E mixtures, test 4 inch specimens in accordance with FM 1-T 283. Provide a mixture having a retained tensile strength ratio of at least 0.80 and a minimum tensile strength (unconditioned) of 100 psi. If necessary, add a liquid anti-stripping agent and/or hydrated lime (meeting the requirements of Section 337) in order to meet these criteria. The anti-strip additive must be listed on the APL.

334-3.2.7 Additional Information: In addition to the requirements listed above, provide the following information with each proposed mix design submitted for verification:

1. The design traffic level and the design number of gyrations (N_{design}).
2. The source and description of the materials to be used.
3. The Department source number and the Department product code of the aggregate components furnished from a Department approved source.
4. The gradation and proportions of the raw materials as intended to be combined in the paving mixture. The gradation of the component materials shall be representative of the material at the time of use. Compensate for any change in aggregate gradation caused by handling and processing as necessary.
5. A single percentage of the combined mineral aggregate passing each specified sieve. Degradation of the aggregate due to processing (particularly material passing the No. 200 sieve) should be accounted for and identified.
6. The bulk specific gravity (G_{sb}) value for each individual aggregate and RAP component, as identified in the Department's aggregate control program.
7. A single percentage of asphalt binder by weight of total mix intended to be incorporated in the completed mixture, shown to the nearest 0.1%.
8. A target temperature for the mixture at the plant (mixing temperature) and a target temperature for the mixture at the roadway (compaction temperature) in accordance

with 320-6.3. Do not exceed a target temperature of 340°F for PG 82-22 (PMA) asphalt binders, 330°F for PG 76-22 (PMA) and PG 76-22 (ARB) asphalt binders, and 315°F for unmodified asphalt binders.

9. Provide the physical properties achieved at four different asphalt binder contents. One of which must be at the optimum asphalt content, and must conform to all specified physical requirements.

10. The name of the Construction Training Qualification Program (CTQP) Qualified Mix Designer.

11. The ignition oven calibration factor.

12. The warm mix technology, if used.

334-3.3 Mix Design Revisions: During production, the Contractor may request a target value revision to a mix design, subject to meeting the following requirements: the target change falls within the limits defined in Table 334-4, appropriate data exists demonstrating that the mix complies with production air voids specification criteria, and the mixture gradation meets the basic gradation requirements defined in 334-3.2.2.

Table 334-4
Limits for Potential Adjustments to Mix Design Target Values

Characteristic	Limit from Original Mix Design
No. 8 sieve and Coarser	± 5.0%
No. 16 sieve	± 4.0%
No. 30 sieve	± 4.0%
No. 50 sieve	± 3.0%
No. 100 sieve	± 3.0%
No. 200 sieve	± 1.0%
Asphalt Binder Content (1)	± 0.3%
Each Component of Aggregate Blend (2)	± 5.0 %

(1) Reductions to the asphalt binder content will not be permitted if the VMA during production is lower than 1.0% below the design criteria.
(2) Revisions to FC-5 mixtures to be determined by the Engineer.

Submit all requests for revisions to mix designs, along with supporting documentation, to the Engineer. In order to expedite the revision process, the request for revision or discussions on the possibility of a revision may be made verbally, but must be followed up by a written request. The verified mix design will remain in effect until the Engineer authorizes a change. In no case will the effective date of the revision be established earlier than the date of the first communication between the Contractor and the Engineer regarding the revision.

A new design mix will be required if aggregate sources change, or for any substitution of an aggregate product with a different aggregate code, unless approved by the Engineer.

334-4 Producer Process Control (PC).

Assume full responsibility for controlling all operations and processes such that the requirements of these Specifications are met at all times. Perform any tests necessary at the plant and roadway for process control purposes. Enter all PC test data into the Department's database. The Engineer will not use these test results in the acceptance payment decision.

Address in the Producer QC Plan how PC failures will be handled. When a PC failure occurs, investigate, at a minimum, the production process, testing equipment and/or sampling methods to determine the cause of the failure, and make any necessary changes to assure compliance with these Specifications. Obtain a follow up sample immediately after corrective actions are taken to assess the adequacy of the corrections. In the event the follow-up PC sample also fails to meet Specification requirements, cease production of the asphalt mixture until the problem is adequately resolved to the satisfaction of the QC Manager.

334-5 Acceptance of the Mixture.

334-5.1 General: The mixture will be accepted at the plant with respect to gradation (P_{-8} and P_{-200}), asphalt content (P_b), and volumetrics (volumetrics is defined as air voids at N_{design}). The mixture will be accepted on the roadway with respect to density of roadway cores. Acceptance will be on a LOT by LOT basis (for each mix design) based on tests of random samples obtained within each sublot taken at a frequency of one set of samples per sublot. A roadway LOT and a plant production LOT shall be the same. Acceptance of the mixture will be based on Contractor QC test results that have been verified by the Department.

334-5.1.1 Sampling and Testing Requirements: Obtain the samples in accordance with FM 1-T 168. Obtain samples at the plant of a sufficient quantity to be split into three smaller samples; one for QC, one for Verification testing and one for Resolution testing; each sample at approximately 35 pounds. The split samples for Verification testing and Resolution testing shall be reduced in size and stored in three boxes each. The approximate size of each box must be 12 inches x 8 inches x 4 inches. Provide, label and safely store sample boxes in a manner agreed upon by the Engineer for future testing.

The asphalt content of the mixture will be determined in accordance with FM 5-563. The gradation of the recovered aggregate will be determined in accordance with FM 1-T 030. Volumetric testing will be in accordance with AASHTO T 312-12and FM 1-T 209. Prior to testing volumetric samples, condition the test-sized sample for one hour, plus or minus five minutes, at the target roadway compaction temperature in a shallow, flat pan, such that the mixture temperature at the end of the one hour conditioning period is within plus or minus 20°F of the roadway compaction temperature. Test for roadway density in accordance with FM 1-T 166.

334-5.1.2 Acceptance Testing Exceptions: When the total combined quantity of hot mix asphalt for the project, as indicated in the Plans for Type SP and Type FC mixtures only, is less than 2000 tons, the Engineer will accept the mix on the basis of visual inspection. The Engineer may require the Contractor to run process control tests for informational purposes, as defined in 334-4, or may run independent verification tests to determine the acceptability of the material.

Density testing for acceptance will not be performed on widening strips or shoulders with a width of 5 feet or less, open-graded friction courses, variable thickness overbuild courses, leveling courses, any asphalt layer placed on subgrade (regardless of type), miscellaneous asphalt pavement, shared use paths, crossovers, or any course with a specified thickness less than 1 inch or a specified spread rate that converts to less than 1 inch as described in 334-1.4. Density testing for acceptance will not be performed on asphalt courses placed on bridge decks or approach slabs; compact these courses in static mode only per the requirements of 330-7.7. In addition, density testing for acceptance will not be performed on the following areas when they are less than 1,000 feet (continuous) in length: turning lanes, acceleration lanes, deceleration lanes, shoulders, parallel parking lanes or ramps. Do not perform density testing for

acceptance in situations where the areas requiring density testing is less than 50 tons within a sublot.

Density testing for acceptance will not be performed in intersections. The limits of the intersection will be from stop bar to stop bar for both the mainline and side streets. A random core location that occurs within the intersection shall be moved forward or backward from the intersection at the direction of the Engineer.

Where density testing for acceptance is not required, compact these courses (with the exception of open-graded friction courses) in accordance with the rolling procedure (equipment and pattern) as approved by the Engineer or with Standard Rolling Procedure as specified in 330-7.2. In the event that the rolling procedure deviates from the procedure approved by the Engineer, or the Standard Rolling Procedure, placement of the mix shall be stopped.

The density pay factor (as defined in 334-8.2) for areas not requiring density testing for acceptance will be paid at the same density pay factor as for the areas requiring density testing within the same LOT. If the entire LOT does not require density testing for acceptance, the LOT will be paid at a density pay factor of 1.00.

334-5.2 Full LOTs: Each LOT will be defined (as selected by the Contractor prior to the start of the LOT) as either (1) 2,000 tons, with each LOT subdivided into four equal sublots of 500 tons each, or (2) 4,000 tons, with each LOT subdivided into four equal sublots of 1,000 tons each. As an exception to this, the initial LOT of all new mix designs shall be defined as 2,000 tons, subdivided into four equal sublots of 500 tons each. Before the beginning of a LOT, the Engineer will develop a random sampling plan for each sublot and direct the Contractor on sample points, based on tonnage, for each sublot during construction.

334-5.3 Partial LOTs: A partial LOT is defined as a LOT size that is less than a full LOT. A partial LOT may occur due to the following:

l. The completion of a given mix type or mix design on a project.

2. Closure of the LOT due to time. LOTs will be closed 30 calendar days after the start of the LOT. Time periods other than 30 calendar days may be used if agreed to by both the Engineer and the Contractor, but under no circumstances shall the LOT be left open longer than 60 days.

3. A LOT is terminated per 334-5.4.4.

All partial LOTs will be evaluated based on the number of tests available, and will not be redefined. If a LOT is closed before the first plant random sample is obtained, then the LOT will be visually accepted by the Engineer and the LOT pay factor will be 1.00.

334-5.4 QC Sampling and Testing: Obtain all samples randomly as directed by the Engineer.

Should the Engineer determine that the QC requirements are not being met or that unsatisfactory results are being obtained, or should any instances of falsification of test data occur, acceptance of the Producer's QC Plan will be suspended and production will be stopped.

334-5.4.1 Lost or Missing Verification/Resolution Samples: In the event that any of the Verification and/or Resolution samples that are in the custody of the Contractor are lost, damaged, destroyed, or are otherwise unavailable for testing, the minimum possible pay factor for each quality characteristic as described in 334-8.2 will be applied to the entire LOT in question, unless called for otherwise by the Engineer. Specifically, if the LOT in question has more than two sublots, the pay factor for each quality characteristic will be 0.55. If the LOT has

two or less sublots, the pay factor for each quality characteristic will be 0.80. In either event, the material in question will also be evaluated in accordance with 334-5.9.5.

If any of the Verification and/or Resolution samples that are in the custody of the Department are lost, damaged, destroyed or are otherwise unavailable for testing, the corresponding QC test result will be considered verified, and payment will be based upon the Contractor's data.

334-5.4.2 Plant Sampling and Testing Requirements: Obtain one random sample of mix per sublot in accordance with 334-5.1.1 as directed by the Engineer. Test the QC split sample for gradation, asphalt binder content and volumetrics in accordance with 334-5.1.1. Complete all QC testing within one working day from the time the samples were obtained.

334-5.4.3 Roadway Sampling and Testing Requirements: Obtain five 6 inch diameter roadway cores within 24 hours of placement at random locations as directed by the Engineer within each sublot. Test these QC samples for density (G_{mb}) in accordance with 334-5.1.1. Obtain a minimum of three cores per sublot at random locations as identified by the Engineer in situations where the sublot/LOT was closed or terminated before the random numbers were reached or where it is impractical to cut five cores per sublot. Do not obtain cores any closer than 12 inches from an unsupported edge. The Engineer may adjust randomly generated core locations for safety purposes or as the Engineer deems necessary. Maintain traffic during the coring operation; core the roadway, patch the core holes (within three days of coring); and trim the cores to the proper thickness prior to density testing.

Density for the sublot shall be based on the average value for the cores cut from the sublot with the target density being the maximum specific gravity (G_{mm}) of the sublot. Once the average density of a sublot has been determined, do not retest the samples unless approved by the Engineer. Ensure proper handling and storage of all cores until the LOT in question has been accepted.

334-5.4.4 Individual Test Tolerances for QC Testing: Terminate the LOT if any of the following QC failures occur:

1. An individual test result of a sublot for air voids does not meet the requirements of Table 334-5,
2. The average sublot density does not meet the requirements of Table 334-5,
3. Two consecutive test results within the same LOT for gradation or asphalt binder content do not meet the requirements of Table 334-5,

When a LOT is terminated due to a QC failure, stop production of the mixture until the problem is resolved to the satisfaction of the QC Manager and/or Asphalt Plant Level II technician responsible for the decision to resume production after a QC failure, as identified in Section 105. In the event that it can be demonstrated that the problem can immediately be or already has been resolved, it will not be necessary to stop production. When a LOT is terminated, make all necessary changes to correct the problem. Do not resume production until appropriate corrections have been made. Inform the Engineer of the problem and corrections made to correct the problem. After resuming production, sample and test the material to verify that the changes have corrected the problem. Summarize this information and provide it to the Engineer prior to the end of the work shift when production resumes.

In the event that a QC failure is not addressed as defined above, the Engineer's approval will be required prior to resuming production after any future QC failures.

Address any material represented by a failing test result, as defined above in this subarticle, in accordance with 334-5.9.5. Any LOT terminated under this subarticle will be limited to a maximum Pay Factor of 1.00 (as defined in 334-8.2) for each quality characteristic.

In the event that a G_{mm} test result differs by more than 0.040 from the mix design G_{mm}, investigate the causes of the discrepancy and report the findings and proposed actions to the Engineer.

Table 334-5 Master Production Range	
Characteristic	Tolerance (1)
Asphalt Binder Content (%)	Target ±0.55
Passing No. 200 Sieve (%)	Target ±1.50
Air Voids (%)	2.30 – 6.00
Density (minimum % G_{mm})(2)	89.50
(1) Tolerances for sample size of n = 1 from the verified mix design (2) Based on an average of 5 randomly located cores	

334-5.5 Verification Testing: In order to determine the validity of the Contractor's QC test results prior to their use in the Acceptance decision, the Engineer will run verification tests.

334-5.5.1 Plant Testing: At the completion of each LOT, the Engineer will test a minimum of one Verification split sample randomly selected from the LOT. Results of the testing and analysis for the LOT will be made available to the Contractor within one working day from the time the LOT is completed. Verification samples shall be reheated at the target roadway compaction temperature for 1-1/2 hours, plus or minus 5 minutes, reduced to the appropriate testing size, and conditioned and tested as described in 334-5.1.1. In lieu of the 1-1/2 hours reheating procedure, the mixture may be reheated to within plus or minus 20°F of the roadway compaction temperature using a microwave oven. Stir the mixture as necessary during the reheating process to maintain temperature uniformity. Subsequently, condition and test the mixture as described in 334-5.1.1.

The Verification test results will be compared with the QC test results based on the between-laboratory precision values shown in Table 334-6.

Table 334-6 Between-Laboratory Precision Values	
Property	Maximum Difference
G_{mm}	0.016
G_{mb} (gyratory compacted samples)	0.022
G_{mb} (roadway cores)	0.014
P_b	0.44%
P_{-200}	FM 1-T 030 (Figure 2)
P_{-8}	FM 1-T 030 (Figure 2)

If all of the specified mix characteristics compare favorably, then the LOT will be accepted, with payment based on the Contractor's QC test data for the LOT.

If any of the results do not compare favorably, then the Resolution samples from the LOT will be sent to the Resolution laboratory for testing, as described in 334-5.6.

334-5.5.2 Roadway Testing: At the completion of each LOT, the Engineer will determine the density (G_{mb}) of each core (previously tested by QC) as described in 334-5.1.1 from the same sublot as the plant samples. For situations where roadway density is not required for the random sublot chosen, then another sublot shall be randomly chosen for roadway density cores only. Results of the testing and analysis for the LOT will be made available to the Contractor within one working day from the time the LOT is completed.

The individual Verification test results will be compared with individual QC test results by the Engineer based on the between-laboratory precision values given in Table 334-6.

If each of the core test results compare favorably, then the LOT will be accepted with respect to density, with payment based on the Contractor's QC test data for the LOT.

If any of the results do not compare favorably, then the core samples from the LOT will be sent to the Resolution laboratory for testing as specified in 334-5.6.

334-5.6 Resolution System:

334-5.6.1 Plant Samples: In the event of an unfavorable comparison between the Contractor's QC test results and the Engineer's Verification test results on any of the properties identified in Table 334-6, the Resolution laboratory will test all of the split samples from the LOT for only the property (or properties) in question. Resolution samples shall be reheated at the target roadway compaction temperature for 1-1/2 hours, plus or minus 5 minutes, reduced to the appropriate testing size, and conditioned and tested as described in 334-5.1.1. In lieu of the 1-1/2 hours reheating procedure, the mixture may be reheated to within plus or minus 20°F of the roadway compaction temperature using a microwave oven. Stir the mixture as necessary during the reheating process to maintain temperature uniformity. Subsequently, condition and test the mixture as described in 334-5.1.1.

334-5.6.2 Roadway Samples: In the event of an unfavorable comparison between the Contractor's QC test data and the Engineer's Verification test data on the density results, the Resolution laboratory will test all of the cores from the LOT. Testing will be as described in 334-5.1.1. Any damaged roadway cores will not be included in the evaluation; replace damaged cores with additional cores at the direction of the Engineer.

334-5.6.3 Resolution Determination: The Resolution test results (for the property or properties in question) will be compared with the QC test results based on the between-laboratory precision values shown in Table 334-6.

If the Resolution test results compare favorably with all of the QC results, then acceptance and payment for the LOT will be based on the QC results, and the Department will bear the costs associated with Resolution testing. No additional compensation, either monetary or time, will be made for the impacts of any such testing.

If the Resolution test results do not compare favorably with all of the QC results, then acceptance and payment for the LOT will be based on the Resolution test data for the LOT, and the costs of the Resolution testing will be deducted from monthly estimates. No additional time will be granted for the impacts of any such testing. In addition, in the event that the application of the Resolution test results in a failure to meet the requirements of Table 334-5, address any material represented by the failing test result in accordance with 334-5.9.5.

In the event of an unfavorable comparison between the Resolution test results and QC test results, make the necessary adjustments to assure that future comparisons are favorable.

334-5.7 Independent Verification (IV) Testing:

334-5.7.1 Plant: The Contractor shall provide sample boxes and take samples as directed by the Engineer for IV testing. Obtain enough material for three complete sets of tests (two samples for IV testing by the Engineer and one sample for testing by the Contractor). If agreed upon by both the Engineer and the Contractor, only one sample for IV testing by the Engineer may be obtained. IV samples will be reheated at the target roadway compaction temperature for 1-1/2 hours, plus or minus 5 minutes, reduced to the appropriate testing size, and conditioned and tested as described in 334-5.1.1. The Contractor's split sample, if tested immediately after sampling, shall be reduced to the appropriate testing size, and conditioned and tested as described in 334-5.1.1. If the Contractor's sample is not tested immediately after sampling, then the sample shall be reheated at the target roadway compaction temperature for 1-1/2 hours, plus or minus 5 minutes, reduced to the appropriate testing size, and conditioned and tested as described in 334-5.1.1. For the IV and Contractor's samples, in lieu of the 1-1/2 hours reheating procedure, the mixture may be reheated to within plus or minus 20°F of the roadway compaction temperature using a microwave oven. Stir the mixture as necessary during the reheating process to maintain temperature uniformity. Subsequently, condition and test the mixture as described in 334-5.1.1. The Contractor's test results shall be provided to the Engineer within one working day from the time the sample was obtained.

If any of the IV test results do not meet the requirements of Table 334-5, then a comparison of the IV test results and the Contractor's test results, if available, will be made. If a comparison of the IV test results and the Contractor's test results meets the precision values of Table 334-6 for the material properties in question, or if the Contractor's test results are not available, then the IV test results are considered verified and the Contractor shall cease production of the asphalt mixture until the problem is adequately resolved (to the satisfaction of the Engineer), unless it can be demonstrated to the satisfaction of the Engineer that the problem can immediately be (or already has been) resolved. Address any material represented by the failing test results in accordance with 334-5.9.5.

If a comparison of the IV test results and the Contractor's test results does not meet the precision values of Table 334-6 for the material properties in question, then the second IV sample shall be tested by the Engineer for the material properties in question. If a comparison between the first and second IV test results does not meet the precision values of Table 334-6 for the material properties in question, then the first IV test results are considered unverified for the material properties in question and no action shall be taken.

If a comparison between the first and second IV test results meets the precision values of Table 334-6 for the material properties in question, then the first IV sample is considered verified and the Contractor shall cease production of the asphalt mixture until the problem is adequately resolved (to the satisfaction of the Engineer), unless it can be demonstrated to the satisfaction of the Engineer that the problem can immediately be (or already has been) resolved. Address any material represented by the failing test results in accordance with 334-5.9.5.

The Engineer has the option to use the IV sample for comparison testing as specified in 334-6.

334-5.7.2 Roadway: Obtain five 6 inch diameter roadway cores within 24 hours of placement, as directed by the Engineer, for IV testing. In situations where it is impractical to cut five cores per sublot, obtain a minimum of three cores per sublot at random locations, as identified by the Engineer. These independent cores will be obtained from the same LOTs and sublots as the Independent Verification Plant samples, or as directed by the Engineer. The density of these cores will be obtained as described in 334-5.1.1. If the average of the results for the sublot does not meet the requirements of Table 334-5 for density, then a comparison of the IV Gmm test results and the Contractor's Gmm test results, if available, will be made in accordance with the procedure provided in 334-5.7.1. Address any material represented by the failing test results in accordance with 334-5.9.5.

334-5.8 Surface Tolerance: The asphalt mixture will be accepted on the roadway with respect to surface tolerance in accordance with the applicable requirements of 330-9.

334-5.9 Minimum Acceptable Quality Levels:

334-5.9.1 PFs Below 0.90: In the event that an individual pay factor for any quality characteristic of a LOT falls below 0.90, take steps to correct the situation and report the actions to the Engineer. In the event that the pay factor for the same quality characteristic for two consecutive LOTs is below 0.90, cease production of the asphalt mixture until the problem is adequately resolved (to the satisfaction of the Engineer), unless it can be demonstrated to the satisfaction of the Engineer that the problem can immediately be (or already has been) resolved. Actions taken must be approved by the Engineer before production resumes.

334-5.9.2 CPFs Less Than 0.90 and Greater Than or Equal to 0.80: If the composite pay factor for the LOT is less than 0.90 and greater than or equal to 0.80, cease production of the asphalt mixture until the problem is adequately resolved (to the satisfaction of the Engineer), unless it can be demonstrated to the satisfaction of the Engineer that the problem can immediately be (or already has been) resolved. Actions taken must be approved by the Engineer before production resumes.

334-5.9.3 CPFs Less Than 0.80 and Greater Than or Equal to 0.75: If the CPF for the LOT is less than 0.80 and greater than or equal to 0.75, address the defective material in accordance with 334-5.9.5.

334-5.9.4 CPFs Less Than 0.75: If the CPF for the LOT is less than 0.75, remove and replace the defective LOT at no cost to the Department, or as approved by the Engineer.

334-5.9.5 Defective Material: Assume responsibility for removing and replacing all defective material placed on the project, at no cost to the Department.

As an exception to the above and upon approval of the Engineer, obtain an engineering analysis in accordance with Section 6 by an independent laboratory (as approved by the Engineer) to determine the disposition of the material. The engineering analysis must be signed and sealed by a Professional Engineer licensed in the State of Florida.

The Engineer may determine that an engineering analysis is not necessary or may perform an engineering analysis to determine the disposition of the material.

Any material that remains in place will be accepted with a CPF as determined by 334-8, or as determined by the Engineer.

If the defective material is due to a gradation, asphalt binder content or density failure, upon the approval of the Engineer the Contractor may perform delineation tests on roadway cores in lieu of an engineering analysis to determine the limits of the defective material that may require removal and replacement. Prior to any delineation testing, all sampling

locations shall be approved by the Engineer. All delineation sampling and testing shall be monitored and verified by the Engineer. For materials that are defective due to air voids, an engineering analysis is required.

When evaluating defective material by engineering analysis or delineation testing, at a minimum, evaluate all material located between passing QC, PC or IV test results. Exceptions to this requirement shall be approved by the Engineer.

334-6 Comparison Testing.

At the start of the project (unless waived by the Engineer) and at other times as determined necessary by the Engineer, provide split samples for comparison testing with the Engineer. The purpose of these tests is to verify that the testing equipment is functioning properly and that the testing procedures are being performed correctly. In the event that the Engineer determines that there is a problem with the Contractor's testing equipment and/or testing procedures, immediately correct the problem to the Engineer's satisfaction. In the event that the problem is not immediately corrected, cease production of the asphalt mixture until the problem is adequately resolved to the satisfaction of the Engineer.

If so agreed to by both the Contractor and the Engineer, the split sample used for comparison testing may also be used for the QC sample. The split sample used for comparison testing must also meet the requirements for IV testing described in 334-5.7.

334-7 Method of Measurement.

For the work specified under this Section (including the pertinent provisions of Sections 320 and 330), the quantity to be paid for will be the weight of the mixture, in tons. For each pay item, excluding overbuild, the pay quantity will be based on the quantity placed on the project, limited to 105% of the adjusted plan quantity for the pay item. The adjusted plan quantity will be determined by dividing the pay item's original plan quantity (including any Engineer approved quantity revisions) by the design G_{mm} stated in 334-1.4, then multiplying it by the tonnage-weighted average G_{mm} of the mixes used for the pay item.

The bid price for the asphalt mix will include the cost of the liquid asphalt and the tack coat application as directed in 300-8. There will be no separate payment or unit price adjustment for the asphalt binder material in the asphalt mix. For the calculation of unit price adjustments of bituminous material, the average asphalt content will be based on the percentage specified in 9-2.1.2. The weight will be determined as provided in 320-3.2 (including the provisions for the automatic recordation system).

Prepare a Certification of Quantities, using the Department's current approved form, for the certified Superpave asphalt concrete pay item. Submit this certification to the Engineer no later than Twelve O'clock noon Monday after the estimate cut-off or as directed by the Engineer, based on the quantity of asphalt produced and accepted on the roadway per Contract. The certification must include the Contract Number, FPID Number, Certification Number, Certification Date, period represented by Certification and the tons produced for each asphalt pay item.

334-8 Basis of Payment.

334-8.1 General: Price and payment will be full compensation for all the work specified under this Section (including the applicable requirements of Sections 320 and 330).

For materials accepted in accordance with 334-5, based upon the quality of the material, a pay adjustment will be applied to the bid price of the material as determined on a LOT by LOT

basis. The pay adjustment will be assessed by calculating a Pay Factor for the following individual quality characteristics: pavement density, air voids, asphalt binder content, and the percentage passing the No. 200 and No. 8 sieves. The pay adjustment will be computed by multiplying a Composite Pay Factor (CPF) for the LOT by the bid price per ton.

334-8.2 Pay Factors:

334-8.2.1 Partial LOTs: For Partial LOTs where no random sample is obtained due to insufficient tonnage, a CPF of 1.00 shall be applied.

334-8.2.2 Two or Less Sublot Test Results: In the event that two or less sublot test results are available for a LOT, Pay Factors will be determined based on Table 334-7, using the average of the accumulated deviations from the target value. (Deviations are absolute values with no plus or minus signs.) Use the 1-Test column when there is only one sublot test result and use the 2-Tests column when there are two sublots.

Table 334-7
Small Quantity Pay Table

Pay Factor	1 Sublot Test Deviation	2 Sublot Test Average Deviation
Asphalt Binder Content		
1.05	0.00-0.23	0.00-0.16
1.00	0.24-0.45	0.17-0.32
0.90	0.46-0.55	0.33-0.39
0.80	>0.55	>0.39
No. 8 Sieve		
1.05	0.00-2.25	0.00-1.59
1.00	2.26-4.50	1.60-3.18
0.90	4.51-5.50	3.19-3.89
0.80	>5.50	>3.89
No. 200 Sieve		
1.05	0.00-0.55	0.00-0.39
1.00	0.56-1.10	0.40-0.78
0.90	1.11-1.50	0.79-1.06
0.80	>1.50	>1.06
Air Voids		
1.05	0.00-0.50	0.00-0.35
1.00	0.51-1.00	0.36-0.71
0.90	1.01-1.70	0.72-1.20
0.80	1.71-2.00	1.21-1.41
0.70	2.01-2.50	1.42-1.77
0.55	>2.50	>1.77
Density (1)		
1.05	0.00-0.50	0.00-0.35
1.00	0.51-1.00	0.36-0.71
0.95	1.01-2.00	0.72-1.41
0.90	2.01-3.00	1.42-2.12
0.80	>3.00	>2.12

Table 334-7 Small Quantity Pay Table		
Pay Factor	1 Sublot Test Deviation	2 Sublot Test Average Deviation
(1). Each density test result is the average of five cores. The target density is 93.00 percent of G_{mm} (92.00 percent when compaction is limited to the static mode or for layers specified to be one inch thick). When compaction is limited to the static mode, no vibratory mode in the vertical direction will be allowed. Other vibratory modes will be allowed, if approved by the Engineer. In this case, the target density is 92.00 percent of G_{mm}.		

334-8.2.3 Three or More Sublot Test Results: When three or more sublot test results are available for a LOT, the variability-unknown, standard deviation method will be used to determine the estimated percentage of the LOT that is within the specification limits. The number of significant figures used in the calculations will be in accordance with requirements of AASHTO R11-06, Absolute Method.

334-8.2.3.1 Percent Within Limits: The percent within limits (PWL) and Pay Factors for the LOT will be calculated as described below. Variables used in the calculations are as follows:

x = individual test value (sublot)
n = number of tests (sublots)
s = sample standard deviation
$\Sigma(x^2)$ = summation of squares of individual test values
$(\Sigma x)^2$ = summation of individual test values squared
Q_U = upper quality index
USL = upper specification limit (target value plus upper specification limit from Table 334-8)
Q_L = lower quality index
LSL = lower specification limit (target value minus lower specification limit from Table 334-8)
P_U = estimated percentage below the USL
P_L = estimated percentage above the LSL

1. Calculate the arithmetic mean $(\overline{X})$ of the test values:

$$\overline{X} = \frac{\sum x}{n}$$

2. Calculate the sample standard deviation (s):

$$s = \sqrt{\frac{n\sum\left(x^2\right) - \left(\sum x\right)^2}{n(n-1)}}$$

3. Calculate the upper quality index (Q_U):

$$Q_U = \frac{\text{USL} - \overline{\text{X}}}{\text{s}}$$

4. Calculate the lower quality index (Q_L):

$$Q_L = \frac{\overline{X} - LSL}{s}$$

5. From Table 334-9, determine the percentage of work below the USL (P_U).

6. From Table 334-9, determine percentage of work above the LSL (P_L) Note: If USL or LSL is not specified; percentages within (USL or LSL) will be 100.

7. If Q_U or Q_L is a negative number, then calculate the percent within limits for Q_U or Q_L as follows: enter Table 334-9 with the positive value of Q_U or Q_L and obtain the corresponding percent within limits for the proper sample size. Subtract this number from 100.00. The resulting number is the value to be used in the next step (Step 8) for the calculation of quality level.

8. Calculate the percent within limits (PWL) = (P_U + P_L) - 100

9. Calculate the Pay Factor (PF) for each quality characteristic using the equation given in 334-8.2.3.2.

Table 334-8
Specification Limits

Quality Characteristic	Specification Limits
Passing No. 8 sieve (percent)	Target ± 3.1
Passing No. 200 sieve (percent)	Target ± 1.0
Asphalt Content (percent)	Target ± 0.40
Air Voids (percent)	4.00 ± 1.20
Density, vibratory mode (percent of G_{mm}):	93.00 + 2.00, - 1.20
Density, static mode (percent of G_{mm}):	93.00 + 3.00, - 1.50 (1)

(1): No vibratory mode in the vertical direction will be allowed. Other vibratory modes will be allowed, if approved by the Engineer.

Table 334-9
Percent Within Limits

Quality Index	Percent within Limits for Selected Sample Size			
	n = 3	n = 4	n = 5	n = 6
0.00	50.00	50.00	50.00	50.00
0.05	51.38	51.67	51.78	51.84
0.10	52.76	53.33	53.56	53.67
0.15	54.15	55.00	55.33	55.50
0.20	55.54	56.67	57.10	57.32
0.25	56.95	58.33	58.87	59.14
0.30	58.37	60.00	60.63	60.94
0.35	59.80	61.67	62.38	62.73
0.40	61.26	63.33	64.12	64.51
0.45	62.74	65.00	65.84	66.27

Table 334-9 Percent Within Limits				
Quality Index	Percent within Limits for Selected Sample Size			
	n = 3	n = 4	n = 5	n = 6
0.50	64.25	66.67	67.56	68.00
0.55	65.80	68.33	69.26	69.72
0.60	67.39	70.00	70.95	71.41
0.65	69.03	71.67	72.61	73.08
0.70	70.73	73.33	74.26	74.71
0.75	72.50	75.00	75.89	76.32
0.80	74.36	76.67	77.49	77.89
0.85	76.33	78.33	79.07	79.43
0.90	78.45	80.00	80.62	80.93
0.95	80.75	81.67	82.14	82.39
1.00	83.33	83.33	83.64	83.80
1.05	86.34	85.00	85.09	85.18
1.10	90.16	86.67	86.52	86.50
1.15	97.13	88.33	87.90	87.78
1.20	100.00	90.00	89.24	89.01
1.25	100.00	91.67	90.54	90.19
1.30	100.00	93.33	91.79	91.31
1.35	100.00	95.00	92.98	92.37
1.40	100.00	96.67	94.12	93.37
1.45	100.00	98.33	95.19	94.32
1.50	100.00	100.00	96.20	95.19
1.55	100.00	100.00	97.13	96.00
1.60	100.00	100.00	97.97	96.75
1.65	100.00	100.00	98.72	97.42
1.70	100.00	100.00	99.34	98.02
1.75	100.00	100.00	99.81	98.55
1.80	100.00	100.00	100.00	98.99
1.85	100.00	100.00	100.00	99.36
1.90	100.00	100.00	100.00	99.65
1.95	100.00	100.00	100.00	99.85
2.00	100.00	100.00	100.00	99.97
2.05	100.00	100.00	100.00	100.00
2.10	100.00	100.00	100.00	100.00
2.15	100.00	100.00	100.00	100.00

Table 334-9 Percent Within Limits				
Quality Index	Percent within Limits for Selected Sample Size			
	n = 3	n = 4	n = 5	n = 6
2.20	100.00	100.00	100.00	100.00
2.25	100.00	100.00	100.00	100.00
2.30	100.00	100.00	100.00	100.00
2.35	100.00	100.00	100.00	100.00
2.40	100.00	100.00	100.00	100.00
2.45	100.00	100.00	100.00	100.00
2.50	100.00	100.00	100.00	100.00
2.55	100.00	100.00	100.00	100.00
2.60	100.00	100.00	100.00	100.00
2.65	100.00	100.00	100.00	100.00

334-8.2.3.2 Pay Factors (PF): Pay Factors will be calculated by using the following equation:

Pay Factor = (55 + 0.5 x PWL) / 100

The PWL is determined from Step (8) of 334-8.2.3.1.

334-8.3 Composite Pay Factor (CPF): A CPF for the LOT will be calculated based on the individual PFs with the following weighting applied: 35% Density (D), 25% Air Voids (V_a), 25% asphalt binder content (P_b), 10% Passing No. 200 (P_{-200}) and 5% Passing No. 8 (P_{-8}). Calculate the CPF by using the following formula:

CPF = [(0.350 x PF D) + (0.250 x PF V_a) + (0.250 x PF P_b) + (0.100 x PF P_{-200}) + (0.050 x PF P_{-8})]

Where the PF for each quality characteristic is determined in either 334-8.2.2 or 334-8.2.3, depending on the number of sublot tests. Note that the number after each multiplication will be rounded to the nearest 0.01.

The pay adjustment shall be computed by multiplying the CPF for the LOT by the bid price per ton.

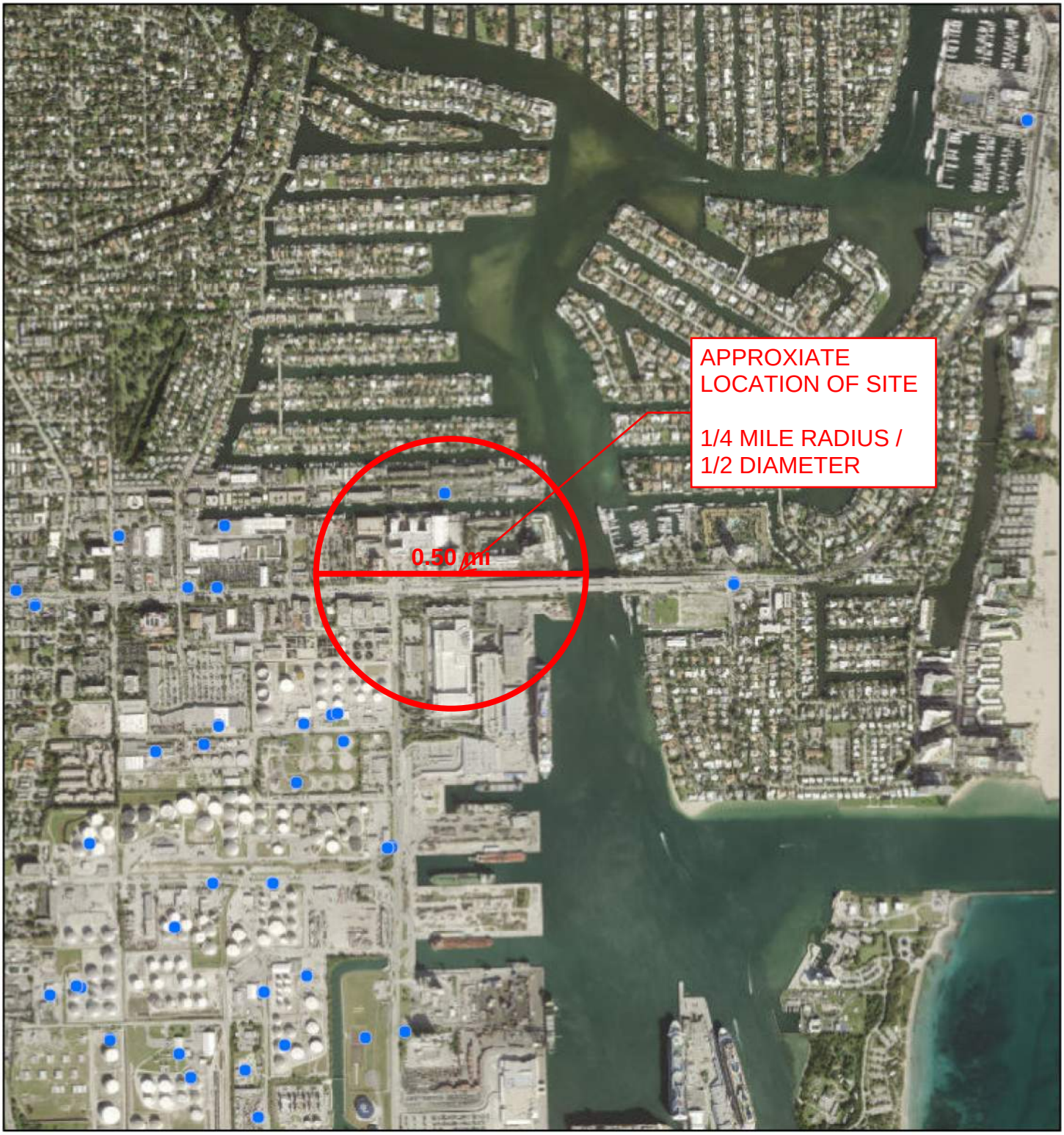
334-8.4 Payment: Payment will be made under:

Item No. 334- 1- Superpave Asphaltic Concrete - per ton.

PROJECT 11080

APPENDIX

Broward County Contaminated Sites



September 17, 2018

1:18,106

0 0.13 0.25 0.5 mi

0 0.2 0.4 0.8 km

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

DRAWING INDEX

CIVIL

CITY OF FORT LAUDERDALE

PROJECT #11080
PORT CONDO
LARGE WATER MAIN IMPROVEMENTS

FORT LAUDERDALE, FLORIDA

BID SET

NPDES PLAN:

FOR LIMITS OF AREA FOR IMPLEMENTATION OF EROSION AND SEDIMENT CONTROL MEASURES CONTRACTOR TO REFER TO THE LIMITS OF PAVEMENT RESTORATION NOTED ON ALL PLAN AND PROFILE SHEETS DESIGNATED BY CROSS HATCHING AND EXTENDED TO THE FULL RIGHT OF WAY OF THE STREET WHERE IMPROVEMENTS ARE BEING IMPLEMENTED. FOR DETAILED NOTES SEE "EROSION AND SEDIMENT CONTROL NOTES" ON SHEET 02.

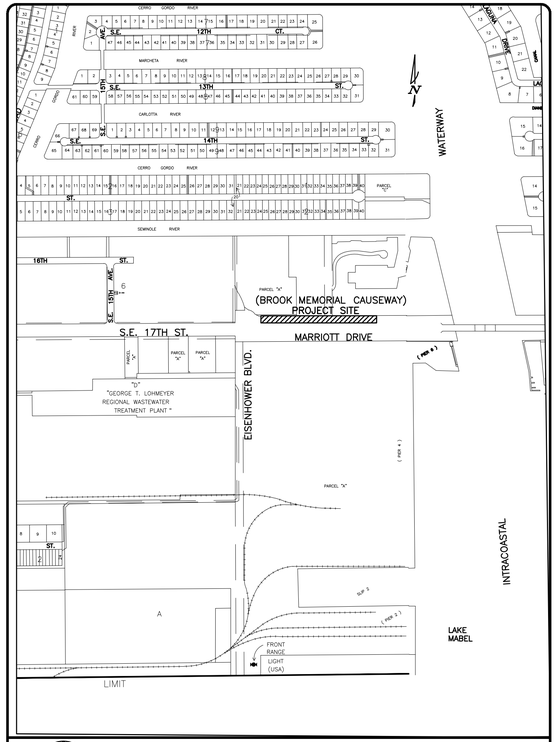
1

THE INTENT OF THESE PLANS IS TO INDICATE CONSTRUCTION OF A NEW 12" PVC DISTRIBUTION WATER MAIN ALONG S.E. 17 STREET/GRANDE DRIVE FROM JUST EAST OF EISENHOWER BOULEVARD EASTERLY TO AN EXISTING 24" WATER MAIN LOCATED APPROXIMATELY 250 LINEAR FEET WEST OF THE INTER-COASTAL WATERWAY. THE NEW DISTRIBUTION SYSTEM EAST OF EISENHOWER BOULEVARD WILL BE INSTALLED IN THE CENTER OF THE NORTHERN-MOST WESTBOUND LANE. WORK INCLUDES INSTALLATION OF NEW STUB-OUTS FOR WATER AND FIRE LINES TO SERVICE NEW DEVELOPMENTS ALONG THE NORTH RIGHT OF WAY OF GRANDE DRIVE. IN ADDITION, INSTALL NEW WATER SERVICE LINES TO EXISTING WATER METERS AND TRANSFER SERVICES TO THE PROPOSED 12" WATER MAIN ALONG GRANDE DRIVE. THE EXISTING WATER SERVICES AND THE EXISTING 6" WATER MAIN WILL BE CAPPED AND PLACED OUT TO SERVICE ONCE THE NEWLY CONSTRUCTED MAIN ARE FULLY COMMISSIONED.

ROBERT ZUCCARO LICENSE No 17931 STATE OF FLORIDA PROFESSIONAL ENGINEER

KEITH & SCHNARS PROJECT NO. 18068.10

KEITH and SCHNARS, P.A.
ENGINEERS, PLANNERS, SURVEYORS
FLORIDA'S Big LOCAL FIRM
CERTIFICATE OF AUTHORIZATION NO. 1337
6500 NORTH ANDREWS AVENUE, FORT LAUDERDALE, FL 33309-2132 (954)776-1616



NORTH LOCATION SKETCH

PROJECT #11080
PORT CONDO
LARGE WATER MAIN IMPROVEMENTS

CITY OF FORT LAUDERDALE
PUBLIC WORKS DEPARTMENT
ENGINEERING & ARCHITECTURE
100 North Andrews Avenue, Fort Lauderdale, Florida 33301

FORT LAUDERDALE CITY COMMISSION

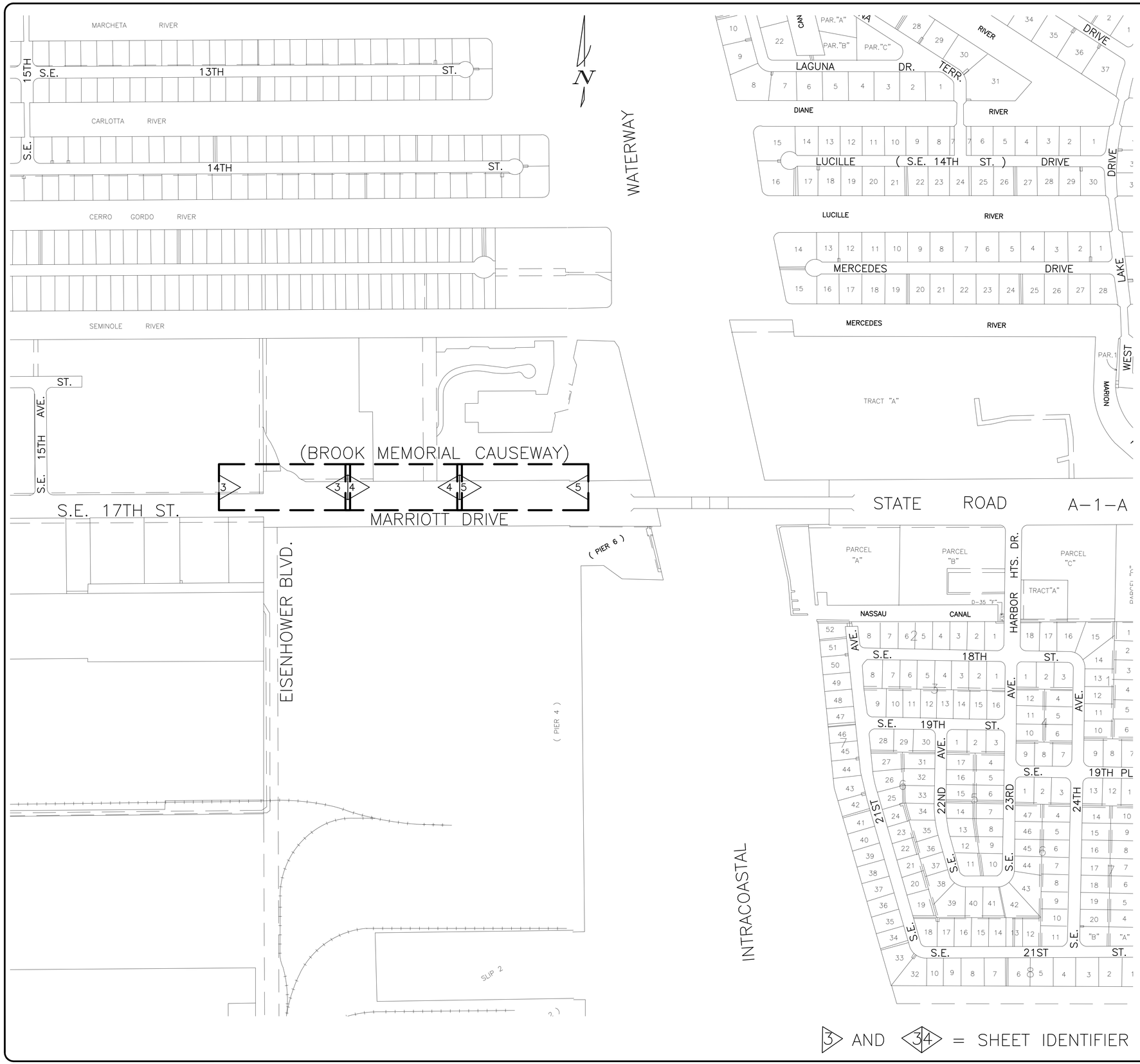
DEAN J. TRANTALIS	MAYOR
HEATHER MORAITIS	COMMISSIONER - DISTRICT I
STEVEN GLASSMAN	COMMISSIONER - DISTRICT II
ROBERT L. MCKINZIE	COMMISSIONER - DISTRICT III
BEN SORENSEN	COMMISSIONER - DISTRICT IV

DANIEL FISHER — PROJECT MANAGER, CITY OF FORT LAUDERDALE — (954) 828-5850

1	6/13/17	JDB	BZ	REV. DIP TO PVC PER CITY

DATE: 03/03/2017
CAD FILE: 11080-000-010COVR
DRAWING FILE No.: WS-06-14

BID SET



3 AND 34 = SHEET IDENTIFIER

SURVEY LEGEND:

SYMBOL	DESCRIPTION
M	EXIST. WATER METER BOX
V	EXIST. VALVE
	PROPOSED VALVE
	PROPOSED FIRE HYDRANT
	PROPOSED WATER MAIN
	WOODEN POWER POLE
	CONCRETE POWER POLE
	BENCH MARK
OR	TREE
	PALM TREE
NBC	NAIL IN BOTTLE CAP
NIA	NAIL IN ASPHALT
—G—	EXIST. GAS LINE
—W—	EXIST. WATER MAIN
—WM—	EXIST. WATER MAIN
—B—	EXIST. BURIED TELEPHONE
—T—	EXIST. TELEPHONE
—UE—	EXIST. UNDERGROUND ELECTRIC
—FM—	EXIST. FORCE MAIN
—OH—	EXIST. OVERHEAD WIRES
—CATV—	EXIST. CABLE TELEVISION
—X—X—	EXIST. CHAIN LINK FENCE
#.##	EXISTING ELEVATION
SOIL BORE	SOIL BORING LOCATION PLAN
	SOIL BORING LOCATION PROFILE

KEITH & SCHNARS PROJECT NO. 18068.10

KEITH and SCHNARS, P.A.
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ROBERT A. CACADO
LICENSE
No 17931
STATE OF FLORIDA
PROFESSIONAL ENGINEER

DRAWN BY: ARC	DATE: 09/2015
DESIGNED BY: BZ	SCALE: N.T.S.
CHECKED BY: BZ	FIELD BOOK:

CITY OF FORT LAUDERDALE
PUBLIC WORKS DEPARTMENT
ENGINEERING & ARCHITECTURE
100 North Andrews Avenue, Fort Lauderdale, Florida 33301

REVISIONS

NO.	DATE	BY	CHK'D	DESCRIPTION

PROJECT # 11080
PORT CONDO
LARGE WATER MAIN IMPROVEMENTS
KEY MAP
BID SET

SHEET NO.	OF
01	10

TOTAL: 10

CAD FILE: 11080-001-KMAP

DRAWING FILE NO. WS-06-14

LEGEND:

SYMBOL	DESCRIPTION
M	WATER METER BOX
	EXISTING VALVE
	PROPOSED VALVE
	FIRE HYDRANT
	BENCH MARK
	TREE
NBC	NAIL IN BOTTLE CAP
NIA	NAIL IN ASPHALT
—G—	GAS LINE
—W—	WATER MAIN
—BT—	BURIED TELEPHONE
—T—	TELEPHONE
—UE—	UNDERGROUND ELECTRIC
—FM—	FORCE MAIN
—OH—	OVERHEAD WIRES
—CATV—	CABLE TELEVISION
—X—X—	CHAIN LINK FENCE
	WOOD FENCE
#.##	EXISTING ELEVATION
SOIL BORE	SOIL BORING LOCATION MARK
	SOIL TYPE SEPERATION MARK

TEMPORARY TRAFFIC CONTROL PLAN:

1. The governing standards and specifications for the traffic control plans are The Florida Department of Transportation, 2016 Design Standards, and 2016 Standard Specifications for Road and Bridge Construction.
2. Regulatory speed established within the work zone travel ways shall be the existing posted speed.
3. The traffic and travel ways shall not be altered by the contractor to create a work zone until all labor and material are available for the construction in that area.
4. Lane closure shall occur only during non–peak hours, 9:00 pm to 5:30 am – Sunday through Thursday nights and 11:00 pm to 7:00 am Friday and Saturday nights.
5. Access shall be maintained to all businesses throughout construction. Index 600 should be followed regarding the use of business entrance signs.

TTCP PHASING NOTES:

1. Construction activities shall be limited to one block at a time.
2. Phase 1 will be repeated at each block where there are proposed improvements.

PHASE 1 – GRANDE DRIVE (SR A1A) WESTBOUND LANE CLOSURES:

1. Close westbound lane in accordance with FDOT STANDARD INDEX 605.
2. Construct improvements as shown on plans.
3. Restore pavement in westbound lane.

WATR01

WATER SYSTEM NOTES:

PIPE D.I.P.

1. Ductile Iron water main pipe shall conform to the requirements of A.N.S.I./ A.W.W.A. C–151/A 21.51–02 and lined and coated per A.N.S.I./A.W.W.A. C–104/A–214–03. 20" and smaller pipe shall be pressure class 350; 24" and larger, pipe shall be pressure class 250.
2. All DIP shall have adequate protective measures against corrosion and it shall be used only if as determined by the design engineer, based on field conditions.
3. All DIP shall be installed in accordance with A.N.S.I./A.W.W.A. C–600–99, or latest revision.

PIPE P.V.C.

4. All P.V.C. mains shall be series 1120, class 150 (DR 18) pressure pipe, conforming to A.N.S.I./A.W.W.A. C–900–07', or latest revision, and shall have push on joints, and iron pipe O.D.
5. All P.V.C. pipe shall be installed in accordance with the Uni–Bell plastic pipe Association's "Guide for installation of P.V.C. pressure pipe for Municipal water distribution system". Water distribution pipe shall be of "BLUE" color. All water main installations shall comply with the color coding requirements of Chapter 62–555.320(21)(b)3 F.A.C. (Florida Administrative Code).
6. Detector tape on all P.V.C. mains shall be installed 18" above the water main.
7. All P.V.C. mains must have #6 copper wire, single strand, placed on top of pipe, shall be electrically continuous over the entire length of the pipe, and fastened every 10' with a #12 wire.

FITTINGS

8. Fittings shall be ductile iron meeting A.N.S.I./A.W.W.A. C153/21.00 and shall be coated with 6 to 8 mil. Thickness coal tar epoxy conforming to the requirements of A.N.S.I./A.W.W.A. C550–05 and C116/A21.03.
9. Restrained joint pipe shall be used for all bends, tees, crosses, plugs, and fire hydrants. Thrust blocks shall not be allowed.
10. Retainer glands/mechanical joint restraint shall be used only if authorized by the Engineer and shall conform to A.N.S.I./A.W.W.A. standards C 111/A–21.11–03, or latest revision.
11. All glands shall be manufactured from ductile iron as listed by underwriter's laboratory for 250 P.S.I. minimum water pressure rating.
12. Glands shall be CLOW Corporation model F–1058, standard fire protection equipment company, or approved equal.

VALVES

13. Tapping valves shall be Mueller H667 or approved equal.
14. Tapping sleeves shall be Mueller H615 or approved equal.
15. Gate valves 3" or less shall be NIBCO T–133 OR T–136 with malleable hand wheels. No substitutions allowed.
16. Gate valves 4" or larger shall meet A.W.W.A. C–500–02 specification (latest revision). Valves shall be Mueller Co. or approved equal.
17. All valves shall be furnished with extension type cast iron valve boxes of proper length for pipe depth. All boxes shall conform with A.W.W.A. specifications with a shaft of no less than 5 inches and have the word "WATER" cast in the cover. Base of valve box shall have a flared section to fit over stuffing box of valve.

HYDRANTS

18. Fire hydrants shall be breakaway Mueller Super Centurion 250, US Pipe Metropolitan 250, American Darling B–84B, Clow Medallion, or approved equal.
19. Fire hydrants shall be installed with the center of the nozzle 18" above finished grade.
20. Dead–end water mains 6" or larger shall terminate with a fire hydrant.

PLACEMENT

21. All water mains shall be installed with a minimum cover of 36•• for P.V.C and 36•• for DIP except where shown differently on plans.
22. A continuous and uniform bedding shall be provided. Backfill material shall be tamped in layers around the pipe as shown on the plans and/or City of Fort Lauderdale Construction Standards and Specifications, January 1982. Rocks or stones larger than 3/4" diameter found in the trench shall be removed for a depth of at least 6" below the bottom of the pipe.
23. Pipe deflection shall not exceed 75% of the maximum deflection recommended by the manufacturer.

SEPARATION

24. Sanitary sewers and force mains should cross under water mains whenever possible. Sanitary sewers and force mains crossing water mains shall be laid to provide a minimum vertical distance of 18" between the invert of the upper pipe and the crown of the lower pipe whenever possible.
25. Where sanitary sewer force mains must cross a water main with less than 18" vertical separation, both the sewer and water main shall be constructed of ductile iron pipe (DIP) at the crossing. Sufficient lengths of DIP must be used to provide a minimum separation of 10 feet between any two joints. All joints on the water main within 20 feet of the crossing must be mechanically restrained. A minimum vertical clearance of 6" must be maintained at all crossings.
26. A minimum 10 foot horizontal separation shall be maintained between any type of sewer and water main in parallel installations whenever possible.
27. The preferred separation between water mains and sewer mains shall be 10 feet. In cases where it is not possible to maintain a 6 foot horizontal separation between the water mains and sewer mains, one of the following conditions must be met. The minimum separation between water and sewer mains shall be 3 feet:

SEPARATION (CONT'D)

27.a The water main must be laid in a separate trench or on an undisturbed earth shelf located on one side of the sewer or force main at such elevation that the bottom of the water main is at least 18 inches above the top of the sewer.

27.b The sewer or force main is encased in concrete or a watertight carrier pipe.

27.c Both the sewer and the water main are constructed of pressure pipe tested to 150 p.s.i.

28. Where it is not possible to maintain a vertical distance of 18" in parallel installations, the water main shall be constructed of DIP and the sanitary sewer or force main shall be constructed of DIP, with a minimum vertical clearance of 6". The water main should be above the sewer. Joints on the water main shall be located as far apart as possible from the joints on the sewer or force main (staggered joints).
29. All crossings shall be arranged so that the sewer pipe joints and the water main pipe joints are equidistant from the point of crossing (pipes centered on the crossing).
30. Where a new pipe conflicts with an existing pipe with less than 18" vertical clearance, the new pipe shall be arranged to meet the crossing requirements above.

TESTING, DISINFECTION

31. Pipe shall be tested under constant pressure of 150 P.S.I. for a minimum test period of 2 hours and shall not exceed the leakage requirements as per A.N.S.I./A.W.W.A. specifications of C–600–05 leakage formula: $Q = (LD\sqrt{P})/ 148{,}000$
    Q = QUANTITY OF MAKEUP WATER, (IN GALLONS PER HOUR)
    L = LENGTH OF PIPE SECTION BEING TESTED, (IN FEET).
    D = NOMINAL DIAMETER OF THE PIPE, (IN INCHES).
    P = AVERAGE TEST PRESSURE DURING THE HYDROSTATIC TEST, (IN POUNDS PER SQUARE INCH GAUGE).
32. The City of Fort Lauderdale Public Services Department will take all bacteriological tests, to be scheduled via inspector. If otherwise specified in contract detailed specification and/or authorized by the engineer of record, bacteriological tests may be performed by a certified environmental testing laboratory.
33. Disinfection of mains shall comply with A.N.S.I./A.W.W.A. C–651–05 standard. Bacteriological sampling points shall be designated on the engineering plans. Minimum one sampling point at each end. Maximum space between sampling points is 1200 feet.

CONNECTION

34. All connections to existing mains shall be made under the direction of the City of Fort Lauderdale.
35. There shall be no connection to an existing water main until pressure and bacteriological tests have been conducted and the results are approved and accepted by the City of Fort Lauderdale.

SERVICE CONNECTIONS

36. All meter service connections shall be bronze from plug valve. No gate valves are to be used (2" or less).
37. Service saddles shall be ductile iron with stainless steel straps. Saddles shall be double strap type. All service saddles shall conform to A.N.S.I./A.W.W.A. C 111/A–21.11–00 and A.S.T.M. A588.
38. All service lines shall be copper tubing, type "K", or plasticized polyethylene 3408, A.S.T.M. D–2737, S.D.R. 9, 200 P.S.I.

GENERAL NOTE:

THE EXISTING 6" WATER MAIN ALONG THE NORTH SIDE OF GRANDE DRIVE IS TO BE CAPPED AND PLACED OUT OF SERVICE, UPON COMPLETION AND COMMISSIONING OF THE NEW 12" PVC WATER MAIN. NEW WATER SERVICE LINES SHALL BE INSTALLED TO SERVICE THE EXISTING PROPERTIES.

EROSION & SEDIMENT CONTROL NOTES:

1. THE CONTRACTOR IS REQUIRED TO ADHERE TO THE REQUIREMENT OF THE NATIONAL POLLUTION DISCHARGE ELIMINATION SYSTEM (NPDES). THE CONTRACTOR SHALL IMPLEMENT BEST MANAGEMENT PRACTICES (BMP's) TO ENSURE COMPLIANCE WITH THE NPDES PROGRAM AND TO MINIMIZE THE IMPACT TO PUBLIC STORMWATER FACILITIES.
2. PRIOR TO CONSTRUCTION, SYNTHETIC SOCKS SHALL BE UTILIZED FOR INLET PROTECTION FROM SEDIMENT IN THE EVENT OF SEVERE RAINS. REFER TO THE FLORIDA STORM WATER EROSION AND SEDIMENTATION INSPECTOR'S MANUAL FOR DETAILS. THEY WILL REMAIN IN PLACE DURING THE ENTIRE DURATION OF CONSTRUCTION.
3. ALL WASTE GENERATED FROM THE CONSTRUCTION SHALL BE DISCARDED IN ACCORDANCE WITH ALL APPLICABLE STATE, LOCAL AND FEDERAL REGULATIONS. THE CONTRACTOR IS TO OBTAIN ALL APPLICABLE CODES AND BECOME FAMILIAR WITH STATE, LOCAL AND FEDERAL REGULATIONS PRIOR TO BEGINNING CONSTRUCTION. REGULATIONS CAN BE FOUND, BUT NOT LIMITED TO, DEPARTMENT OF RESOURCE MANAGEMENT AND DEPARTMENT OF ENVIRONMENTAL PROTECTION.
4. TO ENSURE THAT OFF–SITE VEHICLE TRACKING OF SEDIMENTS AND THE GENERATION OF DUST IS MINIMIZED, CONTRACTOR IS TO PUT INTO PRACTICE THE METHODS AND DETAILS IN FDOT INDEX 106 (LATEST VERSION).
5. DUST GENERATED FROM CONSTRUCTION WILL BE MINIMIZED BY DAILY WATERING OF THE SITE, IF CONSTRUCTION DURATION LASTS MORE THAN ONE(1) DAY.
6. AT ANY TIME DURING CONSTRUCTION THAT THE SYNTHETIC SOCKS ARE DISTURBED, THE SYNTHETIC SOCKS WILL BE RESTORED TO THEIR ORIGINAL STATE WITHIN 24 HOURS. AT NO TIME DURING CONSTRUCTION SHALL WORK BE PERFORMED WITHOUT THE INTEGRITY OF THE SYNTHETIC SOCKS.

KEITH & SCHNARS PROJECT NO. 18068.10

KEITH and SCHNARS, P.A.
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CERTIFICATE OF AUTHORIZATION NO. 1337
6500 NORTH ANDREWS AVENUE, FORT LAUDERDALE, FL. 33309–2132 (954)776–1616

ROBERT A. CACCIO, P.E. LICENSE No 17931 STATE OF FLORIDA PROFESSIONAL ENGINEER

DRAWN BY: ARC	DATE: 09/2015
DESIGNED BY: BZ	SCALE: N/A
CHECKED BY: BZ	
FIELD BOOK:	

CITY OF FORT LAUDERDALE
PUBLIC WORKS DEPARTMENT
ENGINEERING & ARCHITECTURE
100 North Andrews Avenue, Fort Lauderdale, Florida 33301

REVISIONS

NO.	DATE	BY	CHK'D	DESCRIPTION
1	04/06	R.C.	T.A.	REVISE NOTE 33
2	08/08	R.C.	W.S.	REVISE NOTES 4 & 10
3	02/09	R.C.	W.S.	REVISE NOTE 3
4	03/10	R.C.	J.P.	REVISE NOTE 31
5	10/10	R.C.	J.P.	REVISE NOTE 21, 31
6	01/11	R.C.	J.P.	REVISE NOTE 5
7	01/15	A.C.	B.Z.	ADDED TTCP NOTES
8	03/17	J.C.	B.Z.	REMOVED N.I.C. FROM NOTE 4 – 7

PROJECT # 11080
PORT CONDO
LARGE WATER MAIN
STANDARD WATER NOTES
BID SET

SHEET NO.	OF
02	10

TOTAL: 10

CAD FILE: 11080–002–NOTE

DRAWING FILE NO. WS–06–14

CROSSINGS

1. FORCE MAIN OVER WATER
GROUND EL. = 6.55
COVER = 6.5'
16" CIP FM B.O.P. EL.=1.57
6" PVC WM T.O.P. EL.=0.70
CLEARANCE = 18.0"

2. WATER OVER FORCE MAIN
GROUND EL. = 6.75
COVER = 3.0'
1.5" POLY. WM B.O.P. EL.=3.65
16" CIP FM T.O.P. EL.=2.65
CLEARANCE = 12.0"

3. ELECTRIC DUCT OVER WATER
GROUND EL. = 6.75
COVER = 3.0'
6" ELECTRIC B.O.P. EL.=5.10
1.5" POLY. WM T.O.P. EL.=3.78
CLEARANCE = 15.8"

4. WATER OVER FORCE MAIN
GROUND EL. = 6.90
COVER = 2.9'
6" PVC WM B.O.P. EL.=3.47
16" CIP FM T.O.P. EL.=2.47
CLEARANCE = 12.0"

5. WATER OVER FORCE MAIN
GROUND EL. = 6.86
COVER = 3.1'
4" PVC WM B.O.P. EL.=3.45
16" CIP FM T.O.P. EL.=2.45
CLEARANCE = 12.0"

6. WATER OVER FORCE MAIN
GROUND EL. = 6.86
COVER = 3.0'
1.5" POLY. WM B.O.P. EL.=3.77
16" CIP FM T.O.P. EL.=2.44
CLEARANCE = 16.0"

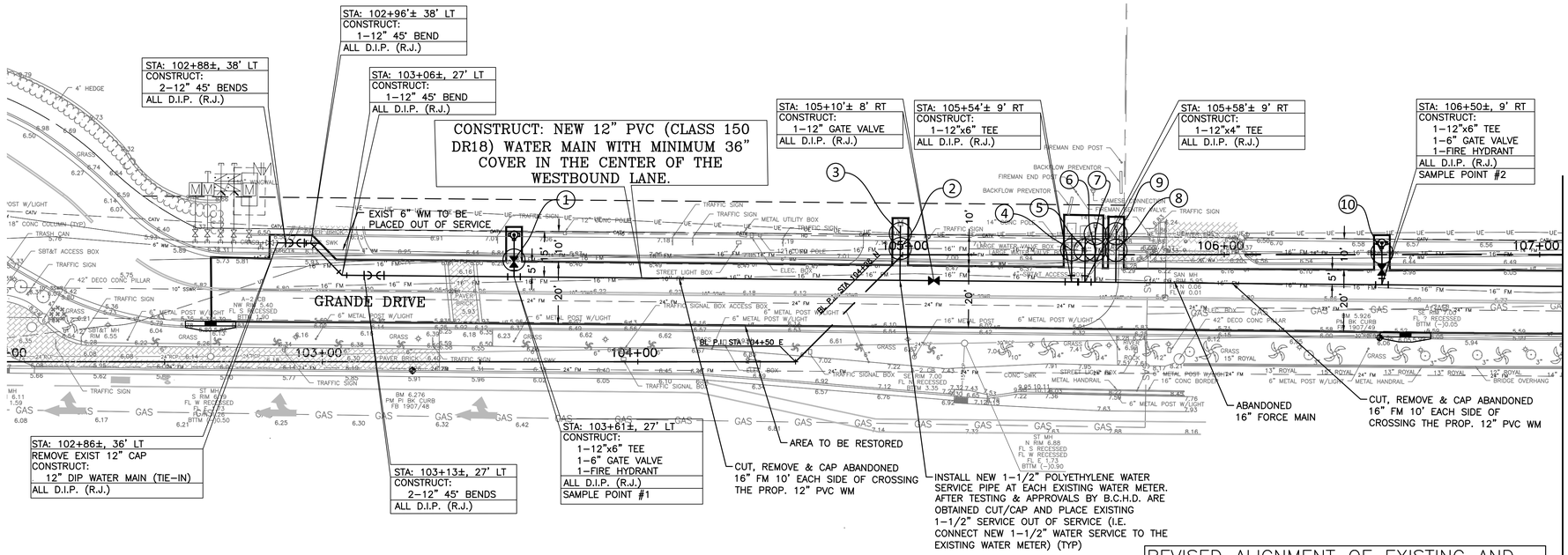
7. ELECTRIC DUCT OVER WATER
GROUND EL. = 6.63
COVER = 3.6'
16" ELECTRIC* B.O.P. EL.=3.53
1.5" POLY. WM T.O.P. EL.=3.03
CLEARANCE = 6.0"

8. WATER OVER FORCE MAIN
GROUND EL. = 6.88
COVER = 3.0'
1.5" POLY. WM B.O.P. EL.=3.75
16" CIP FM T.O.P. EL.=2.42
CLEARANCE = 16.0"

9. ELECTRIC DUCT OVER WATER
GROUND EL. = 6.60
COVER = 3.6'
16" ELECTRIC* B.O.P. EL.=3.49
1.5" POLY. WM T.O.P. EL.=2.99
CLEARANCE = 6.0"

10. WATER OVER FORCE MAIN
GROUND EL. = 6.54
COVER = 2.9'
6" PVC WM B.O.P. EL.=3.13
16" CIP FM T.O.P. EL.=2.13
CLEARANCE = 12.0"

*NOTE: ELECTRICAL DUCT SIZES ARE APPROXIMATE. CONTRACTOR TO COORDINATE WITH UTILITY COMPANY AND FIELD VERIFY PRIOR TO CONSTRUCTION. SEE NOTE #4 THIS SHEET.



MATCH LINE STA: 107+00 SEE SHEET 04

GRAPHIC SCALE
20 0 10 20
1 = 20

REVISED ALIGNMENT OF EXISTING AND ABANDONED FORCE MAINS AND FPL DUCT BANKS PER UPDATED TEST HOLES BY F.R. ALEMAN & ASSOCIATES, INC. RECEIVED ON 01/18/17.

AREA TO BE RESTORED

NOTE: ALL PAVEMENT MARKINGS AND SIGNING DAMAGED DURING CONSTRUCTION, SHALL BE RESTORED.

GENERAL NOTE:

1) ALL WORK WITHIN BROWARD COUNTY RIGHT-OF-WAYS MUST BE IN CONFORMITY WITH THE BROWARD COUNTY MINIMUM STANDARDS AND/OR REQUIREMENTS.

2) ALL WORK WITHIN STATE DEPARTMENT OF TRANSPORTATION (FDOT) RIGHT-OF-WAYS MUST BE IN CONFORMITY WITH FDOT SPECIFICATIONS AND/OR REQUIREMENTS.

3) THE CONTRACTOR MUST POT HOLE AND VERIFY THE LOCATION AND ELEVATION OF EXISTING WATER MAINS BEFORE MAKING A TIE-IN TO NEW WATER MAINS.

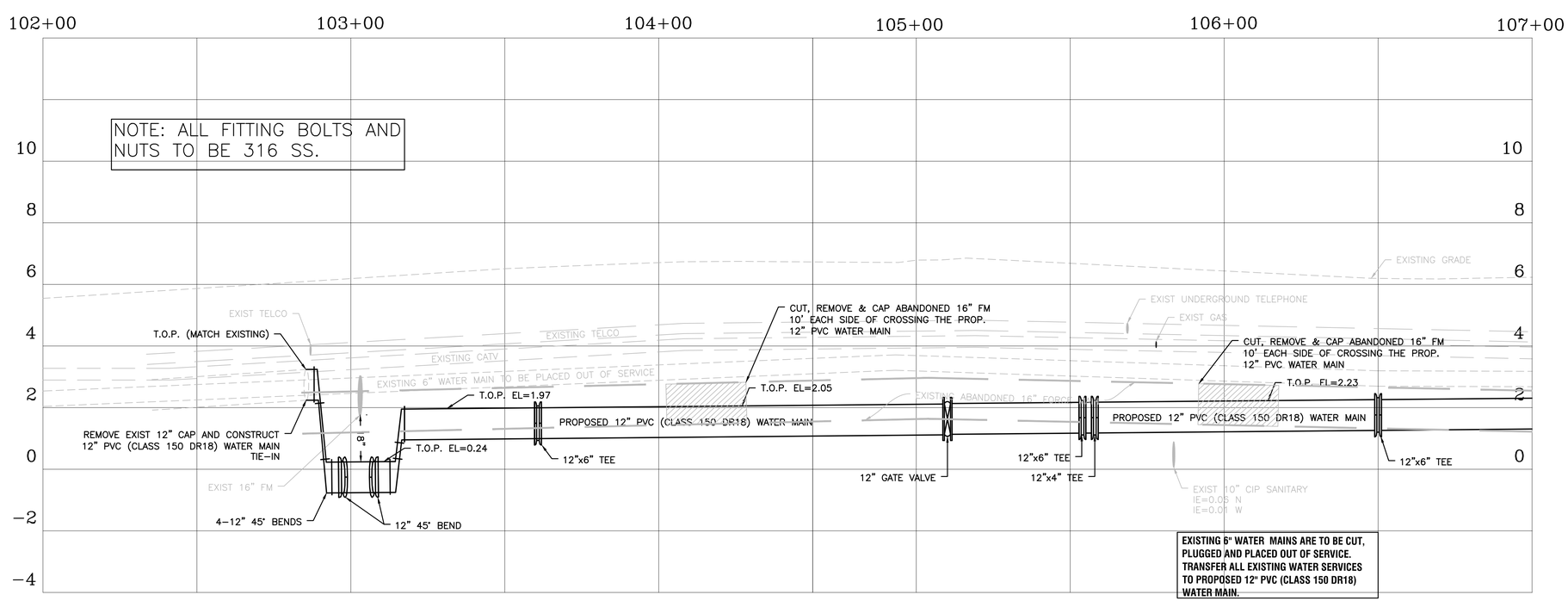
4) THE CONTRACTOR MUST USE EXTREME CARE TO AVOID DAMAGE OR DISRUPTION TO ANY EXISTING UTILITIES, WHETHER SHOWN ON THE PLANS OR NOT. ALL PLAN LOCATIONS ARE APPROXIMATE AND SHALL BE FIELD VERIFIED. CONTRACTOR IS TO CONTACT SUNSHINE ONE CALL OF FLORIDA AT 1-800-432-4770 AND ALL OTHER PARTICIPATING UTILITIES 48-HOURS PRIOR TO CONSTRUCTION FOR FIELD MARK-UP LOCATIONS OF EXISTING UTILITIES AND FACILITIES.

5) THE CONTRACTOR MUST INFORM THE CITY AT LEAST 48-HOURS IN ADVANCE OF CONSTRUCTION, IN WRITING, IF ANY CONFLICT IS DISCOVERED DURING POT HOLE OPERATIONS FOR RESOLUTION BY THE CITY.

6) IT WILL BE THE RESPONSIBILITY OF THE CONTRACTOR TO NOTIFY THE UTILITIES DEPARTMENT OF THE CITY OF FORT LAUDERDALE AT LEAST TWO (2) BUSINESS DAYS IN ADVANCE TO COORDINATE ANY ACTIVITY OF CONSTRUCTION TO BE PERFORMED BY THE CITY'S UTILITIES DEPARTMENT.

811 KNOW WHAT'S BELOW ALWAYS CALL 811 BEFORE YOU DIG
It's fast. It's free. It's the law.
www.callsunshine.com

NOTE: ALL FITTING BOLTS AND NUTS TO BE 316 SS.



EXISTING 6" WATER MAINS ARE TO BE CUT, PLUGGED AND PLACED OUT OF SERVICE. TRANSFER ALL EXISTING WATER SERVICES TO PROPOSED 12" PVC (CLASS 150 DR18) WATER MAIN.

KEITH & SCHNARS PROJECT NO. 18068.10

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FLORIDA'S BIG LOCAL FIRM
CERTIFICATE OF AUTHORIZATION NO. 1337
6500 NORTH ANDREWS AVENUE, FORT LAUDERDALE, FL 33309-2132 (954)776-1616

ROBERT A. CACCIATO, P.E. LICENSE No 17931 STATE OF FLORIDA PROFESSIONAL ENGINEER

DATE:	DRAWN BY:	DESIGNED BY:	SCALE:	CHECKED BY:	FIELD BOOK:
09/2015	ARC/JVG	BZ	1" = 20' 1" = 2'	BZ	

CITY OF FORT LAUDERDALE
PUBLIC WORKS DEPARTMENT
ENGINEERING & ARCHITECTURE
100 North Andrews Avenue, Fort Lauderdale, Florida 33301

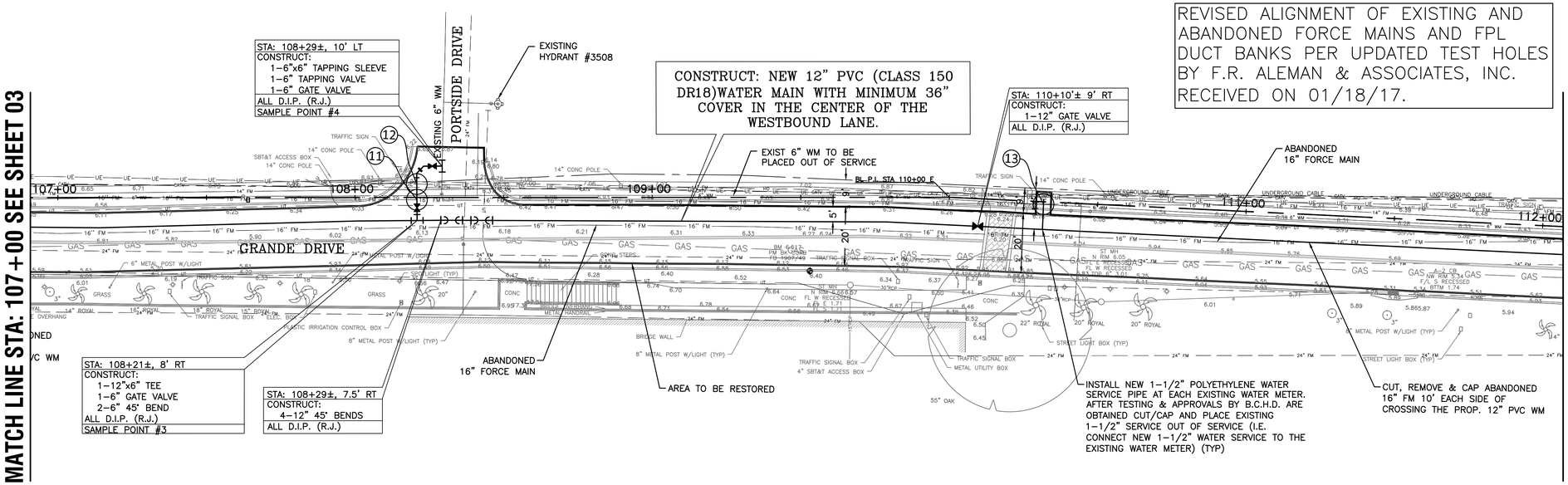
REVISIONS

NO.	DATE	BY	CHK'D	DESCRIPTION
1	03/03/17	JVG	BZ	PIPE PROFILE/ALIGNMENT REV
2	03/27/17	JVG	BZ	REV. PER CITY COMMENTS

PROJECT # 11080
PORT CONDO
LARGE WATER MAIN IMPROVEMENTS
PLAN SHEET
BID SET

SHEET NO. 03 OF 10
TOTAL: 10
CAD FILE: 11080-003-PLAN
DRAWING FILE NO. WS-06-14

MATCH LINE STA: 107+00 SEE SHEET 03



REVISED ALIGNMENT OF EXISTING AND ABANDONED FORCE MAINS AND FPL DUCT BANKS PER UPDATED TEST HOLES BY F.R. ALEMAN & ASSOCIATES, INC. RECEIVED ON 01/18/17.

MATCH LINE STA: 112+00 SEE SHEET 05

GRAPHIC SCALE

20 0 10 20

1 = 20

CROSSINGS

(11) FORCE MAIN OVER WATER
GROUND EL. = 6.32
COVER = 7.0'
16" CIP FM B.O.P. EL.=0.78
6" PVC WM T.O.P. EL.=–0.72
CLEARANCE = 18.0"

(12) ELECTRIC DUCT OVER WATER
GROUND EL. = 6.23
COVER = 7.0'
16" ELECTRIC* B.O.P. EL.=2.13
6" PVC WM T.O.P. EL.=–0.72
CLEARANCE = 34.2"

(13) WATER OVER FORCE MAIN
GROUND EL. = 6.73
COVER = 3.0'
6" PVC WM B.O.P. EL.=3.25
16" CIP FM T.O.P. EL.=2.42
CLEARANCE = 10.0"

*NOTE: ELECTRICAL DUCT SIZES ARE APPROXIMATE. CONTRACTOR TO COORDINATE WITH UTILITY COMPANY AND FIELD VERIFY PRIOR TO CONSTRUCTION. SEE NOTE #4 THIS SHEET.

GENERAL NOTE:

1) ALL WORK WITHIN BROWARD COUNTY RIGHT–OF–WAYS MUST BE IN CONFORMITY WITH THE BROWARD COUNTY MINIMUM STANDARDS AND/OR REQUIREMENTS.

2) ALL WORK WITHIN STATE DEPARTMENT OF TRANSPORTATION (FDOT) RIGHT–OF–WAYS MUST BE IN CONFORMITY WITH FDOT SPECIFICATIONS AND/OR REQUIREMENTS.

3) THE CONTRACTOR MUST POT HOLE AND VERIFY THE LOCATION AND ELEVATION OF EXISTING WATER MAINS BEFORE MAKING A TIE–IN TO NEW WATER MAINS.

4) THE CONTRACTOR MUST USE EXTREME CARE TO AVOID DAMAGE OR DISRUPTION TO ANY EXISTING UTILITIES, WHETHER SHOWN ON THE PLANS OR NOT. ALL PLAN LOCATIONS ARE APPROXIMATE AND SHALL BE FIELD VERIFIED. CONTRACTOR IS TO CONTACT SUNSHINE ONE CALL OF FLORIDA AT 1–800–432–4770 AND ALL OTHER PARTICIPATING UTILITIES 48–HOURS PRIOR TO CONSTRUCTION FOR FIELD MARK–UP LOCATIONS OF EXISTING UTILITIES AND FACILITIES.

5) THE CONTRACTOR MUST INFORM THE CITY AT LEAST 48–HOURS IN ADVANCE OF CONSTRUCTION, IN WRITING, IF ANY CONFLICT IS DISCOVERED DURING POT HOLE OPERATIONS FOR RESOLUTION BY THE CITY.

6) IT WILL BE THE RESPONSIBILITY OF THE CONTRACTOR TO NOTIFY THE UTILITIES DEPARTMENT OF THE CITY OF FORT LAUDERDALE AT LEAST TWO (2) BUSINESS DAYS IN ADVANCE TO COORDINATE ANY ACTIVITY OF CONSTRUCTION TO BE PERFORMED BY THE CITY'S UTILITIES DEPARTMENT.

AREA TO BE RESTORED

NOTE: ALL PAVEMENT MARKINGS AND SIGNING DAMAGED DURING CONSTRUCTION, SHALL BE RESTORED.

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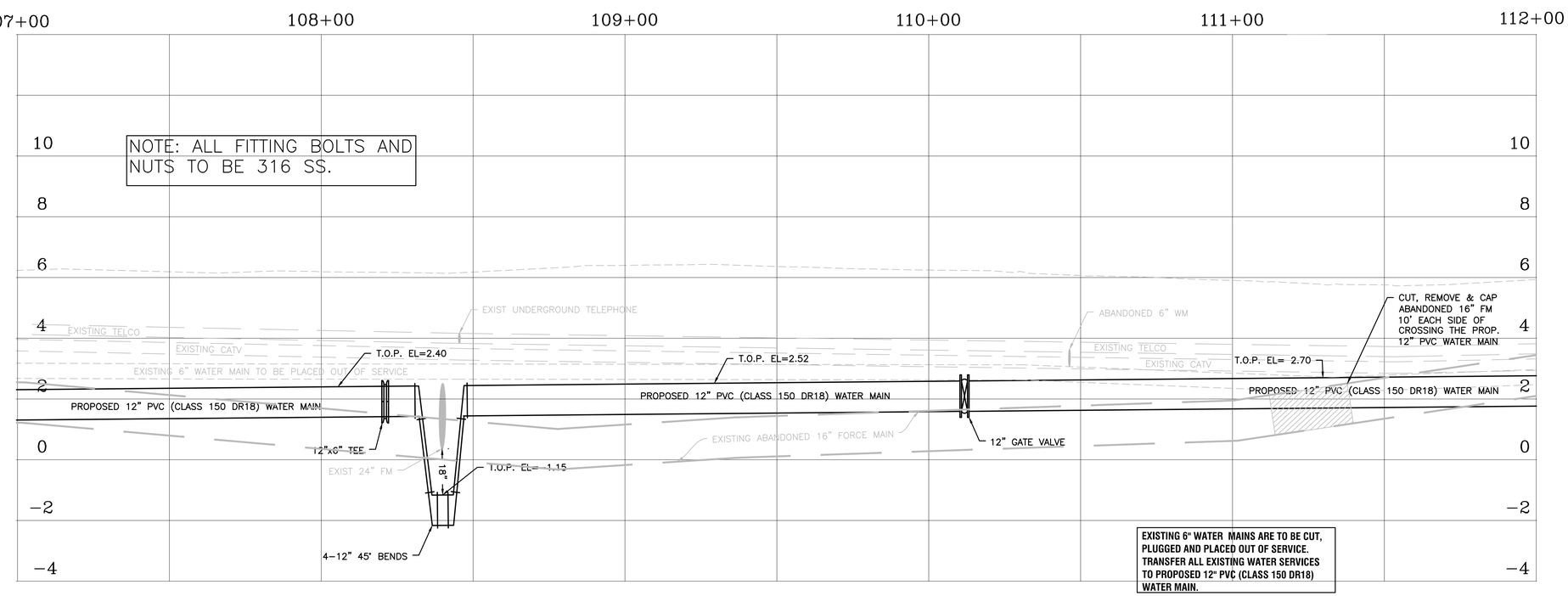


STATE OF FLORIDA PROFESSIONAL ENGINEER ROBERT A. MCCAHON No 17931

DATE:	DRAWN BY:	DESIGNED BY:	CHECKED BY:	FIELD BOOK:
09/2015	ARC/JVG	BZ	BZ	

SCALE: 1" = 20' 1" = 2'

CITY OF FORT LAUDERDALE
PUBLIC WORKS DEPARTMENT
ENGINEERING & ARCHITECTURE
100 North Andrews Avenue, Fort Lauderdale, Florida 33301

REVISIONS

NO.	DATE	BY	CHK'D	DESCRIPTION
1	03/03/17	JVG	BZ	PIPE PROFILE/ALIGNMENT REV
2	03/27/17	JVG	BZ	REV. PER CITY COMMENTS
3	04/28/17	JVG	BZ	REV. 90° BENDS TO 45°

PROJECT # 11080
PORT CONDO
LARGE WATER MAIN IMPROVEMENTS
PLAN SHEET
BID SET

SHEET NO. 04 OF 10

TOTAL: 10

CAD FILE: 11080–004–PLAN

DRAWING FILE NO. WS–06–14

CROSSINGS

(14) FORCE MAIN OVER WATER
GROUND EL. = 6.29
COVER = 8.2'
24" CIP FM B.O.P. EL.=-0.39
6" PVC WM T.O.P. EL.=-1.89
CLEARANCE = 18.0"

(15) ELECTRIC DUCT OVER WATER
GROUND EL. = 6.36
COVER = 8.3'
36" ELECTRIC* B.O.P. EL.=0.88
6" PVC WM T.O.P. EL.=-1.89
CLEARANCE = 33.2"

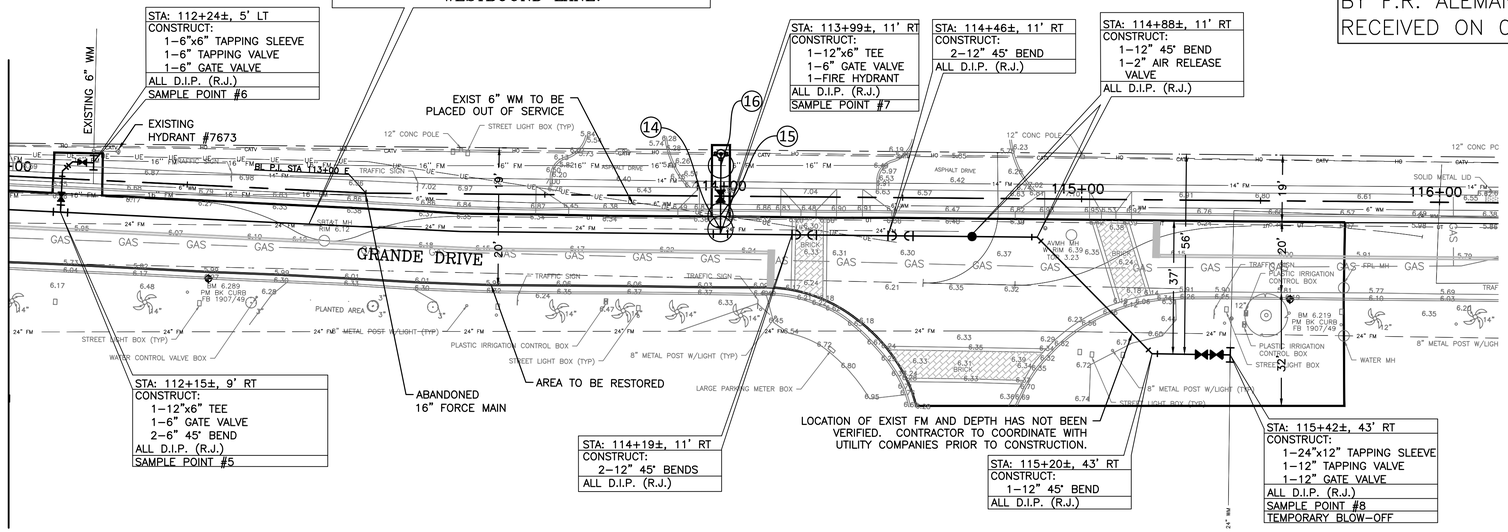
(16) FORCE MAIN OVER WATER
GROUND EL. = 6.33
COVER = 8.2'
16" CIP FM B.O.P. EL.=1.65
6" PVC WM T.O.P. EL.=-1.89
CLEARANCE = 42.5"

*NOTE: ELECTRICAL DUCT SIZES ARE APPROXIMATE. CONTRACTOR TO COORDINATE WITH UTILITY COMPANY AND FIELD VERIFY PRIOR TO CONSTRUCTION. SEE NOTE #4 THIS SHEET.

CONSTRUCT: NEW 12" PVC (CLASS 150 DR18) WATER MAIN WITH MINIMUM 36" COVER IN THE CENTER OF THE WESTBOUND LANE.

REVISED ALIGNMENT OF EXISTING AND ABANDONED FORCE MAINS AND FPL DUCT BANKS PER UPDATED TEST HOLES BY F.R. ALEMAN & ASSOCIATES, INC. RECEIVED ON 01/18/17.

MATCH LINE STA: 112+00 SEE SHEET 04



GRAPHIC SCALE
20 0 10 20
1 = 20

GENERAL NOTE:

1) ALL WORK WITHIN BROWARD COUNTY RIGHT-OF-WAYS MUST BE IN CONFORMITY WITH THE BROWARD COUNTY MINIMUM STANDARDS AND/OR REQUIREMENTS.

2) ALL WORK WITHIN STATE DEPARTMENT OF TRANSPORTATION (FDOT) RIGHT-OF-WAYS MUST BE IN CONFORMITY WITH FDOT SPECIFICATIONS AND/OR REQUIREMENTS.

3) THE CONTRACTOR MUST POT HOLE AND VERIFY THE LOCATION AND ELEVATION OF EXISTING WATER MAINS BEFORE MAKING A TIE-IN TO NEW WATER MAINS.

4) THE CONTRACTOR MUST USE EXTREME CARE TO AVOID DAMAGE OR DISRUPTION TO ANY EXISTING UTILITIES, WHETHER SHOWN ON THE PLANS OR NOT. ALL PLAN LOCATIONS ARE APPROXIMATE AND SHALL BE FIELD VERIFIED. CONTRACTOR IS TO CONTACT SUNSHINE ONE CALL OF FLORIDA AT 1-800-432-4770 AND ALL OTHER PARTICIPATING UTILITIES 48-HOURS PRIOR TO CONSTRUCTION FOR FIELD MARK-UP LOCATIONS OF EXISTING UTILITIES AND FACILITIES.

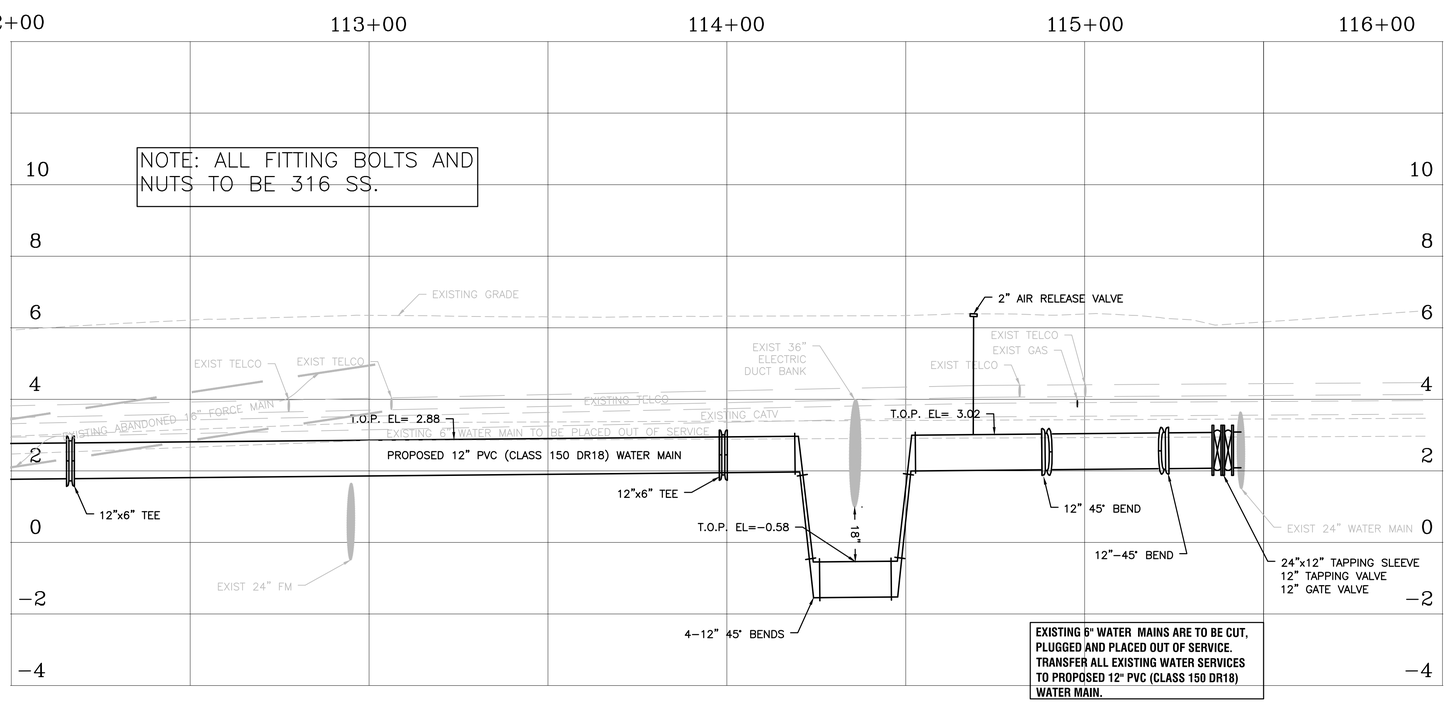
5) THE CONTRACTOR MUST INFORM THE CITY AT LEAST 48-HOURS IN ADVANCE OF CONSTRUCTION, IN WRITING, IF ANY CONFLICT IS DISCOVERED DURING POT HOLE OPERATIONS FOR RESOLUTION BY THE CITY.

6) IT WILL BE THE RESPONSIBILITY OF THE CONTRACTOR TO NOTIFY THE UTILITIES DEPARTMENT OF THE CITY OF FORT LAUDERDALE AT LEAST TWO (2) BUSINESS DAYS IN ADVANCE TO COORDINATE ANY ACTIVITY OF CONSTRUCTION TO BE PERFORMED BY THE CITY'S UTILITIES DEPARTMENT.

AREA TO BE RESTORED

NOTE: ALL PAVEMENT MARKINGS AND SIGNING DAMAGED DURING CONSTRUCTION, SHALL BE RESTORED.

NOTE: ALL FITTING BOLTS AND NUTS TO BE 316 SS.



EXISTING 6" WATER MAINS ARE TO BE CUT, PLUGGED AND PLACED OUT OF SERVICE. TRANSFER ALL EXISTING WATER SERVICES TO PROPOSED 12" PVC (CLASS 150 DR18) WATER MAIN.

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www.callsunshine.com

ROBERT A. ELICAGO
LICENSE No 17931
STATE OF FLORIDA
PROFESSIONAL ENGINEER

DRAWN BY:	DATE:
ARC/JVG	09/2015
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CITY OF FORT LAUDERDALE
PUBLIC WORKS DEPARTMENT
ENGINEERING & ARCHITECTURE
100 North Andrews Avenue, Fort Lauderdale, Florida 33301

REVISIONS

NO.	DATE	BY	CHK'D	DESCRIPTION
1	03/03/17	JVG	BZ	PIPE PROFILE/ALIGNMENT REV
2	03/27/17	JVG	BZ	REV. PER CITY COMMENTS
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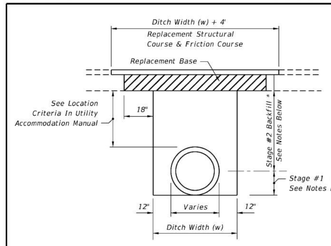
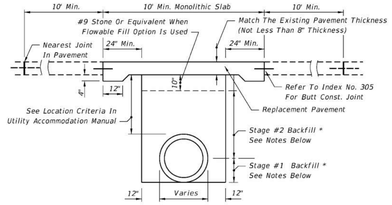
PROJECT # 11080
PORT CONDO
LARGE WATER MAIN IMPROVEMENTS
PLAN SHEET
BID SET

SHEET NO. 05 OF 10
TOTAL: 10
CAD FILE: 11080-005-PLAN
DRAWING FILE NO. WS-06-14





FLEXIBLE PAVEMENT NOTES

PAVEMENT REMOVAL AND REPLACEMENT

Pavement shall be mechanically sawed.

The replacement asphalt shall match the existing structural and friction courses for type and thickness in accordance with current FDOT asphalt mix specifications.

The new base materials shall be either of the same type and composition as the materials removed or of equal or greater structural adequacy (See Index No. 514).

BACKFILL

COMPACTED AND STABILIZED FILL OPTION

Backfill material shall be placed in accordance with Section 125 of the Standard Specifications.

In Stage #1, construct compacted fill beneath the haunches of the pipe, using mechanical tamps suitable for this purpose. This compaction applies to the material placed beneath the haunches of the pipe and above any bedding.

In Stage #2, construct compacted fill along the sides of the pipe and up to the bottom of the base,with the upper 12" receiving Type B Stabilization. In lieu of Type B Stabilization, the Contractor may construct using Optional Base Group 3.

* FLOWABLE FILL OPTION

If compaction can not be achieved through normal mechanical methods then flowable fill may be used.

Flowable fill is to be placed in accordance with Section 121 of the Specifications, as approved by the Engineer.

Do not allow the utility being installed to float. If a method is provided to prevent flotation from occurring, Stages #1 and #2 can be combined, if approved by the Engineer.

In Stage #1, place flowable fill midway up on both sides of the utility. Allow to harden before placing Stage #2.

In Stage #2, place flowable fill to the bottom of the existing base course.

FLEXIBLE PAVEMENT CUT

RIGID PAVEMENT NOTES

PAVEMENT REMOVAL AND REPLACEMENT

High early strength cement concrete (3000 psi) meeting the requirements of Standard Specification 346 shall be used for rigid pavement replacement.

Pavement shall be mechanically sawed and restored to conform with existing pavement joints within 12 hours. (See Index No. 305)

GRANULAR BACKFILL

Any edgedrain system that is removed shall be replaced with the same type materials. Any edgedrain system that is damaged shall be repaired with methods approved by the Engineer.

Fill material shall be placed in accordance with the Standard Specifications. Fill material shall be special select soil in accordance with Index No. 505.

In Stage #1, construct compacted fill beneath the haunches of the pipe, using mechanical tamps suitable for this purpose. This compaction applies to the material placed beneath the haunches of the pipe and above any bedding.

In Stage #2, construct fill along the sides of the pipe and up to the bottom of replacement pavement.

* FLOWABLE FILL OPTION

If mechanical compaction can not be achieved through normal mechanical methods then flowable fill may be used.

Flowable fill is to be placed in accordance with Section 121 of the Specifications, as approved by the Engineer.

Do not allow the utility being installed to float. If a method is provided to prevent flotation from occurring, Stages #1 and #2 can be combined, if approved by the Engineer.

In Stage #1, place flowable fill midway up on both sides of the utility. Allow to harden before placing Stage #2.

In Stage #2, place flowable fill to the bottom of the stone layer.

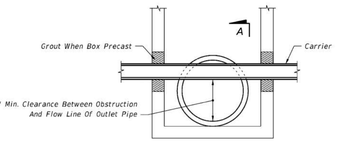
RIGID PAVEMENT CUT

GENERAL NOTES

1. *The details provided in this standard index apply to cases in which jack and bore or directional boring methods are not required by the Engineer.*
2. *Flowable fill shall not be placed directly over loose, or high plastic, or muck material (see Index 505) which will cause settlement due to fill weight. Where highly compressible material exists, the amount, shape and depth of flowable fill must be engineered to prevent pavement settlement.*
3. *These details do not apply to utility cuts longitudinal to the centerline of the roadway which may require the additional use of geotextiles, special bedding and backfill, or other special requirements.*
4. *Method of construction must be approved by the Engineer.*
5. *Some pipe may require special granular backfill up to 6" above top of pipe. Geotextiles may be required to encapsulate the special granular material.*
6. *Where asphalt concrete overlays exist over full slab concrete pavement, the replacement pavement shall have an overlay constructed over the replacement slab. The overlay shall match the existing asphalt pavement thickness. The replacement friction course shall match the existing friction course, except structural course may be used in lieu of dense graded friction course.*
7. *All shoulder pavement, curb, curb and gutter, and their substructure disturbed by utility trench cut construction shall be restored in kind.*
8. *The use of flowable fill to reduce the time traffic is taken off a facility is acceptable but must have prior approval by the Engineer. Flowable fill use is allowed only when properly engineered for pavement crossings, whether straight or diagonal, and shall not be installed for significant depths or lengths. The maximum length shall be fifty (50) feet and a maximum depth of six (6) feet unless supported by an engineering document prepared by a registered professional engineer that specializes in soils engineering. The engineering document shall address the evaluation of local groundwater flow interruption and settlement potential.*
9. *Excavatable flowable fill is to be used when the flowable fill option is selected.*

TRENCH CUTS AND RESTORATIONS ACROSS ROADWAYS

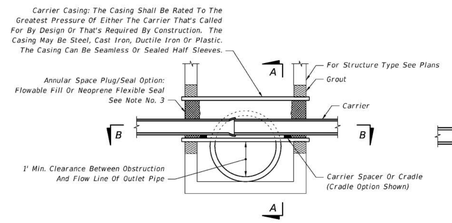
LAST REVISION	REVISION	DESCRIPTION:			INDEX NO.	SHEET NO.
07/01/12			2015 DESIGN STANDARDS	MISCELLANEOUS UTILITY DETAILS	307	1 of 3



SECTION LONGITUDINAL TO CARRIER PIPE (Nonpressure Or Nonfluid Carrier Installations)

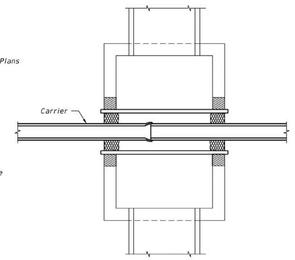
No Joints Allowed Within Structure

UTILITY CONFLICT CONDITION I

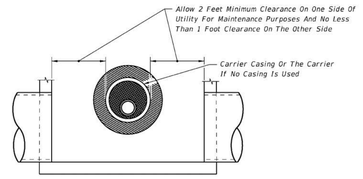


SECTION LONGITUDINAL TO CARRIER PIPE (Pressure Or Fluid Carrier Installations)

UTILITY CONFLICT CONDITION II



SECTION BB



DESIGNER'S NOTE

"Sumped" Conflict Manholes Shall Not Be Used Unless The System Is Hydraulically Designed To Account For The Headloss Generated If The Sump Is Completely Blocked

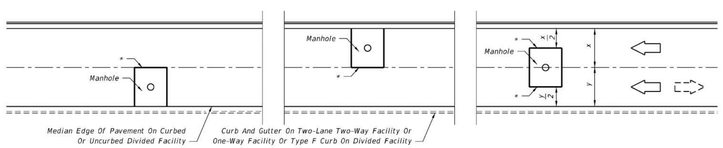
SECTION AA

NOTES FOR UTILITY CONFLICT PIPE

1. *These details are for construction field expediency to resolve utility conflicts that cannot be remedied by relocation. For conflicts determined during design, use the construction shop drawings for structure details.*
2. *Concrete used in conflict structures shall be as specified in ASTM C478. 4000 psi may be used in lieu of Class I concrete.*
3. *Maximum opening for pipe shall be the pipe OD plus 6". Mortar used to seal the pipe into the opening will be of such mix that shrinkage will not cause leakage into or out of the structure.*
4. *If the conflict structure is round or there are multiple inlet or outlet pipes, then the wall section should be reviewed for strength.*
5. *If during construction or the plans design process it is determined that a potable water supply line must pass though a storm drain structure, it must be in compliance with Chapter 62-555.314 (3) F.A.C. and shown on the design or construction plans and submitted to the Florida Department of Environmental Protection (FDEP) Administrator For Drinking Water in the respective FDEP District for review and comment. This Index and rule citation provide accepted methods for addressing conflicts when and where they cannot be reasonably avoided. To be submitted along with the plans shall be a justification describing inordinate cost and the impracticality of avoidance. If identified, properly justified, and accomplished in accordance with this index, approval is granted. Upon request, the Utility Agency Owner (UAO) must provide support data on the cost of relocation or adjustment to the FDOT for submittal to the FDEP. See the following web site for District FDEP Drinking Water Contacts: www.dep.state.fl.us/water/drinkingwater/index.htm and click on "Organization" on the menu to the right.*

UTILITY CONFLICT PIPES THRU STORM DRAIN STRUCTURES

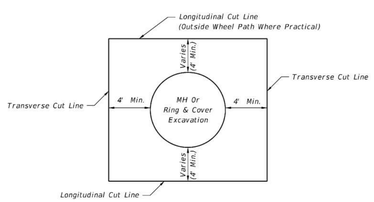
LAST REVISION	REVISION	DESCRIPTION:			INDEX NO.	SHEET NO.
07/01/09			2015 DESIGN STANDARDS	MISCELLANEOUS UTILITY DETAILS	307	2 of 3



* Longitudinal Cut Lines For Both Curbed And Uncurbed Facilities Must Coincide With A Regular Seam Or Midlane Point In Order To Be Outside The Wheel Path

PLAN VIEW

FOR TWO OR MORE LANES (TWO LANES SHOWN)



PARTIAL CUTS FOR RING AND COVER ADJUSTMENTS

NOTES

1. *No irregular seams are permitted. All seams must be clean sawed.*
2. *Pavement cut seams for underground utility structures in rigid pavement are the same longitudinally, but the transverse seams shall extend to the nearest existing joint.*
3. *See Sheet 1 for replacement pavement.*

NONTRENCH PAVEMENT CUTS FOR UNDERGROUND UTILITY STRUCTURES IN PAVEMENT

LAST REVISION	REVISION	DESCRIPTION:			INDEX NO.	SHEET NO.
07/01/04			2015 DESIGN STANDARDS	MISCELLANEOUS UTILITY DETAILS	307	3 of 3

ROBERT ALCARO JR. LICENSE No 77931 STATE OF FLORIDA PROFESSIONAL ENGINEER

DRAWN BY:	DATE:
ARC	09/2015
DESIGNED BY:	SCALE:
BZ	AS NOTED
CHECKED BY:	
BZ	
FIELD BOOK:	

CITY OF FORT LAUDERDALE
PUBLIC WORKS DEPARTMENT
ENGINEERING & ARCHITECTURE
100 North Andrews Avenue, Fort Lauderdale, Florida 33301

REVISIONS

NO.	DATE	BY	CHK'D	DESCRIPTION
1	12/07	R.C.	S.E.	DETL 100BC MODIFIED

PROJECT # 11080
PORT CONDO
LARGE WATER MAIN IMPROVEMENTS
STANDARD DETAILS
BID SET

KEITH & SCHNARS PROJECT NO. 18068.10

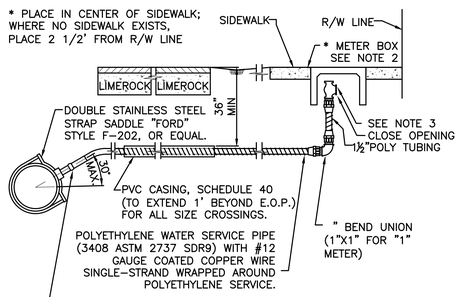
KEITH and SCHNARS, P.A.
ENGINEERS, PLANNERS, SURVEYORS
FLORIDA'S BIG LOCAL FIRM
CERTIFICATE OF AUTHORIZATION NO. 1337
6500 NORTH ANDREWS AVENUE, FORT LAUDERDALE, FL 33309-2123 (954)776-1616

SHEET NO.	OF
06	10

TOTAL: 10

CAD FILE: 11080-006-DETL

DRAWING FILE NO. WS-06-14

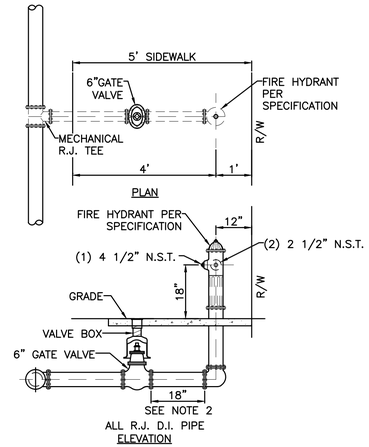


NOTE:

1. GROUND KEY ANGLE METER STOP,CONDUCTIVE COMPRESSION FOR CTS O.D. TUBING, X METER FLANGE 180° TURN CHECK-LOCK WING "MUELLER" H-14277, FOR 2-INCH INCLUDING THE STAINLESS STEEL LINER, "MUELLER" 506141 (FOR 2-INCH) OR APPROVED EQUAL, AND MUELLER 110 COMPRESSION CONNECTION.
2. METER BOXES FOR 5/8, 3/4, AND 1 INCH METERS SHALL BE THE OKIE DOKIE #890-40-260282 MEDIUM BOX AND 890-40-260257 MEDIUM LID OR EQUAL.
3. CONNECT ANGLE VALVE TO EXISTING METER WHERE APPLICABLE.

300 TYPICAL WATER SERVICE INSTALLATION

Scale: 1" = 2'

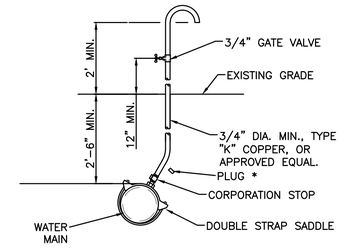


NOTES:

1. ACTUAL LOCATION OF FIRE HYDRANT TO BE DECIDED IN THE FIELD WITH ENGINEER'S APPROVAL.
2. KEEP VALVE AS CLOSE AS POSSIBLE TO THE HYDRANT.

302 TYPICAL NEW FIRE HYDRANT ASSEMBLY INSTALLATION

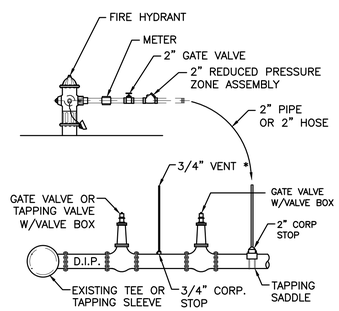
Scale: 1" = 2'



* NOTE: AFTER TESTS REMOVE 3/4" TUBING AND INSTALL PLUG ON CORPORATION STOP.

304 TYPICAL BACTERIOLOGICAL SAMPLING POINT AT INTERMEDIATE POINTS

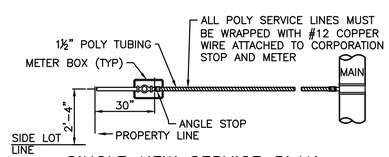
Scale: 1" = 2'



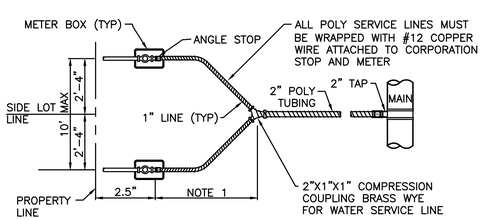
* NOTE: AFTER TESTS REMOVE 3/4" TUBING AND 2" GALVANIZED PIPE AND INSTALL PLUGS ON CORPORATION STOPS.

305 FILLING CONNECTION

Scale: N.T.S.



SINGLE NEW SERVICE PLAN



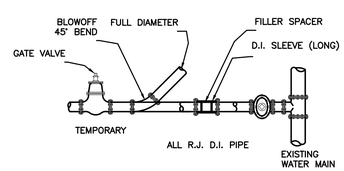
NOTE:

1. KEEP 1½" WYE AS CLOSE AS POSSIBLE TO METER BOX.

DOUBLE NEW SERVICE PLAN

301 TYPICAL WATER SERVICE

Scale: 1" = 2'

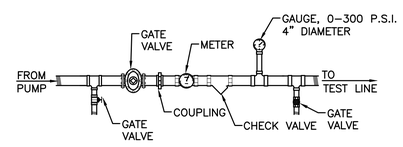


NOTES:

1. UPON COMPLETION OF THE PIPE INSTALLATION FOR ANY SECTION, THE MAINS SHALL BE SWABBED AND FLUSHED TO REMOVE DIRT AND ANY OTHER FOREIGN MATTER BY ACHIEVING A MINIMUM VELOCITY OF 2.5 FEET PER SECOND IN THE PIPE. TEMPORARY FITTINGS, PIPE, ETC. MAY BE NEEDED TO FACILITATE FLUSHING.
2. INSTALL A 45° BEND AND ASSOCIATED PIPING AS SHOWN TO DIRECT THE FLUSHING WATER AWAY FROM THE IMMEDIATE WORK AREA AND EXERCISE DUE CARE SO AS TO ENSURE THAT THE WATER USED IN FLUSHING DOES NOT CAUSE A NUISANCE OR INFLICT PROPERTY DAMAGE.
3. BENDS AND PIPING SHALL BE THE SAME SIZE AS THE LINE TO BE FLUSHED.
4. PRIOR TO THE ACTUAL LINE FLUSHING OPERATION, THE CONTRACTOR SHALL PROPERLY NOTIFY THE CITY INSPECTOR OF SUCH INTENDED WATER USE.
5. NO EXISTING VALVES SHALL BE TURNED ON OR OFF, EXCEPT BY AUTHORIZED CITY PERSONNEL.
6. FLUSHING SHALL NOT BE ACCOMPLISHED WITHOUT THE ACTUAL PRESENCE OF THE CITY INSPECTOR.
7. AFTER THE LINE UNDER CONSTRUCTION HAS BEEN SUCCESSFULLY FLUSHED THE CONTRACTOR SHALL REMOVE THE TEMPORARY PIPING ARRANGEMENT AND PROCEED WITH THE REMAINING CONSTRUCTION AS SPECIFIED.
8. THERE MAY BE SPECIAL REQUIREMENTS FOR FLUSHING PIPE LARGER THAN 12" DIAMETER.

303 FLUSHING CONNECTION AND BLOW OFF DETAIL

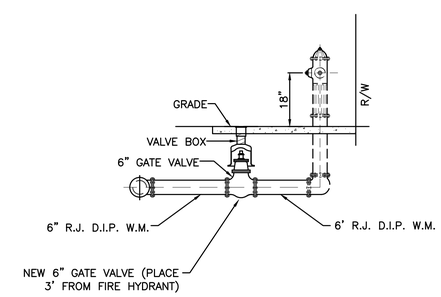
Scale: 1" = 2'



NOTE:
PRESSURE TEST TO INCLUDE SERVICES TO ANGLE STOP.

306 PRESSURE TEST DETAIL

Scale: N.T.S.



NOTES:

1. RECONNECT EXISTING FIRE HYDRANT TO NEW WATER MAIN.
2. KEEP VALVE AS CLOSE AS POSSIBLE TO THE HYDRANT.
3. WHEN FIRE HYDRANT "TEE" IS ON P.V.C. PIPE RUN, CONSTRUCT 1 LENGTH OF D.I.P. (R.J.) PIPE ON EACH SIDE OF FIRE HYDRANT "TEE".

308 RELOCATE OR CONNECT EXISTING FIRE HYDRANT

Scale: 1" = 2'

KEITH & SCHNARS PROJECT NO. 18068.10

KEITH and SCHNARS, P.A.
ENGINEERS, PLANNERS, SURVEYORS
FLORIDA'S BIG LOCAL FIRM
CERTIFICATE OF AUTHORIZATION NO. 1337
6500 NORTH ANDREWS AVENUE, FORT LAUDERDALE, FL. 33309-2132 (954)776-1616

ROBERT ALCARO
LICENSE
No 17931
STATE OF FLORIDA
PROFESSIONAL ENGINEER

DRAWN BY: ARC	DATE: 09/2015
DESIGNED BY: BZ	SCALE: AS NOTED
CHECKED BY: BZ	
FIELD BOOK:	

CITY OF FORT LAUDERDALE
PUBLIC WORKS DEPARTMENT
ENGINEERING & ARCHITECTURE
100 North Andrews Avenue, Fort Lauderdale, Florida 33301

REVISIONS

NO.	DATE	BY	CHK'D	DESCRIPTION

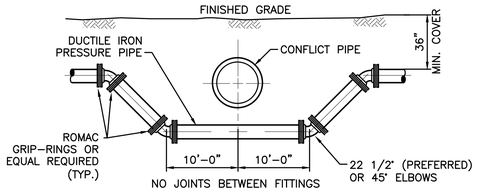
PROJECT # 11080
PORT CONDO
LARGE WATER MAIN IMPROVEMENTS
STANDARD DETAILS
BID SET

SHEET NO.	OF
07	10

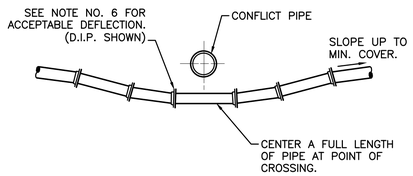
TOTAL: 10

CAD FILE: 11080-007-DETL

DRAWING FILE NO. WS-06-14



FITTING TYPE



DEFLECTION TYPE

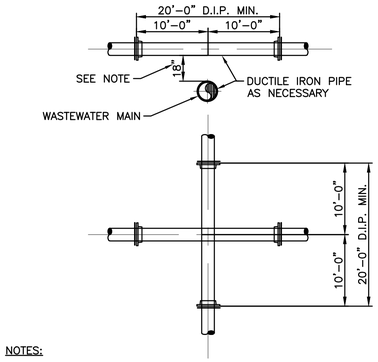
NOTES:

1. STORM SEWER, GRAVITY WASTEWATER AND RECLAIMED WATER MAIN CROSSING UNDER POTABLE WATER MAINS SHALL BE LAID TO PROVIDE A MINIMUM VERTICAL DISTANCE OF EIGHTEEN (18) INCHES BETWEEN THE INVERT OF THE UPPER PIPE AND THE CROWN OF THE LOWER PIPE. WHERE THIS MINIMUM SEPARATION CANNOT BE MAINTAINED, THE CROSSING SHALL BE ARRANGED SO THAT THE STORM/WASTEWATER/RECLAIMED WATER PIPE JOINTS AND POTABLE WATER MAIN JOINTS ARE EQUIDISTANT FROM THE POINT OF CROSSING WITH NO LESS THAN TEN (10) FEET BETWEEN ANY TWO JOINTS, BOTH PIPES SHALL BE D.I.P., AND THE MINIMUM VERTICAL SEPARATION SHALL BE 6 INCHES. WHERE THERE IS NO ALTERNATIVE TO STORM/WASTEWATER/RECLAIMED WATER PIPES CROSSING OVER A POTABLE WATER MAIN, THE CRITERIA FOR MINIMUM 18" VERTICAL SEPARATION BETWEEN LINES AND JOINT ARRANGEMENT, AS STATED ABOVE, SHALL BE REQUIRED, AND BOTH PIPES SHALL BE D.I.P. IRRESPECTIVE OF SEPARATION. D.I.P. IS NOT REQUIRED FOR STORM SEWERS.
2. MAINTAIN MIN. TEN (10) FEET HORIZONTAL DISTANCE BETWEEN POTABLE WATER MAIN AND STORM SEWER, WASTEWATER MAIN, OR FORCE MAIN. MAINTAIN MIN. THREE (3) FEET HORIZONTAL DISTANCE (WALL TO WALL) BETWEEN RECLAIMED WATER MAIN AND POTABLE WATER MAIN, STORM SEWER, WASTEWATER GRAVITY MAIN OR FORCE MAIN.
3. FORCE MAIN CROSSING POTABLE WATER MAIN OR RECLAIMED WATER MAIN SHALL BE LAID TO PROVIDE A MINIMUM VERTICAL DISTANCE OF EIGHTEEN (18) INCHES BETWEEN THE OUTSIDE OF THE FORCE MAIN AND OUTSIDE OF THE POTABLE WATER MAIN OR RECLAIMED WATER MAIN WITH THE POTABLE WATER MAIN OR RECLAIMED WATER MAIN CROSSING OVER THE FORCE MAIN.
4. FITTINGS SHALL BE RESTRAINED.
5. THE DEFLECTION TYPE CROSSING IS PREFERRED.
6. DO NOT EXCEED 75% OF MANUFACTURER'S RECOMMENDED MAXIMUM JOINT DEFLECTION FOR DUCTILE IRON PIPE. NO DEFLECTION AT THE JOINT IS ALLOWED FOR P.V.C. PIPE. BENDING OF P.V.C. PIPE SHALL NOT EXCEED THE FOLLOWING PARAMETERS:

PVC PIPE SIZE (INCH)	MIN. ALLOWED RADIUS (FT.)	MAX. DEFLECTION (INCH) PER 20' LENGTH
6"	300	8"
8"	400	6"
10"	600	4"
12"	600	4"

401 PRESSURE PIPE CONFLICT NOTES

Scale: N/A



NOTES:

1. STORM SEWER, GRAVITY WASTEWATER AND RECLAIMED WATER MAIN CROSSING UNDER POTABLE WATER MAINS SHALL BE LAID TO PROVIDE A MINIMUM VERTICAL DISTANCE OF EIGHTEEN (18) INCHES BETWEEN THE INVERT OF THE UPPER PIPE AND THE CROWN OF THE LOWER PIPE. WHERE THIS MINIMUM SEPARATION CANNOT BE MAINTAINED, THE CROSSING SHALL BE ARRANGED SO THAT THE STORM/WASTEWATER/RECLAIMED WATER PIPE JOINTS AND POTABLE WATER MAIN JOINTS ARE EQUIDISTANT FROM THE POINT OF CROSSING WITH NO LESS THAN TEN (10) FEET BETWEEN ANY TWO JOINTS, BOTH PIPES SHALL BE D.I.P., AND THE MINIMUM VERTICAL SEPARATION SHALL BE 6 INCHES. WHERE THERE IS NO ALTERNATIVE TO STORM/WASTEWATER/RECLAIMED WATER PIPES CROSSING OVER A POTABLE WATER MAIN, THE CRITERIA FOR MINIMUM 18" VERTICAL SEPARATION BETWEEN LINES AND JOINT ARRANGEMENT, AS STATED ABOVE, SHALL BE REQUIRED, AND BOTH PIPES SHALL BE D.I.P. IRRESPECTIVE OF SEPARATION. D.I.P. IS NOT REQUIRED FOR STORM SEWERS.
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402 STANDARD WATER AND SEWER SEPARATION DETAIL

Scale: 1" = 10'

I. FORCE MAIN AND WATER MAIN OUTSIDE OF WELLFIELD PROTECTION ZONE

MAXIMUM QUANTITY OF WATER (GALLONS PER HOUR) THAT MAY BE SUPPLIED TO MAINTAIN PRESSURE WITHIN 5 P.S.I. OF THE SPECIFIED TEST PRESSURE.

(MECHANICAL OR PUSH-ON JOINT, 18 FT. NOMINAL LENGTHS, PER 1000 FT. OF PIPE)

AVG. TEST PRESSURE	PIPE DIAMETER (INCHES)												
PSI	2	3	4	6	8	10	12	14	16	18	20	24	30
150	0.10	0.14	0.18	0.27	0.37	0.46	0.55	0.64	0.73	0.83	0.92	1.10	1.38

NOTES:

1. TO OBTAIN THE MAXIMUM QUANTITY OF WATER FOR PIPE WITH 20 FT. NOMINAL LENGTHS, MULTIPLY THE QUANTITY CALCULATED FROM THE TABLE BY 0.9.<<
2. THE MAXIMUM QUANTITY OF ADDED WATER FOR A PIPELINE IS CALCULATED BY MULTIPLYING THE QUANTITY PER HOUR AS OBTAINED FROM THE ABOVE TABLE, BY THE DURATION OF THE TEST IN HOURS, AND BY THE TOTAL LENGTH OF THE LINE BEING TESTED DIVIDED BY 1,000. IF THE LINE UNDER TEST CONTAINS SECTIONS OF VARIOUS DIAMETERS, THE MAXIMUM QUANTITY ADDED WILL BE THE SUM OF THE COMPUTED QUANTITIES FOR EACH SIZE.<<
3. MAXIMUM TEST LENGTH = 2,500 FEET PER SECTION.<<
4. THIS STANDARD SHALL REFLECT ANY REVISION OF A.W.W.A. C-600-05. HOWEVER, THE MAXIMUM QUANTITY OF WATER ADDED SHALL NOT EXCEED 50% OF RECOMMENDED LIMIT PER APPLICABLE AWWA C-600-05 STANDARD.<<
5. STANDARD TEST PRESSURE = 150 P.S.I.
6. FORMULA BASIS: $L = \frac{(S)x(D)x(P)^{1/2}}{148{,}000}$

   L = MAXIMUM QUANTITY OF WATER TO BE ADDED (GALLONS PER HOUR)
   S = LENGTH OF PIPE TESTED (FEET)
   D = DIAMETER OF PIPE (INCHES)
   P = TEST PRESSURE (P.S.I.)

7. PRESSURE TEST DURATION TO BE MIN. 2 HOURS.
8. DISINFECTION OF MAINS SHALL COMPLY WITH A.N.S.I./A.W.W.A. C-651-05 STANDARD.
9. DUCTILE IRON WATER MAIN PIPE SHALL CONFORM TO THE REQUIREMENTS OF A.N.S.I./A.W.W.A. C-151-'02.

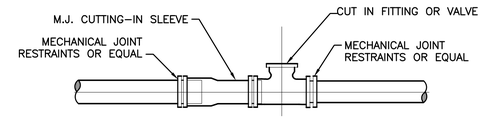
II. FORCE MAIN AND WATER MAIN WITHIN WELLFIELD PROTECTION ZONE.

NOTES:

1. PRESSURE TEST PROCEDURE TO FOLLOW THE CURRENT AWWA C-600-05 STANDARD (150psi, (2) HOUR DURATION). THERE SHALL BE NO PRESSURE DROP IN THE PIPE DURING THE TEST ("ZERO" FILL-UP TOLERANCE).

403 PRESSURE TEST CRITERIA

Scale: N/A

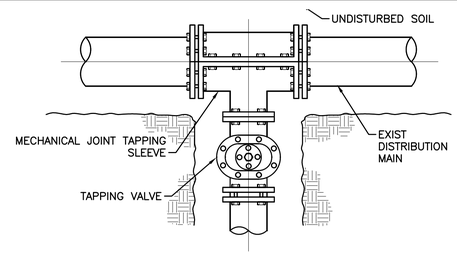


DUCTILE IRON-MECHANICAL JOINT

1. MECHANICAL JOINTS RESTRAINTS ARE REQUIRED THROUGHOUT ASSEMBLY.

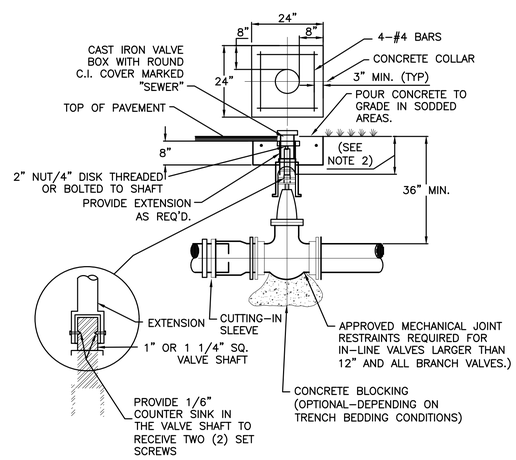
404 PRESSURE PIPE STANDARD CUT-IN DETAIL

Scale: 1" = 10'



405 PLAN TAPPING TEE ASSEMBLY DETAIL

Scale: 1" = 10'



NOTES:

1. CONCRETE COLLAR IS NOT REQUIRED IN PAVED AREAS IF PAVEMENT SURFACE IS FINISHED PRIOR TO CONDITIONAL FINAL INSPECTION.
2. WHEN VALVE NUT IS DEEPER THAN 36" AN EXTENSION WITH UNIVERSAL JOINT SHALL BE REQUIRED TO BRING OPERATING NUT 24"-30" BELOW FINISHED GRADE. EXTENSION BOLTS & NUTS SHALL BE 316 STAINLESS STEEL. A 316 STAINLESS STEEL CENTERING PLATE SHALL ALSO BE REQUIRED.
   VALVE BOXES SHALL HAVE LOCKING COVERS MARKED "SEWER" OR "WATER".
3. EXTENSION RISER TO BE D.I.P.
4. AT DEAD END OR WHERE MAIN LINES CHANGE DIRECTION, VALVES SHALL BE RESTRAINED USING MECHANICAL JOINT RESTRAINT.

406 TYPICAL VALVE DETAIL

Scale: 1" = 2'

KEITH & SCHNARS PROJECT NO. 18068.10

KEITH and SCHNARS, P.A.
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6500 NORTH ANDREWS AVENUE, FORT LAUDERDALE, FL 33309-2132 (954)776-1616
CERTIFICATE OF AUTHORIZATION NO. 1337

REGISTERED PROFESSIONAL ENGINEER
ROBERT ZUCCARO
LICENSE No 17931
STATE OF FLORIDA

DRAWN BY: ARC	DATE: 09/2015
DESIGNED BY: BZ	SCALE: AS NOTED
CHECKED BY: BZ	FIELD BOOK:

CITY OF FORT LAUDERDALE
PUBLIC WORKS DEPARTMENT
ENGINEERING & ARCHITECTURE
100 North Andrews Avenue, Fort Lauderdale, Florida 33301

REVISIONS

NO.	DATE	BY	CHK'D	DESCRIPTION

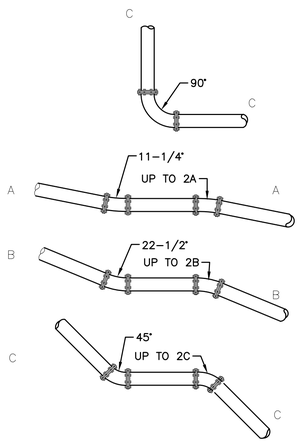
PROJECT # 11080
PORT CONDO
LARGE WATER MAIN IMPROVEMENTS
STANDARD DETAILS
BID SET

SHEET NO. 08 OF 10

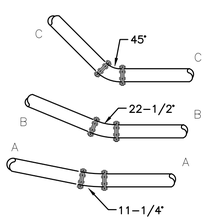
TOTAL: 10

CAD FILE: 11080-008-DETL

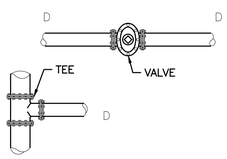
DRAWING FILE NO. WS-06-14



OFFSETS



DEFLECTIONS



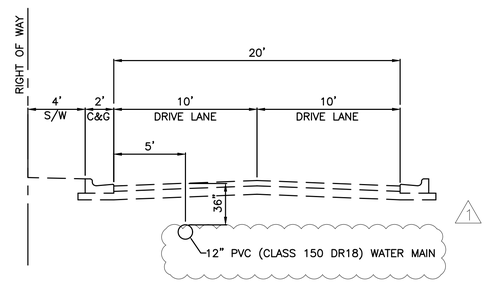
DEAD ENDS

	DISTANCE IN FEET		
SIZE	A & B	C	D
4"	18	18	54
6"	18	18	72
8"	18	36	90
10"	18	36	108
12"	18	36	126
14"	18	54	144
16"	18	54	162
18"	18	54	180
20"	18	72	198
24"	18	72	216

NOTE:
1. FOR PIPE SIZE OVER 24" SEE SPECIFICATIONS
2. RESTRAIN AS SHOWN ON DRAWINGS.

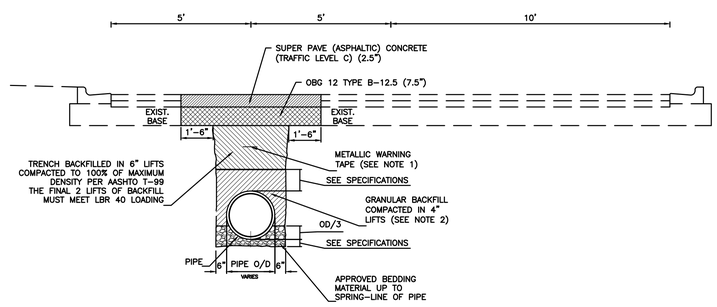
409 MINIMUM RESTRAINED JOINT LENGTH FOR PRESSURE MAINS

Scale: 1" = 10'



12" WATER MAIN LOCATION DETAIL

1"=5'



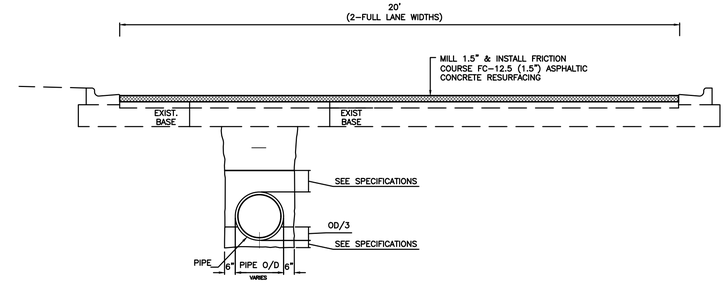
RIGHT OF WAY
TRENCH REPAIR, MILLING, AND OVERLAY

NOTES:

1. 2" WIDE METALLIC WARNING TAPES SHALL BE INSTALLED BETWEEN 6" AND 12" BELOW FINISH GRADE ABOVE MAIN.
2. UNLESS OTHERWISE SPECIFIED SELECTED MATERIAL SHALL BE FREE OF STONES LARGER THAN 3/8" DIA.
3. REPLACE ALL LANE MARKINGS, REFLECTIVE MARKERS AND DAMAGED TRAFFIC SIGNS.

100BC * F.D.O.T. & BROWARD COUNTY TYPICAL TRENCH AND PAVEMENT RESTORATION * (MODIFIED DETAIL)

SCALE: N.T.S.



FULL LANE WIDTH
MILLING AND OVERLAY

NOTES:

1. REPLACE ALL LANE MARKINGS, REFLECTIVE MARKERS AND DAMAGED TRAFFIC SIGNS.

MILLING AND RESURFACING DETAIL (2-FULL LANE WIDTHS)

SCALE: N.T.S.

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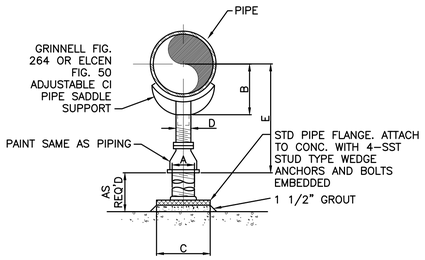
REVISIONS

NO.	DATE	BY	CHK'D	DESCRIPTION
1	03/27/17	JVG	BZ	REV. PER CITY COMMENTS

PROJECT # 11080
PORT CONDO
LARGE WATER MAIN IMPROVEMENTS
STANDARD DETAILS
FDOT PERMIT SET

FDOT PERMIT SET

SHEET NO. 09	OF 10
TOTAL:	10
CAD FILE: 11080-009-DETL	
DRAWING FILE NO. WS-06-14	



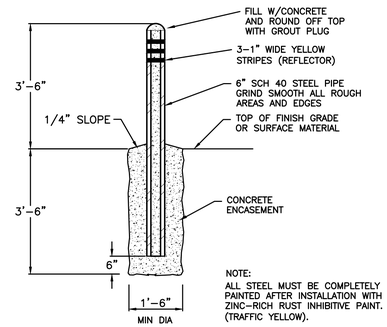
NOTES:

1. PROVIDE HALF ROUND RIGID INSULATION AND INSULATION PROTECTION SHIELD, SIMILAR TO GRINNELL FIGURE 167 OR ELCEN FIGURE 219, WHERE PIPING IS INSULATED.
2. PROVIDE NEOPRENE WAFFLE ISOLATION PAD, SIMILAR TO MASON TYPE 'W' OR KORFUND KORPAD 40, UNDER SUPPORT FOOT WHEN PIPING IS ISOLATED OR SUPPORT IS ADJACENT TO MECHANICAL EQUIPMENT.
3. FOR BASE, HEIGHT AND FLANGE DIMENSIONS, SEE TABLE.

DIMENSION TABLE						
PIPE SIZE	A	B	C	D	E	
					MIN.	MAX.
4"	3"	4–1/4"	9"	2–1/2"	9–1/4"	14"
6"	3"	5–1/2"	9"	2–1/2"	10–1/2"	15–1/4"
8"	3"	6–7/8"	9"	2–1/2"	11–3/4"	16–1/2"
10"	3"	8–1/2"	9"	2–1/2"	13–1/2"	18–1/4"
12"	3"	9–15/16"	9"	2–1/2"	15"	19–3/4"

500 PIPE SUPPORT

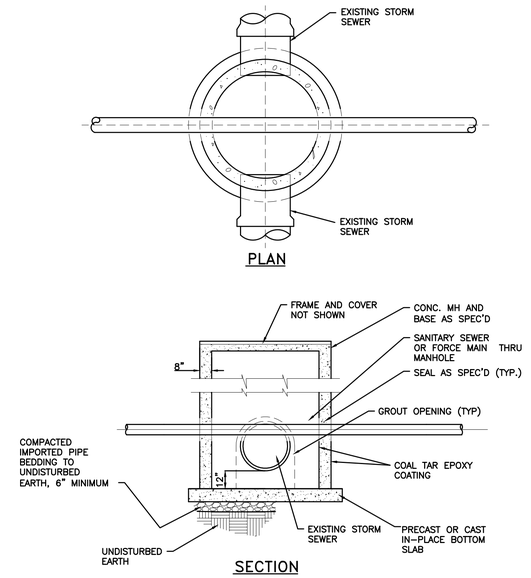
Scale: 1" = 1'



NOTE:
ALL STEEL MUST BE COMPLETELY PAINTED AFTER INSTALLATION WITH ZINC–RICH RUST INHIBITIVE PAINT. (TRAFFIC YELLOW).

502 GUARD POST

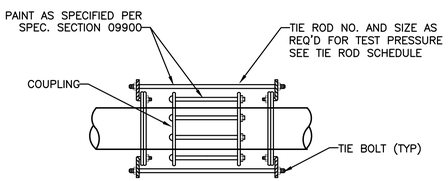
Scale: 1" = 2'



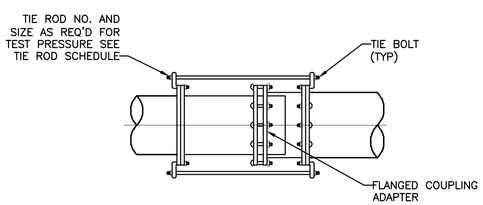
NOTE: CONTRACTOR SHALL DETERMINE PIPE SIZES, PIPE INVERT ELEVATIONS AND ANGLES OF PIPE ENTRY AND EXIT.

604 CONFLICT MANHOLE FOR EXISTING STORM SEWERS

Scale: 1" = 4'



RESTRAINED COUPLING

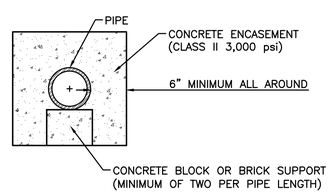


RESTRAINED FLANGED COUPLING ADAPTER

TIE ROD SCHEDULE															
TEST PRESSURE		25 PSI		50 PSI		100 PSI		150 PSI		225 PSI		375 PSI	
PIPE DIAMETER (IN.)	MINIMUM PIPE WALL THICKNESS (IN.) *	TIE RODS		TIE RODS		TIE RODS		TIE RODS		TIE RODS		TIE RODS	
		DIA (IN.)	NO. REQD	DIA (IN.)	NO. REQD	DIA (IN.)	NO. REQD	DIA (IN.)	NO. REQD	DIA (IN.)	NO. REQD	DIA (IN.)	NO. REQD
6	3/16	—	—	—	—	5/8	2	5/8	2	5/8	2	5/8	2
8	3/16	—	—	—	—	5/8	2	5/8	2	5/8	2	3/4	2
10	3/16	—	—	—	—	5/8	2	5/8	2	3/4	2	7/8	2
12	3/16	5/8	2	5/8	2	5/8	2	5/8	2	3/4	2	7/8	4

501 RESTRAINED COUPLING DETAILS

Scale: N/A



NOTES:

1. WHERE MINIMUM COVER, 36", IS NOT AVAILABLE ENCASEMENT WILL BE REQUIRED.
2. ALL CONCRETE ENCASEMENTS MUST BE FORMED AND INSPECTED BY THE CITY'S INSPECTOR PRIOR TO PLACING CONCRETE AND BACKFILLING.
3. WRAP PIPE IN VISQUEEN PRIOR TO POURING ENCASEMENT.
4. AT CROSSINGS, ENCASEMENT SHALL EXTEND TEN FEET (10') ON EITHER SIDE OF CROSSING.
5. BEGINNING AND ENDING OF ENCASEMENTS SHALL NOT BE MORE THAN 6" FROM A PIPE JOINT.

503 PIPE CONCRETE ENCASEMENT

Scale: 1" = 1'

KEITH & SCHNARS PROJECT NO. 18068.10

KEITH and SCHNARS, P.A.
ENGINEERS, PLANNERS, SURVEYORS
FLORIDA'S Big LOCAL FIRM
CERTIFICATE OF AUTHORIZATION NO. 1337
6500 NORTH ANDREWS AVENUE, FORT LAUDERDALE, FL. 33309–2132 (954)776–1616

FDOT PERMIT SET

ROBERT ALCARO
LICENSE No 17931
STATE OF FLORIDA
PROFESSIONAL ENGINEER

DRAWN BY: ARC	DATE: 09/2015
DESIGNED BY: BZ	SCALE: AS NOTED
CHECKED BY: BZ	
FIELD BOOK:	

CITY OF FORT LAUDERDALE
PUBLIC WORKS DEPARTMENT
ENGINEERING & ARCHITECTURE
100 North Andrews Avenue, Fort Lauderdale, Florida 33301

REVISIONS

NO.	DATE	BY	CHK'D	DESCRIPTION

PROJECT # 11080
PORT CONDO
LARGE WATER MAIN IMPROVEMENTS
STANDARD DETAILS
FDOT PERMIT SET

SHEET NO.	OF
10	10
TOTAL:	10
CAD FILE: 11080–010–DETL	
DRAWING FILE NO. WS–06–14	

CITY OF FORT LAUDERDALE
PUBLIC WORKS DEPARTMENT

MINORITY BUSINESS ENTERPRISE (MBE) - WOMEN BUSINESS ENTERPRISE (WBE)

PRIME CONTRACTOR IDENTIFICATION FORM

In order to assist us in identifying the status of those companies doing business with the City of Fort Lauderdale, this form must be completed and returned with your bid package.

Name of Firm:

Address of Firm:

Telephone Number:

Name of Person Completing Form:

Title:

Signature:

Date:

City Project Number:

City Project Description:

Please check the item(s) which properly identify the status of your firm:

☐ Our firm is not a MBE or WBE.

☐ Our firm is a MBE, as at least 51 percent is owned and operated by one or more socially and economically disadvantaged individuals.

☐ American Indian ☐ Asian ☐ Black ☐ Hispanic

☐ Our firm is a WBE, as at least 51 percent is owned and operated by one or more women.

☐ American Indian ☐ Asian ☐ Black ☐ Hispanic

MBE/WBE CONTRACTOR INFORMATION

The City, in a continuing effort, is encouraging the increased participation of minority and women-owned businesses in Public Works Department related contracts. Along those lines, we are requiring that each firm provide documentation detailing their own programs for utilizing minority and women-owned businesses.

Submit this information as a part of this bid package and refer to the checklist, to ensure that all areas of concern are covered. The low responsive bidder may be contacted to schedule a meeting to discuss these objectives. It is our intention to proceed as quickly as possible with this project, so your cooperation in this matter is appreciated.

CONTRACTOR CHECKLIST

☐ List Previous City of Fort Lauderdale Contracts

☐ Number of Employees in your firm

--Percent (%) Women

--Percent (%) Minorities

--Job Classifications of Women and Minorities

☐ Use of minority and/or women subcontractors on past projects.

☐ Nature of the work subcontracted to minority and/or women-owned firms.

☐ How are subcontractors notified of available opportunities with your firm?

☐ Anticipated amount to be subcontracted on this project.

☐ Anticipated amount to be subcontracted to minority and/or women-owned businesses on this project.

QUESTIONNAIRE SHEET

PLEASE PRINT OR TYPE:

Firm Name:

President

Business Address:

Telephone:

Fax:

E-Mail Address:

What was the last project of this nature which you completed? Include the year, description, and contract value.

The following are named as three corporations and representatives of those corporations for which you have performed work similar to that required by this contract, and which the City may contact as your references (include addresses, telephone numbers and e-mail addresses). Include the project name, year, description, and contract value.

How many years has your organization been in business?

Have you ever failed to complete work awarded to you; if so, where and why?

The name of the qualifying agent for the firm and his position is:

Certificate of Competency Number of Qualifying Agent:

Effective Date: Expiration Date:

Licensed in: Engineering Contractor's License #

(County/State)

Expiration Date:

NOTE: To be considered for award of this contract, the bidder must submit a financial statement upon request.

NOTE: Contractor must have proper licensing and shall provide copy of same with his proposal.

QUESTIONNAIRE SHEET

1. Have you personally inspected the proposed work and have you a complete plan for its performance?

2. Will you sublet any part of this work? If so, list the portions or specialties of the work that you will.

a)

b)

c)

d)

e)

f)

g)

3. What equipment do you own that is available for the work?

4. What equipment will you purchase for the proposed work?

5. What equipment will you rent for the proposed work?

LOCAL BUSINESS PRICE PREFERENCE CERTIFICATION STATEMENT

The Business identified below certifies that it qualifies for the local business price preference classification as indicated herein, and further certifies and agrees that it will re-affirm its local preference classification annually no later than thirty (30) calendar days prior to the anniversary of the date of a contract awarded pursuant to this ITB. Violation of the foregoing provision may result in contract termination.

(1) _____
Business Name

is a **Class A** Business as defined in City of Fort Lauderdale Ordinance No. C-17-26, Sec.2-186. A copy of the City of Fort Lauderdale current year Business Tax Receipt **and** a complete list of full-time employees and evidence of their addresses shall be provided within 10 calendar days of a formal request by the City.

(2) _____
Business Name

is a **Class B** Business as defined in the City of Fort Lauderdale Ordinance No. C-17-26, Sec.2-186. A copy of the Business Tax Receipt **or** a complete list of full-time employees and evidence of their addresses shall be provided within 10 calendar days of a formal request by the City.

(3) _____
Business Name

is a **Class C** Business as defined in the City of Fort Lauderdale Ordinance No. C-17-26, Sec.2-186. A copy of the Broward County Business Tax Receipt shall be provided within 10 calendar days of a formal request by the City.

(4) _____
Business Name

requests a **Conditional Class A** classification as defined in the City of Fort Lauderdale Ordinance No. C-17-26, Sec.2-186. Written certification of intent shall be provided within 10 calendar days of a formal request by the City.

(5) _____
Business Name

requests a **Conditional Class B** classification as defined in the City of Fort Lauderdale Ordinance No. C-17-26, Sec.2-186. Written certification of intent shall be provided within 10 calendar days of a formal request by the City.

(6) _____
Business Name

is considered a **Class D** Business as defined in the City of Fort Lauderdale Ordinance No. C-17-26, Sec.2-186 and does not qualify for Local Preference consideration.

BIDDER'S COMPANY: _____

AUTHORIZED COMPANY PERSON: _____ _____ _____

3 4

TRENCH SAFETY

Bidder acknowledges that included in the appropriate bid items of his bid and in the Total Bid Price are costs for complying with the Florida Trench Safety Act, Florida Statutes 553.60 – 553.64. The bidder further identifies the costs of such compliance to be summarized below:

Trench Safety Measure (Description)	Units of Measure (LF/SF)	Unit (Quantity)	Unit Cost	Extended Cost
A.			$	$
B.			$	$
C.			$	$
D.			$	$

Total: $

The bidder certifies that all trench excavation done within his control in excess of five feet (5') in depth shall be in accordance with the Occupational Safety and Health Administration's excavation safety standards, C.F.R. s. 1926.650 Subpart P., and the Florida Trench Safety Act, Florida Statutes 553.60-553.64.

Failure to complete the above may result in the bid being declared non-responsive.

DATE: _____ _____
(SIGNATURE)

STATE OF: _____ COUNTY OF: _____

PERSONALLY APPEARED BEFORE ME, the undersigned authority,

_____
(Name of Individual Signing)

_____ who, after first being duly sworn by me,
_____ affixed his/her signature in the space provided above on this
_____ day of _____, 20____.

_____
NOTARY PUBLIC

My Commission Expires: _____

NON-COLLUSION STATEMENT:

By signing this offer, the vendor/contractor certifies that this offer is made independently and free from collusion. Vendor shall disclose below any City of Fort Lauderdale, FL officer or employee, or any relative of any such officer or employee who is an officer or director of, or has a material interest in, the vendor's business, who is in a position to influence this procurement.

Any City of Fort Lauderdale, FL officer or employee who has any input into the writing of specifications or requirements, solicitation of offers, decision to award, evaluation of offers, or any other activity pertinent to this procurement is presumed, for purposes hereof, to be in a position to influence this procurement.

For purposes hereof, a person has a material interest if they directly or indirectly own more than 5 percent of the total assets or capital stock of any business entity, or if they otherwise stand to personally gain if the contract is awarded to this vendor.

In accordance with City of Fort Lauderdale, FL Policy and Standards Manual, 6.10.8.3,

3.3. City employees may not contract with the City through any corporation or business entity in which they or their immediate family members hold a controlling financial interest (e.g. ownership of five (5) percent or more).

3.4. Immediate family members (spouse, parents and children) are also prohibited from contracting with the City subject to the same general rules.

Failure of a vendor to disclose any relationship described herein shall be reason for debarment in accordance with the provisions of the City Procurement Code.

NAME	RELATIONSHIPS

In the event the vendor does not indicate any names, the City shall interpret this to mean that the vendor has indicated that no such relationships exist.

CONTRACTOR'S CERTIFICATE OF COMPLIANCE WITH NON-DISCRIMINATION PROVISIONS OF THE CONTRACT

The completed and signed form should be returned with the Contractor's submittal. If not provided with submittal, the Contractor must submit within three business days of City's request. Contractor may be deemed non-responsive for failure to fully comply within stated timeframes.

Pursuant to City Ordinance Sec. 2-17(a)(i)(ii), bidders must certify compliance with the Non-Discrimination provision of the ordinance.

(a) Contractors doing business with the City shall not discriminate against their employees based on the employee's race, color, religion, gender (including identity or expression), marital status, sexual orientation, national origin, age, disability or any other protected classification as defined by applicable law.

Contracts. Every Contract exceeding $100,000, or otherwise exempt from this section shall contain language that obligates the Contractor to comply with the applicable provisions of this section.

The Contract shall include provisions for the following:

(i) The Contractor certifies and represents that it will comply with this section during the entire term of the contract.

(ii) The failure of the Contractor to comply with this section shall be deemed to be a material breach of the contract, entitling the City to pursue any remedy stated below or any remedy provided under applicable law.

Authorized Signature

Print Name and Title

Date

CONTRACT PAYMENT METHOD

The City of Fort Lauderdale has implemented a Procurement Card (P-Card) program which changes how payments are remitted to its vendors. The City is transitioning from traditional paper checks to credit card payments via MasterCard or Visa as part of this program.

This allows you as a vendor of the City of Fort Lauderdale, to receive your payment fast and safely. No more waiting for checks to be printed and mailed.

In accordance with Article 7, item 7.6 of the contract, payments on this contract will be made utilizing the City's P-Card. Accordingly, bidders must presently have the ability to accept these credit cards or take whatever steps necessary to implement acceptance of a card before the start of the contract term, or contract award by the City.

Please indicate with which credit card you prefer to be paid:

☐ Master Card

☐ Visa Card

Company Name: _____

Signature: _____

Print Name Title: _____

CONSTRUCTION BID CERTIFICATION

Please Note: All fields below must be completed. If the field does not apply to you, please note N/A in that field. If you are a foreign corporation, you may be required to obtain a certificate of authority from the department of state, in accordance with Florida Statute §607.1501 (visit http://www.dos.state.fl.us/).

Company: (Legal Registration)

Address:

City: State: Zip:

Telephone No. FAX No. Email:

Does your firm qualify for MBE or WBE status: MBE ☐ WBE ☐

If a corporation, state the name of the President, Secretary and Resident Agent. If a partnership, state the names of all partners. If a trade name, state the names of the individuals who do business under the trade name.

Name	**Title**	**Name**	**Title**
Name	**Title**	**Name**	**Name**

ADDENDUM ACKNOWLEDGEMENT - Bidder acknowledges that the following addenda have been received and are included in the bid:

Addendum No.	Date Received	Addendum No.	Date Received	Addendum No.	Date Received	Addendum No.	Date Received

VARIANCES: If you take exception or have variances to any term, condition, specification, or requirement in this bid you must specify such variance in the space provided below or reference in the space provided below all variances contained on other pages within your bid. Additional pages may be attached if necessary. No variances will be deemed to be part of the bid submitted unless such is listed and contained in the space provided below. The City does not, by virtue of submitting a variance, necessarily accept any variances. If no statement is contained in the below space, it is hereby implied that your response is in full compliance with this competitive solicitation. If you do not have variances, simply mark N/A. If submitting your response electronically through BIDSYNC you must also click the "Take Exception" button.

The below signatory affirms that he has or will obtain all required permits and licenses from the appropriate agencies, and that his firm is authorized to do business in the State of Florida. The below signatory agrees to furnish all labor, tools, material, equipment and supplies, and to sustain all the expense incurred in doing the work set forth in strict accordance with the bid plans and contract documents at the unit prices indicated if awarded a contract. The below signatory has not divulged to, discussed, or compared this bid with other bidders, and has not colluded with any other bidder or parties to this bid whatsoever. Furthermore, the undersigned guarantees the truth and accuracy of all statements and answers contained in this bid. The below signatory also hereby agrees, by virtue of submitting or attempting to submit a bid, that in no event shall the City's liability for bodder's direct, indirect, incidental, consequential, special or exemplary damages, expenses, or lost profits arising out of this competitive solicitation process, including but not limited to public advertisement, bid conferences, site visits, evaluations, oral presentations, or award proceedings exceed the amount of Five Hundred Dollars ($500.00). This limitation shall not apply to claims arising under any provision of indemnification or the City protest ordinance contained in this competitive solicitation.

Submitted by:

Name (printed)	Signature
Date:	Date:

Question and Answers for Bid #12150-693 - Port Condo Large Water Main Improvements (P11080)

Overall Bid Questions
There are no questions associated with this bid.