

Solicitation 12242-493

River Oaks Preserve Project P11419

Bid Designation: Public



City of Fort Lauderdale

Bid 12242-493 River Oaks Preserve Project P11419

Bid Number 12242-493
 Bid Title River Oaks Preserve Project P11419

Bid Start Date Aug 22, 2019 4:13:43 PM EDT
 Bid End Date Oct 4, 2019 2:00:00 PM EDT
 Question & Answer End Date Sep 17, 2019 5:00:00 PM EDT

Bid Contact Penelope Burger
 Procurement Administrator
 Finance
 pburger@fortlauderdale.gov

Contract Duration One Time Purchase
 Contract Renewal Not Applicable
 Prices Good for 120 days

Pre-Bid Conference Sep 5, 2019 10:00:00 AM EDT
Attendance is optional
Location: River Oaks Preserve site. For reference, River Oaks Preserve is next to the Lauderdale Marine Center 2029 SW 20th St, Fort Lauderdale, FL 33315. The City will conduct a site tour immediately following the onsite pre-bid conference. Attendees to the pre-bid meeting should familiarize themselves with the meeting site location, in advance of the actual scheduled pre-bid meeting.

Bid Comments The project consists of the construction of a preservation park for the public, featuring wetlands and an elevated boardwalk, that incorporates a historic CSX bascule bridge, all in conformance with the Contract Documents.

**Added on Aug 27, 2019:
 FOR REFERENCE ONLY ADD:
 The attached Department of the Army Initial Proffered Permit No. SAJ-2006-06782(SP-PWB).
 Added on Sep 5, 2019:
 ADD:
 River Oaks Preserve Drawings To Scale.
 Added on Sep 9, 2019:
 Pre-Bid Sign In Sheet
 Added on Sep 25, 2019:
 Bid Opening date changed and other information added.
 See Addendum 3 for details.**

Addendum # 1

New Documents	Addendum No. 1.pdf
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Addendum # 2

New Documents Addendum 2 River Oaks Preserve 12242-493 Drawings To Scale.pdf

Addendum # 3

New Documents P11419.ADDENDUM 3.pdf

Previous End Date Sep 26, 2019 2:00:00 PM EDT New End Date Oct 4, 2019 2:00:00 PM EDT

Item Response Form

Item 12242-493--01-01 - Base Bid: General Conditions and Mobilization

Lot Description Base Bid

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

Licenses, and all administrative costs not specifically identified in other bid items. Mobilization, Demobilization and Maintenance of Traffic not to exceed 10% of project cost excluding mobilization, demobilization, MOT and any Allowances. All labor, materials, equipment, and all other incidentals required for all temporary facilities, transportation, communications, office, maintenance, project signs, and any other pre- or post-construction expenses necessary for the start or cessation of the Work, not specifically identified in the costs of the work. See Section 01025 for complete description.

Item 12242-493--01-02 - Base Bid: Clearing, Grubbing and Grading

Lot Description Base Bid

Quantity 29040 square yard

Unit Price

Delivery Location City of Fort Lauderdale

[See ITB Specifications](#)
 See ITB Specifications
 Fort Lauderdale FL 33301
 Qty 29040

Description

All equipment, materials, supplies, and labor necessary to obtain permit approval from the Florida Department of Environmental Protection, and prepare and implement a prevention, control, and abatement of erosion and water pollution plan to the Agency's and Owner's satisfaction. See Section 01025 for complete description.

Item 12242-493--01-03 - Base Bid: Excavation

Lot Description Base Bid

Quantity 40440 cubic yard

Unit Price

Delivery Location City of Fort Lauderdale

[See ITB Specifications](#)
 See ITB Specifications
 Fort Lauderdale FL 33301
 Qty 40440

Description

Excavate and remove soil and rock as necessary for the grading of the site. See Section 01025 for complete description.

Item **12242-493--01-04 - Base Bid: Embankment**
 Lot Description Base Bid
 Quantity **6284 cubic yard**
 Unit Price
 Delivery Location **City of Fort Lauderdale**
[See ITB Specifications](#)
 See ITB Specifications
 Fort Lauderdale FL 33301
 Qty 6284

Description

Furnish and install all materials, equipment, labor, and any other costs not specifically identified in other bid items. See Section 01025 for complete description.

Item **12242-493--01-05 - Base Bid: Muck**
 Lot Description Base Bid
 Quantity **9500 cubic yard**
 Unit Price
 Delivery Location **City of Fort Lauderdale**
[See ITB Specifications](#)
 See ITB Specifications
 Fort Lauderdale FL 33301
 Qty 9500

Description

Furnish and install all materials, equipment, labor, and any other costs not specifically identified in other bid items. See Section 01025 for complete description.

Item **12242-493--01-06 - Base Bid: Ditch Bottom Inlet, Type K**
 Lot Description Base Bid
 Quantity **1 each**
 Unit Price
 Delivery Location **City of Fort Lauderdale**
[See ITB Specifications](#)
 See ITB Specifications
 Fort Lauderdale FL 33301
 Qty 1

Description

Furnish and install all materials, equipment, labor, and any other costs associated with Type K ,10 ft, Sump 2 ft, INDEX 235, with FRP Baffle & Bleeder Drain, with 36 inch x 48 inch Steel Grate. See Section 01025 for complete description.

Item **12242-493--01-07 - Base Bid: U-Type Endwalls**

Lot Description **Base Bid**
 Quantity **2 each**
 Unit Price
 Delivery Location **City of Fort Lauderdale**
 [See ITB Specifications](#)
 See ITB Specifications
 Fort Lauderdale FL 33301
 Qty 2

Description

Furnish and install all materials, equipment, labor, and any other costs for U-Type Endwall Std 261, 1-6 Slope, 24 inch Pipe. See Section 01025 for complete description.

Item **12242-493--01-08 - Base Bid: 19 inch x 30 inch R.C.P., Elliptical**
 Lot Description **Base Bid**
 Quantity **81 linear foot**
 Unit Price
 Delivery Location **City of Fort Lauderdale**
 [See ITB Specifications](#)
 See ITB Specifications
 Fort Lauderdale FL 33301
 Qty 81

Description

Furnish and install all materials, equipment, labor, and any other costs not specifically identified in other bid items. See Section 01025 for complete description.

Item **12242-493--01-09 - Base Bid: 24 inch Dia. Checkmate, Slip Inline Check Valve**
 Lot Description **Base Bid**
 Quantity **1 each**
 Unit Price
 Delivery Location **City of Fort Lauderdale**
 [See ITB Specifications](#)
 See ITB Specifications
 Fort Lauderdale FL 33301
 Qty 1

Description

Furnish and install all materials, equipment, labor, and any other costs not specifically identified in other bid items. See Section 01025 for complete description.

Item **12242-493--01-10 - Base Bid: 19 inch x30 inch Dia. Checkmate, Slip Inline Check Valve**
 Lot Description **Base Bid**
 Quantity **1 each**
 Unit Price
 Delivery Location **City of Fort Lauderdale**
 [See ITB Specifications](#)
 See ITB Specifications
 Fort Lauderdale FL 33301
 Qty 1

Description

Furnish and install all materials, equipment, labor, and any other costs not specifically identified in other bid items. See Section 01025 for complete description.

Item **12242-493--01-11 - Base Bid: 24 inch Dia. R.C.P.**
 Lot Description **Base Bid**
 Quantity **50 linear foot**
 Unit Price
 Delivery Location **City of Fort Lauderdale**
 [See ITB Specifications](#)
 See ITB Specifications
 Fort Lauderdale FL 33301
 Qty 50

Description

Furnish and install all materials, equipment, labor, and any other costs not specifically identified in other bid items. See Section 01025 for complete description.

Item **12242-493--01-12 - Base Bid: Proposed Elevation Adjustment Existing 19 inch x 30 inch R.C.P. Elliptical**
 Lot Description **Base Bid**
 Quantity **86 linear foot**
 Unit Price
 Delivery Location **City of Fort Lauderdale**
 [See ITB Specifications](#)
 See ITB Specifications
 Fort Lauderdale FL 33301
 Qty 86

Description

Furnish and install all materials, equipment, labor, and any other costs not specifically identified in other bid items. See Section 01025 for complete description.

Item **12242-493--01-13 - Base Bid: Proposed Elevation Adjustment Existing Inlet, Type E**
 Lot Description **Base Bid**
 Quantity **2 each**
 Unit Price
 Delivery Location **City of Fort Lauderdale**
 [See ITB Specifications](#)
 See ITB Specifications
 Fort Lauderdale FL 33301
 Qty 2

Description

Furnish and install all materials, equipment, labor, and any other costs not specifically identified in other bid items. See Section 01025 for complete description.

Item **12242-493--01-14 - Base Bid: Proposed Elevation Adjustment Existing Endwall (FDOT S-U3)**
 Lot Description **Base Bid**
 Quantity **1 each**

Unit Price

Delivery Location **City of Fort Lauderdale**
[See ITB Specifications](#)
 See ITB Specifications
 Fort Lauderdale FL 33301
Qty 1

Description

Furnish and install all materials, equipment, labor, and any other costs not specifically identified in other bid items. See Section 01025 for complete description.

Item **12242-493--01-15 - Base Bid: Chainlink Fence**

Lot Description **Base Bid**

Quantity **3181 linear foot**

Unit Price

Delivery Location **City of Fort Lauderdale**
[See ITB Specifications](#)
 See ITB Specifications
 Fort Lauderdale FL 33301
Qty 3181

Description

Furnish and install all materials, equipment, labor, and any other costs not specifically identified in other bid items. See Section 01025 for complete description.

Item **12242-493--01-16 - Base Bid: Existing Tree Removal and Disposal**

Lot Description **Base Bid**

Quantity **499 each**

Unit Price

Delivery Location **City of Fort Lauderdale**
[See ITB Specifications](#)
 See ITB Specifications
 Fort Lauderdale FL 33301
Qty 499

Description

Furnish and install all materials, equipment, labor, and any other costs not specifically identified in other bid items. See Section 01025 for complete description.

Item **12242-493--01-17 - Base Bid: Existing Tree Relocation**

Lot Description **Base Bid**

Quantity **25 each**

Unit Price

Delivery Location **City of Fort Lauderdale**
[See ITB Specifications](#)
 See ITB Specifications
 Fort Lauderdale FL 33301
Qty 25

Description

Furnish and install all materials, equipment, labor, and any other costs not specifically identified in other bid items. See Section 01025

for complete description.

Item **12242-493--01-18 - Base Bid: Pickerelweed (Bare Root)**
 Lot Description **Base Bid**
 Quantity **5000 each**
 Unit Price
 Delivery Location **City of Fort Lauderdale**
 [See ITB Specifications](#)
 See ITB Specifications
 Fort Lauderdale FL 33301
 Qty 5000

Description

Furnish and install all materials, equipment, labor, and any other costs not specifically identified in other bid items. See Section 01025 for complete description.

Item **12242-493--01-19 - Base Bid: Duck potato (Bare Root)**
 Lot Description **Base Bid**
 Quantity **5000 each**
 Unit Price
 Delivery Location **City of Fort Lauderdale**
 [See ITB Specifications](#)
 See ITB Specifications
 Fort Lauderdale FL 33301
 Qty 5000

Description

Furnish and install all materials, equipment, labor, and any other costs not specifically identified in other bid items. See Section 01025 for complete description.

Item **12242-493--01-20 - Base Bid: Arrow arum (Bare Root)**
 Lot Description **Base Bid**
 Quantity **2400 each**
 Unit Price
 Delivery Location **City of Fort Lauderdale**
 [See ITB Specifications](#)
 See ITB Specifications
 Fort Lauderdale FL 33301
 Qty 2400

Description

Furnish and install all materials, equipment, labor, and any other costs not specifically identified in other bid items. See Section 01025 for complete description.

Item **12242-493--01-21 - Base Bid: Fireflag (Bare Root)**
 Lot Description **Base Bid**
 Quantity **2260 each**
 Unit Price
 Delivery Location **City of Fort Lauderdale**

See ITB Specifications
 See ITB Specifications
 Fort Lauderdale FL 33301
 Qty 2260

Description

Furnish and install all materials, equipment, labor, and any other costs not specifically identified in other bid items. See Section 01025 for complete description.

Item **12242-493--01-22 - Base Bid: Swamp lily (Bare Root)**
 Lot Description **Base Bid**
 Quantity **3200 each**
 Unit Price
 Delivery Location **City of Fort Lauderdale**
See ITB Specifications
 See ITB Specifications
 Fort Lauderdale FL 33301
 Qty 3200

Description

Furnish and install all materials, equipment, labor, and any other costs not specifically identified in other bid items. See Section 01025 for complete description.

Item **12242-493--01-23 - Base Bid: Bald Cypress (7 gal)**
 Lot Description **Base Bid**
 Quantity **80 each**
 Unit Price
 Delivery Location **City of Fort Lauderdale**
See ITB Specifications
 See ITB Specifications
 Fort Lauderdale FL 33301
 Qty 80

Description

Furnish and install all materials, equipment, labor, and any other costs not specifically identified in other bid items. See Section 01025 for complete description.

Item **12242-493--01-24 - Base Bid: Slash pine (7 gal)**
 Lot Description **Base Bid**
 Quantity **70 each**
 Unit Price
 Delivery Location **City of Fort Lauderdale**
See ITB Specifications
 See ITB Specifications
 Fort Lauderdale FL 33301
 Qty 70

Description

Furnish and install all materials, equipment, labor, and any other costs not specifically identified in other bid items. See Section 01025 for complete description.

Item 12242-493--01-25 - Base Bid: Cabbage palm (8-10 foot)
 Lot Description Base Bid
 Quantity 150 each
 Unit Price
 Delivery Location **City of Fort Lauderdale**
 [See ITB Specifications](#)
 See ITB Specifications
 Fort Lauderdale FL 33301
 Qty 150

Description

Furnish and install all materials, equipment, labor, and any other costs not specifically identified in other bid items. See Section 01025 for complete description.

Item 12242-493--01-26 - Base Bid: Fakahatchee grass (1 gal)
 Lot Description Base Bid
 Quantity 180 each
 Unit Price
 Delivery Location **City of Fort Lauderdale**
 [See ITB Specifications](#)
 See ITB Specifications
 Fort Lauderdale FL 33301
 Qty 180

Description

Furnish and install all materials, equipment, labor, and any other costs not specifically identified in other bid items. See Section 01025 for complete description.

Item 12242-493--01-27 - Base Bid: Sand cordgrass (1 gal)
 Lot Description Base Bid
 Quantity 200 each
 Unit Price
 Delivery Location **City of Fort Lauderdale**
 [See ITB Specifications](#)
 See ITB Specifications
 Fort Lauderdale FL 33301
 Qty 200

Description

Furnish and install all materials, equipment, labor, and any other costs not specifically identified in other bid items. See Section 01025 for complete description.

Item 12242-493--01-28 - Base Bid: Firebush (1 gal)
 Lot Description Base Bid
 Quantity 600 each
 Unit Price
 Delivery Location **City of Fort Lauderdale**
 [See ITB Specifications](#)
 See ITB Specifications
 Fort Lauderdale FL 33301

Qty 600

Description

Furnish and install all materials, equipment, labor, and any other costs not specifically identified in other bid items. See Section 01025 for complete description.

Item 12242-493--01-29 - Base Bid: Wild coffee (1 gal)

Lot Description Base Bid

Quantity 1220 each

Unit Price

Delivery Location **City of Fort Lauderdale**
[See ITB Specifications](#)
 See ITB Specifications
 Fort Lauderdale FL 33301
 Qty 1220

Description

Furnish and install all materials, equipment, labor, and any other costs not specifically identified in other bid items. See Section 01025 for complete description.

Item 12242-493--01-30 - Base Bid: Muhly grass (Liner)

Lot Description Base Bid

Quantity 300 each

Unit Price

Delivery Location **City of Fort Lauderdale**
[See ITB Specifications](#)
 See ITB Specifications
 Fort Lauderdale FL 33301
 Qty 300

Description

Furnish and install all materials, equipment, labor, and any other costs not specifically identified in other bid items. See Section 01025 for complete description.

Item 12242-493--01-31 - Base Bid: Giant bulrush (Bare Root)

Lot Description Base Bid

Quantity 1060 each

Unit Price

Delivery Location **City of Fort Lauderdale**
[See ITB Specifications](#)
 See ITB Specifications
 Fort Lauderdale FL 33301
 Qty 1060

Description

Furnish and install all materials, equipment, labor, and any other costs not specifically identified in other bid items. See Section 01025 for complete description.

Item 12242-493--01-32 - Base Bid: White water lily (Bare Root)

Lot Description Base Bid

Quantity **3200 each**
 Unit Price
 Delivery Location **City of Fort Lauderdale**
See ITB Specifications
 See ITB Specifications
 Fort Lauderdale FL 33301
 Qty 3200

Description

Furnish and install all materials, equipment, labor, and any other costs not specifically identified in other bid items. See Section 01025 for complete description.

Item **12242-493--01-33 - Base Bid: Cocoplum (1 gal)**
 Lot Description **Base Bid**
 Quantity **850 each**
 Unit Price
 Delivery Location **City of Fort Lauderdale**
See ITB Specifications
 See ITB Specifications
 Fort Lauderdale FL 33301
 Qty 850

Description

Furnish and install all materials, equipment, labor, and any other costs not specifically identified in other bid items. See Section 01025 for complete description.

Item **12242-493--01-34 - Base Bid: Fakahatchee grass (1 gal)**
 Lot Description **Base Bid**
 Quantity **200 each**
 Unit Price
 Delivery Location **City of Fort Lauderdale**
See ITB Specifications
 See ITB Specifications
 Fort Lauderdale FL 33301
 Qty 200

Description

Furnish and install all materials, equipment, labor, and any other costs not specifically identified in other bid items. See Section 01025 for complete description.

Item **12242-493--01-35 - Base Bid: Firebush (1 gal)**
 Lot Description **Base Bid**
 Quantity **850 each**
 Unit Price
 Delivery Location **City of Fort Lauderdale**
See ITB Specifications
 See ITB Specifications
 Fort Lauderdale FL 33301
 Qty 850

Description

Furnish and install all materials, equipment, labor, and any other costs not specifically identified in other bid items. See Section 01025 for complete description.

Item **12242-493--01-36 - Base Bid: Boardwalk W/Railings**
 Lot Description **Base Bid**
 Quantity **5355 square foot**
 Unit Price
 Delivery Location **City of Fort Lauderdale**
 See ITB Specifications
 See ITB Specifications
 Fort Lauderdale FL 33301
 Qty 5355

Description

Furnish and install all materials, equipment, labor, and any other costs not specifically identified in other bid items. See Section 01025 for complete description.

Item **12242-493--01-37 - Base Bid: Timber Piles for Boardwalk**
 Lot Description **Base Bid**
 Quantity **200 each**
 Unit Price
 Delivery Location **City of Fort Lauderdale**
 See ITB Specifications
 See ITB Specifications
 Fort Lauderdale FL 33301
 Qty 200

Description

Furnish and install all materials, equipment, labor, and any other costs not specifically identified in other bid items. See Section 01025 for complete description.

**CITY OF FORT LAUDERDALE
CONTRACT AND SPECIFICATIONS PACKAGE**

BID NO. 12242-493

PROJECT NO. 11419

RIVER OAKS PRESERVE



Penelope Burger
Procurement Administrator
Telephone: (954) 828-5189
E-mail: pburger@fortlauderdale.gov

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APPENDICES

APPENDIX A – Geotechnical Report by Radise International

APPENDIX B – Pre – Stormwater Permit - Broward County Environmental Protection and Growth Management Department Permit Dated 12.18.15

APPENDIX C – Post – Stormwater Permit - Broward County Environmental Protection and Growth Management Department Permit Dated 11.30.18

APPENDIX D – DEP Agreement No. NF019

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

CITB Prime Contractor ID
 CITB Questionnaire Sheets
 CITB Non-Collusion Statement
 Non-Discrimination Certification Form
 Contract Payment Method
 CITB Construction Bid Certification
 CITB Specific References

INVITATION TO BID

Sealed bids will be received electronically until 2:00 P.M., local time, on **September 26th, 2019**, and opened immediately thereafter in the 5th Floor Conference Room, City Hall, 100 North Andrews Avenue, Fort Lauderdale, Florida, 33301, for **BID NO.,12242-493, PROJECT NO. 11419, River Oaks Preserve**.

This project consists of Drawing File No. 4-135-81; 40 sheets.

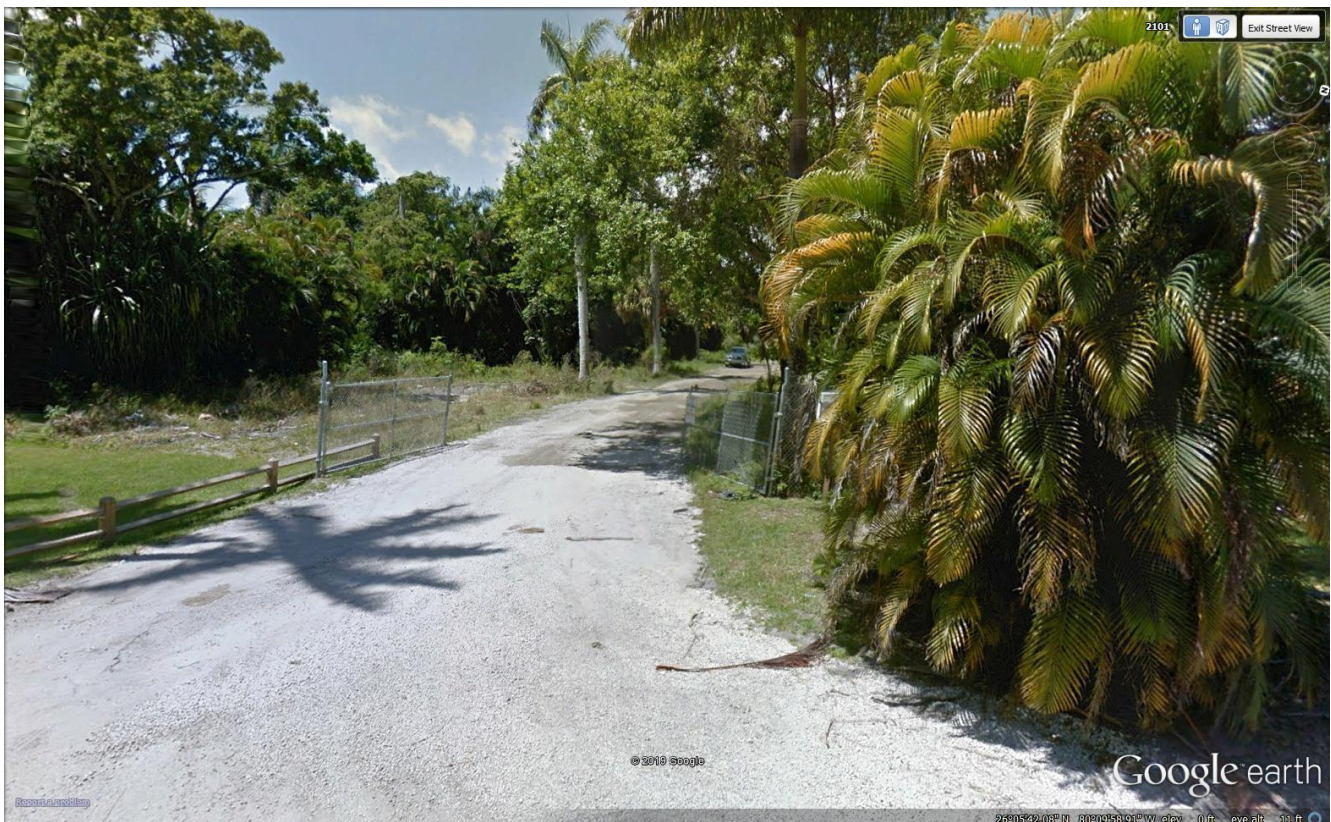
Project Location: The project is located at 2101 SW 19th Ave, Fort Lauderdale, FL 33315.

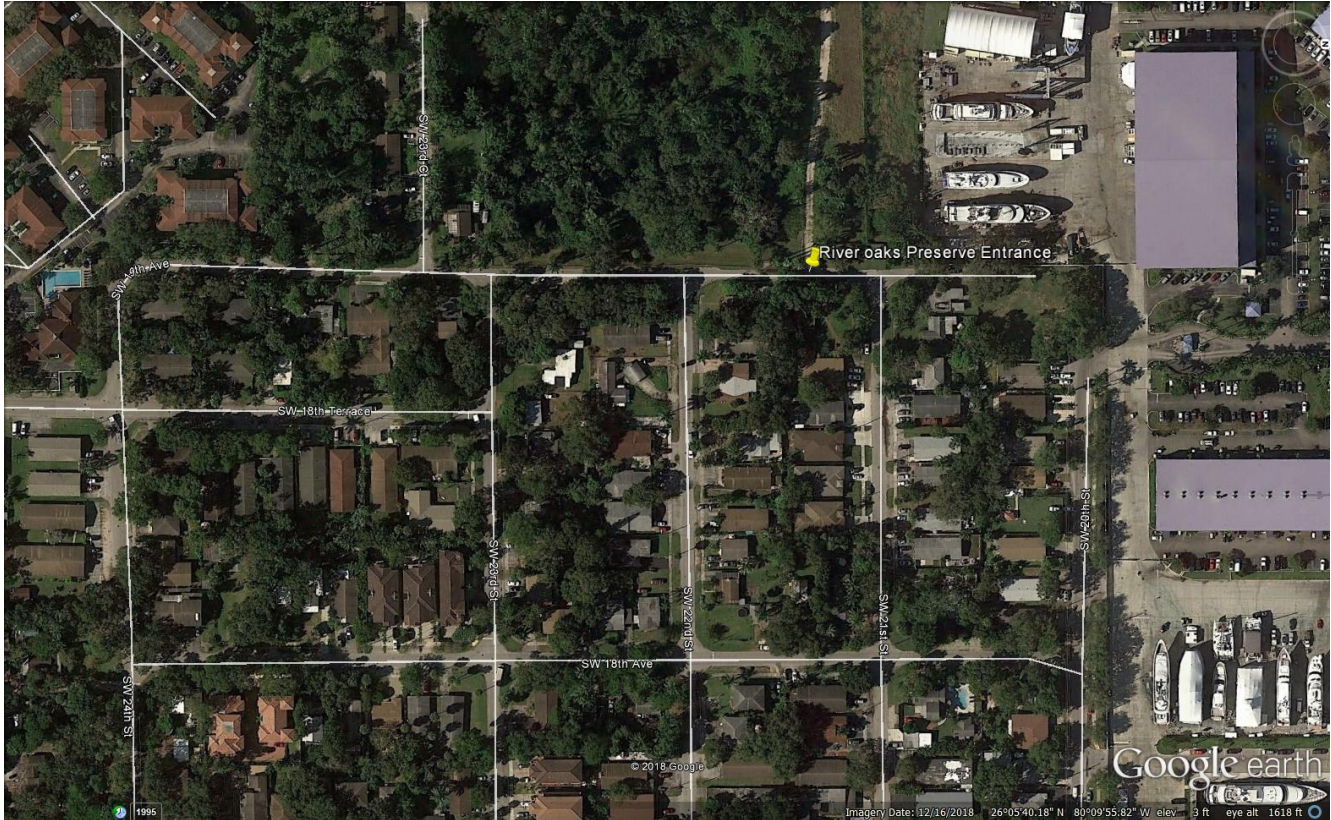
Description of the work: The project consists of the construction of a preservation park for the public, featuring wetlands and an elevated boardwalk, that incorporates a historic CSX bascule bridge, all in conformance with the Contract Documents.

NOTE: Payment on this contract will be made by Visa or MasterCard.

Licensing Requirements: Possession of a Certified General Contractor License in the State of Florida.

Pre-Bid Meeting/Site visit: A pre-bid meeting and site visit will be held on **Thursday September 5th, 2019, at 10:00 A.M.** at the River Oaks Preserve site. Contractors are to drive into the dirt driveway until they arrive at the open area inside of the fenced entrance gate. For reference, River Oaks Preserve is next to the Lauderdale Marine Center 2029 SW 20th St, Fort Lauderdale, FL 33315. The City will conduct a site tour immediately following the onsite pre-bid conference. Attendees to the pre-bid meeting should familiarize themselves with the meeting site location, in advance of the actual scheduled pre-bid meeting.





While attendance is not mandatory, it is strongly suggested that all Contractors attend the pre-bid conference. It will be the sole responsibility of the bidder to inspect the City's location(s) and become familiar with the scope of the City's requirements and systems prior to submitting a bid. 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 bidder 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.

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.

- 2) Bidders may **upload** their original executed bid bond on BIDSYNC to accompany their bids with the electronic proposal, and deliver the original, signed and sealed hard copy within five (5) 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 33301-1016, before time of bid opening, with the company name, bid number and title clearly indicated on the envelope.
- 4) Bidders can **mail** their bid bond to the Finance Department, Procurement Services Division, 100 North Andrews Avenue, Room 619, Fort Lauderdale, FL 33301-1016, before time of bid opening, with the company name, bid number and title clearly indicated on the envelope.

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.

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.

CONCERNING SUBCONSULTANTS, SUPPLIERS, AND OTHERS - The amount of work that is sublet by the Bidder shall be limited by the condition that the Bidder, shall with his own organization, perform at least forty percent (40%) of the total dollar amount of the Work to be performed under the Agreement.

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.

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

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 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 follow the protest procedure as found in the city's procurement ordinance within five (5) days after a notice of intent to award is posted on the city's web site 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 web site at the following link: [https://library.municode.com/fl/fort lauderdale/codes/code of ordinances?nodeId=COOR CH2A D ARTVFI DIV2PR S2-182DIREPR](https://library.municode.com/fl/fort%20lauderdale/codes/code%20of%20ordinances?nodeId=COOR_CH2A_D_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 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 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.

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. The ordinance may also be viewed on the City's website at http://www.fortlauderdale.gov/clerk/LobbyistDocs/lobbyist_ordinance.pdf .

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 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 SUBMITTALS WILL NOT BE ACCEPTED. PLEASE SUBMIT YOUR BID RESPONSE ELECTRONICALLY.**

04. INFORMATION OR CLARIFICATION

For information concerning procedures for responding to this solicitation, contact Penelope Burger, **Procurement Administrator**, at (954) 828-5189 or email at pburger@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 **15** calendar days (10 working days) after the date when the Contract Time commences to run as provided in the Notice to Proceed.

- 5.2 The Work shall be Substantially Completed within **150** calendar days (126 working 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 **180** calendar days (132 working 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.

Possession of a Certified General Contractor License in the State of Florida.

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 shall have previous construction experience in wetlands, wetland construction and restoration, and boardwalks in South Florida within the past five (5) 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; overall construction costs, project name 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.

Allowance	\$
Additional work as requested by the City	5,000
FPL, AT&T allowance	5,000
Maintenance of traffic allowance	25,000
Permit fee allowance	2,000
Permit fees and testing allowance	2,000
TOTAL	\$39,000

Note: DO NOT ADD ALLOWANCE TO BID

The City will add this allowance to your bid

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

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 its 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 through insurers authorized or eligible to write policies in the State of Florida and possess an A.M. Best rating of A-, VII or better, subject to approval by the City's Risk Manager.

The coverages, limits, and/or endorsements required herein protect the interests of the City, and these coverages, limits, and/or endorsements shall in no way be required to 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 exposures, 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 Crane and Rigging Liability

Coverage must be afforded for any crane operations under the Commercial General or Business Automobile Liability policy as necessary, in line with the limits of the associated policy.

Coverage may be provided in the form of an endorsement to the Commercial General Liability policy, or in the form of a separate policy covering Watercraft Liability or Protection and Indemnity for Bodily Injury and Property Damage.

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 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 respects to the City, a Florida municipal corporation, its officials, employees, and volunteers. Any insurance or self-insurance maintained by the City, a Florida municipal corporation, its officials, employees, or volunteers shall be non-contributory.

Any exclusion or provision in any insurance policy maintained by the Contractor that excludes coverage required in this Agreement shall be deemed 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 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 Dronix Suarez, E.I., whose address is 101 NE, 3rd Ave, #1410, Fort Lauderdale, FL 33301, telephone number: (954) 828-6982, and email address is dsuarez@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 **Two Hundred Fifty Dollars (\$250.00)** 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. The City reserves the right to revise this program as necessary.

15. WORK SCHEDULE (including overtime hours):

Regular work hours: 7:00 am to 4:30 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: \$ 100/hr.

17. OTHER CONDITIONS:**17.1 FUNDING:**

17.1.1 The State of Florida Department of Environmental Protection (DEP), is the recipient of federal assistance from the U.S. Environmental Protection Agency (EPA) through federal Grant Agreement No. C9-99451516-0, for the purpose of implementing Florida's Nonpoint Source Management Program pursuant to the federal Clean Water Act (CWA) § 319(h).

17.1.2 Subsequently, DEP and the City of Fort Lauderdale entered into Agreement No. NF019 to provide federal financial assistance for the River Oaks Preserve Project.

17.1.3 Bidders shall familiarize themselves with the required nature, conditions, and to the extent of the federal grant funding program. Nonpoint Source web pages for any information: <https://floridadep.gov/wra/319-tmdlfund>

17.2 PERMITS:

17.2.1 The combined Broward County Environmental Protection and Growth Management Department Permit DF13-1113 and the South Florida Water Management District Environmental Resource Permit 06-7241P are provided.

**17.2.2 Pending – United States Army Corp Permit SAJ-2006-06782
Pending – Broward County Tree Permit**

These permits are near ready and will be released to the awarded Contractor

**CITY OF FORT LAUDERDALE
CONSTRUCTION AGREEMENT**

THIS AGREEMENT made and entered into this _____ day of _____, 2019, 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:

RIVER OAKS PRESERVE
ITB # 12242-493
PROJECT # 11419

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

Project Location: The project is located at 2101 SW 19th Ave. Fort Lauderdale, FL 33315

Description of the work: The project consists of the construction of a preservation park for the public, featuring wetlands and an elevated boardwalk, that incorporates a historic CSX bascule bridge, all in conformance with the Contract Documents, all in conformance with the Contract Documents.

- 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 Dronix Suarez, E.I., whose address is 101 N.E. 3rd Avenue, #1410, Fort Lauderdale, FL 33301, telephone number: (954) 828-6982, and email address is dsuarez@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: File No. 4-135-81; 40 sheets

- 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., 12256-493, 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 15 calendar days (10 working days) of the date of the Notice to Proceed.
- 5.2 The Work shall be Substantially Completed within 150 calendar days (126 working 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 180 calendar days (132 working 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 (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. The City reserves the right to revise this program as necessary.

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 4:30 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 entities 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 eq.*).

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 Technical Clarifications and Interpretations:
- 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 data 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: 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.

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.

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.

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.

10.3.5 REQUIRED COVERAGES

10.3.5.1 Crane and Rigging Liability

Coverage must be afforded for any crane operations under the Commercial General or Business Automobile Liability policy as necessary, in line with the limits of the associated policy.

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 trials 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, expeditors, 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 **Two Hundred Fifty Dollars (\$250.00)** 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 Contractor 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 Contractor 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 Contractor 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 Contractor 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 addition 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.

SAMPLE CONSTRUCTION
AGREEMENT

River Oaks Preserve
(Contractor)
Project #11419

CITY

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

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

By: _____
CHRISTOPHER J. LAGERBLOOM
City Manager

(CORPORATE SEAL)

ATTEST:

By: _____
JEFFREY A. MODARELLI
City Clerk

Approved as to Legal Form:

By: _____
RHONDA MONTOYA HASAN
Assistant City Attorney

SAMPLE CONSTRUCTION AGREEMENT

CONTRACTOR

WITNESSES:

CONTRACTOR.,
a Florida corporation.

By _____

Print Name

PRINT NAME

Title

ATTEST:

Print Name

BY: _____

PRINT NAME

Secretary

(CORPORATE SEAL)

STATE OF FLORIDA:
COUNTY OF BROWARD:

The foregoing instrument was acknowledged before me this ____ day of _____, 2019, 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; and

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, conflicts, 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 aid 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: prcontract@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.

PROJECT 11419

**SECTION 01001
GENERAL REQUIREMENTS****PART 1 - PROJECT DESCRIPTION**1.01 GENERAL

- A. A brief description of the Work is stated in the INVITATION TO BID. To determine the full scope of the Project or any particular part of the Project, coordinate the applicable information in these Contract Documents and review the available project drawings.
- B. The Work under this Contract shall be performed by the CONTRACTOR as required by the OWNER. Work will be authorized by a Notice to Proceed issued to the CONTRACTOR. The CONTRACTOR shall complete all work within the number of calendar days stipulated in the Contract unless an extension in the time of completion is granted by the ENGINEER. Upon satisfactory 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 system, sewage transmission system and pumping stations 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 transmission, collection and pumping facilities necessary to accomplish the Work.

1.02 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 DOT Specifications and the requirements stated herein, the requirements herein shall prevail.
- B. CONTRACTOR shall be required to submit Maintenance of Traffic Plans (MOT) for work in the County and State and City Roadways. 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.

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PART 2 - SEQUENCE OF OPERATIONS**2.01 SCHEDULING**

- A. General: Prepare and submit schedule in accordance with the provisions of Section 01311, Construction Schedules.
- 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 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. The CONTRACTOR shall have sufficient manpower, equipment, and material to complete the project.
- D. No work shall commence without express consent of the ENGINEER.
- 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 ENGINEER.

2.02 MOBILIZATION AND DEMOBILIZATION

- A. 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.

2.03 COORDINATION

- A. 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 ENGINEER.

2.04 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.

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- 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 ENGINEER. Two business days advanced notice shall be given in order that the ENGINEER 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 and in proper working order prior to the shutdown of existing services or utilities.
- 2.05 OPERATION OF EXISTING SYSTEM PROHIBITED

- A. At no time 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 CONDITIONS3.01 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.

3.02 INFORMATION ON SITE CONDITIONS

- A. General: Information obtained by the ENGINEER regarding site conditions, subsurface information, groundwater elevations, existing construction of site facilities as applicable are contained in the project documents. The ENGINEER does not assume any responsibility for the completeness or interpretation of the information.

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3.03 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 811 or visit <http://www.sunshine811.com> at least 2 business days (10 business days for water crossings) prior to any excavation and make arrangements for locating all utilities in the project area.

3.04 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 2 business 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 or sewer laterals that interfere with trenching, he may, by obtaining prior approval of the property owner, the ENGINEER, 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.
- H. Telephone and communications drops and signal 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 CONTRACTOR shall be replaced at the CONTRACTOR'S expense.

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1. Damaged cable shall be replaced as an entire run, from junction box to junction box.
2. Notify Broward County Engineering two business days in advance of the need to remove traffic detection loops.
3. CONTRACTOR shall verify marked cables and signal systems prior to excavation.

3.05 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 ENGINEER 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.

3.06 EASEMENTS AND WORK ON PRIVATE PROPERTY

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

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- C. 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.
- D. Prior to removing an existing structure or item, provide written notice to the OWNER at least 14 days in advance of the anticipated removal.
- E. The CONTRACTOR shall not engage in private construction activities within the project area without the presence of a contract with the private owner of the property containing a hold harmless clause protecting the CITY from any and all damages that occur during the performance of the privately authorized work.

PART 4 - SAFETY AND CONVENIENCE**4.01 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 ENGINEER.
- 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.

4.02 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 ENGINEER.
- 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 ENGINEER, giving full details of the claim.

4.03 SAFE ACCESS BY FEDERAL, STATE, AND LOCAL GOVERNMENT OFFICIALS, CITY WORKERS

- 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.

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4.04 PROTECTION OF PROPERTY

- A. Protect stored materials located adjacent to the proposed work. Notify OWNER affected by the construction at least two business days in advance of the time construction begins.
- 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 ENGINEER, and the OWNER.

4.05 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.

4.06 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. MOT plans that result in restricted access for emergency vehicles must be submitted and approved 2 weeks prior to the proposed closing with separate and specific notification made to the ENGINEER to provide for appropriate agency coordination.
- B. The CONTRACTOR shall leave a night emergency telephone number or numbers with the police department, the ENGINEER, and the OWNER, so that contact may be made easily at all times in case of barricade and flare trouble or other emergencies.

PART 5 - PRESERVATION, RESTORATION, AND CLEANUP5.01 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, gardens, 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.

PROJECT 11419

5.02 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.

5.03 HISTORIC PRESERVATION

- A. If the project work should uncover prehistoric or historic artifacts associated with Native American cultures, early colonial cultures, or American settlements, all project activities in the area shall cease immediately.
- B. All such discoveries shall be reported to the Division of Historical Resources. Review and Compliance Section at (800) 847-7278.
- C. Project activities in the affected area cannot resume without authorization from the Division of Historic Resources.

PART 6 - PERMITS

- A. Permits To Be Obtained by the OWNER Include the Following: N/A
- B. OWNER has prepared plans for CONTRACTOR to submit and pull a permit:
1. City of Fort Lauderdale Building Permit.
 2. Tree removal and trimming permits.
 3. BCEPGMD: Environmental permits.
- C. Permits to be Obtained by the CONTRACTOR Include, but are not limited to the following:
1. Local and County Building permits.
 2. Local, County, and State contracting licenses.
 3. MOT approval from local, county, and state agencies as required.
 4. BCEPGMD/SFWMD/FDEP: Dewatering permit, including NPDES permit if required.
- D. The CONTRACTOR shall comply with all applicable permit conditions.

END OF SECTION

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**SECTION 01005
INTENT OF DRAWINGS AND SPECIFICATIONS**

PART 1 – GENERAL**1.01 THE REQUIREMENT**

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

PART 2 -- PRODUCTS
(NOT USED)

PART 3 -- EXECUTION
(NOT USED)

END OF SECTION

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SECTION 01010 - SUMMARY OF WORK**PART 1 - GENERAL****1.01 SCOPE****A. City of Fort Lauderdale**

1. CITY's Representative/Engineer: Dronix Suarez, E.I., Project Manager II
2. Project Description: This project consists of the construction of a preservation park for the public featuring wetlands, and an elevated boardwalk that incorporates a historic CSX bascule bridge. Craven Thompson & Associates is the Design Consultant for this project.
3. Project Location: The project is located within the southwest section of River Oaks neighborhood. It is bounded by SW 23rd Court to the south, SW 19th Avenue to the east, SW 21st Street to the north and I-95 to the west.
4. DESCRIPTION OF WORK
The following is a general list of the work included. It is not intended to be complete. Consult the contract drawings and specifications for all contract requirements.

The project consists of the construction of a preservation park for the public featuring wetlands, and an elevated boardwalk that incorporates a historic CSX bascule bridge.

1.02 NOTICE TO BIDDERS

- A. The successful bidder, in order to be considered responsive, must possess the appropriate License as described in the Contract Documents.
- B. It should also be noted that the successful bidder will, at the time of the pre- construction conference, be required to show that each of the CONTRACTOR'S subcontractors is in compliance with the CITY's Code of Ordinances.
- C. The CONTRACTOR shall adhere to the requirements and guidelines stated in the FDEP Grant Agreement No. NF019. This project receives assistance from the U.S. Environmental Protection Agency (EPA) through federal Grant Agreement No. C9-99451516-0 for the purposes of implementing Florida's Nonpoint Source Management Program pursuant to the federal Clean Water Act (CWA) §319(h); and pursuant to CWA §319(h), as determined by the Department's application process and with final approval by the EPA, the Grantee is a subrecipient of §319(h) funds in order to implement projects or activities to reduce nonpoint source pollution and restore Florida's impaired water bodies.

1.03 SITE INVESTIGATION

- A. The CONTRACTOR, by virtue of signing the Contract and any associated Task Orders, acknowledges that CONTRACTOR and all subcontractors have satisfied themselves to the nature and location of the work, the general and local conditions including, but not restricted to: those bearing upon transportation; disposal, handling and storage of materials; access roads to the site; the conformation and conditions of the work area; and the character of equipment and facilities needed preliminary to and during the performance of the work. Failure on the part of the CONTRACTOR to completely or properly evaluate the site conditions shall not be grounds for additional compensation.

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- B. The CONTRACTOR, by virtue of signing the Contract and associated Task Orders, acknowledges that CONTRACTOR and subcontractors have satisfied themselves as to the nature and extent of soil and (underground) water conditions on the project site. No additional payment will be made to the CONTRACTOR because of differences between actual conditions and those shown by the boring logs.

1.04 WORK BY OTHERS

- A. Concurrent Work by Other CONTRACTORS: The CONTRACTOR'S attention is directed to the fact that other contractors may conduct work at the site during the performance of the WORK under this Contract. The CONTRACTOR shall conduct its operations so as to cause little or no delay to WORK of such other contractors, and shall cooperate fully with such contractors to provide continued safe access to their respective portions of the site, as required to perform work under their respective contracts.
- B. Interference with Work on Utilities: The CONTRACTOR shall cooperate fully with all utility forces of the OWNER or forces of other public or private agencies engaged in the relocation, altering, or otherwise rearranging of any facilities which interfere with the progress of the WORK, and shall schedule the WORK so as to minimize interference with said relocation, altering, or other rearranging of facilities.

1.05 WORK SEQUENCE

The CONTRACTOR shall schedule and perform the work in such a manner as to result in the least possible disruption to the public's use of any parking lot, roadways, driveways, and utilities. Utilities shall include but not be limited to water, sewerage, drainage structures, ditches and canals, gas, electric, television, fiber optic lines, and telephone. Prior to commencing with the WORK, the CONTRACTOR shall perform a location investigation of existing underground utilities and facilities, and shall have obtained all required permits and permissions, the CONTRACTOR shall also deliver written notice to the CITY'S ENGINEER, and property occupants (private and public) of all planned disruption to roadway, driveways, temporary displacement of fences, mailboxes, street signs and traffic signs, and utilities 72 hours in advance of disruption.

1.06 WORK SCHEDULE

- A. Time is of the essence in completing this project and each associated Task Order. Because time is of the essence the CONTRACTOR shall commit the necessary resources to this project to complete it in a timely manner. Those resources may include multiple working crews, working overtime, etc. Because time is of the essence, the CONTRACTOR'S construction progress will be monitored closely on a weekly basis. The Construction progress will be measured with the approved construction schedule submitted by the CONTRACTOR. If the CITY'S ENGINEER determines that the CONTRACTOR is behind schedule based on the approved schedule's critical path, or if the schedule does not meet the Critical Path Method (CPM) requirements as specified in Section 01311, the CONTRACTOR will be required to commit those resources necessary to ensure the completion of the project in a timely manner including working overtime, adding other work crews, etc. All costs incurred to implement measures to complete the work in timely manner, including any overtime or other fees associated with required inspections, will be borne by the CONTRACTOR at no additional cost to the OWNER.

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B. REQUIRED PERIODS OF WORK SUSPENSION

1. CONTRACTOR shall shut down operations for all City Holidays, terminating production work by noon on the day preceding the holiday (or the weekend before said holiday) and not resuming operations until the start of the following week (or the day after the holiday, whichever is later). The CONTRACTOR shall ensure that the site is restored per Sections 01001 and 01010 and all areas that are off limits to the public will be clearly delineated and protected. For a full list of holidays, please refer to the CITY's website, however these include, but are not limited to New Year's Eve and Day, Martin Luther King's Birthday, Memorial Day, the 4th of July, Labor Day, Thanksgiving Day and the day after Thanksgiving Day, Christmas Eve and Christmas.
2. The CONTRACTOR shall include these provisions in the schedule required in 01311 and there shall be no additional time granted for these work suspensions.
3. No additional compensation shall be granted for demobilization, cleaning and remobilization as a result of these work suspensions.
4. During the work suspensions, the CONTRACTOR shall remain liable for the safety and security of the project site and be available 24 hours per the Contract Documents. CONTRACTOR shall have personnel visit the site daily during these suspensions to ensure the safety and security of the site.

C. SCHEDULE

1. CONTRACTOR shall submit scheduling information for the work noted in the Contract and/or each associated Task Order.
2. No separate payment shall be made for preparation and/or revision of the schedule.

- D. 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 8 a.m. and 5:00 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 AM to 4:30 PM 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.

1.07 COMPUTATION OF CONTRACT TIME

- A. It is the CONTRACTOR'S responsibility to provide clear and convincing documentation to the ENGINEER as to the effect additional work will have with respect to additional contract time extension that may be justified. If additional quantities of work can be carried

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out concurrent with other existing construction activities without disrupting the critical path of the project then no contract time extension will be granted. The CONTRACTOR is obligated to provide documentation to the CITY if additional elements of work affect the critical path of the project. If work set forth in the original scope of the project is deleted, the contract time may be reduced. This contract is a calendar day contract. While the CONTRACTOR may be granted time to suspend work operations for vacations or holidays, contract time will not be suspended. During suspensions, the CONTRACTOR shall be responsible for all maintenance of traffic and liability without additional compensation from the CITY.

1.08 CONTRACTOR USE OF PREMISES

- A. The CONTRACTOR's use of the project site shall be limited to its construction operations. The CONTRACTOR will arrange for storage of materials and a copy of an agreement for use of other property shall be furnished to the ENGINEER.

1.09 POST AWARD KICK-OFF MEETING

- A. After the award of the Contract, a Post Award Kick-Off Meeting will be held between the CONTRACTOR, the CITY'S ENGINEER, CITY Staff and other interested parties. The ENGINEER will set the time and place of the conference. The purpose of this meeting is to communicate administrative and operational requirements of the Contract. The requirements for construction mobilization, quality, safety, and execution of the project will be explained and documented. Submittal requirements, project communications, schedule, quality and safety requirements will be outlined and dates set for submission of pre-construction submittals.

1.11 PRE-CONSTRUCTION CONFERENCE

- A. After the award of Contract, a Pre-construction Work Conference will be held between the CONTRACTOR, the ENGINEER, the CITY, other interested Agencies, representatives of Utility Companies and others affected by the work. The ENGINEER will set the time and place of this conference. The CONTRACTOR shall bring to the conference a copy of the proposed work schedule for the approval by the ENGINEER of the proposed methods and manner of executing the work including sequences of operation and time schedule. The work shall be performed in accordance with such schedule or approved amendments thereto.

1.12 UTILITY LOCATIONS

- A. As far as possible, all existing utility lines in the project area have been shown on the plans. However, the CITY does not guarantee that all lines are shown, or that said lines are in their true location. It shall be the CONTRACTOR'S responsibility to identify and locate all underground or overhead utility lines or equipment affected by the project. No additional payment will be made to the CONTRACTOR because of discrepancies in actual and plan location of utilities and damages suffered as a result thereof.
- B. The CONTRACTOR shall notify each utility company involved at least thirty (30) days prior to the start of construction to arrange for positive underground location, relocation or support of its utility where that utility may be in conflict with or endangered by the proposed construction. The CONTRACTOR shall pay for relocation of water mains or other utilities for the convenience of the CONTRACTOR. The CONTRACTOR shall pay for all charges by utility companies for temporary support of its utilities. All costs of

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permanent utility relocations to avoid conflict shall be the responsibility of the CONTRACTOR and the utility company involved.

- C. The CONTRACTOR shall schedule and coordinate their work in such a manner that they are not delayed by the utility companies relocating or supporting their utilities. No compensation will be paid to the CONTRACTOR for any loss of time or delay.
- D. All overhead, surface, and underground structures and/or utilities encountered are to be carefully protected from damage or displacement. All damage to said structures and/or utilities is to be completely repaired within a reasonable time; needless delay will not be tolerated. The CITY reserves the right to remedy any damage by ordering outside parties to make repairs at the expense of the CONTRACTOR. All repairs made by the CONTRACTOR are to be made to the satisfaction of the utility owner and shall be inspected by a representative of the utility owner and the ENGINEER.
- E. The CONTRACTOR should be aware of the Sunshine 811, which has a free locating service for CONTRACTORS and excavators. Within forty-eight hours before excavating, dial toll free 1-800-432-4770 (or local 811), and a locator will be dispatched to the work location. CONTRACTOR shall reasonably notify other utility companies not notified by Sunshine 811.
- F. The permits on page 93 will be obtained for the project by the CITY prior to beginning construction (not applicable). The CONTRACTOR is responsible for compliance with any and all permit conditions. In the event that the CITY must obtain permits in addition to those listed below, the CONTRACTOR shall not have any claim for damages arising from any delay caused by the CITY'S obtaining said additional permits.
- G. CONTRACTOR shall obtain all applicable construction/building permits with Local, County, and State prior to commencement of work.

1.13 LINE AND GRADE N/A

1.14 PROTECTION AND RESTORATION OF SURVEY MONUMENTS

- A. The CONTRACTOR shall carefully protect from disturbance all survey monuments, stakes and bench marks, whether or not established by CONTRACTOR, and shall not remove or destroy any surveying point until it has been properly witnessed by the ENGINEER. All major survey monuments that have been damaged by the CONTRACTOR such as section corners, 1/4 section corners, property corners or block control points shall be replaced at the CONTRACTOR'S expense with markers of a size and type approved by the ENGINEER. The replacement shall be under the supervision of a Florida Registered Land Surveyor where directed by the ENGINEER.

1.15 EQUIPMENT

- A. All equipment necessary and required for the proper construction of all facilities shall be on the construction site, in first-class working condition.

1.16 STORAGE SITES

- A. The CONTRACTOR shall furnish, at CONTRACTOR'S expense, properly zoned areas suitable for field office, material storage and equipment service and storage. No material may be stored in the public right of way without prior authorization by the agency having jurisdiction. The CONTRACTOR shall keep these areas in a clean and orderly condition

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so as not to cause a nuisance or sight obstruction to motorists or pedestrians.

1.17 OWNERSHIP OF EXISTING MATERIALS

- A. All materials removed or excavated from the job site shall remain the property of the CITY until released by the Contract Administrator, at which time it shall become the property of the CONTRACTOR, who shall dispose of it in a manner satisfactory to the ENGINEER.

1.18 EXCESS MATERIAL

- A. Upon direction of the ENGINEER, all vegetation, debris, concrete or other unsuitable materials shall be disposed of in areas provided by the CONTRACTOR and approved by the ENGINEER. Any excess material desired to be retained by the CITY shall be delivered by the CONTRACTOR to a designated area within a 5-mile radius of the project, at no extra cost to the CITY.

1.19 AUDIO-VISUAL PRECONSTRUCTION RECORD

- A. General:
1. Prior to beginning any Contract or Task Order work, the CONTRACTOR shall thoroughly photograph or have a continuous color audio-video recording taken along the entire length of the project to serve as a record of preconstruction conditions.

1.20 ENVIRONMENTAL PROTECTION

- A. The CONTRACTOR shall furnish all labor and equipment and perform all work required for the prevention of environmental pollution during and as a result of the work under this contract. For the purpose of this contract, environmental pollution is defined as the presence of chemical, physical, or biological elements or agents which adversely affect human health or welfare; unfavorably alter ecological balances of importance to human life, affect other species of importance to man, or degrade the utility of the environment for aesthetic and recreational purposes. The control of environmental pollution requires consideration of air, water, land and involves noise, solid waste management and management of radiant energy and radioactive materials, as well as other pollutants. Environmental pollution prevention shall be in accordance with NPDES requirements with no additional cost to the CITY.

1.21 MAINTENANCE AND PROTECTION OF TRAFFIC

- A. The CONTRACTOR shall provide all necessary traffic control devices in order to redirect, protect, warn or maintain existing vehicular and pedestrian traffic during the course of construction.

B. TRAFFIC CONTROL

The CONTRACTOR is required to submit a conceptual Traffic Control Plan at the Pre-Construction Conference. This preliminary plan should identify the phases of construction that the CONTRACTOR plans to proceed with and identify traffic flows during each phase. The ENGINEER will have ten (10) days to notify the CONTRACTOR of any comments. Once the conceptual plan for maintaining traffic has been approved, the CONTRACTOR will be required to submit a detailed plan showing each phase's Maintenance and Protection Plan prior to starting construction of any phase.

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- The "Maintenance of Traffic" plan shall include pedestrian traffic as well as vehicular traffic.

It shall be the responsibility of the CONTRACTOR for any necessary Construction, Pavement Marking and Signage or any Pedestrian Signalization and/or Signal Modification to accommodate an alternate safe walk route.

- The CONTRACTOR, at all times, shall conduct the work in such a manner as to insure the least obstruction to traffic as is practical. Convenience of the general public and of the residents adjacent to the work shall be provided for in a satisfactory manner, as determined by the CITY'S ENGINEER.
- Sidewalks, gutters, drains, fire hydrants and private drives shall, insofar as practical, be kept in condition for their intended uses. Fire hydrants on or adjacent to the work shall be kept accessible to fire apparatus at all times, and no material or obstruction shall be placed within twenty (20) feet of any such hydrant.
- The CONTRACTOR shall furnish a sufficient number of protective devices to protect and divert the vehicular and pedestrian traffic from working areas closed to traffic, or to protect any new work. Failure to comply with this requirement will result in the ENGINEER shutting down the work until the CONTRACTOR provides the necessary protection.
- Any time traffic is diverted for a period of time that will exceed one-work day temporary pavement markings will be required. Existing pavement markings that conflict with the new work zone traffic pattern must be obliterated. Painting over existing pavement markings (black out) is not permitted.

1.22 MAINTENANCE AND PROTECTION OF EXISTING DRAINAGE SYSTEM

- A. It shall be the responsibility of the CONTRACTOR to maintain positive drainage on the surface and to ensure that the existing underground drainage system continues to function as intended during the construction. The CONTRACTOR shall follow the plans to ensure that existing catch basins and manholes are being protected during the entire phase of construction.

1.23 APPLICATION FOR PAYMENT FOR STORED MATERIALS

- A. Application for payment for stored materials may not be made by the CONTRACTOR.

1.24 SPECIAL CONDITIONS FOR CONSTRUCTION BY OTHER AGENCIES

- A. It will be the CONTRACTOR'S responsibility to coordinate construction schedules with other contractors so as to minimize disruptions, and inconveniences. The project site shall be safe at all times for construction workers and marina visitors.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION

SUMMARY OF WORK

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**SECTION 01025
MEASUREMENT AND PAYMENT**

PART 1 - GENERAL1.01 SUBMITTALS

- A. Informational:
1. Submit schedule on OWNER's form.
 2. Application for Payment.
 3. Final Application for Payment.

1.02 SCHEDULE

- A. Prepare a schedule for the Work in accordance with the requirements of Section 01311.
- B. Unit Price Work: Reflect unit price quantity and price breakdown from the conformed Bid Form
- C. Lump Sum Work:
1. Reflect schedule format included in conformed Bid Form.
 2. List Bonds and insurance premiums, mobilization, demobilization, facility startup, 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.
- E. Summation of all the Work shall equal the Contract Price.

1.03 APPLICATION FOR PAYMENT

- A. Transmittal Summary Form: Attach one Summary Form with each detailed Application for Payment. Execute certification by authorized officer of CONTRACTOR.
- B. Use detailed Application for Payment Form provided by ENGINEER.
- 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, (4 copies), a listing of materials on hand as applicable, and such supporting data as may be requested by ENGINEER.

1.04 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 not meeting above requirements or loads of 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 ENGINEER.

<u>ITEM</u>	<u>METHOD OF MEASUREMENT</u>
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 will be made
SF	Square Foot
SY	Square Yard
TON	Ton - Weight Measure by Scale (2,000 pounds)
BR	Bare Root
GAL	Gallon
LN	Liner

1.05 FDEP GRANT REQUIREMENTS

- A. The CONTRACTOR shall meet the requirements and guidelines set forth in the DEP Agreement No. NF019 for; Terms and Period of Agreement, Funding or Consideration or Invoicing, Retainage, Indemnification, Default or Termination or Force Majeure, Remedies or Financial Consequences, Record Keeping or Audit, Subcontracts, Prohibited Local Government Construction Preferences, Lobbying Prohibition, Compliance with Law, Notice, Contacts, Insurance, Conflict of Interest, Equipment, Unauthorized Employment, Quality Assurance Requirements, Discrimination, Debarment or Suspension, Copyright, Patent and Trademark, Contract Provisions and Regulations, Land Acquisition, Physical Access and Inspection, Public Records Access, Termination False Certification, Scrutinized Companies, Boycotting, Execution in Counterparts, Severability Clause. See Attachment A of the DEP

Agreement No. NF019 for the Grant Work Plan.

- B. All cost associated with meeting the requirements and guidelines set forth in the DEP Agreement No. NF019 shall be included in the bid of the project.

1.06 PAYMENT

A. General:

1. Progress payments will be made monthly.
2. The date for 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 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.
8. Telephone and communication 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 CONTRACTOR 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 structure as fences, irrigation systems, 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 ENGINEER, 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 CITY may withhold payment to the CONTRACTOR pending resolution of any claims by private owners.

B. General:

No material price increases will be allowed, including gasoline, diesel, asphalt cement, or other materials.

- C. Payment for Lump Sum Work covers all Work specified or shown for all specification items within the contract documents.

1.06 GENERAL CONDITIONS AND MOBILIZATION (Bid Item No. 1)

- A. Mobilization, Demobilization and Maintenance of Traffic not to exceed 5% of project cost excluding mobilization, demobilization, MOT and any Allowances.
- B. Payment for will be made at the lump sum price developed from the cost of the unit price items. Mobilization includes, but is not limited to all required testing with passing results, video of existing site conditions and final completion, test holes for verification of existing utility/storm pipe sizes and elevations, insurance, site cleanup, sanitary facilities, labor associated with permit acquisition, CONTRACTOR staging area, project signs, project coordination, demobilization and maintenance of traffic. Partial payments will be made as follows:
 - 25% at the beginning of the work
 - 50% at 10% complete
 - 75% at 25% complete
 - 100% at 100% complete
- C. Payment for maintenance of traffic will be made at the lump sum price named in the Bid Schedule. Payment for maintenance of traffic will be made in equal monthly amounts during

the duration of the contract time. Existing traffic signage shall be maintained and protected at all times. There shall be no additional payment for replacement.

1.07 CLEARING, GRUBBING AND GRADING (Bid Item No. 2)

- A. Measurement for payment of clearing, grubbing and grading work area will be based upon the lump sum amount named in the bid schedule for area actually cleared, grubbed and graded, as detailed in the Drawings, all in accordance with the requirements of the Contract Documents.
- B. Payment for clearing, grubbing and grading will be made at the unit price lump sum for such clearing and grubbing as named in the Bid Schedule which price will constitute full compensation for clearing and grubbing of work area, including removal of trees up to 6" diameter not specifically identified on the plans, all trees specifically identified on the plans to be removed regardless of diameter, bushes, grasses, logs, debris, and all else necessary for a complete and functional work area.

1.08 UPLAND EXCAVATION (Bid Item No. 3)

- A. Measurement for payment of excavation will be based upon the number of cubic yards of material actually excavated, as detailed in the drawings, all in accordance with the requirements of the Contract Documents.
- B. Payment for excavation will be made at the unit price per cubic yard named in the Bid Schedule, which price shall constitute full compensation for excavation, handling of material, grading, tree protection, root pruning if necessary, disposal of excess waste or unsuitable material and all else necessary for a complete and functional removal.

1.09 FURNISH & PLACE EMBANKMENT (Bid Item No. 4)

- A. Measurement for payment for furnishing and placing embankment will be based upon the number of cubic yards of such materials actually compacted in place to the elevation indicated and densities passed all in accordance with the requirements of the Contract Documents.
- B. Payment for furnishing and embankment will be made at the unit price per cubic yard named in the Bid Schedule to the elevations shown on the plans, which price shall constitute full compensation for furnishing all such suitable material, in place, including all transportation of offsite and onsite material, handling, cleaning, positioning grading and compacting of said fill to required specifications and disposal of waste or unsuitable material.

1.10 FURNISH & PLACE MUCK (Bid Item No. 5)

- A. Measurement for payment for furnishing and placing muck will be based upon the number of cubic yards of such materials actually compacted in place to the elevation indicated and densities passed all in accordance with the requirements of the Contract Documents.
- B. Payment for furnishing muck will be made at the unit price per cubic yard named in the Bid Schedule to the elevations shown on the plans, which price shall constitute full compensation for furnishing all such suitable material, in place, including all transportation of offsite and onsite material, handling, cleaning, positioning grading and compacting of said fill to required specifications and disposal of waste or unsuitable material.

1.11 FURNISH & INSTALL DRAINAGE STRUCTURES (Bid Item No. 6 - 7)

- A. Measurement for payment to furnish and install ditch bottom inlet and U-type endwall structures will be based upon the actual quantity, each, of such ditch bottom inlet and U-type endwall structures constructed, all in accordance with the requirement of the Contract Documents.
- B. Payment for furnishing and installing ditch bottom inlet and U-type endwall structures will be made at the unit price, each, named in the Bid Schedule which price shall constitute full compensation for the completed installation of the structure including but not limited to excavation, dewatering (including cleaning adjacent discharge pipe), backfill and compaction, and construction of the reinforced concrete structure including frame seal precast bench, invert system, coatings, grates, ring and cover and all else necessary for a complete and functional installation.

1.12 FURNISH & INSTALL DRAINAGE PIPE (Bid Item No. 8)

- A. Measurement for payment for furnishing and installing drainage pipe will be based upon the number of linear feet of such pipe actually constructed as determined by measurement along the centerline of the pipe in place, not including through structures, all in accordance with the requirements of the Contract Documents.
- B. Payment for furnishing and installing drainage pipe will be made at the unit price per linear foot of pipe named in the Bid Schedule which shall constitute full compensation for complete installation, but is not limited to, providing all necessary pipe excavation, dewatering, connecting to existing storm pipe, bedding backfilling, compaction, temporary or permanent pavement restoration, and temporary relocation of existing utilities as required for a complete and functional installation.

1.13 FURNISH AND INSTALL CHECK VALVE (Bid Item No. 9 – 10)

- A. Measurement for payment to furnish and install check valves will be based upon the actual quantity, each, of such check valve constructed, all in accordance with the requirements of the Contract Documents.
- B. Payment for furnishing and installing check valves will be made at the unit price, each, named in the Bid Schedule which price shall constitute full compensation for the completed installation of the check valve including but not limited to excavation, dewatering, backfill and compaction, construction of the reinforced concrete structure, and construction of headwalls, wingwalls, barrier walls, plugs, etc.

1.14 ALL WORK ASSOCIATED WITH PIPE ADJUSTMENT (Bid Item No. 11 - 14)

- A. Measurement for payment for adjusting existing storm pipes will be based upon the actual quantity, each, of such existing storm pipes adjusted, all in accordance with the requirements of the Contract Documents.
- B. Payment for adjusting storm pipes will be made at the unit price, each, named in the Bid Schedule which price shall constitute full compensation for the completed adjustment of the existing storm pipes including but not limited to excavation, dewatering, backfill and

compaction, construction of the reinforced concrete structure, and construction of headwalls, wingwalls, barrier walls, plugs, etc.

1.15 FURNISH & INSTALL CHAINLINK FENCE (Bid Item No. 15)

- A. Measurement for payment to remove and dispose of the existing chain link fence will be based upon the actual quantity, linear feet of such fence actually removed all in accordance with the Contract Documents.
- B. Payment for removal and disposal of the existing chain link fence will be made at the unit price per linear foot of fence named in the Bid Schedule which price shall constitute full compensation for the removal and disposal or such fencing.

1.16 REMOVE/DISPOSE/RELOCATE EXISTING TREES (Bid Item No. No. 16 – 17)

- A. Measurement for removal/disposal/relocation of trees and palms will be made on a unit price per each tree removed & disposed or relocated. The CONTRACTOR shall be paid the amount indicated in the bid proposal for each tree required to be removed and disposed of or relocated for the proper execution of the work as directed by the ENGINEER. This price paid shall be for each tree removed or relocated including obtaining appropriate tree removal permits, removal of stumps and disposal of all debris associated with the removal of the tree.
- B. Payment to remove/dispose/relocate of trees and palms will be made at the unit price each named in the Bid Schedule. Removal and disposal or relocation of trees and palms shall include obtaining of appropriate tree removal permits, spading of the tree, root pruning, replanting, maintenance cutting of the tree, removal of the stump, and the removal disposal of all vegetative matter as required by the Contract Documents or directed by the ENGINEER.

1.17 FURNISH AND INSTALL TREES AND PLANTS (Bid Item No. 18 - 36)

- A. Measurement for payment for furnishing and installing trees and plants will be based upon the actual number, of each tree or plant installed all in accordance with requirements of the Contract Documents.
- B. Payment for furnishing and installing trees and plants will be made at the unit price, each, named in the Bid Schedule which price shall constitute full compensation for the complete installation, watering for one year for establishment, guys, weed control, and planting soil.

1.18 FURNISH & INSTALL BOARDWALK (Bid Item No. 37)

- A. Measurement for payment for the item, furnish & install boardwalk including railings, posts, and observation decks will be based upon the number, square foot of such boardwalk, actually constructed, as detailed in the DRAWINGS, all in accordance with the requirements of the Contract Documents.
- B. Payment for furnishing and installing the boardwalk will be made at the unit price, square foot as named in the Bid Schedule which price will constitute full compensation for the complete installation of the boardwalk including observation decks, railings, posts, concrete,

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footings, steel, hardware, decking, columns, joists, railings, coatings, connection to existing gravel surface and pavement, excavation, backfill, dewatering, compaction, restoration and all else necessary for a complete and functional boardwalk.

1.19 FURNISH & INSTALL TIMBER PILES FOR BOARDWALK (Bid Item No. 38)

- A. Measurement for payment for furnishing and installing timber piles will be based upon the number each of such timber piles actually used, all in accordance with the requirements of the Contract Documents.
- B. Payment for furnishing and installing timber piles will be made at the unit price each installed per the contract documents as named in the bid schedule, including but not limited to equipment excavation, reinforcement, piles, hardware, etc. and all restoration and all else necessary for a complete and functional installation.

1.20 BONDS AND INSURANCE (Bid Item No. 39)

Payment for bonds and insurance will be made at the lump sum price named in the Bid Schedule. The CONTRACTOR may request payment for this bid item after the Initial Notice to Proceed has been issued.

Bonds and Insurance are limited to 2.5% of the Total Bid Price. No amount in excess of 2.5% of the Contract value will be made. The 2.5% ceiling on Bonds and Insurance is not responsiveness, just an instruction on the amount the CITY will pay for Bonds and Insurance.

1.20 PERMIT FEES BASE BID SCHEDULE (Bid Item Nos. 40 - 41)

- A. Payment for permit fees will be based upon the actual permit fees required by the CONTRACTOR from the various agencies having jurisdiction for construction of the project, in accordance with the Contract Documents.
- B. The allowance amount shown on the contract is an estimate for the project and is a cost pass through item and no markups will be added to this item. The CONTRACTOR shall submit documentation with pay request verifying actual cost. Only permit fees substantiated by the CONTRACTOR and approved by the ENGINEER will be paid as part of this bid item. Any balance in this item at the end of the project shall be credited back to the OWNER.

1.21 OPTIONAL SERVICES (Bid Item No. 42)

- A. Bid Item "Optional Services", is a contingency item to be utilized ONLY as authorized by the CITY. This Item may authorize additional work to the CONTRACTOR for unforeseen conditions and for items not specifically included in the individual bid items. This item may not be used at all or may be partially used. The disbursement of any/all of this item is totally at the discretion of the ENGINEER/CITY and shall **not** be considered "due" the CONTRACTOR.

NONPAYMENT FOR REJECTED OR UNUSED PRODUCTS

MEASUREMENT AND PAYMENT

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

PARTIAL PAYMENT FOR STORED MATERIALS AND EQUIPMENT

- ii. Partial Payment: No partial payments will be made for stored materials.

ALLOWANCES

- iii. The allowances shall be used only at the discretion of and as ordered by the OWNER.
- iv. 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

1.01 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.

1.02 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. Water and Sewer Department: Fort Lauderdale Public Services Department.
 - a. Contact Person: Emergency Hotline.
 - b. Telephone: 954-828-8000.
3. Gas Company: TECO Peoples Gas.
 - a. Contact Person: Dispatch.
 - b. Telephone: 305-957-3857, ext. 7490 or 1-877-832-6747.
4. Electric Company: FPL Subaqueous.
 - a. Contact Person: Ernesto Dominguez.
 - b. Telephone: 954-581-3088
5. Telecom: AT&T
 - a. Contact: Otis Keeve
 - b. Telephone: 954-723-2540 or 561-540-9263
6. Telecom: Comcast
 - a. Contact: Leonard Maxwell-Newbold
 - b. Telephone: 954-447-8405 or 444-5113
 - a. Contact: Enrique Tur
 - b. Telephone: 954-447-8483

7. Telecom: FP&L FiberNet.
 - a. Contact: Danny Haskett.
 - b. Telephone: 305-552-2931 or 786-246-7827.
8. Broward County Traffic Engineering Division (For Traffic Signal Communications Systems Underground Cable and Traffic Loops):
 - a. Contact: Bob Blount.
 - b. Telephone: 954-847-2745 or 954-261-4427.

1.03 PROJECT MEETINGS

A. General:

1. Project Manager (City): Schedule physical arrangements for meetings throughout progress of Work, prepare meeting agenda with CITY ENGINEER, OWNER and CONTRACTOR 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 minutes after each meeting to participants and parties affected by meeting decisions.
2. Representatives of CITY ENGINEER, 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 limited to:
 - a. OWNER'S representatives
 - b. CITY ENGINEER'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 CITY ENGINEER may request to attend.
 - g. ENGINEER's representatives.
 - h. Others as appropriate.

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- 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. CITY ENGINEER, as appropriate.
 - c. CONTRACTOR, Subcontractors and Suppliers, as appropriate.
 - d. ENGINEER's representative(s).
 - e. Others as appropriate.
 3. On a monthly basis, the CITY ENGINEER 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 CITY ENGINEER 4 days in advance of meeting date.
 4. Provide suggested agenda to CITY ENGINEER 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, CITY ENGINEER, and ENGINEER.

1.04 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.

1.05 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.

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- 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 ENGINEER and sufficiently ahead of construction to avoid possible delays to CONTRACTOR'S Work.

1.06 ADJACENT FACILITIES AND PROPERTIES

A. Examination:

1. After Effective Date of the Agreement and before Work at site is started, CONTRACTOR, CITY ENGINEER, 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, including neighboring properties.
2. Periodic reexamination shall be jointly performed to include, but not 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 CONTRACTOR'S operations, and is for the protection of adjacent property owners, CONTRACTOR, and OWNER.

1.07 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. CITY 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 CITY ENGINEER.

E. Color Prints:

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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.

1.08 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, video graph construction site and property adjacent to construction site.
- B. In the case of preconstruction recording, no Work shall begin in the area prior to CITY ENGINEER'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 the construction site and areas adjacent to and within the right-of-way or easement, and on CONTRACTOR storage and staging areas.
- D. CITY ENGINEER shall have right to select subject matter and vantage point from which videos are to be taken.
- E. Videotaping shall be by a professional commercial videographer, experienced in shooting construction videos.
- F. Video Format and Quality:
 1. 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:

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- 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. DVD Label:
 - a. DVD 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 DVD Log: Maintain an ongoing log that incorporates above noted label information for DVD'S on Project.

H. The Following Shall be Included with the Video Documentation:

1. Coverage is required within and adjacent to the construction site, 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.

1.09 REFERENCE POINTS, SURVEYS, AND RECORD DRAWINGS

- A. Location and elevation of benchmarks are shown on Drawings.
- B. CONTRACTOR'S Responsibilities:

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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.
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 CITY ENGINEER, submit documentation.
7. Provide competent employee(s), tools, stakes, and other equipment and materials as CITY ENGINEER 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.
8. CONTRACTOR shall be responsible for performing survey and preparing "as-built" drawings for the pump station construction.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 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.

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- 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 CITY ENGINEER

END OF SECTION

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**SECTION 01300
SUBMITTALS****PART 1 – GENERAL**1.01 DEFINITIONS

- A. Action Submittal: Written and graphic information submitted by CONTRACTOR, that requires ENGINEER'S approval.
- B. Informational Submittal: Information submitted by CONTRACTOR, that does not require the City of Fort Lauderdale Project Construction Manager's (PCM's) approval. Submittals not meeting conditions of the Contract will be returned.

1.02 PROCEDURES

- A. The CONTRACTOR shall prepare and submit select construction related correspondence, (transmittals, RFIs, proposals, etc.) to the PCM. During the preconstruction meeting, the CONTRACTOR shall be instructed by the PCM on the details for submitting correspondence for this Contract.
- B. Direct submittals to the PCM at the following address, unless specified otherwise:
 - 1. City of Fort Lauderdale, 100 North Andrews Avenue, 4th Floor Engineering – Public Works Engineering, Fort Lauderdale, FL 33301;
- C. Transmittal of submittal:
 - 1. The CONTRACTOR shall:
 - a. Review each submittal and check for compliance with the Contract Documents.
 - b. Stamp each submittal with the uniform approval stamp before submitting to the PCM.
 - 1) The stamp shall include the Project Name, submittal number, specification section number, CONTRACTOR's reviewer name, date of CONTRACTOR's approval, and a statement certifying that the submittal have been reviewed, checked and approved for compliance with the Contract Documents.
 - 2) The PCM will not review submittals that do not bear the 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 the 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 the original number with sequential alphabetic suffix.

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- b. Specification section and paragraph to which submittal applies.
 - c. Project title and CITY project number
 - d. Names of the CONTRACTOR, subcontractor or supplier, and manufacturer as appropriate.
 4. Identify and describe each deviation or variation from the 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 the submittal package unless otherwise directed to in the specifications.
 3. Present in a clear and thorough manner and in sufficient detail to show kind, size, arrangement, and function of components, materials and devices, and compliance with the Contract Documents.
 4. Index with labeled tab dividers in an orderly manner.
- E. Timeliness: 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 PCM's receipt of submittal.
 2. The PCM will act upon the CONTRACTOR's submittal and transmit the response to the CONTRACTOR not later than 21 days after receipt, unless otherwise specified.
 3. Resubmittals will be subject to the same review time.
 4. No adjustment of contract times or price will be allowed due to delays in the progress of the work caused by rejection and subsequent resubmittals.
- G. Resubmittals: Clearly identify each correction or change made.
- H. Incomplete submittals:
 1. The PCM will return the entire submittal for CONTRACTOR's revision if a preliminary review deems it incomplete.
 2. When any of the following are missing, submittal shall be deemed incomplete:
 - a. The CONTRACTOR's review stamp, completed and signed.
 - b. Transmittal of the CONTRACTOR's Submittal, completed and signed.
 - c. Insufficient number of copies.
- I. Submittals not required by the Contract Documents:
 1. Will not be reviewed and will be returned stamped, "Not Subject to Review."

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2. The PCM will keep one copy and return all remaining copies to the CONTRACTOR.

1.03 ACTION SUBMITTALS

- A. Prepare and submit Action Submittals required by individual Specification sections.
- B. Shop Drawings:
 1. Copies: Six
 2. 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.
 3. Manufacturer's Standard Schematic Drawings 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.
 4. Product Data: Provide as specified in individual Specification sections.
 5. Foreign Manufacturers: When proposed, include following additional information:
 - a. Names and addresses of at least two companies that maintain technical service representatives close to the 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 Specification section.
 - b. Prepared from same materials to be used for the Work.
 - c. Cured and finished in manner specified.
 - d. Physically identical with product proposed for use.

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- D. Action Submittal Dispositions: PCM will review, mark, stamp as appropriate and distribute marked up copies as noted:
1. **No Exceptions Taken:**
 - a. CONTRACTOR may incorporate product(s) or implement Work covered by submittal.
 - b. Distribution:
 - 1) One copy retained by the PCM.
 - 2) One copy furnished to the City Inspector.
 - 3) One copy retained in CITY'S Project file.
 - 4) Remaining copies returned to CONTRACTOR appropriately annotated.
 2. **Note Comments:**
 - a. CONTRACTOR may incorporate product(s) or implement Work covered by submittal, in accordance with ENGINEER'S notations.
 - b. Distribution:
 - 1) One copy retained by the PCM.
 - 2) One copy furnished to the CITY Inspector.
 - 3) One copy retained in CITY'S Project file.
 - 4) Remaining copies returned to CONTRACTOR appropriately annotated.
 3. **Resubmit:**
 - a. Make corrections or obtain missing portions, and resubmit.
 - b. Except for portions indicated, may begin to incorporate product(s) or implement Work covered by submittal, in accordance with ENGINEER'S notations.
 - c. Distribution:
 - 1) One copy retained by the PCM.
 - 2) One copy furnished to the CITY Inspector.
 - 3) One copy retained in CITY's Project file.
 - 4) Remaining copies returned to CONTRACTOR appropriately annotated.
 4. **Rejected:**
 - a. CONTRACTOR may not incorporate product(s) or implement Work covered by submittal.
 - b. Distribution:
 - 1) One copy retained by the PCM.
 - 2) One copy furnished to the CITY Inspector.
 - 3) One copy retained in CITY'S Project file.
 - 4) Remaining copies returned to CONTRACTOR appropriately annotated.
 5. Not Subject to Review: Information received is not required by the Contract.

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1.04 INFORMATIONAL SUBMITTALS

A. General:

1. Copies: Submit 3 copies, unless otherwise indicated in individual Specification section.
2. Refer to individual Specification sections for specific submittal requirements.
3. The PCM will review each submittal. If submittal meets conditions of the Contract, The PCM will forward copies to appropriate parties. If the PCM determines that the submittal does not meet conditions of the Contract and is therefore considered unacceptable, the PCM will retain one copy and return remaining copies with 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 sections.

6. Manufacturer's Certificate of Compliance: In accordance with Section 01640, Manufacturers' Services.

7. Manufacturer's Certificate of Proper Installation: In accordance with Section 01640, Manufacturers' 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 or load diagram, if applicable.
5. Calculations.

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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 or published information that documents manufacturer's recommendations, guidelines, and procedures in accordance with individual Specification sections.
- H. Operation and Maintenance Data: As required in Section 01430, Operation and Maintenance Data.
- I. Schedules:
1. Schedule of Shop Drawing and Sample Submittals: Prepare separately or in combination with Construction Schedule as specified in Section 01311, Construction Schedules.
 - 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 PCM including reviewing and processing time.
 - b. On a monthly basis, submit an updated schedule to the PCM 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 01311, Construction Schedules.
 4. Progress Schedules: In accordance with Section 01311, Constructions Schedules.
- J. Special Guarantee: Supplier's written guarantee as required in individual Specification sections.
- K. 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 Sub, trade, Specialist, consultant, installer, and other professionals.
- L. 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 PCM one copy of correspondence and transmittals (to include enclosures and attachments) between the CONTRACTOR and governing agency.
- M. 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.

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- b. Date of test, Project title and number, and name and signature of authorized person.
 - c. Test results.
 - d. If test or 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 referenced standard or code.
 - f. Date issued, testing laboratory name, address, and telephone number, and name and signature of laboratory inspector.
 - g. If test or 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.
- N. Testing and Startup Data: In accordance with Section 01810, Equipment Testing and Facility Startup.
- O. Training Data: In accordance with Section 01640, Manufacturers' Services.
- 1.05 SUPPLEMENTS
- A. The supplement listed below, following "END OF SECTION," is part of this Specification.
 - 1. Forms: Transmittal of CONTRACTOR's Submittal.
- 1.06 CONTRACTOR CORRESPONDENCE
- A. The CONTRACTOR shall submit selected construction related correspondence. During the pre-construction meeting, the CONTRACTOR shall be instructed by the PCM (phone 954-828-5071) 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. RFIs
 - 2. CCIRs
 - 3. Daily Reports

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1.07 SUPPLEMENTS

A. The supplement listed below, following "END OF SECTION," is part of this specification.

1. Forms: Transmittal of CONTRACTOR's Submittal.

1.08 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 PCM 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

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The 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)

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SECTION 01311
CONSTRUCTION SCHEDULES

PART 1 -- GENERAL1.01 SUBMITTALS

- A. The CONTRACTOR shall provide a detailed Construction Schedule showing the CONTRACTOR's plan for completing the Work as required by the Contract Documents within the contract completion time. The format of the schedule shall be a bar chart (Gantt Chart). The schedule shall include the time from the date on the Notice to Proceed to the date for final completion. The date for final completion can be less than or equal to the date calculated from the contract time.
- B. The CONTRACTOR's Construction Schedule shall show activities including, but not limited to the following:
1. Notice to Proceed
 2. Permits (Application preparation, submittal and review)
 3. Submittals, with review time
 4. Early procurement activities for long lead equipment and materials
 5. Mobilization summary
 6. Initial site work
 7. Specified Work sequences and construction constraints
 8. Major structural, mechanical, equipment, electrical, architectural, and instrumentation and control Work.
 9. The work required by the contract and not covered in the previous items
 10. Access restrictions to CITY facilities, roadways or private property
 11. System startup summary
 12. Contract Milestone and Completion Dates
 13. Substantial Completion
 14. Project closeout summary
 15. Demobilization summary
 16. Final Completion
- C. The CONTRACTOR shall show the duration and sequences of activities required for complete performance of the Work reflecting means and methods chosen by the CONTRACTOR.
- D. The procedure for approval of the Construction Schedule is as follows:
1. The CONTRACTOR shall submit a Preliminary Construction Schedule within fourteen (14) days after Notice to Proceed.
 2. The CITY shall provide comments within ten (10) working days of receipt of the Preliminary Construction Schedule.

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3. The CONTRACTOR shall address the CITY's comments and submit the initial Construction Schedule within ten (10) working days after receiving CITY review comments.
 4. After the CITY accepts the initial Construction Schedule, it will be used to track the Work. The Construction Schedule will be submitted to CITY Management, residents and entities having jurisdiction in or near the project area, as appropriate.
 5. The CONTRACTOR shall provide for each Construction Schedule submission four (4) legible color copies, or one emailed copy in PDF.
 6. For unacceptable Construction Schedule Submittals the CONTRACTOR shall make requested corrections and resubmit within seven (7) days.
- E. The CONTRACTOR shall update the schedule periodically to depict the progress of the work. Updated schedules will be required:
1. For every progress meeting
 2. At the written request of the CITY

The CONTRACTOR shall not change the completion time or other key durations in updated schedules without providing a written explanation to the CITY and obtaining written approval for the change from the CITY. The CONTRACTOR shall not provide an updated schedule showing a completion time greater than the contract time. Approved change orders are required to move the contract time, and the completion time shall not exceed the approved contract time. If it is absolutely necessary to show non approved adjustments to the completion time, non-approved adjustments shall be shown as additional lines in the Gantt Chart below and separate from the approved progress schedule. In addition, the CONTRACTOR shall add the heading, "Non Approved Adjustments" above the lines added to the Gantt Chart. Despite being shown on the schedule, non-approved adjustments shall not be construed to indicate approval of a change to the project completion time.

- F. If the CONTRACTOR fails to complete an activity by its latest scheduled completion date and this failure is anticipated to extend Contract Times (or Milestones), the CONTRACTOR shall, within seven (7) days of such failure, submit a written statement as to how the CONTRACTOR intends to correct nonperformance and return to acceptable current progress schedule. Actions by the CONTRACTOR to complete the Work within Contract Times (or Milestones) will not be justification for adjustment to Contract Price or Contract Times.
- G. If the progress of the Work does not appear sufficient to complete the work within the contract time, the CONTRACTOR shall provide a recovery schedule at the request of the CITY. The recovery schedule shall show completion within the contract time and shall include descriptions of the changes the CONTRACTOR will make to meet the contract completion time.
- 1.02 APPROVED CONSTRUCTION SCHEDULE
- A. When accepted by the CITY, the initial Construction Schedule will replace the Preliminary Construction Schedule. Subsequent revisions will be considered as Updated Construction Schedules.

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1.03 CONSTRUCTION SCHEDULE – FORMAT

- A. General: The Progress Schedule shall be a bar chart (Gantt Chart). Computer generated schedules are preferred, but hand drawn schedules are acceptable as long as the appearance is very similar for all submitted schedules and updates.
- B. The Construction Schedule and Updates shall:
1. Show days as the unit of measure
 2. Show all project-related activities reasonably required to complete the Work
 3. Show interdependence and sequence of construction
 4. Identify the Work of separate stages and other logically grouped activities, and clearly identify critical path of activities.
- C. For submittal of Construction Schedules and Updates, the CONTRACTOR shall:
1. Provide the schedule printed on paper not greater than 11 inches by 17 inches or smaller than 8 1/2 inches by 11 inches, unless otherwise approved. If necessary, the schedule shall be printed in color.

Include a title block on each page of the schedule showing the name of the Project, CITY, date submitted, revision or update number, and the name of the scheduler. Updated schedules shall indicate the current data date. If the schedule has more than one page, all pages shall be numbered.
 2. Identify horizontally across top of the schedule the timeframe by year, month, and day.
 3. Identify each activity with a descriptive title. If necessary, the CONTRACTOR shall add notes at the bottom of the schedule with brief descriptions of the Work associated with that activity.
 4. Indicate the critical path on the schedule.
 5. Provide notes below the bar chart schedule to describe any controlling relationships between activities.
 6. Plot activities on a time-scaled basis, with the length of each activity proportional to the current estimate of the duration.
 7. Provide a legend to describe standard and special symbols used.

1.04 CONSTRUCTION SCHEDULE UPDATES

- A. Updated Construction Schedules Shall Reflect:
1. Progress of Work to within two (2) working days prior to submission
 2. Approved changes in Work scope and activities modified since the schedule or last update was accepted.
 3. Delays in Submittals or resubmittals, deliveries, or Work
 4. Adjusted or modified sequences of Work
 5. Other identifiable changes
 6. Revised projections of progress and completion
- B. The CONTRACTOR shall produce detailed sub-schedules during the Project, upon request of the CITY to further define critical portions of the Work such as facility shutdowns.

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- C. The CONTRACTOR shall produce a highlighted 4-week Look Ahead Schedule for construction meetings as determined by the CITY, with schedule information compiled from the latest DETAILED PROGRESS SCHEDULE update.
- D. CITY may direct the CONTRACTOR to increase plant, equipment, labor force or working hours if CONTRACTOR fails to:
 - 1. Complete a Milestone activity by its completion date.
 - 2. Satisfactorily execute Work as necessary to prevent delay to overall completion of Project, at no additional cost to CITY.

1.05 SCHEDULE ACCEPTANCE

- A. The CITY's Acceptance will demonstrate agreement that:
 - 1. The proposed schedule is accepted with respect to:
 - a. Contract Times, including Final Completion and all intermediate Milestones are within the specified times.
 - b. Specified Work sequences and constraints are shown as specified.
 - c. Specified CITY-furnished Equipment or Material arrival dates, or range of dates, are included.
 - d. Access restrictions are accurately reflected.
 - e. Start-up and testing times are as specified.
 - f. Submittal review times are as specified.
 - g. Startup testing duration is as specified and timing is acceptable
 - 2. In all other respects, CITY's acceptance of the CONTRACTOR's schedule indicates that, in the CITY's judgment, the schedule represents a reasonable plan for constructing the Work in accordance with the Contract Documents. The CITY's review will not make any change in the Contract requirements. Lack of comment on any aspect of schedule that is not in accordance with the Contract Documents will not indicate acceptance of that change.
 - 3. The Schedule remains the CONTRACTOR's responsibility and the CONTRACTOR retains responsibility for performing all activities, for activity durations, and for activity sequences required to construct the Work in accordance with the Contract Documents.

PART 2 -- PRODUCTS (Not Used) PART

3 -- EXECUTION (Not Used)

END OF SECTION

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**SECTION 01500
CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS**

PART 1 - GENERAL**1.01 REFERENCES**

A. The following is a list of standards which may be referenced in this Section:

1. American Association of Nurserymen: American Standards for Nursery Stock.
2. U.S. Weather Bureau, "Rainfall-Frequency Atlas of the U.S. for Durations from 30 Minutes to 24 Hours and Return Periods from 1 to 100 Years."
3. U.S. Department of Agriculture, "Urban Hydrology for Small Watersheds."
4. Federal Emergency Management Agency.
5. NFPA, National Fire Prevention Standard for Safeguarding Building Construction Operations.
6. Florida Department of Law Enforcement – Domestic Terrorism Task Force for Code Orange Conditions.

1.02 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. Access Roads: Routes, cross-sections, and drainage facilities.
 - b. Parking area plans.
 - c. CONTRACTOR's field office, storage yard, and storage building plans, including gravel surfaced area.
 - d. Fencing and protective barrier locations and details.
 - e. Staging area location plan and permits as required.
 - f. Maintenance of Traffic (MOT) Plans: As specified herein, and proposed revisions thereto.
 - g. Plan for maintenance of existing sanitary sewer and potable water services and systems.

1.03 MOBILIZATION

A. Mobilization includes, but not be limited to:

1. Obtaining required permits.
2. Moving CONTRACTOR's field office and equipment required for operations onto site.
3. Installing temporary construction power, wiring, and lighting facilities.
4. Providing onsite communication facilities as required.
5. Providing onsite sanitary facilities and potable water facilities as specified and as required by Laws and Regulations, and governing agencies.

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6. Arranging for and erection of CONTRACTOR's work and storage yard.
 7. Posting OSHA required notices and establishing safety programs and procedures.
 8. Having CONTRACTOR's superintendent at site full time.
- B. CONTRACTOR is responsible for finding a suitable location for a project staging and material storage area, as required.
- C. CONTRACTOR is responsible for finding a suitable location for the project field office as well as the ENGINEER'S field office if required by the project. Field offices may be stand-alone facilities or suitable, existing commercial office space.

1.04 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.

1.05 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.

1.06 VEHICULAR TRAFFIC

- A. Maintenance of Traffic Plans (MOTs):
1. Adhere to MOTs reviewed and accepted by the PCM, and approved by the appropriate agency. Changes to this plan shall be made only by written approval of appropriate public authority and the PCM. 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: CONTRACTOR shall be prepare and submit MOTs where required by federal, state, county, or local agencies having jurisdiction. CONTRACTOR shall obtain all required approvals and permits associated with the MOTs.
1. Temporary traffic control on City streets shall utilize barrels in lieu of folding barricades. CONTRACTOR is to submit a sample or detail of proposed barrel to be used as part of the MOT submittal.
 2. CONTRACTOR shall submit copies of all MOT's to the CITY concurrent with submittal to the approving authority.
 3. CONTRACTOR shall submit three copies of the agency-approved MOT prior to initiation of construction or as required by specific permits contained herein.
 4. All MOTs shall be ATS certified.

1.07 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 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.
 7. Thirty days prior to the beginning of construction the CONTRACTOR shall notify the Transit Superintendent at the Broward county Mass Transit Division, (954) 357-8381, to arrange a pre-construction -

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transit route/pedestrian access safety meeting. This meeting is to determine all bus routes affected and to make any necessary arrangements for rerouting and temporary signing.

PART 2 - PRODUCTS

2.01 PROJECT SIGN

- A. Refer to attached Project Sign Detail, provided as a supplement to this Section.
- B. Two required; placement as directed by OWNER.

PART 3 - EXECUTION

3.01 TEMPORARY UTILITIES

- A. Power:
 - 1. Electric power will be available at or near site. Determine type and amount available and make arrangements for obtaining temporary electric power service, metering equipment, and pay all costs for the electric power used during contract period, except for portions of the Work designated in writing by Engineer as substantially complete.
 - 2. Cost of electric power used in performance and acceptance testing will be borne by CONTRACTOR.
- B. Lighting: Provide temporary lighting to meet all applicable safety requirements to allow erection, application, or installation of materials and equipment, and observation or inspection of the Work.
- C. 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.
- D. Water:
 - 1. Hydrant Water:
 - a. Is available from nearby hydrants. Secure written permission for

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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.
- E. Sanitary and Personnel Facilities: Provide and maintain facilities for CONTRACTOR's employees, Subcontractors, and all other onsite employer's employees. Service, clean, and maintain facilities and enclosures.
- F. 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).

3.02 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 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 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 CONTRACTOR .
8. Notify property owners and utility offices that may be affected by construction operation at least 5 working days in advance.
 - a. All homes and businesses affected by construction activities shall be notified by use of a "doorhanger" type announcement describing at a minimum, the nature of the Work, the proposed schedule and the CONTRACTOR's contact information. An

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example doorhanger is provided as a supplement to this Section.

- 1) The doorhangers shall be attached to the door, fence or other suitable location.
 - 2) The doorhanger shall be enclosed in an 8-½ -inch by 11-inch, weather resistant clear plastic bag with the notification information clearly visible from the outside.
- b. Before exposing a utility, obtain utility OWNER's permission. Should service of utility be interrupted due to 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.
 - a. Online communication of existing or temporary signalization shall be maintained by interconnect cable or phone lines during construction.
 - b. A time based coordination (TBC) system may be used only if either of the above is not feasible. TBC systems shall be developed by a traffic engineer registered in the State of Florida subject to County approval.
 - c. All reported malfunctions of traffic control systems shall be responded to by the CONTRACTOR within 2 hours and repaired within 24 hours.
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 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

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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.
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 for water treatment plant sites will be delivered through the central depot.
 - 2) All packages shall have the name of a CONTRACTOR's employee stationed at the jobsite.
 - 3) All delivery drivers shall have suitable photo identification and will be required to go through security procedures.
 - 4) 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

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conditions. No access by CONTRACTOR or subcontractor personnel will be permitted until clearance has been granted by the OWNER.

D. Barricades 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.
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 PCM.
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 PCM 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. Replace those removed in a condition equal to or better than original.

G. Finished Construction: Protect finished floors and concrete floors exposed as well as those covered with composition tile or other applied surfacing.

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- H. Waterways: Keep ditches, culverts, and natural drainages continuously free of construction materials and debris.
- I. 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.

3.03 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 nonstorm 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 CITY'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.

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- 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 stormdrains, including discharge from dewatering systems, will not be permitted without the installation of a sediment removal system approved by the OWNER.
1. The CONTRACTOR shall be responsible for maintaining all erosion and sediment control facilities to insure that they continue to function as intended and do not create a health or environmental hazard.
 2. In the event of expected precipitation events, the CONTRACTOR shall remove all erosion or sediment barriers blocking CITY drains or inlets.
 3. All sediment barriers installed on City drains and inlets shall be removed immediately upon installation of the final pavement and cleanup.

3.04 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.

3.05 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 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

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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 detours and other operations affecting traffic and access. Provide at least 72 hours' notice to PUBLIC WORKS DIRECTOR 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.

3.06 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.

3.07 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. 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.
 - 2. At least 75 percent of all roadways shall have a maintained trench surface as described below at all times during the project.
 - 3. Construction in affected roadways shall be completed in sequence so that all improvements are completed, except for final pavement restoration during one continuous period. This includes water and sewer services to the edge of the right-of-way.
- 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.

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- 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 2 hours, provide written notice to each OWNER so affected 3 days prior to such closure. In such cases, closings of up to 4 hours may be allowed. Closures of up to 10 hours may be allowed if a week's written notice is given and undue hardship does not result.
- F. CONTRACTOR shall submit MOT forms and/or applications as required by the agency with jurisdiction. The Temporary Modification of Traffic Form provided as a supplement to this Section shall be submitted to the PCM 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 CONTRACTOR obtains written permission from 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. Maintain top of backfilled trenches, before they are paved, to allow normal vehicular traffic to pass over.
1. Trench maintenance will consist of compacted sub-base with asphalt prime, temporary asphalt, or flowable fill as described in Section 02575, Surface Restoration.
 2. Provide temporary access driveways where required.
 3. Cleanup operations shall follow immediately behind backfilling.
 4. Watering of untreated backfill shall be utilized to control dust as directed by the ENGINEER until such time as adequate trench maintenance has been achieved.
- J. 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.
- K. 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 CONTRACTOR's night emergency telephone numbers to police department.
- L. 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.
- M. Remove or relocate barricades on designated trash collection days to allow

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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.

N. 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 ENGINEER may permit.

O. 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.

P. Coordinate traffic routing with that of others working in same or adjacent areas.

3.08 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 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 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.

3.09 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. At least weekly, sweep all floors (basins, tunnels, platforms, walkways, sidewalks, driveways, roof surfaces), and pick up all debris and dispose.

C. Provide approved containers for collection and disposal of waste materials, debris, and rubbish. At least at weekly intervals, dispose of such waste

CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS

01500-13

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materials, debris, and rubbish offsite.

- D. 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.
- B. Sign Dimensions:
1. The project sign shall be dimensioned as shown on the Drawings.
 2. The staging area sign shall be limited to overall dimensions of 48 inches by 48 inches.

3.11 SUPPLEMENTS

- A. The supplements listed below, following "END OF SECTION," are part of this Specification.
1. Supplement - 1, Project Sign Detail, (2 required).
 2. Supplement - 2, Staging Area Sign Detail.
 3. Supplement - 3, Temporary Modification of Traffic (MOT) Routing Form.
 4. Supplement - 4, Door Hanger Notification Template.

END OF SECTION

ORDINANCE NO. C-02-

AN ORDINANCE AMENDING THE UNIFIED LAND DEVELOPMENT REGULATIONS OF THE CITY OF FORT LAUDERDALE, FLORIDA, AMENDING SECTION 47-19.2, ACCESSORY BUILDINGS AND STRUCTURES, GENERAL, TO ADD A NEW SUBSECTION ENTITLED "CONSTRUCTION STAGING AREAS" TO PERMIT PROPERTY TO BE USED AS A STAGING AREA IN CONNECTION WITH PUBLIC CONSTRUCTION PROJECTS AS A TEMPORARY USE IN ANY ZONING DISTRICT AND PROVIDING REQUIREMENTS AND A PROCESS FOR REVIEW, APPROVAL AND TERMINATION OF APPROVAL.

BE IT ORDAINED BY THE CITY COMMISSION OF THE CITY OF FORT LAUDERDALE, FLORIDA:

SECTION 1. That Section 47-19.2, Accessory buildings and structures, general, of the Unified Land Development Regulations (hereinafter referred to as "ULDR") of the City of Fort Lauderdale, Florida, is hereby amended to add a new subsection FF as follows:

Sec. 47-19.2. Accessory buildings and structures, general

FF. 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 materials shall include the parking and 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 Section 47-24,

C-02-

Development Permits and Procedures, include the following:

- a. A description and sketch dimensioned to scale of the proposed use of the subject property as a construction staging 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 sign and 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 stating that the property owner shall consent to the temporary use of the property for construction staging as provided in the temporary construction permit application and acknowledging 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, shall be erected around the

- perimeter of the site. The fence shall have a minimum height of 6.5 feet and a maximum height of 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 sign 16 square feet in size adjacent to the street, clearly visible from the right-of-way identifying the project by name, the name of the contractor, and the engineer responsible for construction management, and shall provide 24-hour phone contact information.
- 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 areas 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

- perimeter of the site. The fence shall have a minimum height of 6.5 feet and a maximum height of 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 sign 16 square feet in size adjacent to the street, clearly visible from the right-of-way identifying the project by name, the name of the contractor, and the engineer responsible for construction management, and shall provide 24-hour phone contact information.
- 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 areas 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 Section 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.

A recommendation from both entities 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 Section 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 Section 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 Section 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 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 FF. 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.

SECTION 2. That Table 1 of Section 47-24, Development Permits and Procedures, is hereby amended to add "public project construction staging area" as a Site Plan Level I review, as shown on the Exhibit attached hereto and made a part hereof.

ORDINANCE NO. C-02-

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SECTION 3. That if any clause, section or other part of this Ordinance shall be held invalid or unconstitutional by any court of competent jurisdiction, the remainder of this Ordinance shall not be affected thereby, but shall remain in full force and effect.

SECTION 4. That all ordinances or parts of ordinances in conflict herewith, be and the same are hereby repealed.

SECTION 5. That this Ordinance shall be in full force and effect ten days from the date of final passage.

PASSED FIRST READING this the _____ day of _____, 2002.
PASSED SECOND READING this the _____ day of _____, 2002

Mayor
JIM NAUGLE

ATTEST

City Clerk
LUCY MASLIAH

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C-02-

Chart 3

SECTION 47-24. DEVELOPMENT PERMITS AND PROCEDURES

TABLE 1. DEVELOPMENT PERMITS AND PROCEDURES

Permit	Department	Development Review Committee	Planning & Zoning Board (Local Planning Agency)	Historic Preservation Board	City Commission	Board of Adjustment	Criteria for Review
CENTRAL BEACH AREA DISTRICTS - see Section 47-12 and other regulations provided in this Table 1.	--	--	--	--	--	--	1. Adequacy Review Sec. 47-25.2 2. Neighborhood Compatibility Review Sec. 47-25.3
SITE PLAN-LEVEL I DEPARTMENT							
1. Sidewalk cafe	DP		A		CRR/PZ		1. Adequacy Review Sec. 47-25.2 2. Outdoor Uses, Sidewalk Cafe Sec. 47-19.9
2. Mobile vendor	DP		A		CRR/PZ		1. Adequacy Review Sec. 47-25.2 2. Mobile Vendor, Sec. 47-18.22
3. Residential-less than 5 units	DP		A		CRR/PZ		Adequacy Review Sec. 47-25.2
4. New nonresidential construction-5,000 square feet or less	DP		A		CRR/PZ		Adequacy Review Sec. 47-25.2
5. Modification of waterway lot widths in RS-4.4 & RS-8 Districts	DP		A		CRR/PZ		1. Adequacy Review Sec. 47-25.2 2. Modification of Lot Width, Sec. 47-23.10
6. Change of use-different operation but does not involve development which requires a Site Plan Level II or higher permit-See Sec. 47-3.5.B.a	DP		A		CRR/PZ or Dept.		Nonconforming Uses, Section 47-3

7. Reuse of nonconforming structure	DP		A		CRR/PZ or Dept.		1. Adequacy Review Sec. 47-25.2, and 2. Neighborhood Compatibility Review Sec. 47-25.3 3. Nonconforming Uses, Section 47-3
8. Continuation of nonconforming status	DP		A		CRR/PZ or Dept.		Nonconforming Uses, Section 47-3
9. Approval of off-site parking	DP		A		CRR/PZ or Dept.		Parking and Loading Sec. 47-20.18
10. Temporary Construction Staging	DP				A		Section 47-19.2.FF.
...							
SITE PLAN-LEVEL II DEVELOPMENT REVIEW COMMITTEE							

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TEMPORARY MODIFICATION OF TRAFFIC (MOT) ROUTING FORM

DATE:

APPLICANT/ADDRESS/PHONE:

PERMIT NO. _____ (PROVIDED BY CITY AT TIME OF PERMIT APPLICATION)
--

PROJECT NAME/ADDRESS: _____

- This routing form should be completed and submitted as an attachment to the above-referenced permit (hereinafter "PERMIT").
- Obtaining signatures on this routing form does not constitute any approvals by the City. The MOT may be implemented only after issuance of the PERMIT, subject to satisfaction of all prerequisite conditions.
- This form is for MOT's within rights-of-way under City of Fort Lauderdale's jurisdiction. If the MOT or detour routes affect rights-of-way under Broward County jurisdiction, the County's form (available on the City website) should also be completed with the required signatures and attached. If the detours affect FDOT right-of-way, a permit from FDOT must be attached.
- If work is taking place in County or FDOT RW, an MOT permit is not required from the City. However, PERMIT applicant (hereinafter APPLICANT) is asked to provide two weeks advance notice of any closures or detours to the City's Public Information Office.

Specific dates and times requested for MOT implementation:

Begin _____ End _____

Describe Work, including location of site and address, names of affected streets, why MOT is necessary, nature of the construction, deliveries, staging areas, if cranes will be used, etc. (staging and storage of materials/equipment are not permitted in the right-of-way). Please note if additional sheets have been attached for the description of work.

Describe MOT, the number of lanes affected on each street, if metered parking spaces will be displaced, if detours are necessary, if flagmen will be provided, if MOT will be full-time (or times of day the MOT is to be in effect) and any other special considerations related to this request. Please note if additional sheets have been attached for the description of MOT.

Attach: MOT plan prepared by a certified worksite traffic control technician or traffic control supervisor (as appropriate for the complexity of the job), with a copy of current certification.

If implementation of an approved PERMIT is found to adversely affect public safety and/or public convenience or there is a conflict with a higher public purpose, the APPLICANT may be required to modify the MOT plan or the PERMIT may be temporarily suspended or permanently revoked at any time with reasonable notice from the City.

The MOT plan shall be in accordance with provisions of the latest edition of Part IV of the Manual of Uniform Traffic Control Devices for Streets and Highways and FDOT Design Standards. Compliance with the requirements of the approved plan shall be the responsibility of the APPLICANT.

(APPLICANT)

(Print Name/Title)

As a consideration for the permission granted herein, _____ (APPLICANT) agrees to indemnify and hold harmless the City of Fort Lauderdale for any damages, claims or injuries that may result from the MOT plan approved under the PERMIT.

(Name of Company)

By: _____
(Company Officer, President, or Authorized Agent)

Rev. 6-8-12

Project Name: _____ **PERMIT NUMBER:** _____

Applicant should collect the signatures in this section (if required). To expedite processing, signatures may be requested concurrently via fax or pdf and provided on separate copies of this page.

(Date)

Police Department (Patrol Secretary Office)
(Required only if MOT includes a detour for any direction of travel)
1300 West Broward Boulevard
Tel.: (954) 828-5477 (call for appointment)

(Date)

Fire-Rescue Department
(Required only if MOT includes a detour for any direction of travel)
Bill Findland, Assistant Chief
528 NW 2nd Street
Tel.: (954) 828-4351 (call for appointment); Fax: (954) 828-6843

(Date)

Maj Shakib/ Studies Section
(Required only if MOT/detour affects County road or intersection)
2300 W. Commercial Boulevard
(Please call (954) 847-2655 for appt. Walk-ins NOT accepted)

After above signatures are collected, Applicant should forward the MOT Plan and this routing form to the person listed below.

(Date)

Transportation and Mobility
Heslop Daley, Project Engineer
290 NE 3rd Avenue
Tel: (954) 828-5734 Fax: (954) 828-3734

City Manager's signature to be requested by City Staff only (if signature is required)

(Date)

City Manager's Office
Lee R. Feldman, ICMA-CM, City Manager
100 N. Andrews Avenue, 7th Floor
Tel.: (954) 828-5013 or Fax: (954) 828-5121

A copy of the PERMIT, this routing form and MOT shall be kept on-site and made available to the City inspector at all times.

This form is for MOT plans associated with private utility projects and private development projects. MOT plans for City Capital Improvement Projects shall be coordinated through Engineering Inspection or the Project Manager. Traffic modifications required for special events shall be arranged through the City's Special Events Coordinator, Jeff Meehan at (954) 828-6705.

**SECTION 01590
PROJECT 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.

City of Fort Lauderdale

Keeping the Ocean in the Ocean
Bringing Drier Streets to Hendricks Isle

What's Happening?
The City of Fort Lauderdale is combating poor roadway drainage resulting from seasonal high tides and major rain events.
www.fortlauderdale.gov

Benefits 5,000 Neighbors

- Improved vehicular access during high tide and rain events
- Better drainage of roadway
- Enhanced neighborhood

Cost
\$20,000

Completion
August 2013

Contractor
ABC Company

We're Working On:

- Installing interconnected underground catch basins
- Cleaning existing drainage pipes, including the outfall pipes
- Removing and replacing the concrete valley gutters that transport water to the catch basins
- Installing drainage valves to help alleviate flooding from high tides

Fort Lauderdale City Commission

John P. "Jack" Seiler Mayor	Bruce G. Roberts Vice Mayor, District I	Dean J. Tranfalis Commissioner, District II	Bobby B. DuBose Commissioner, District III	Romney Rogers Commissioner, District IV	Lee R. Feldman, ICMA-CM City Manager
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END OF SECTION

RIVER OAKS STORMWATER PRESERVE

Project No. 11419

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SECTION 01780
CONTRACT CLOSEOUT

PART 1 GENERAL1.01 SUBMITTALS

A. Informational Submittals:

1. Submit prior to application for final payment.
 - a. Record Documents.
 - b. Special Bonds, Special Guarantees, and Service Agreements.
 - c. Consent of Surety to Final Payment.
 - d. Releases or Waivers of Liens and Claims.
 - e. Releases from Agreements.
 - f. Final Application for Payment: Submit in accordance with procedures and requirements stated in Section 01025, Measurement and Payment.
 - g. Spare Parts, Special Tools and 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 CITY.
4. Form is attached as a Supplement to this Section.

1.02 RECORD DOCUMENTS

A. Quality Assurance:

1. Furnish qualified and experienced person, whose duty and responsibility shall be to maintain record documents.
2. Accuracy of Records:
 - a. Coordinate changes within record documents, making legible and accurate entries on each sheet of Drawings and other documents where such entry is required to show change.
 - b. Purpose of Project record documents is to document factual information regarding aspects of the Work, both concealed and visible, to enable future modification of the Work to proceed without lengthy and expensive site measurement, investigation, and examination.
3. Make entries within 24 hours after receipt of information that a change in the Work has occurred.

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Prior to submitting each request for progress payment, request CITY's review and approval of current status of record documents. Failure to properly maintain, update, and submit record documents may result in a deferral by CITY to recommend whole or any part of CONTRACTOR's Application for Payment, either partial or final.

1.03 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 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 CITY of the reasons.
 - 2. OWNER or its representatives will examine the site, and OWNER will direct CONTRACTOR to complete the Work that may be necessary to satisfy terms of the side agreement or special easement.
 - 3. Should CONTRACTOR refuse to perform this Work, OWNER reserves right to have it done by separate contract and deduct cost of same from Contract Price, or require CONTRACTOR to furnish a satisfactory Bond in a sum to cover legal claims for damages.
 - 4. When 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) 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 CONTRACTOR has failed to fulfill terms of side agreement or special easement, or (ii) CONTRACTOR is unable to contact or has had undue hardship in contacting grantor.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 MAINTENANCE OF RECORD DOCUMENTS

- A. General:
 - 1. Promptly following commencement of Contract Times, secure from ENGINEER at no cost to CONTRACTOR, one complete set of Contract Documents. Drawings will be full size.
 - 2. Delete ENGINEER title block and seal from all documents.

Project No. 11419

3. Label or stamp each record document with title, "RECORD DOCUMENTS," in neat large printed letters.
 4. Record information concurrently with construction progress and within 24 hours after receipt of information that change has occurred. Do not cover or conceal Work until required information is recorded. CONTRACTOR is responsible for providing "red-lined" markups of all changes including revised locations of buried features.
 5. CONTRACTOR shall provide original signed and sealed "as-built" drawings and electronic copies of the new pump station and sanitary sewer upon completion of construction. He shall employ a professional land surveyor licensed in the state of Florida. All work shall be in accordance with City of Fort Lauderdale surveying standards and per NAVD 88.
- B. Preservation:
1. Maintain documents in a clean, dry, legible condition and in good order. Do not use record documents for construction purposes.
 2. Make documents and Samples available at all times for observation by PCM or ENGINEER.
- C. Making Entries on Drawings:
1. Using an erasable colored pencil (not ink or indelible pencil), clearly describe change by graphic line and note as required.
 - a. Color Coding:
 - 1) Green when showing information deleted from Drawings.
 - 2) Red when showing information added to Drawings.
 - 3) Blue and circled in blue to show notes.
 2. Date entries.
 3. Call attention to entry by "cloud" drawn around area or areas affected.
 4. Legibly mark to record actual changes made during construction, including, but not limited to:
 - a. Depths of various elements of foundation in relation to finished first floor data if not shown or where depth differs from that shown.
 - b. Horizontal and vertical locations of existing and new Underground Facilities and appurtenances, and other underground structures, equipment, or Work. Reference to at least two measurements to permanent surface improvements.
 - c. Location of internal utilities and appurtenances concealed in the construction referenced to visible and accessible features of the structure.
 - d. Locate existing facilities, piping, equipment, and items critical to the interface between existing physical conditions or construction and new construction.

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- e. Changes made by Addenda and Field Orders, Work Change Directive, Change Order, Written Amendment, and ENGINEER'S written interpretation and clarification using consistent symbols for each and showing appropriate document tracking number.
5. Dimensions on Schematic Layouts: Show on record drawings, by dimension, the centerline of each run of items such as are described in previous subparagraph above.
 - a. Clearly identify the item by accurate note such as "cast iron drain," "galv. water," and the like.
 - b. Show, by symbol or note, vertical location of item ("under slab," "in ceiling plenum," "exposed," and the like).
 - c. Make identification so descriptive that it may be related reliably to Specifications.

3.02 FINAL CLEANING

- A. At completion of the Work or of a part thereof and immediately prior to CONTRACTOR's request for certificate of Substantial Completion; or if no certificate is issued, immediately prior to CONTRACTOR's notice of completion, clean entire site or parts thereof, as applicable.
 1. Leave the Work and adjacent areas affected in a cleaned condition satisfactory to OWNER and PCM.
 2. Remove grease, dirt, dust, paint or plaster splatter, stains, labels, fingerprints, and other foreign materials from exposed surfaces.
 3. Repair, patch, and touch up marred surfaces to specified finish and match adjacent surfaces.
 4. Clean all windows.
 5. Clean and wax wood, vinyl, or painted floors.
 6. Broom clean exterior paved driveways and parking areas.
 7. Hose clean sidewalks, loading areas, and others contiguous with principal structures.
 8. Rake clean all other surfaces.
 9. Replace air-handling filters and clean ducts, blowers, and coils of ventilation units operated during construction.
 10. Leave water courses, gutters, and ditches open and clean.
- B. Use only cleaning materials recommended by manufacturer of surfaces to be cleaned.
- C. Meet all requirements of Section 02575, Surface Restoration.

3.03 SUPPLEMENTS

A. The supplements listed below, following "END OF SECTION," are part of this Specification.

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 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) SUBCONTRACTOR _____

Business Name

Address

Telephone & Fax Nos.

Email Address/Company Website (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

CONTRACT CLOSEOUT

01780 - 1

PROJECT 11419

**SECTION 02015
MOBILIZATION, SITE PREPARATION AND DEMOBILIZATION**

PART 1 - GENERAL1.01 THE REQUIREMENT

- A. The Work specified in this section consists of all Work necessary to move in personnel and equipment and prepare the site for construction, complete and to remove the same personnel and equipment from the site when construction is complete.
- B. The limits of the Contractor's staging area and other applicable restrictions are shown on the Drawings.

PART 2 - PRODUCTS2.01 TEMPORARY UTILITIES

- A. The Contractor shall provide all temporary facilities required for performing the Work as specified in Section entitled "CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS".

PART 3 - EXECUTION3.01 LAYOUT

- A. The Contractor shall set up construction facilities in a neat and orderly manner within designated areas as noted on the Staging Plan drawing of the Contract documents. It shall accomplish all required Work in accordance with applicable portions of these specifications and shall confine its operations to Work areas as shown on the drawings.

3.02 DEMOBILIZATION

- A. At the completion of Work the Contractor shall remove its personnel, equipment, and temporary facilities from the site in a timely manner. The Contractor shall also be responsible for transporting all unused materials belonging to the City to a place of storage on site designated by the City and for removing from the site and disposing of all other materials and debris resulting from the construction. It shall then return all areas used for its activities to a condition as noted on the Contract documents.

END OF SECTION

PROJECT 11419

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PROJECT 11419

**SECTION 02100
EROSION CONTROL, SEDIMENTATION AND CONTAINMENT
OF CONSTRUCTION MATERIALS**

PART 1 - GENERAL1.01 DESCRIPTION

- A. Provide all work and take all measures necessary to control soil erosion resulting from construction operations, prevent flow of sediment from construction site, and contain construction materials (including excavation and backfill) within protected working area as to prevent damage to any stream or wetlands.
- B. A preliminary Stormwater Pollution Prevention Plan (SWPPP) was prepared for permitting purposes on behalf of the City for the Stormwater Improvements [REDACTED] neighborhood project. A copy is included in the Appendices. The SWPPP is preliminary in nature because the Contractor is responsible for creating its own final SWPPP for regulatory approval and enforcing its requirements in accordance with applicable Federal, State, and local regulations. The complete Erosion and Sedimentation Control Plan will be submitted by the Contractor and approved by the Engineer before the start of construction. The Contractor will provide all labor, materials, and equipment required in the prevention of environmental pollution and degradation and thereby for the protection of all environmental resources encountered during construction.

1.02 REFERENCE

- A. "Guidelines for Erosion and Sediment Control, Planning and Implementation" published by the United States Environmental Protection Agency.
- B. "Processes, Procedures and Methods to Control Pollution Resulting from all Construction Activity", published by the United States Environmental Protection Agency.
- C. "The Florida Stormwater, Erosion, and Sedimentation Control Inspector's Manual" published by the Florida Department of Environmental Protection.

1.03 SUBMITTALS

- A. Two weeks prior to the start of the work, submit to Engineer, for review, a plan with detailed sketches showing the proposed methods to be used for controlling erosion during construction.

1.04 QUALITY ASSURANCE

- A. Operations restricted to areas of work indicated on drawings and area which must be entered for construction of temporary or permanent facilities.
- B. Engineer has authority to limit surface area of erodible earth material exposed by clearing and grubbing, excavation, borrow and fill operations and to direct immediate permanent or temporary pollution control measures to prevent contamination of any stream or wetlands, including construction of temporary berms, dikes, dams, sediment

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basins, sediment traps, slope drains, and use of temporary mulches, mats, or other control devices or methods as necessary to control erosion.

PART 2 - PRODUCTS2.01 FILTER BARRIER

- A. A temporary sediment barrier consisting of a filter fabric stretched across and attached to supporting posts and entrenched. The filter barrier shall be constructed of wooden stakes and synthetic filter fabric.
- B. Synthetic filter fabric shall be a pervious sheet of propylene, nylon, polyester, or polyethylene yarn. Synthetic filter fabric shall contain ultraviolet ray inhibitors and stabilizers to provide a minimum of 6 months of expected usable construction life at a temperature range of 0 degree Fahrenheit to 120 degree Fahrenheit.
- C. Stakes for filter barriers shall be 1" x 2" wood (preferred), or equivalent metal with a minimum length of 3 feet (90 cm).
- D. Unless shown differently on the Drawings, the height of a filter barrier shall be a minimum of 15 inches and shall not exceed 18 inches.
- E. Standard strength synthetic filter fabric shall be purchased in a continuous roll and cut to the length of the barrier to avoid the use of joints (and thus improve the strength and efficiency of the barrier).
- F. Filter barriers shall be trenched into the ground a minimum of 6".

PART 3 - EXECUTION3.01 GENERAL

- A. Prior to the start of work, provide and install the site sedimentation and erosion control as indicated on the Drawings and the Contractor prepared SWPPP and as required by applicable regulations. Maintain such system for the duration of the project.
- B. Install baled hay or straw erosion/silt fence checks in all locations as directed, surrounding base of all deposits of stored excavated material outside of disturbed area, and where directed by the Engineer.
- C. Hold bales in place with two 2 in. by 2 in. by 3 ft. stakes so that each bale is butted tightly against adjoining bale thereby precluding short-circuiting of erosion check.
- D. Construct earth berms or diversions to intercept and divert runoff water from critical areas.
- E. Discharge silt-laden water from excavations onto filter fabric mat and/or baled hay or straw sediment traps to ensure that only sediment-free water is returned to watercourses.
- F. Do not place excavated soil material adjacent to watercourse in manner that will cause it to wash away by high water or runoff.

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- G. Prevent damage to vegetation by excessive watering or silt accumulation in the discharge area.
- H. Do not dump soiled material into any streams, wetlands, surface waters, or unspecified locations.
- I. Do not pump silt-laden water from trenches or excavations into surface waters, streams, wetlands, or natural or man-made channels leading thereto.
- J. Prevent damage to vegetation adjacent to or outside of construction area limits.
- K. Do not dispose of trees, brush, debris, paints, chemicals, asphalt products, concrete curing compounds, fuels, lubricants, insecticides, washwater from concrete trucks or hydroseeders, or any other pollutant in streams, wetlands, surface waters, or natural or man-made channels leading thereto, or unspecified locations.
- L. Do not alter flow line of any stream unless indicated or specified.

3.02 FILTER BARRIER INSTALLATION

- A. The stakes shall be spaced a maximum of 3 feet apart at the barrier location and driven securely into the ground a minimum of 8 inches.
- B. A trench shall be excavated approximately 4 inches wide and 4 inches deep along the line of stakes and upslope from the barrier.
- C. The filter material shall be stapled to the wooden stakes, and 8 inches of the fabric shall be extended into the trench. Heavy duty wire staples at least 1/2 inch long, hog rings, or tie wire shall be used. Filter material shall not be stapled to existing trees.
- D. The trench shall be backfilled and the soil compacted over the filter material.

3.03 FILTER BARRIER MAINTENANCE

- A. Silt fences and filter barriers shall be inspected immediately after each rainfall and at least daily during prolonged rainfall. Any required repairs shall be made immediately.
- B. Should the fabric on the filter barrier decompose or become ineffective before the end of the expected usable life and the barrier still be necessary, the fabric shall be replaced promptly.
- C. Sediment deposits should be removed after each storm event. They must be removed when deposits reach approximately one-half the height of the barrier.
- D. Any sediment deposits remaining in place after the silt fence or filter barrier is no longer required shall be dressed to conform with the existing grade, prepared, and seeded.

3.04 CLEANING OF EXISTING DRAINAGE STRUCTURES

- A. All existing drainage catch basins and manholes within the project area shall be cleaned of debris and maintained debris free throughout the construction period.

END OF SECTION

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**SECTION 02110
CLEARING AND GRUBBING****PART 1 - GENERAL**1.01 THE REQUIREMENT

- A. The Contractor shall clear and grub the areas to be occupied by the facilities to be constructed including all areas to be excavated, filled, paved or planted as shown on the Drawings and as specified herein.

1.02 DEFINITIONS

- A. Clearing shall consist of the cutting, removal and satisfactory disposal of all trees, stumps, brush, shrubs, rubbish and any other objectionable material within the designated areas.
- B. Grubbing shall consist of the removal and disposal of all stumps larger than 1-1/2 inches in diameter and other objectionable material to a depth of at least 12 inches below the ground surface.

PART 2 - PRODUCTS

(NOT USED)

PART 3 - EXECUTION3.01 PROTECTION OF ADJACENT AREAS

- A. The Contractor shall protect areas shown on the Drawings or designated by the Engineer to remain protected from damage by construction operations by erecting suitable barriers of other acceptable means. Areas outside the limits of construction as shown on the Drawings shall be protected and no equipment or materials shall be stored or allowed to damage these areas.

3.02 DISPOSAL

- A. All roots, vegetation, lime sludge, and other refuse shall be removed from the site and disposed of by the Contractor. Burning of any material on the site will not be permitted.

END OF SECTION

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**SECTION 02200
SITE PREPARATION****PART 1 - GENERAL**1.01 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. Grubbing: Removal of vegetation and other organic matter including stumps, buried logs, and roots greater than 2 inches caliper to a depth of 12 inches below subgrade.
- D. Scalping: Removal of sod without removing more than upper 3 inches of topsoil.
- E. Stripping: Removal of topsoil remaining after applicable scalping is completed.
- F. Project Limits: Areas, as specified, within which Work is to be performed.

1.02 QUALITY ASSURANCE

- A. Obtain CONSULTANT's approval of staked clearing, grubbing, and stripping limits, prior to commencing clearing, grubbing, and stripping.

1.03 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 - MATERIALS

(not used)

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PART 3 - EXECUTION**3.01 GENERAL**

- A. Clear, grub, and strip areas actually needed for waste disposal, borrow, or site improvements within limits specified.
- B. Property obstructions which are to remain in-place, such as buildings, 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 PROJECT MANAGER and the City of Fort Lauderdale Urban Forester.

3.02 LIMITS

- A. As Follows, but not to Extend beyond Project Limits.
 - 1. Excavation Including Trenches: 5 feet beyond top of cut slopes or shored wall.
 - 2. Fill:
 - a. Clearing and Grubbing: 5 feet beyond toe of permanent fill.
 - b. Stripping and Scalping: 2 feet beyond toe of permanent fill.
 - 3. Waste Disposal:
 - a. Clearing: 5 feet beyond perimeter.
 - b. Scalping and Stripping: Not required.
 - c. Grubbing: Around perimeter as necessary for neat finished appearance.
 - 4. Overhead Utilities:
 - a. Clearing, Grubbing, Scalping, and Stripping: Wherever grading is required, including borrow pits, ditches, etc.
 - b. Other Areas: As shown.
- B. Remove rubbish, trash, and junk from entire area within Project limits.

3.03 TEMPORARY REMOVAL OF INTERFERING PLANTINGS

- A. Remove and store, as specified in the Contract Documents, 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 plant prior to its removal. Record sufficient information to uniquely identify each plant removed and to assure accurate replacement.

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3.04 CLEARING

- A. Clear areas within limits specified.
- B. Fell trees so that they fall away from facilities and vegetation not designated for removal.
- C. Cut stumps not designated for grubbing 12 inches below the ground surface.
- D. Cut off shrubs, brush, weeds, and grasses to within 2 inches of ground surface.

3.05 GRUBBING

- A. Grub areas within limits specified.

3.06 SCALPING

- A. Do not remove sod until after clearing and grubbing is completed and resulting debris is removed.
- B. Scalp areas within limits specified.

3.07 STRIPPING

- A. Do not remove topsoil until after scalping is completed.
- B. Strip areas within limits to minimum depths specified. Do not remove subsoil with topsoil.
- C. Stockpile strippings, meeting requirements of Section 02911, Soil Preparation, for topsoil, separately from other excavated material.

3.08 TREE REMOVAL OUTSIDE CLEARING LIMITS

- A. Remove Within Project Limits:
 - 1. Dead, dying, leaning, or otherwise unsound trees that may strike and damage Project facilities in falling.
 - 2. Trees designated by CONSULTANT.
- B. Cut stumps off flush with ground, remove debris, grind stump and if disturbed, restore surrounding area to its original condition.

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3.09 TREE TOPPING

- A. Top trees designated by CITY PROJECT MANAGER so remaining portion will not strike facilities in falling. Where topping will remove more than 1/2 of a tree's crown, remove entire tree.
- B. Treat wounds resulting from topping in accordance with standard horticultural practice to preserve the natural character of the tree.

3.10 PRUNING

- A. Remove branches below the following heights:
 - 1. Sixteen feet above roadways and shoulders.
 - 2. Nine feet above sidewalks.
 - 3. Six feet above roofs.
- B. Prune only after planting and in accordance with standard horticultural practice to preserve the natural character of the plant. Perform in presence of the CONSULTANT. Remove all dead wood, suckers, and broken or badly bruised branches. Use only clean, sharp tools. Do not cut lead shoot.

3.11 DISPOSAL

- A. Clearing and Grubbing Debris:
 - 1. Woody debris may be chipped. Chips may be sold to Contractor's benefit or used for landscaping onsite as mulch or uniformly mixed with topsoil, provided that resulting mix will be fertile and not support combustion. Maximum dimensions of chipped material used onsite shall be 1/4-inch by 2 inch. 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.
- C. Strippings:
 - 1. Dispose of strippings that are unsuitable for topsoil or that exceed quantity required for topsoil offsite or in waste disposal areas approved by CONSULTANT.
 - 2. Stockpile topsoil in sufficient quantity to meet Project needs. Dispose of excess strippings as specified for clearing and grubbing.

END OF SECTION

SITE PREPARATION

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**SECTION 02240
DEWATERING****PART 1 GENERAL (NOT USED)****PART 2 PRODUCTS (NOT USED)****PART 3 EXECUTION**3.01 GENERAL

- A. The CONTRACTOR shall be responsible for design, installation, permitting 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).
- C. The CONTRACTOR shall submit a dewatering plan to the CONSULTANT for review. The CONTRACTOR is advised that the SFWMD, FDOT, Broward County Environmental Protection & Growth Management Department. (BCEPGMD), etc. may require that a dewatering plan, prepared by a State of Florida licensed Professional Engineer or Registered Professional Geologist, be submitted and approved prior to issuance of a dewatering permit. The CONTRACTOR will retain a State of Florida Licensed Professional Engineer or Registered Professional Geologist to provide an initial report of potential dewatering issues in the Site vicinity. The CONTRACTOR shall retain a State of Florida Licensed Professional Engineer or Registered Geologist to provide any additional services required by regulatory agencies regarding dewatering and contaminated sites.
- D. The CONTRACTOR is advised that the Broward County Environmental Protection Department may have identified contaminated sites within ¼ mile radius of the project site. The CONTRACTOR may be required to provide testing and monitoring of the dewatering operations, and to institute dewatering methods and controls, as required by BCEPD, SFWMD, FDOT, etc. The CONTRACTOR will be responsible for all costs associated with means and methods of dewatering which will be set forth by dewatering permits.

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3.02 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 the Contract Documents, 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.

3.03 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.

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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.

3.04 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 2 feet 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 is 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 maybe 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.

3.05 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 5 calendar days of the time that the CONTRACTOR anticipates using such alternate method.

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- 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.

3.06 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. 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 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. Affected storm sewer outfalls shall be protected with floating silt booms as approved by the Broward County Environmental Protection & Growth Management Department (BCEPGMD) and the ENGINEER. All accumulated debris resulting from the dewatering discharge collecting in the boom shall be removed on a daily basis.

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- D. 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 BCEPGMD. The CONTRACTOR will be responsible for all fines associated with the violation of the dewatering permit conditions issued to the CONTRACTOR.
- E. 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.

3.07 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 nonshrink grout.

3.08 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. CONTRACTOR shall be responsible for sample collection and laboratory analysis.
- B. If analytical testing (by CONTRACTOR) documents and indicates elevated concentrations above FDEP action levels (Chapter 62-777, Florida Administrative Code) dewatering operations will be suspended until appropriate treatment and or construction measures can be implemented. CONTRACTOR shall not resume operations until notified to do so in writing by Broward County. There shall be no delay or mobilization claim. 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.

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- C. Treatment of the groundwater will include three options depending on the magnitude of the contamination in the trench or as determined by the CONTRACTOR in conjunction with Broward County: Granular Activated Carbon (GAC) Treatment Vessels, Mobile Air Stripping Units, or Vacuum Truck Removal and Disposal or other method as approved by the County. 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.
- E. Effluent water from the treatment system will be analyzed by the CONTRACTOR to confirm that concentrations are below regulatory limits.
- F. A Dewatering Plan describing the dewatering approach, groundwater monitoring, and remediation alternative shall be provided by the CONTRACTOR.

END OF SECTION

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SECTION 02260
EXCAVATION SUPPORT AND PROTECTION

PART 1 GENERAL (NOT USED)

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.01 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 geotechnical information available when designing the excavation support system.

3.02 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.

3.03 TRENCHES

- A. For trench excavation exceeding 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

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**SECTION 02315
FILL AND BACKFILL****PART 1 GENERAL**1.01 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.

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- 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

2.01 EARTHFILL

- A. Excavated material from required excavations and designated borrow sites, free from rocks larger than 3 inches, from roots and other organic matter, ashes, cinders, trash, debris, and other deleterious materials.
- B. Material containing more than 10 percent gravel, stones, or shale particles is unacceptable.
- C. Provide imported material of equivalent quality, if required to accomplish Work.

2.02 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
3/4 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

2.03 WATER FOR MOISTURE CONDITIONING

- A. Free of hazardous or toxic contaminants, or contaminants deleterious to proper compaction.

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2.04 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 FDOT No. 57 stone or 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 EXECUTION3.01 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 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.

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- 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.

3.02 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.

3.03 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.

3.04 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. Earthfill: One test per 400 feet of pipe run.

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2. Granular Fill: One test per 400 feet of pipe run.
3. Foundation Stabilization Rock: One test per lift.

3.05 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): Earthfill.
 - 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 areas is prohibited unless, in Engineer's opinion, backfill will remain stable, and over-excavated material is replaced as compacted earthfill.

END OF SECTION

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**SECTION 02316
EXCAVATION****PART 1 GENERAL**1.01 QUALITY ASSURANCE

- A. Provide adequate survey control to avoid unauthorized over-excavation.

1.02 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.

1.03 SEQUENCING AND SCHEDULING

- A. CONTRACTOR shall call the utility companies 72 hours before excavation, see Section 01040, Coordination for each utility company phone number and contact person.

PART 2 PRODUCTS (NOT USED)**PART 3 EXECUTION**3.01 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. Trim to neat lines where concrete is to be deposited against earth.
- 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 over-excavation. Do not over-excavate 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. Replace over-excavated material as specified in Section 02315, Fill and Backfill.
- 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.

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3.02 UNCLASSIFIED EXCAVATION

- A. Excavation is unclassified. Complete all excavation regardless of the type, nature, or condition of the materials encountered.

3.03 TRENCH WIDTH

- A. Minimum Width of Trenches:
1. Single Pipes, Conduits, Direct-Buried Cables, and Duct Banks:
 - a. Less than 4-Inch Outside Diameter or Width: 18 inches.
 - b. Greater than 4-Inch Outside Diameter or Width: 18 inches greater than outside diameter or width of pipe, conduit, direct-buried cable, or duct bank.
 2. Multiple Pipes, Conduits, Cables, or Duct Banks in Single Trench: 18 inches greater than aggregate width of pipes, conduits, cables, duct banks, plus space between.
 3. Increase trench widths by thicknesses of sheeting, if used.
 4. 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.

3.04 EMBANKMENT AND CUT SLOPES

- A. Shape, trim, and finish cut slopes to conform with lines, grades, and cross-sections shown, with proper allowance for topsoil or slope protection, where shown.
- B. Remove stones and rock that exceed 3-inch 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 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.

3.05 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.

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- 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.

3.06 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 underground facilities.
- C. Dispose of debris resulting from removal of organic matter, trash, refuse, and junk.

END OF SECTION

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**SECTION 02319
SUBGRADE PREPARATION****PART 1 GENERAL**1.01 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.

1.02 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**3.01 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.

3.02 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.

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3.03 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.

3.04 TESTING

- A. Proof-roll subgrade with equipment specified in Article Compaction to detect soft or loose subgrade or unsuitable material, as determined by Engineer.

3.05 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

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**SECTION 02320
TRENCH BACKFILL****PART 1 GENERAL**1.01 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 PRODUCTS2.01 GEOTEXTILE

- A. As specified by the Contract Documents.

2.02 TRENCH STABILIZATION MATERIAL

- A. Foundation stabilization rock as specified in Section 02315, Fill and Backfill.

2.03 BEDDING MATERIAL AND PIPE ZONE MATERIAL

- A. Granular fill as specified in Section 02315, Fill and Backfill.

2.04 EARTH BACKFILL

- A. Earth fill as specified in Section 02315, Fill and Backfill.

TRENCH BACKFILL

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PART 3 EXECUTION**3.01 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.

3.02 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 ENGINEER. ENGINEER will determine depth of over-excavation, if any, required.

3.03 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.

3.04 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 from the following depths below the bottom to the springline of the pipe are as follows, except increase depths listed by 6 inches in areas of rock excavation:

TRENCH BACKFILL

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1. Pipe, 15 Inches and Smaller: 4 inches.
 2. Pipe, 18 Inches to 36 Inches: 6 inches.
 3. Pipe, 42 Inches and Larger: 8 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, conduit, direct-buried cable, or duct bank.
- 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.

3.05 BACKFILL PIPE ZONE

- A. Furnish granular fill or imported bedding material as directed by the ENGINEER.
- B. Upper Limit of Pipe Zone Shall Not Be Less Than Following:
1. Pipes:
 - a. Up to 12-Inch Diameter: 6 inches above top of pipe.
 - b. Greater than 12-Inch Diameter: 12 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 their 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 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

TRENCH BACKFILL

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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.

3.06 BACKFILL ABOVE PIPE ZONE

A. General:

- 1. Process excavated material to meet specified gradation requirements.
- 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 until at least 4 feet of backfill is placed over top of pipe.
- 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 prior to placing succeeding lifts.

C. Backfill for Areas Under Facilities and Pavements: Backfill trench above the pipe zone with granular backfill in lifts not exceeding 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.

3.07 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.

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- 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 described in Section 02315 Fill and Backfill.
- 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 FDOT # 57 stone or granular fill as described in Section 02315, Fill and Backfill. This lift shall be compacted in accordance with the provisions of this Section 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.

3.08 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 thereafter as record information is available to verify that pipe inverts and slopes are acceptable.

3.09 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.

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**SECTION 02340
SOIL EROSION STABILIZATION****PART 1 GENERAL****1.01 DEFINITIONS**

- A. Soil Erosion Stabilization:
1. Provide erosion control measures on the Project and in areas where work is accomplished in conjunction with the Project, so as to prevent pollution of water, detrimental effects to public or private property adjacent to the Project.
 2. Ground surfaces exposed during the wet season.
 3. Areas which will not be subjected to heavy wear by ongoing construction traffic.
 4. Temporary and long-term stabilization of new disturbed ditches, swales, storm water ponds, or disturbed ground with intermittent construction traffic.
- B. Buffer Zone: Undisturbed area or, strip of natural vegetation, or an established suitable planting adjacent to disturbed area that reduces erosion and runoff.
- C. Coordinate the installation of temporary erosion control features with the construction of the permanent erosion control features to the extent necessary to ensure economical, effective, and continuous control of erosion and water pollution.
- D. Permanent Stabilization:
1. Permanently stabilize exposed soil surfaces at finished grades
 2. Permanent stabilization methods include, but are not limited to, sodding (permanent), mulching, and landscaping.
 3. Immediately perform permanent stabilization at each completed excavation and embankment areas except for areas that are scheduled to be redisturbed.
 4. Incorporate all permanent erosion control features into the Project at the earliest practical time.

1.02 DELIVERY, STORAGE, AND PROTECTION

- A. General: Prevent or reduce the discharge of pollutants to storm water from all material delivery or storage by minimizing the storage of hazardous materials onsite, storing materials in a designated area, installing secondary containment, conducting regular inspection, and training employees or subcontractors.
- B. Sod: Provide as indicated on the plans.
- C. Mulch: Mark package of mulch to show air-dry weight.

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1.03 SEQUENCING AND SCHEDULING

- A. CONTRACTOR shall accept responsibility for existing soil and erosion control on the site, including maintenance, installed before starting earth disturbance activities.
- B. Projects permitted by the South Florida Water Management District require written approval of the erosion/sedimentation control plan. Engineer's acceptance of Construction Period Erosion/Sedimentation Control Plan required prior to starting earth disturbing activities.
- C. Complete soil preparation, sodding, fertilizing, mulching, and matting on disturbed areas that will require stabilization either because the area has reached final grade (permanent landscaping) or because the area remains unworked for over 14 days (temporary sodding) during the wet season.
- D. Notify ENGINEER at Least 3 Working Days in Advance of:
 - 1. Materials delivery.
 - 2. Start of planting activity.
- E. Sodding: Perform under favorable weather conditions during seasons that are normal, for such Work as determined by accepted local practice.

1.04 MAINTENANCE

- A. Operations:
 - 1. Sodded Areas: Perform during maintenance period to include:
 - a. Watering: Keep surface moist.
 - b. Washouts: Repair by filling with topsoil, and replace sodded areas.
 - c. Mulch: Replace wherever and whenever washed or blown away.
 - d. Resod unsatisfactory areas or portions thereof immediately if a satisfactory stand has not been produced.
 - 2. Inspect, repair, and replace as necessary all erosion control measures during the time period from start of construction to completion of construction.
 - 3. Inspect a minimum of at least once every 7 days or after each storm event and at least daily during prolonged rainfall. At no time shall more than 1 foot of sediment be allowed to accumulate in any erosion control device. The cleaning operation shall not dispose of sediment offsite.
- B. Sediment Removal:
 - 1. Remove sediment from erosion control devices and work into the grading plan at least once a week as required to maintain proper operation of devices. The cleaning operation shall not dispose of sediment offsite.
 - 2. Sediment shall be removed and the controls upgraded or repaired as needed as soon as practicable, but not later than 2 days after the surrounding exposed ground has dried sufficiently to prevent further damage from equipment needed for repair operations.

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3. In the event of continuous rainfall over a 24 hour period, or other circumstances that preclude equipment operation in the area, hand carry and install additional sediment controls as approved by the Engineer.
4. Replace rock filters with new rock at least once a month or when the sediment reduces by one half the filtering capacity of the facility.

PART 2 PRODUCTS**2.01 FERTILIZER**

- A. Commercial, uniform in composition, free-flowing, suitable for application with equipment designed for that purpose.
- B. Fertilizer shall have the Following Minimum Percentage of Plant Food by Weight:
 1. Nitrogen: 16 percent.
 2. Phosphoric Acid: 4 percent.
 3. Potash: 8 percent.
- C. At least 50 percent of phosphoric acid shall be from normal superphosphate or an equivalent source which will provide a minimum of two units of sulfur.

2.02 SOD

- A. As indicated on the plans.

2.03 MULCH

- A. The mulch material shall be dry straw or hay, consisting of oat, rye, or wheat straw, or of pangola, peanut, coastal bermuda, or bahia grass, hay or compost; and shall be free from noxious weeds and plants.
- B. Any plant officially listed as being noxious or undesirable by any Federal Agency, any agency of the State of Florida or any local jurisdiction in which the project is being constructed shall not be used. Furnish to the Engineer, prior to incorporation onto the project, a certification from the Florida Department of Agriculture and Consumer Services, Division of Plant Industry, stating that the Mulch materials are free of noxious weeds. Any such noxious plant or plant part found to be delivered as mulch will be removed by the CONTRACTOR at his expense and in accordance with the law.
- C. Only undeteriorated mulch which can readily be cut into the soil shall be used. The "air-dry" weight (as defined by the Technical Association of the Pulp and Paper Industry, for wood cellulose) shall be marked on each package by the producer.

2.04 SOIL TACKIFIER

- A. Derived from natural organic plant sources containing no growth or germination-inhibiting materials.

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- B. Capable of hydrating in water, and readily blend with other slurry materials.
- C. Wood Cellulose Fiber: Add as tracer, at rate of 150 pounds per acre.
- D. Manufacturers and Products:
 - 1. Chevron Asphalt Co.; CSS-1.
 - 2. Terra; Tack AR.
 - 3. J-Tack; Reclamare.

2.05 EROSION CONTROL MATTING

- A. Excelsior mat or straw blanket; staples as recommended by matting manufacturer.
- B. Manufacturers and Products:
 - 1. Akzo Industries, Ashville, NC.
 - 2. North American Green, Evansville, IN.

2.06 REINFORCED PLASTIC COVERING

- A. Co-extruded, copolymer laminate reinforced with a nonwoven grid of high strength nylon cord submersed in a permanently flexible adhesive media allowing for equal tear resistance in all directions.
- B. Black in color and ultraviolet stabilized.
- C. Physical Requirement (Minimum Average Roll Values):
 - 1. Tear Strength: 130 pounds.
 - 2. Elongation: 620 percent.
 - 3. Minimum Thickness: 6 mil.
- D. Manufacturers:
 - 1. Reef Industries, Inc., Houston, TX.
 - 2. Griffolyn Co., Houston, TX.

2.07 SILT FENCE

- A. Support Posts: As recommended by manufacturer of geotextile.
- B. Fasteners: Heavy-duty wire staples at least 1-inch long, tie wires, or hog rings, as recommended by manufacturer of geotextile.
- C. Filter Fabric: Polyester, polypropylene, or nylon filaments, woven into a uniform pattern, distinct and measurable openings.
 - 1. Filaments: Resistant to damage from exposure to ultraviolet rays and heat.
 - 2. Material Edges: Finish so that, filaments retain their relative positions under stress.

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D. In accordance with requirements of Table No. 1:

Table No. 1 - Filter Fabric		
Physical Property	Required Value	Test Method
Weight, lbs/sq yd, min.	4	ASTM D3776
Equivalent Opening Size, max.	50-70	U.S. Standard Sieve
Grab Tensile Strength, lb, min. ARV	400	ASTM D4632
Elongation, % max.	25	ASTM D1682
Mullen Burst Strength, psi, min. ARV	200	ASTM D3786
Ultraviolet Radiation Resistance, % Strength Retention	80	ASTM D4355
Flow Rate, gpm/sf, min. ARV	30 to 50	ASTM D4491

E. Manufacturers:

1. Polyfelt, Evergreen, AL.
2. Dupont Co., Wilmington, DE.
3. Mirafi, Inc., Charlotte, NC.

2.08 STRAW BALES

- A. Machine baled clean salt hay or straw of oats, wheat, barley, or rye, free from seed of noxious weeds, using standard baling wire or string.

2.09 POSTS FOR STRAW BALES

- A. Two-inch by 2-inch untreated wood, rebar, or commercially manufactured metal posts.

2.10 STABILIZED CONSTRUCTION ENTRANCES

- A. Clean pit run or 2 inches minus gravel.
- B. Subgrade geotextiles as specified on the plans.

2.11 DUST CONTROLLER

- A. Nontoxic materials that do not have an adverse effect on soil structure or establishment and growth of vegetation.
 1. Calcium chloride meeting the requirements of AASHTO M144.
 2. Water; reasonably clean, and shall be free from suspended water.

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PART 3 EXECUTION3.01 GENERAL

- A. Erosion control measures are required during all construction and site disturbance activities, and shall remain until permanent site ground covers are in-place.
- B. Limitation of Exposure of Erodible Earth: The ENGINEER may limit the surface areas of unprotected erodible earth exposed by the construction operation, and may direct the CONTRACTOR to provide erosion or pollution control measures to prevent contamination of any river, stream, lake, tidal waters, reservoir, canal, or other water impoundments, or to prevent detrimental effects on property outside the project right-of-way or damage to Project. Limit the area in which excavation and filling operations are being performed so that it does not exceed the capacity to keep the finish grading, grassing, sodding, and other such permanent erosion control measures current in accordance with the accepted schedule.
- C. Do not allow the surface area of erodible earth that clearing and grubbing operations or excavation and filling operations expose to exceed 750,000 ft² without specific prior approval by the Engineer. This limitation applies separately to clearing and grubbing operations and excavation and filling operation.
- D. The ENGINEER may increase or decrease the amount of surface area the CONTRACTOR may expose at any one time.
- E. The implementation of the erosion control plan and the construction maintenance, replacement and upgrading the erosion control devices are the responsibility of the CONTRACTOR until all construction is completed and landscaping established and approved. During the construction period, the erosion control devices shall be upgraded for unexpected storm events and to ensure that sediment and sediment laden water do not leave the site.
- F. Maintain existing buffer zones adjacent to Project Limits. Keep all construction equipment, debris, and soils out of the natural buffer zone.

3.02 STABILIZED CONSTRUCTION ENTRANCES

- A. Provide a graveled construction access at each access point between the site and any public or private road or other paved surfaces.
- B. Place subgrade geotextile on the ground prior to aggregate placement.

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- C. Place aggregate over the subgrade geotextile to a minimum thickness of 8 inches.
- D. Minimum dimensions for stabilized construction entrances are 50 feet in length by 20 feet in width.

3.03 SOIL PREPARATION

- A. Before start of sodding, and after surface has been shaped and graded, and lightly compacted to uniform grade, scarify soil surface to minimum depth of 1 inch.

3.04 SODDING

- A. As specified on the plans.

3.05 MULCHING

- A. Apply uniformly on disturbed areas that will remain undisturbed for 7 days or more, as requested by Engineer, and on all sodded areas.
- B. Application: Sufficiently loose to permit penetration of sunlight and air circulation, and sufficiently dense to shade ground, reduce evaporation rate, and prevent or materially reduce erosion of underlying soil.
 - 1. As recommended by manufacturer.

3.06 SOIL TACKIFIER

- A. Spray on after mulch is in place.
- B. The soil tackifier shall be applied at the rate per acre specified by manufacturer for applicable grades.

3.07 REINFORCED PLASTIC COVERING

- A. Place on areas where sodding and erosion control matting have not controlled erosion, and over all temporary stockpiles.
- B. Install in single thickness, strips parallel to direction of drainage. Anchor plastic in 6-inch by 6-inch trench backfilled with compacted native material.
- C. Maintain tightly in place by using sand bags on ropes with a maximum 10-foot grid spacing in all directions.
- D. Tape or weight down full length, overlap seams at least 12 inches.
- E. Remove at final acceptance unless notified otherwise by Engineer.

3.08 SILT FENCE

- A. Install prior to starting earth disturbing activities upslope of fence.

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- B. Install silt fence along contour where shown on the Drawings. Do not deviate from grade more than 4 inches.
- C. One-piece filter fabric or continuously sewn to make one-piece filter fabric for full height of the fence, including portion buried in the toe trench.
- D. When joints are necessary, splice filter fabric together only at a support post, with a minimum 6-inch overlap, and securely fasten both ends to support post.
- E. Filter fabric shall not extend more than 30 inches above the ground surface. Securely fasten to upslope side of each support post using ties. Filter fabric shall not be stapled to existing trees.
- F. Take precaution not to puncture filter fabric during installation. Repair or replace damaged area.
- G. Remove silt fence after upslope area has been permanently stabilized. Immediately dress sediment deposits remaining after the sediment fence has been removed to conform to existing grade. Prepare and sod graded area.

3.09 TEMPORARY SOIL STOCKPILES

- A. Cover with reinforced plastic covering, as directed in Article Reinforced Plastic Covering.
- B. Protect perimeter of stockpile from erosion with ditches.

3.10 DUST CONTROL

- A. Apply appropriate dust control measures on a continuous basis until permanent stabilization measures are in place.
- B. Apply on construction routes and other disturbed areas subject to surface dust movement and where off-site damage may occur if dust is not controlled.
- C. Avoid creating erosion when using water as a dust controller.

3.11 STRAW BALES

- A. Embed minimum of 4 inches in flat-bottomed trench.
- B. Place with ends tightly abutting or overlapped. Corner abutment is not acceptable.
- C. Install so that bale bindings are oriented around the sides and not over the top and bottom of the bale.
- D. Use two posts for each bale. Drive posts through the bale until top of post is flush with top of bale and post is 1-1/2 feet to 2 feet in the ground.
- E. Wedge loose straws in any gaps between bales.

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3.12 EROSION CONTROL MATTING

- A. Place on sodded slopes 3H to 1V, and steeper.
- B. Apply sod and fertilizer prior to matting.
- C. At top of slope, entrench material in 6-inch by 6-inch trench. Secure matting at 1 foot intervals down the slope. At the bottom of the slope, extend the mat 2 feet beyond the toe of slope, turn material under 4 inches, and staple at 1 foot intervals.
- D. Mats shall be stapled in-place as they are installed down the slope face. The mats shall have direct contact with the soil surface.
- E. Overlap:
 - 1. Lengthwise: 1 foot minimum.
 - 2. Crosswise: 6 inches minimum.

3.13 CLEANUP

- A. Sediment trapped in erosion control devices shall be removed from the site or regraded into the slopes on the site. Do not flush sediment-laden water into drainage system.
- B. After site restoration is complete and when approved by the Engineer, all temporary erosion control measures shall be completely removed and disposed offsite to locations that are approved by federal, state, and local authorities.
- C. Silt fence, straw bales, reinforced plastic covering, and any other erosion control devices shall be disposed offsite to locations that are approved by federal, state, and local authorities.

END OF SECTION

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**SECTION 02481
TREE RELOCATION AND PROTECTION**

PART 1 – GENERAL

1.01 WORK TO BE PERFORMED AND WORK INCLUDED

- A. Prepare and relocate trees and palms designated for relocation within the project boundaries, to include all aspects of preparation, relocation, protection, and maintenance.
- B. Protection and care of existing trees and palms to remain within the project boundaries, to include all aspects of protection, pruning, fertilization, and watering.
- C. Watering by water truck.
- D. Follow up maintenance as required by these Specifications.
- E. 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 SUBMITTALS

- A. Verification of Qualifications: The Contractor shall provide a list of references and project list of a minimum of 5 projects that the Contractor has successfully completed that are similar in scope and nature.
- B. List of all equipment to be utilized during tree preparation and transplanting.
- C. Literature on specified wetting agents, fertilizers, and soil conditioners.

1.03 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 Arboriculturists.

1.04 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.

1.05 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.
- 1.06 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 year following final project acceptance shall be removed by the Contractor, including root ball, and backfilling of pit, at no cost to the City.
 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 – MATERIALS

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.
- 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 the Contract Documents.
- 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 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 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 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 4 weeks prior to relocation.

3.03 RELOCATION OF TREES AND PALMS

A. General: Trees to be relocated shall be as directed by the CONSULTANT.

B. Preparation:

1. Trees and palms shall be injected with soil amendments a minimum of 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 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. All Tree Pits to be lined with root barrier adjacent to roadways and sidewalks as directed by CITY PROJECT MANAGER.
- D. Digging and Handling - Broadleaf Trees:
1. Notify CITY 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 be 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 02535**STRUCTURES**PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. All applicable provisions of the Bidding and Contract Requirements, and Division 1 - General Requirements shall govern the work under this section.

1.02 WORK INCLUDED

- A. The work covered by this section shall include the furnishing of all labor, equipment, services, materials, products and tests to perform all operations in connection with the construction of all structures as shown on the plans, defined in these specifications and subject to the terms and conditions of this contract, including, but not limited to, manhole, catch basins, and inlets.

1.03 SUBMITTALS

- A. The Contractor shall furnish the CITY PROJECT MANAGER shop drawings of the precast manhole for approval. Shop drawings should illustrate all dimensions, reinforcements and specifications for the complete manual.

PART 2 - PRODUCTS

2.01 MORTAR

- A. Mortar for use in constructing and plastering sewer structures shall conform to ASTM C-270, "Specifications for Mortar for Unit Masonry". A Portland cement-hydrated lime mixture or a masonry cement may be used provided that the same materials are used throughout the project.
- B. Mortar materials shall be proportioned by volume and shall consist of one part Type II Portland Cement to two parts aggregate (sand). Portland Cement shall conform to ASTM C-150, "Specifications for Portland Cement". Aggregate shall conform to ASTM C-144, "Specifications for Aggregate for Masonry Units."

2.02 PRECAST CONCRETE MANHOLE

- A. Precast manhole sections shall conform to the plans or ASTM C-478, Specifications for Precast Reinforced Concrete Manhole Sections as modified thereto whichever is more restrictive. Concrete shall attain a minimum compressive strength of 4,000 psi at 28 days. Minimum wall thickness shall be eight (8") inches.
- B. Unless otherwise specified on the plans, all joints shall be made with neoprene or rubber "O" ring compression joints; mastic joint sealing compound, or approved equal. After assembly, all joints shall be filled with mortar and pointed to provide a smooth surface without joint voids.

- C. The base and walls that compose the bottom section of precast manhole shall be of monolithic construction, minimum 8 inches thick, and the edge of the base slab shall project a minimum 4 inches beyond the outside diameter of the wall.
- D. Holes for piping shall be 6 inches larger than the outside diameter of the respective pipe. After the pipe is set, the void space between the pipe and the hole perimeter shall be completely filled with non-shrinking, quick-setting, waterproof cement mortar and struck smooth.
- E. The minimum height of precast base section shall be 36 inches from the bottom of the base slab; however, no holes for piping shall be cast less than 8 inches from the top of the base section or less than 2 inches from the top of the base slab.

2.03 ENDWALLS, CATCH BASINS, INLETS AND JUNCTIONS BOXES

- A. Endwalls, catch basins, inlets and junction boxes shall be constructed at the locations shown and to the dimensions indicated on site plans. Unless otherwise specified on the plans, inlets, junction boxes, catch basins, and similar structures may be constructed of brick, concrete block, poured concrete or precast concrete. Precast catch basins shall conform to latest A.C.I. and P.C.A. specifications. Concrete shall have not less than 4,000 psi compressive strength at 28 days. Minimum wall thickness shall be six (6") inches.
- B. Unless otherwise specified on the plans, all concrete for these structures shall be Class I concrete as specified in the Florida Department of Transportation "Standard Specifications for Road and Bridge Construction", latest revision, Section 345. Mortar for use in constructing and plastering shall be as previously set forth in this section.
- C. Brick shall be solid hard-burned clay conforming to ASTM Serial C-32-93, Grade SM. Concrete brick shall conform to ASTM Serial C-55-75, Grade P-I. Concrete block shall conform to ASTM Serial C-90-78, Grade PI.
- D. All brick or concrete block structures covered in this Section shall be plastered inside and outside with 1/2 inch of cement mortar. Inside surfaces shall be smooth and even.
- E. Base slabs and walls of concrete structures shall be constructed in a continuous pour between expansion joints.
- F. For each grate type inlet, two layers of Mirafi 140 fabric of "Poly Filter X" polypropylene material or approved equal, shall be sandwiched between 2 x 2 x 10/10 welded wire fabric cut to the grate size and attached to the underside of the grate. The sandwiched filter material shall be wired to the cross members of the grate each way on 4-inch centers. After inlet construction and the roadway construction is completed and the project site work (including landscaping) has been established, the filter material and fabric shall be removed with any retained silt or sand.

2.04 CASTINGS (INCLUDING FRAMES, COVERS AND GRATINGS)

- A. Iron castings shall conform to ASTM A-48, "Specifications for Gray Iron Castings", and shall be Class 30. Frames and grates may be Class 20.
- B. All castings shall be made of clean, even grain, tough grey cast iron. The castings shall be smooth, true to pattern and free from projections, sand holes, warp and other defects. The horizontal surface of the frame cover seats and the under surface of the

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frame cover seat which rests upon the cover seat shall be machined. After machining, it shall not be possible to rock any after it has been seated in any position in its associated frame. Machining shall be required only on those frames and covers intended for vehicular traffic.

- C. Bearing surfaces between cast frames, covers and grates shall be machined and fitted together to assure a true and even fit. Within areas of vehicular traffic, the frames, covers and gratings shall be machined-ground so that irregularity of contact will be reduced to a minimum and will be rattle-proof.
- D. All manhole covers shall be provided with concealed pick holes. Manufacturer's name and catalog number shall be cast on all frames, covers, grates, etc. Covers shall be lettered "Storm" "Storm Drain" or "Storm Sewer" or "Sanitary Sewer" as applicable and shall be plainly visible. The manhole frames and covers shall be flush with finished grade. Sanitary Sewer manhole covers shall bear the CITY logo as manufactured by US Foundry or approved equal.
- E. Grates and covers for inlets shall be as shown on the plans, set to the grades indicated and conforming with the requirements of the castings described above. Grates shall be furnished complete with frames specifically constructed to provide full bearing at all points of contract.

PART 3 - EXECUTION

3.01 CHANNELS

- A. Channels shall be accurately and smoothly formed in accordance with the plans. Channels shall be constructed of concrete with trowel finished surfaces. The upper surface of the manhole shall be sloped toward the channels as shown.
- B. Drop pipe at sanitary sewer manhole shall be installed when the difference in elevation between the pipe invert and the invert at the center of the manhole exceeds two feet (2'), or where directed by the CITY PROJECT MANAGER. The drop manhole shall be built according to the plans and specifications.
- C. After channels are formed and section joints are pointed, the interior of the manhole shall be painted with two coats of Koppers Bitumastic 300-M (7 mils per coat) or approved equal. The exterior shall be painted in a similar manner, if required by local regulations.

3.02 CONCRETE GRADE RINGS

- A. All concrete grade rings shall meet ASTM C478 and shall be a minimum 4,000 psi @ 28 days. Concrete grade rings shall be a minimum thickness of 2 inches and a maximum thickness of 6 inches. No more than 8 inches of concrete grade rings shall be installed on one manhole. Concrete grade rings shall be laid in mortar and all joints shall be finished smooth and not be less than ¼ inch or more than ½ inch in thickness. Concrete grade rings shall be painted with two coats of Koppers Bitumastic 300-M (7 mils per coat) or approved equal.

3.03 MANHOLE AND STRUCTURES

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- A. All joints shall be finished water tight, all openings for sewers, frames, etc., in precast manhole and catch basins shall be cast at time of manufacture. Spaces around all piping entering or leaving manhole shall be completely filled with Embeco mortar or equal.
 - B. All manhole shall be set plumb to line and grade and shall rest on a firm carefully graded subgrade which shall provide uniform bearing under base.
 - C. Grout for manhole bottoms shall consist of broken block, brick and 2:1 cement mortar.
- 3.04 CLEANING AND MAINTENANCE
- A. All structures shall be cleaned and maintained in workable condition until accepted by the CITY PROJECT MANAGER.

END OF SECTION

SECTION 02575
SURFACE RESTORATION

PART 1 GENERAL

1.01 STANDARD SPECIFICATIONS

- A. When referenced in this Section, shall mean Florida Department of Transportation, Standard Specifications for Road and Bridge Construction, current edition.

1.02 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 between the sidewalk and edge of pavement, the ground surface will be graded into a swale as shown on the Drawings and provided 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 placed in kind, using similar materials of construction.
3. Trees, shrubs, and personal property (e.g. mail boxes) located in the swale 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. Payment for restoration outside the limits of work shall be repaired at the CONTRACTOR's expense.

1.03 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. The intent of the Drawings is to provide a full lane, permanent trench repair for all work crossing or running parallel with roadways. Temporary restoration to provide a passable surface is also required.
- D. Overlay of asphalt pavement may be required as shown on the Drawings.
- E. Provide finished gradation and grassing in accordance with Contract Documents.

1.04 OPTIMUM MOISTURE CONTENT

- A. "Optimum moisture content" shall be determined by the ASTM standard specified to determine the maximum dry density for relative compaction.

1.05 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

2.01 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.

2.02 LIME ROCK BASE COURSE

- A. Aggregate quality and gradation shall meet the requirements of the Standard Specifications.

2.03 BITUMINOUS PRIME AND TACK COAT

- A. Prime Coat: Material shall be cutback asphalt, Grade RC-70 or RC-250 meeting the requirements of the Standard Specifications, or approved equal.

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- B. Tack Coat: Material shall be emulsified asphalt, Grade RS-2, SS-1, or SS-1H meeting the requirements of the Standard Specifications.
- C. Tack coats used for temporary trench stabilization shall be sanded to prevent damage to vehicles.

2.04 ASPHALT CONCRETE

- A. The asphalt concrete for trench leveling, restoration and overlay shall be Type SP and S-III, meeting the requirements of the Standard Specifications and Section 02772, Asphalt Concrete Pavement.
- B. Aggregate: The aggregate shall meet the requirements 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.

2.05 FLOWABLE FILL

- A. Provide flowable fill with a mix design meeting the requirements 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.

2.06 CONCRETE

- A. Concrete shall be 3,000 psi minimum concrete meeting the requirements 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 the Standard Specifications.
- D. Reinforcing Steel: Conform to ASTM A615, Grade 60.

2.07 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 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 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.

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- D. The CONTRACTOR shall provide painted traffic stripping 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.

2.08 SWALE STABILIZATION

- A. Materials used for stabilization of swale areas 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**3.01 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.
- 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. If control of dust is inadequate by these means, the ENGINEER may direct the immediate application of a prime or tack coat in accordance with the provisions of this Section, at no additional cost to the OWNER. The ENGINEER reserves the right to delay additional excavation activities until dust control measures are adequate.
- 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.

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3.02 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.

3.03 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.

3.04 STREET MAINTENANCE

- A. Maintain all trenches as specified in this section and under Section 02320, Trench Backfill.

3.05 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, and with the approval of the Engineer, the CONTRACTOR shall provide a minimum 10 inches of excavatable, flowable fill. The flowable fill shall be placed up to 1 ½ inches from the top of the existing pavement or to the fill line without vibration or compaction. Flowable fill shall not be placed during periods of inclement weather and rainfall. Provide a means to confine the material within the designated space. Flowable fill installed in accordance with this provision shall comply with temporary pavement restoration provisions.

3.06 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 trench repair to completely remove existing asphalt.
- C. Milled and ground asphalt can be mixed for use with the limerock base course material.
- D. To avoid the trench restoration areas appearing as "patches", trench repair may be accompanied by additional milling and resurfacing to full lane widths, as directed by the Engineer.

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3.07 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 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 for the bituminous tack coat shall meet the requirements of the Standard Specifications.

3.08 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 as 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 more than 2 feet wide beyond the trench area shall be left in place and a full overlay applied to the limits of the existing road width.

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2. Existing base beyond the trench area shall be left in place.
3. Full lane or width roadways shall have a consistent cross-section and straight edge of pavement delineation's.

3.09 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 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 conform to the Drawings. Asphalt or asphalt stains 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.

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- 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 shown on the Drawings.
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 trench.
- 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 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 and no compensation will be made 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

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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. 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 with 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.
- C. To extend manhole use grade rings as specified, do not use leveling rings. Remove the frame and cover, rebuild the manhole top to raise it so that the new height meets the overlay elevations and then replace the frame and cover in accordance with Section 02533, Manholes, and the Drawings.

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.

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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 4 inches and 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 Paragraph 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 installed in accordance with Section 02771, Concrete Curbs and Sidewalks.

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 have those markers 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 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.

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- 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 shown on the Drawings.

3.24 SWALE RESTORATION

- A. New or existing swale areas (areas between pavement edge and sidewalks, or right-of-way line if there is no existing or proposed sidewalk) shall be graded and reshaped to the cross section shown on the Drawings. Where storm inlets are present, the swale shall have a consistent longitudinal slope towards the inlet.
- B. Swale areas with previously existing improved surfaces, including but not limited to asphalt, concrete, pavers, crushed or decorative rock, shall be restored in kind. Asphalt paved areas shall be constructed with a minimum 6-inch stabilized subbase and minimum 6-inch compacted limerock base, primed and topped with minimum 1-inch asphalt.
- C. Swale areas with previously unimproved or turfed surfaces will be restored with soil stabilization where existing natural soil will not support vehicle loads normally imposed by movement and parking of heavy vehicles without rutting and shifting of soil. Subject to the approval of the Engineer, this work may be performed in connection with preparation of subgrade or construction of the limerock base course.
- D. Swale areas with previously unimproved or turfed surfaces will be topped with sod. St. Augustine "Floritam" and two inches of topsoil shall be used in irrigated areas and where St. Augustine sod was previously established. Bahia sod shall be placed in all other areas not previously improved or sodded.

3.25 SWALE STABILIZATION

- A. Where swale stabilization is required as indicated above, stabilization shall be achieved by the addition and mixing in of suitable stabilizing materials. It shall be incorporated into the existing swale soils by plowing, disking, harrowing, blading or mixing with rotary tillers or other appropriate equipment approved by the Engineer, until the mixed materials are of uniform bearing value throughout the width and at least 6-inch depth from the top of the swale after the swale is graded and shaped to the section indicated on the plans.
- B. The swale areas shall be mixed and compacted to achieve a minimum average dry density of 90 percent throughout the 6-inch thickness, as determined by AASHTO T180. In the determination of such average, the minimum acceptable density shall be 85 percent and the maximum density which shall be used in calculations shall be 100 percent (if the tested density is reported above 100 percent).
- C. Density tests for swale stabilization shall be made at intervals not less than one set of three per CITY block on each side of the roadway, or at increased intervals as directed by the ENGINEER when required to

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measure small or isolated sections (except where such testing may be considered unnecessary by the Engineer). Each set of three shall be averaged as indicated above for determination of meeting the minimum requirements.

3.26 BRICK OR PAVER RESTORATION

- A. Restore pavers and apron area as shown in the Drawings.
- B. If brick and paver materials are damaged, new materials shall match or all materials within the crossing must be replaced at no additional cost. New materials shall be approved by the OWNER.

END OF SECTION

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**SECTION 02630
STORM DRAINAGE FACILITIES****PART 1 - GENERAL**1.01 SUMMARY

- A. Work under this section shall consist of providing all labor, plant facilities, materials, tools, equipment, shop drawings and supervision necessary and required to install all of the storm drainage facilities, including piping, fittings, structures, bedding, and backfilling, as specified in accordance with the contract documents.

1.02 WORK INCLUDED

- A. Provide all labor, materials, necessary equipment and services to complete the Storm Drainage Facilities work, as indicated on the drawings, as specified herein or both, except as for items specifically indicated as "NIC ITEMS".

1.03 REFERENCE STANDARDS

- A. American Society For Testing and Materials (ASTM)
1. A185 – Steel Welded Wire Fabric, Plain, for Concrete Reinforcement
 2. A615 – Deformed and Plain Billet-Steel Bars for Concrete Reinforcement
 3. A760 – Corrugated Steel Pipe, Metallic-Coated for Sewers and Drains
 4. A798 – Installation of Corrugated-Steel Pipe for Sewers and Other Applications
 5. A929 – Metallic-Coated by the Hot-Dip Process for Corrugated Steel Pipe
 6. C76 – Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe
 7. C478 – Precast Reinforced Concrete Manhole Sections
 8. C1479 – Installation of Reinforced Concrete Pipe
 9. C990-01A – Joints for Concrete Pipe, Manholes, and Precast Box Sections Using Preformed Flexible Joint Sealants
 10. D2321 – Installation of Thermoplastic Pipe for Sewer/Gravity-Flow Applications
 11. D3034 – Type PSM Poly(Vinyl Chloride) (PVC) Sewer Pipe and Fittings
 12. D3212 – Joints for Drain and Sewer Plastic Pipes Using Elastomeric Seals
 13. F477 – Elastomeric Seals (Gaskets) for Joining Plastic Pipe
 14. F794 – Poly(Vinyl Chloride) (PVC) Profile Gravity Sewer Pipe and Fittings Based on Controlled Inside Diameter

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15. F949 – Poly(Vinyl Chloride) (PVC) Corrugated Sewer Pipe With a Smooth Interior and Fittings
- B. American Association of State Highway and Transportation Officials (AASHTO)
1. M198 – Joints for Circular Concrete Sewer and Culvert Pipe Using Flexible Watertight Gaskets
 2. M252 – Corrugated Polyethylene Drainage Tubing
 3. M274 – Aluminum-Coated (Type 2), for Corrugated Steel Pipe
 4. M294 – Corrugated Polyethylene Pipe. 12 to 14 inch Diameter
 5. M36 – Metallic Coated Corrugated Steel Culverts and Underdrains
 6. M190 – Bituminous Coated Corrugated Metal Culvert Pipe and Pipe Arches
 7. M199 – Standard Specification for Precast Reinforced Concrete Manhole Sections
- C. American Water Works Association (AWWA)
1. C110 – Ductile-Iron and Gray-Iron Fittings, 3 in through 48 in (75 mm through 1200 mm), for Water and Other Liquids (revision of ANSI/AWWA C110/A21.10-93)
 2. C111 – Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings
 3. C151 – Ductile-Iron Pipe, Centrifugally Cast, for Water
- D. American Concrete Institute (ACI)
1. 301 – Structural Concrete for Buildings, Specifications for
 2. 318 – Building Code Requirements for Structural Plain Concrete

1.04 CLEARING

- A. Clearing or installation of pipe and all drainage structures shall be confined within the working limits of the trenches. Trees, utility poles, survey monuments, underground and overhead utilities shall be suitably protected and preserved.

1.05 EXISTING UTILITIES

- A. Furnish temporary support, adequate protection and maintenance of all underground and surface utility structures, drains, sewers, cables, etc., and other obstructions encountered in the progress of the work.
- B. When the grade of alignment of the pipe is obstructed by existing utility structures, such as conduits, ducts, pipes, branch connections to water or sewer mains, and other obstructions, the obstructions shall be permanently supported, relocated, removed or

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reconstructed by the Contractor in cooperation with the owners of such structures. No deviation shall be made from the required line or grade except as directed in writing by the CITY PROJECT MANAGER.

- C. It shall be the responsibility of the Contractor to notify the owners of existing utilities in the area of construction a minimum of 48 hours prior to any excavation adjacent of such utilities, so that field locations of said utilities may be established.
 - D. Temporary relocation of existing utilities (to be removed) to accommodate installation of storm drain pipe shall be the responsibility of the Contractor and approved by the CITY PROJECT MANAGER. No additional payment shall be made for temporary relocation of existing utilities and shall be considered part of the bid item for the pipe.
- 1.06 PROJECT RECORD DOCUMENTS
- A. Accurately record as-built locations of pipe runs, connections, catch basins, cleanouts, top elevations and invert elevations.
 - B. Identify and describe unexpected variations of subsurface conditions and location of any utilities encountered.
- 1.07 QUALITY ASSURANCE
- A. All costs related to re-inspection due to failures shall be paid for by the Contractor at no additional expense to the OWNER. OWNER reserves the right to direct any inspection that is deemed necessary. Contractor shall provide free access to site for inspection activities.

PART 2 - PRODUCTS

2.01 PIPE

A. REINFORCED CONCRETE CULVERT PIPE:

1. Concrete pipe shall be produced by a reputable manufacturer engaged in the full time business of manufacturing concrete pipe. Pipe manufacturer shall produce the pipe from an approved, permanent plant acceptable to the CITY PROJECT MANAGER.
2. All concrete pipe shall be reinforced and shall conform to the requirements of ASTM C-76. "Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe". All pipe shall be a minimum of Class III. Pipe shall have an interior surface which is smooth, uniform and free from rough spots, irregularities and projections. Nominal pipe lengths shall be 8' unless authorized otherwise by the CITY PROJECT MANAGER. Lifting holes will be permitted, one hole per length.
3. Concrete pipe may be either bell and spigot, tongue and groove or modified tongue and groove.
4. Internal rubber gasket joints shall be used. The internal rubber gasket joint shall be supplied by the pipe manufacturer and shall be completely compatible in every respect with the pipe furnished. The rubber gasket on the inside of the

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bell or groove shall be installed on the pipe at the plant by the pipe manufacturer. All materials and accessories for the rubber gasket joint and the methods of jointing shall be in strict conformance with the pipe manufacturer's direction and recommendation. Joint must be completely water tight.

5. Cement grout joints shall be completely water tight and acceptable to the CITY PROJECT MANAGER. A full bed of mortar shall be placed in the bell and/or groove and on the tongue and/or spigot. The annular space in the pipe joint shall be wiped with cement mortar to insure the joint is filled and to present a smooth surface. The complete exterior periphery of the joint shall have a standard cement grout diaper joint. Diaper shall be installed with the aid of an approved cloth ring. Cement mortar joints shall be made in the dry. Mortar and grout shall be one part Portland Cement to two parts by weight of sand. Mortar shall have enough water to make a stiff mixture that can be molded and worked. Cement mortar joints shall not be covered until inspected and approved by the CITY PROJECT MANAGER.

B. HIGH PERFORMANCE POLYPROPYLENE PIPE

1. High Performance polypropylene storm pipe shall be produced by a reputable manufacturer engaged in the full time business of manufacturing of piping.
2. All High Performance polypropylene storm pipe shall have a smooth wall interior and annular exterior corrugations conforming to the requirements of ASTM F2736 and AASHTO M330.
3. Joints: Pipe shall be joined with a gasket integral bell and spigot joint meeting the requirements of ASTM F2736. Joint must be completely water tight according to the requirements of ASTM 3212. Spigots shall have gaskets meeting requirements of ASTM F477. The gasket joint on the inside of the bell shall be installed on the pipe at the plant by the pipe manufacturer and covered with a removable, protective wrap to ensure the gasket is free from debris. A joint lubricant provided from the manufacturer shall be used on the gasket and bell during assembly. All materials and accessories for the gasket joint and the methods of jointing shall be in strict conformance with the pipe manufacturer's direction and recommendation.

C. HIGH DENSITY POLYETHYLENE PIPE:

1. High Density Polyethylene Pipe (HDPE), shall be corrugated type, smooth interior, conforming to ASTM F2648, ASTM F477, ASTM 3212, AASHTO M252 and AASHTO M294 and shall be smooth interior and annular exterior corrugations with a Manning's "n" value of 0.012l.
2. Basic Material:
 - a. Extruded Pipe and Blow Molded Fittings: Pipe and fittings shall be made of virgin PE compounds which conform with the requirements for Type III, Category 4 or 5, Grade P33, Class C; or Grade P34, Class C, as defined and described in ASTM D 1248.
 - b. Rotational Molded Pipe and Fittings: Pipe and fittings shall be made of virgin PE compounds which conform with the requirements of Type III,

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Category 3, Grade P33, Class C: or Grade P34, Class C, as defined and described in ASTM D1248.

3. Corrugated Polyethylene Pipe shall meet the requirements as describe in ASTM D 2412 for pipe stiffness.
 4. Corrugated Polyethylene Pipe shall be in accordance for brittleness with ASTM D 2444.
- D. PVC CORRUGATED PIPE
1. PVC Corrugated storm pipe shall be produced by a reputable manufacturer engaged in the full time business of manufacturing of piping and conform to the requirements of ASTM F949.
 2. PVC Corrugated storm pipe shall have smooth wall interior and annular exterior corrugations. Pipe shall be made of PVC having a minimum cell classification of 12454 per ASTM D1784.
 3. Joints: Pipe shall be joined with a gasket integral bell and spigot joint meeting the requirements of ASTM F2736. Joint must be completely water tight according to the requirements of ASTM 3212. Spigots shall have gaskets meeting requirements of ASTM F477. The gasket joint on the inside of the bell shall be installed on the pipe at the plant by the pipe manufacturer and covered with a removable, protective wrap to ensure the gasket is free from debris. A joint lubricant provided from the manufacturer shall be used on the gasket and bell during assembly. All materials and accessories for the gasket joint and the methods of jointing shall be in strict conformance with the pipe manufacturer's direction and recommendation.

PART 3 – EXECUTION

3.01 GENERAL

- A. Contractor shall only use the pipe material as specified on the plans. Alternate materials will not be allowed unless approved by the CITY PROJECT MANAGER in writing.
- B. The Contractor shall install all drainage structures and pipe in the locations shown on the drawings and/or as approved by the OWNER. Pipe shall be of the type and sizes specified on the drawings and shall be laid accurately to line and grade. Structures shall be accurately located and properly oriented.
- C. Excavation and Backfilling for Utilities – The provisions of the Contract Documents for Excavation and Backfilling shall govern all work under this Section.
- D. Storage and Handling of Pipe – All pipe shall be protected against impact, shock and free fall, and only equipment of sufficient capacity and proper design shall be used in the handling of the pipe. Storage of pipe on the job shall be in accordance with the pipe manufacturer's recommendations.
- E. Damage to Pipe

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1. Pipe which is defective from any cause, including damage caused by handling, and determined by the OWNER as unrepairable, shall be unacceptable for installation and shall be replaced at no cost to the OWNER and as directed by the OWNER; and,
 2. Pipe that is damaged or disturbed through any cause prior to acceptance of the work, shall be repaired realigned or replaced as directed by the OWNER, at the Contractor's expense.
- F. Manholes, catch basins and drain inlets shall be constructed as soon as the pipe laying reaches the location of the structures. Should the Contractor continue his pipe laying without making provisions for completion of the structures, the OWNER shall have the authority to stop the pipe laying operations until the structure is completed.
- G. Any structure, which is mislocated or oriented improperly, shall be removed and re-built in its proper location, alignment and orientation at the Contractor's expense.

3.02 EXCAVATIONS

- A. Trenches shall be kept as nearly vertical as possible and, if required, shall be properly sheeted and braced. Where, in the opinion of the CITY PROJECT MANAGER, damage could result from withdrawing sheeting, the sheeting shall be left in place. Not more than 100 feet of trench shall be opened at any one time or in advance of pipe laying unless permitted by the CITY PROJECT MANAGER.
1. Except in rock, water-bearing earth or where a granular or concrete base is to be used, mechanical excavation of trenches shall be stopped above the final grade elevation so that the pipe may be laid on a firm, undisturbed native earth bed. If overdigging occurs, all loosened earth shall be removed and the trench bottom brought back to grade with granular material.
 2. Excavations and trenches in rock shall be carried to a depth of not less than 8 inches below the pipe bottom. This space shall be filled with granular material or washed rock.
 3. Width of trenches shall be such as to provide adequate space for placing and jointing pipe properly, but in every case the trench shall be kept to a minimum width.
 4. Any unstable soil encountered shall be removed and replaced with gravel, crushed rock or rock and sand suitably compacted.

3.03 PREPARATION TO TRENCH BOTTOM

- A. Water shall not be allowed in the trenches while the trench bottom is being prepared or while pipe is being installed, unless directed by the CITY PROJECT MANAGER.
- B. A continuous trough shall be shaped to receive the bottom quadrant of the pipe barrel. Bell holes shall be excavated so that after placement, only the barrel of the pipe receives bearing pressure from the trench bottom.
- C. Where unsuitable soil conditions are encountered, the trench bottom shall be excavated to a minimum of 8 inches below the proposed bottom of the pipe, and a trough as described above shall be formed with sharp sand or bedding rock to

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uniformly support the bottom quadrant of the pipe barrel.

3.04 BEDDING

- A. Bedding material, when required, shall be in accordance with the Contract Documents.

3.05 PIPE INSTALLATION

A. Laying Pipe

1. Unloading and Handling: All pipes shall be unloaded and handled with reasonable care. Pipes shall not be rolled or dragged over gravel or rock during handling. The Contractor shall take necessary precautions to ensure the method used in lifting or placing the pipe does not induce stress fatigue in the pipe and the lifting device used uniformly distributes the weight of the pipe along its axis or circumference.
2. Each length of pipe shall be inspected for defects and cracks before carefully lowered into the trench. Any damaged or any pipe that has had its grade disturbed after laying shall be removed and replaced. Bituminous coated pipe shall be handled with special care and repair of damaged coating shall conform with AASHTO M190.
3. Lay pipe on prepared foundation starting at the downgrade end according to line and grade with the necessary drainage structures, fittings, bends and appurtenances as shown on the drawings. Rigid pipes shall be laid with the bell or groove ends upgrade with the spigot or tongue fully inserted. Reinforced concrete pipe shall be installed in accordance with ASTM C1479.
4. Pipe sections shall be firmly joined together with appropriate gaskets or bands.
5. Pipe shall be protected during handling against impact shocks and free falls. Pipe shall be kept clean at all times and no pipe shall be used that does not conform to the Specifications.
6. The laying of the pipe shall be commenced at the lowest point with spigot ends pointing in the direction of flow. All pipe shall be laid with ends abutting and true to line and grade. They shall be laid in accordance with manufacturer's requirements as approved by the CITY PROJECT MANAGER.
7. Pipe shall be laid accurately to the line and grade as designated on the plans. Preparatory to making pipe joints, all surfaces of the portions of the pipe to be jointed, or of the factory made jointing material, shall be clean and dry. Lubricant, primers, adhesive, etc., shall be used as recommended by the pipe or joint manufacturer's specifications. The jointing materials or factory fabricated joints shall then be placed, fitted, joined and adjusted in such a manner as to obtain a water tight line. As soon as possible after the joint is made, sufficient backfill material shall be placed along each side of the pipe to prevent movement of pipe off line and grade.
8. The exposed ends of all pipe shall be suitably plugged to prevent earth, water, or other substances from entering the pipe when construction is not in progress.

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3.06 BACKFILLING TRENCHES

- A. No trenches or excavations shall be backfilled until the trench and installation has been inspected and approval given by the CITY PROJECT MANAGER. Under no circumstances shall water be permitted to rise in unbackfilled trenches after pipe has been placed. Trenches shall be backfilled with approved material, free of large clods, stones or rocks and carefully deposited in layers not to exceed 6 inches until enough fill has been placed to provide a cover of not less than 1 foot above the pipe. Each layer shall be placed, then carefully and uniformly tamped, so as to eliminate the possibility of pipe displacement. The remainder of backfill materials shall then be placed, moistened and compacted in 8 inch layers to 98% maximum AASHTO T-180 density.
- B. Whenever the trenches have been improperly filled or if settlement occurs, they shall be refilled, compacted, smoothed off and made to conform to grade. Unless otherwise directed or shown on the plans, backfill in trenches in or through roadways shall be made as specified above, except that the entire fill above 1 foot over the pipe shall be deposited in layers not to exceed 8 inches in thickness, moistened, and compacted to density equal to or greater than that of adjacent material so that pavement can be placed immediately.

3.07 CONCRETE ENCASEMENT OF DRAINAGE PIPE

- A. Trenches in which encasement for pipe are to be placed may be excavated completely with mechanical equipment. Prior to formation of the encasement, temporary supports consisting of timber wedges or masonry shall be used to support the pipe in place. Temporary supports shall have minimum dimensions and shall support the pipe at no more than two places, one at the bottom of the barrel of the pipe adjacent to the shoulder of the socket and the other near the spigot end.

3.08 DRAINAGE STRUCTURES

- A. All structures shall be built to the line and grade shown on drawings. All reinforced concrete work shall be in strict conformance with the concrete specifications contained herein. After erection of the forms and placing of the steel, the Contractor must have inspection and approval from the CITY PROJECT MANAGER before placing any concrete. After removal of the forms, the Contractor shall backfill around each structure with approved granular fill. The fill shall be placed in layers not exceeding 8 inches in depth measured loose and compacted to 98% of the maximum density as determined by the modified proctor, AASHTO T-180. No defects of any kind in the pipe section will be accepted. All pipe stubs shall be made of the same type of pipe. Pipe stubs shall be sealed with a concrete plug, water tight. The ends of the pipes which enter masonry shall be neatly cut to fit the inner face of the masonry. Cutting shall be done before the pipes are built in.

3.09 INFILTRATION AND EXFILTRATION TESTS

- A. Tests for watertightness shall be made by the Contractor. Leakage of completed storm drainage system shall not exceed 500 U.S. gallons per day per inch diameter per mile of pipe under minimum hydrostatic pressure of 2 feet. Test shall be conducted in a manner satisfactory to the CITY PROJECT MANAGER. Any portion of the project not conforming to the above requirements shall be corrected by the Contractor, at his own expense, prior to acceptance by the CITY PROJECT MANAGER.

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3.10 RESTORATION OF SURFACES AND/OR STRUCTURES

- A. The Contractor shall restore and/or replace paving, curbing, sidewalks, fences and survey points, or any other disturbed surfaces or structures to a condition equal to that before the work was begun and to the satisfaction of the CITY PROJECT MANAGER. Relative to restoration of surfaces and/or structures, the Contractor shall comply with all requirements of governing agencies including city, town, county and state.

3.11 PROTECTION AND CLEANING

- A. The Contractor shall maintain all pipe installations and drainage structures in a condition such that they will function continuously and shall be kept clean of silt, debris and other foreign matter from the pipe and drainage structure is installed until the project is accepted.

3.12 FINAL INSPECTION

- A. All storm sewers shall be lamed by the CITY PROJECT MANAGER prior to acceptance of the work. Repairs or misalignment shown necessary by the tests shall be corrected at the Contractor's expense. All sewers shall be thoroughly cleaned before being placed into use and shall be kept clean until final acceptance by the CITY PROJECT MANAGER.
- B. Upon completion of the work and before final acceptance by the OWNER, the entire drainage system shall be subject to a final inspection in the presence of the OWNER and/or CITY PROJECT MANAGER. The work shall not be considered as complete until all requirements for line, grade, cleanliness, and workmanship have been completed.

END OF SECTION

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**SECTION 02710
LIMEROCK BASE****PART 1 GENERAL**1.01 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 PRODUCTS2.01 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.

2.02 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.

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- 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**3.01 SUBGRADE PREPARATION**

- A. As specified in Section 02319, Subgrade Preparation.
- B. Obtain Engineer's acceptance of subgrade before placement of limerock base rock.
- C. Do not place base materials on soft, muddy subgrade.

3.02 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.

3.03 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.

3.04 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.

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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.

3.05 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.

3.06 SURFACE TOLERANCES

- A. Finished Surface of Base Course and Leveling Course: Within plus or minus 0.10-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.

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3.07 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.

3.08 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.

3.09 CLEANING

- A. Remove excess material; clean stockpile areas of aggregate.

END OF SECTION

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**SECTION 02761
PAVEMENT MARKING****PART 1 GENERAL**1.01 STANDARD SPECIFICATIONS

- A. When referenced in this section, shall mean Florida Department of Transportation, Standard Specifications for Road and Bridge Construction, current edition.

1.02 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 PRODUCTS2.01 PAINT

- A. Color: White, yellow, or blue traffic paint meeting the requirements 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.

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2.02 THERMOPLASTIC STRIPING

- A. White or yellow thermoplastic striping material meeting the requirements of the Standard Specifications.

2.03 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
- D. Markers shall meet the requirements of the Standard Specifications.

2.04 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 and Section 971-14 of the Standard Specifications.

PART 3 EXECUTION3.01 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.

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- 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.

3.02 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.

3.03 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.

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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.

3.04 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 thickness of 0.10 to 0.15 inch for lane lines and 0.07 to 0.10 inch for edge or other lines in accordance with FDOT 711-4.3.
 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.

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- 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.

3.05 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.

3.06 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.

3.07 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.

3.08 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

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**SECTION 02771
CONCRETE CURBS AND SIDEWALKS****PART 1 GENERAL (NOT USED)****PART 2 PRODUCTS****2.01 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.

2.02 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.

2.03 CURING COMPOUND

- A. Liquid membrane-forming, clear or translucent, suitable for spray application and meeting ASTM C309, Type 1.

PART 3 EXECUTION**3.01 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.

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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.

3.02 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.

3.03 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:

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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.

3.04 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 1/4 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

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**SECTION 02772
ASPHALT CONCRETE PAVEMENT****PART 1 GENERAL**1.01 STANDARD SPECIFICATIONS

- A. When referenced in this Section shall mean Florida Department of Transportation, Standard Specifications for Road and Bridge Construction, current edition.

1.02 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.

1.03 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 PRODUCTS2.01 MATERIALS

- A. Prime Coat: Cut-back asphalt, Grades RC-70 or RC-250 meeting the requirements of the Standard Specifications.
- B. Tack Coat: Emulsified asphalt, Grade RS-2, SS-1, or SS-1H meeting the requirements 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.

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2.02 ASPHALT CONCRETE MIX

A. General:

1. Mix formula shall not be modified except with the written approval of 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 meeting the requirements in 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 of the Standard Specifications.
 - a. Mineral Filler shall meet the requirements of the Standard Specifications

E. Asphalt Cement: Paving Grade AC-30 meeting the requirements of Section 916 of the Standard Specifications.

PART 3 EXECUTION3.01 GENERAL

- A. Traffic Control: Minimize inconvenience to traffic, but keep vehicles off freshly treated or paved surfaces to avoid pickup and tracking of asphalt.
- B. Driveways: Repave driveways from which pavement was removed. Leave driveways in as good or better condition than before start of construction.

3.02 LINE AND GRADE

- A. Provide and maintain intermediate control of line and grade, independent of the underlying base to meet finish surface grades and minimum thickness.
- B. Shoulders: Construct to line, grade, and cross-section shown.

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3.03 PREPARATION

- A. Prepare subgrade as specified in Section 02319, Subgrade Preparation.
- B. Existing Roadway:
 - 1. Modify profile by grinding, milling, or overlay methods as approved, to provide meet lines and surfaces and to produce a smooth riding connection to existing facility.
 - 2. Resurface entire roadway following adjustment of base and asphalt grades.
 - 3. Paint edges of meet line with tack coat prior to placing new pavement.
- C. Thoroughly coat edges of contact surfaces (curbs, manhole frames) with emulsified asphalt or asphalt cement prior to laying new pavement. Prevent staining of adjacent surfaces.

3.04 PAVEMENT APPLICATION

- A. General: Place asphalt concrete mixture on an approved, prepared base in conformance with this Section.
- B. Prime Coat:
 - 1. Heat cut-back asphalt between 100 degrees F and 150 degrees F prior to application.
 - 2. Apply uniformly to clean, dry surfaces. Avoiding overlapping of applications.
 - 3. Do not apply when moisture content of upper 3 inches of base exceeds optimum moisture content of base, or if free moisture is present.
 - 4. Application Rate: Minimum 0.1 gallons per square yard of surface area.
 - 5. Remove or redistribute excess material.
 - 6. Allow a minimum of 5 full days for curing of primed surface before placing asphalt concrete.
- C. Tack Coat:
 - 1. Apply uniformly to clean, dry surfaces. Avoiding overlapping of applications.
 - 2. Do not apply more tack coat than necessary for the day's paving operation.
 - 3. Touch up missed or lightly coated surfaces and remove excess material.
 - 4. Application Rate:
 - a. Minimum 0.05 gallons to maximum 0.12 gallons of asphalt (residual if diluted emulsified asphalt) per square yard of surface area.
 - b. Apply at rate, within range specified, sufficient to assure good bonding, but not so heavy that surplus asphalt flushes into asphalt concrete being placed.
- D. Pavement Mix:

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1. Prior to Paving:
 - a. Sweep primed surface free of dirt, dust, or other foreign matter.
 - b. Patch holes in primed surface with asphalt concrete pavement mix.
 - c. Blot excess prime material with sand.
 2. Place asphalt concrete pavement mix in lifts as shown.
 3. Compacted Lift Thickness:
 - a. Minimum: Twice the maximum aggregate size, but in no case less than 3/4 inch. Minimum thickness for Type S-III and SP-9.5 is 1 1/2 inches.
 - b. Maximum: 4 inches.
 4. Total Compacted Thickness: As shown.
 5. Apply such that meet lines are straight and edges are vertical.
 6. Collect and dispose of segregated aggregate from raking process. Do not scatter material over finished surface.
 7. Joints:
 - a. Offset edge of each layer a minimum of 6 inches so joints are not directly over those in underlying layer.
 - b. Offset longitudinal joints in roadway pavements, so longitudinal joints in wearing layer coincide with pavement centerlines and lane divider lines.
 - c. Form transverse joints by cutting back on previous day's run to expose full vertical depth of layer.
 8. Succeeding Lifts: Apply tack coat to pavement surface between each lift.
 9. After placement of pavement, seal meet line by painting a minimum of 6 inches on each side of the joint with cut-back or emulsified asphalt. Cover immediately with sand.
- E. Compaction:
1. Roll until roller marks are eliminated and compacted to 100 percent of the laboratory compacted mixture.
 2. Joint Compaction:
 - a. Place top or wearing layer as continuously as possible.
 - b. Pass roller over unprotected end of freshly laid mixture only when placing of mix is discontinued long enough to permit mixture to become chilled.
 - c. Cut back previously compacted mixture when Work is resumed to produce a slightly beveled edge for full thickness of layer.
 - d. Cut away waste material and lay new mix against fresh cut.
- F. Tolerances:
1. General: Conduct measurements for conformity with crown and grade immediately after initial compression. Correct variations immediately by removal or addition of materials and by continuous rolling.
 2. Completed Surface or Wearing Layer Smoothness:
 - a. Uniform texture, smooth, and uniform to crown and grade.
 - b. Maximum Deviation: 1/8 inch from lower edge of a 12-foot straightedge, measured continuously parallel and at right angle to centerline.
 - c. If surface of completed pavement deviates by more than twice the specified tolerances, remove and replace wearing surface.

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3. Transverse Slope Maximum Deviation: ¼ inch in 12 feet from the rate of slope shown.
4. Finished Grade:
 - a. Perform a field differential level survey on a maximum 50-foot grid and along all grade breaks.
 - b. Maximum Deviation: 0.02 foot from the grade shown.

G. Seal Coat:

1. General: Apply seal coat of paving grade or emulsified asphalt to finished surface at longitudinal and transverse joints, joints at abutting pavements, areas where the asphalt concrete was placed by hand, patched surfaces, and other areas as directed by the Engineer.
2. Preparation:
 - a. Maintain surfaces that are to be sealed free of holes, dry, and clean of dust and loose material.
 - b. Seal in dry weather and when the temperature is above 35 degrees F.
3. Application:
 - a. Fill cracks over 1/16 inch in width with an asphalt-sand slurry or approved crack sealer prior to sealing.
 - b. When sealing patched surfaces and joints with existing pavements, extend minimum 6 inches beyond edges of patches.

3.05 PAVEMENT OVERLAY

A. Preparation:

1. Remove fatty asphalt, grease drippings, dust, and other deleterious matter.
2. Surface Depressions: Fill with asphalt concrete mix, and thoroughly compact.
3. Damaged Areas: Remove broken or deteriorated asphalt concrete and patch as specified in Article Patching.
4. Portland Cement Concrete Joints: Remove joint filler to minimum 1/2 inch below surface.

B. Application:

1. Tack Coat: As specified in this Section.
2. Place and compact asphalt concrete as specified in Article Pavement Application.
3. Place first layer to include widening of pavement and leveling of irregularities in the surface of the existing pavement.
4. When leveling irregular surfaces and raising low areas, the actual compacted thickness of any one lift shall not exceed 2 inches.
5. The actual compacted thickness of intermittent areas of 120 square yards or less may exceed 2 inches, but not 4 inches.
6. Final wearing layer shall be of uniform thickness, and meet grade and cross-section as shown.

3.06 PATCHING

A. Preparation:

ASPHALT CONCRETE PAVEMENT

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1. Remove damaged, broken, or unsound asphalt concrete adjacent to patches. Trim to straight lines exposing smooth, sound, vertical edges.
 2. Prepare patch subgrade as specified in Section 02319, Subgrade Preparation.
- B. Application:
1. Patch Thickness: 3 inches or thickness of adjacent asphalt concrete, whichever is greater.
 2. Place asphalt concrete mix across full width of patch in layers of equal thickness.
 3. Spread and grade asphalt concrete with hand tools or mechanical spreader, depending on size of area to be patched.
- C. Compaction:
1. Roll patches with power rollers capable of providing compression of 200 to 300 pounds per linear inch. Use hand tampers where rolling is impractical.
 2. Begin rolling top course at edges of patches, lapping adjacent asphalt surface at least 1/2 the roller width. Progress toward center of patch overlapping each preceding track by at least 1/2 the width of roller.
 3. Make sufficient passes over entire area to remove roller marks and to produce desired finished surface.
- D. Tolerances:
1. Finished surface shall be flush with and match grade, slope, and crown of adjacent surface.
 2. Tolerance: Surface smoothness shall not deviate more than plus 1/4 inch or minus 0 when a straightedge is laid across patched area between edges of new pavement and surface of old surfacing.

3.07 FIELD QUALITY CONTROL

- A. General: Provide services of an approved certified independent testing laboratory to conduct tests.
- B. Field Density Tests:
1. Perform tests from cores or sawed samples.
 2. Measure with properly operating and calibrated nuclear density gauge.
 3. Maximum Density: In accordance with ASTM D2041, using a sample of mix taken prior to compaction from the same location as the density test sample.
- C. Testing Frequency:
1. Quality Control Tests:
 - a. Asphalt Content, Aggregate Gradation: Once per every 500 tons of mix or once every 4 hours, whichever is greater.

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- b. Mix Design Properties, Measured Maximum (Rice's) Specific Gravity: Once every 1,000 tons or once every 8 hours, whichever is greater.
2. Density Tests: Once every 500 tons of mix or once every 4 hours, whichever is greater.

END OF SECTION

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**SECTION 02900
LANDSCAPE WORK****PART 1 - GENERAL**1.01 RELATED DOCUMENTS

- A. All applicable provisions of the "INFORMATION TO BIDDERS", "STANDARD FORM OF AGREEMENT", and Division 1 - General Requirements shall govern the work under this Section.

1.02 WORK INCLUDED

- A. The work included in this section consists of furnishing all labor, supplies equipment and materials necessary to complete the installation of all landscaping as shown on the Plans as base bid including the installation of sod and seeding as shown, as well as all other related responsibilities as described in these Specifications and accompanying plans.
- B. Installation: All plant materials included shall be of the specific size and quality indicated on the plans and in these specifications and shall be installed in strict accordance with sound nursery practices and shall include maintenance and watering for all work outlined on the plans and specifications until final acceptance.
- C. Quantities and Locations: The LANDSCAPE ARCHITECT reserves the right to adjust the number and locations of the designated types and species to be used at any of the locations shown in order to provide for any modifications which might become necessary.

1.03 RELATED WORK1.04 QUALITY ASSURANCE

- A. Responsibility for Assuring Quality Work: The CONTRACTOR's Superintendent shall be well versed in Florida plant material, planting operations, blue print reading, and coordination with other performing contracts or services in the job area.

All employees shall be competent and highly skilled in their particular job in order to properly perform the work assigned to them. The CONTRACTOR shall be responsible for maintaining the quality of the material on the job throughout the duration of the CONTRACT.

- B. Correct Grade of Plants: In the event that it becomes apparent that any nursery supplying plants for this work has knowingly and consistently represented the grade of plants as being higher than their actual grades as determined under these provisions, all plants already delivered from such sources shall be removed from the job at the CONTRACTOR's expense, and no further plants will be accepted from such nursery until written evidence is submitted and confirmed that all material for delivery has been inspected and approved by inspectors of the State Plant Board as being of the grade as represented.

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- C. Authority for Nomenclature, Species, Etc.: All plant material shall conform to the names given in Hortus Third, 1976 edition. Names of varieties not included therein conform generally with names accepted in the nursery trade.
- D. Grade Standards: All plant materials shall be nursery grown except where specified as collected material, and shall comply with all required inspections, grading standards and plant regulations as set forth by the Florida Department of Agriculture's "Grades and Standards for Nursery Plants" revised 1973, or with any superseding specifications that may be called for on the Plans or in the Specifications. ALL PLANTS NOT LISTED IN THE GRADES AND STANDARDS FOR NURSERY PLANTS, shall conform to a Florida No. 1 as to: (1) Health and Vitality, (2) Condition of Foliage, (3) Root System, (4) Freedom from Pest or Mechanical Damage, (5) Heavily Branched and Densely Foliated according to the accepted normal shape of the species, or sport, (6) Form and branching habit.
- E. Balled and Burlapped (B&B) and Wire Balled and Burlapped (WB&B) Plants: These plants shall be properly protected until they are planted. The plant shall be handled only by the earth ball and not be the plant itself.

Any (B&B) or (WB&B) plant which shows evidence of having handled by a method other than the method outlined above, and resulting in a cracked or broken ball or of the roots being loosened within the ball shall be rejected.

For plants grown in soil of loose texture, which does not readily adhere to the root system, (especially in the case of large plant material), WB&B plants may be specified. For WB&B plants, before plant is removed from the hole, sound hog wire shall be placed around the burlapped ball and looped and tensioned until the burlapped ball is substantially packaged by the tightened wire netting, such as to prevent disturbing of the loose soil around the roots during handling. Any wire, synthetic material or chemically treated material will be removed from the rootball at planting time, all ties shall be removed from the rootball and around the trunk at planting.

- F. Container Grown Plants (CG): Any Container Grown (CG) plants, which have become "pot bound" or for which the top system is out of proportion (larger) to the size of the container, will not be acceptable.

With metal containers, unless the root-ball system slips easily and unbroken from the can, a nursery can-cutter shall be used to slit the can in such a way that the can may be opened fully.

CG plants shall not be removed from the can until immediately before planting, and with all due care to prevent damage to the root system.

- G. Submit to the LANDSCAPE ARCHITECT the names and locations of nurseries proposed as sources of acceptable plant material. The LANDSCAPE ARCHITECT reserves the right to visit the nursery to inspect and/or select the specified material.

1.05 DELIVERY, STORAGE AND HANDLING

- A. Inspection and Transporting: Movement of nursery stock shall comply with all Federal, State, and local laws and regulations. Therefore, required inspection certificates shall accompany each shipment, and shall be filed with the LANDSCAPE ARCHITECT.

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Wrap root balls with burlap. Wire wraps burlap if root ball is not sufficiently compacted. Palms will not require burlap wrapping if the following requirements are met:

1. Dug from marl or heavy soil that adheres to roots and retains shape without shattering.
2. Moistened material used to cover ball and roots not exposed to wind and sun.
3. Transport material on vehicles large enough to allow plants not to be crowded. Plants shall be covered to prevent wind damage during transit and shall be kept moist, fresh and protected at all times. Such protection shall encompass the entire period, which the plants are in transit, being handled, or are in temporary storage.

- B. All plant material shall not remain on the work site longer than two (2) days prior to being installed.

1.06 SUBSTITUTIONS

- A. Substitutions of plant types or change in the size of plant material will only be permitted upon submission of documented proof that the particular plant type and size specified is not obtainable.
- B. Where B&B or WB&B plants are specified, CG plants of the same species, etc., will not be accepted. Where a B&B or WB&B is not specified on a particular plant material, B&B, WB&B or CG plants may be used provided they meet all specifications.

1.07 GUARANTEE

- A. All plant material shall be guaranteed for a minimum of one (1) calendar year from the time of final acceptance.

1.08 REPLACEMENT

- A. The guaranteeing of plant material shall be construed to mean the complete and immediate replacement of plant material if it is:
1. Not in a healthy growing condition.
 2. There is a question to its survival ability at the end of the guarantee period.
 3. It is dead.

1.09 SIZE, QUALITY AND GRADE OF REPLACEMENT

- A. Replacement plant material shall be of the same species, quality and grade as that of the plant to be replaced. The size of the replacement shall not necessarily be the same size as the original specified plant at its initial planting but shall closely match specimens of the same species. Replacements shall be guaranteed for a period equal to the originally specified guarantee. This guarantee period shall begin at time of plant replacement.

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1.10 GUARANTEE NULL AND VOID

- A. The guarantee shall be null and void for plant material which is damaged or dies as a result of "Act of God" limited to hail, freeze, lightening, winds which exceed hurricane force, and lethal yellowing, providing the plant was in a healthy growing condition prior to these "Acts of God".

PART 2 - MATERIALS2.01 PLANT MATERIAL

- A. All material shall be as specified on the construction plans.

PART 3 - EXECUTION3.01 INSPECTION

- A. Utilities: The location and existence of utilities (overhead and underground) shall be thoroughly investigated and verified by the CONTRACTOR before the work begins in the area of said utilities. The CONTRACTOR shall exercise care in digging and work so as not to damage existing utilities in said areas, such as underground pipes, cables, wires, etc. Should such overhead or underground obstructions be encountered which interfere with planting, the LANDSCAPE ARCHITECT shall be consulted immediately in order for a decision to be made on the relocations of plant material to clear such obstruction. The CONTRACTOR shall be responsible for the immediate repair of any damage to utilities caused by CONTRACTOR's work.

3.02 PREPARATION

- A. Preparation shall be as specified on the construction plans and details sheets.

3.03 INSTALLATION

- A. Preparation shall be as specified on the construction plans and details sheets.

3.04 CLEANING AND PROTECTION

- A. Disposal of Trash: All debris and other objectionable material created through planting operations and landscape construction shall be removed completely on a daily basis from the job or as directed by the LANDSCAPE ARCHITECT. Excess soil shall be disposed of as directed by the ENGINEER.
- B. Responsibility for Protection and Restoration of Property: The CONTRACTOR shall be responsible for all damage to property whether it is accidental or necessary for the completion of the contract.
- C. Protection Against Mechanical Damage: The CONTRACTOR's responsibility for protection against mechanical damage shall include providing protection from vehicles and providing warning signs and barricades as might be necessary and CONTRACTOR shall repair, restore and replace any planting areas which become damaged as a result of any negligence of the CONTRACTOR or CONTRACTOR's employees in complying with

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these requirements. Coordination shall be with the CITY and the LANDSCAPE ARCHITECT.

D. Responsibility Prior to Final Acceptance:

1. Maintenance shall begin immediately after each plant is planted and continue until final acceptance by the CITY.
2. Plants shall be hand watered, soaking thoroughly each day for the first two weeks (14 calendar days) and every other day for the following two-week period. Soaking then shall continue on a twice-weekly basis for another period of eight (8) weeks for a total of 90 days or three (3) months, whichever is longer. All watering is required without regard to an irrigation system.
3. Plant maintenance shall include watering, pruning, weeding, cultivating, mulching, tightening and repairing of guys, stakes, braces, etc., replacement of sick or dead plants, resetting plants to proper grades or upright position and maintenance of the watering saucer, and all other care needed for proper growth of the plants. Plant material rejected during the course of the construction shall be removed within five (5) working days and replaced before the inspection for completion will be scheduled.
4. During the maintenance period and up to the issuance of Certificate of Final Acceptance, the CONTRACTOR shall do all seasonal spraying and/or dusting of all planting. The materials and methods shall be in accordance with the highest standard nursery practices and as recommended by the Horticultural Engineer and approved by the LANDSCAPE ARCHITECT, prior to implementation.
5. Planting areas and plants shall be protected against trespassing and damage. If any plants become damaged or injured they shall be treated or replaced, as directed and in compliance with this specification. No work shall be done within or over planting areas or adjacent to plants without proper safeguards and protection.

3.05 MEASUREMENT AND PAYMENT

- A. Measurement and payment will be based on the actual quantities installed at the unit prices bid in the bid schedule.

END OF SECTION

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**SECTION 02919
TOPSOIL****PART 1 - GENERAL**1.01 RELATED DOCUMENTS

- A. All applicable provisions of the Bidding and Contract Requirements, and Division 1 - General Requirements shall govern the work under this Section.

1.02 WORK INCLUDED

- A. Provide all labor, materials, necessary equipment and services to complete the work, as indicated on the drawings, as specified herein or both.
- B. Including but not necessarily limited to the following:
1. Topsoil Stripping.
 2. Topsoil Mixing and Spreading.
- C. There shall be no classification of excavation for measurement of payment regardless of materials encountered.

1.03 RELATED WORK**PART 2 - PRODUCTS**2.01 TOPSOIL

- A. Topsoil shall be obtained from any previously established stockpile on site, to the extent that suitable material is available.
- B. Additional topsoil, if required, shall be obtained by mixing existing on-site sandy fill with imported muck or compost if existing on-site fill is determined to be insufficient.
- C. Topsoil, whether obtained from stockpile, or mixed as described in "B" above, shall be sandy loam, and shall have the following characteristics:
1. 95% of topsoil shall pass a ¼ inch sieve.
 2. Topsoil shall be free of stones 1" in longest dimensions, earth clods, plant parts, and debris.
 3. Organic matter content shall be 9% to 11% of total dry weight.
 4. pH and nutrient content shall be adjusted as necessary to conform with recommendations made by testing laboratory. (See 2.01 (D))
- D. CONTRACTOR is responsible for the testing of the samples for both the existing top soil that is stripped and stock piled as well as any new topsoil that may be needed. Test shall

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indicate compliance with the specifications and recommendations as to the type and quantity of soil additives required to bring the nutrient content and pH to satisfactory levels for planting specified plant material. Tests shall be required at a rate of one per 500 cubic yards of material placed, for the first 5,000 cubic yards of material, and may be reduced at the LANDSCAPE ARCHITECT discretion thereafter. Sampling shall be done in the presence of the LANDSCAPE ARCHITECT. The CONTRACTOR shall be responsible for the cost of testing.

PART 3 - EXECUTION3.01 JOB CONDITIONS

- A. Protection: Use all means necessary to protect existing objects and vegetation. In the event of damage, immediately make all repairs and replacements necessary to the acceptance of the LANDSCAPE ARCHITECT.

3.02 FILLING AND GRADING

- A. Topsoil shall be spread in a uniform 2" layer after compaction, over all sodded areas, and finished to grades shown on the plans, making allowance, where necessary, for sod.

END OF SECTION

TOPSOIL

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**SECTION 02980
WETLAND PLANTING****PART 1 - GENERAL****1.01 RELATED DOCUMENTS**

- A. Drawings and the General Provisions of Contract, including General and Supplementary Conditions and Division 1 and 2-Specification Sections, apply to the work of this section.
- B. Materials List: Major materials and components of work have been categorized and listed on the Drawings. Other materials indicated in the Specifications or drawings may be necessary to complete components as listed and/or to complete the entire job.
- C. Discrepancies: Each item or component has been estimated in quantity units common to landscape construction trade. If quantities of plants or other materials appear to be in conflict, insufficient or in excess, notify the OWNER promptly for clarification prior to submitting bid proposals.
- D. Permits: The CONTRACTOR shall read and understand permits issued by the Broward County Environmental Protection and Growth Management Department (Permit No. DF13-1113) and U.S. Army Corps of Engineers (Permit No. SAJ-2006-06782). This project shall be in conformance with conditions specified in those permits.
 - 1. All Environmental Regulation Agency requirements shall have precedence over specifications stated herein, and reference shall be made to the approved permits. CONTRACTOR to contact the Engineer for clarification as necessary.

2.01 GENERAL REQUIREMENTS

- A. To perform the authorized activities and prior to the initiation of any work authorized by this permit, the OWNER, or PROJECT CONSULTANT, and the CONTRACTOR shall attend a pre-construction meeting with field representatives, regulatory staff, and any other local government entities as necessary. The PROJECT CONSULTANT will notify regulatory entities and contractor of commencement and the preconstruction meeting date and time.
- B. Prior to construction, the CONTRACTOR shall be responsible for ensuring that the permit conditions are explained to all construction personnel working on the project, and for providing each subcontractor with a copy of this permit. A copy of all regulatory permits must be onsite during construction at all times.
- C. All surface waters and wetlands outside the specific limits of construction authorized by this permit shall be protected from erosion, siltation, sedimentation, and/or scouring. The Erosion control shall meet the permit requirements of all agencies listed and meet the requirements listed in this specification.

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1.03 DESCRIPTION OF WORK

- A. Intent: The CONTRACTOR shall order and furnish all labor, materials, supplies, tools and transportation and perform all operations in connection with and reasonably incidental to the installation of necessary planting substrate, complete installation of the planting including maintenance and the guarantee as shown on the drawings and described in this specification. The work shall include but not necessarily be limited to the following:
1. Acquisition of the quantity and quality of plants as specified in the approved plant list, as attached in the planting plan prepared by the PROJECT CONSULTANT.
 2. Planting soil preparation and amenities as described below in earthwork specification and site preparation.
 3. Planting of all plants located in the project area(s) defined by the grading and planting plan, and as identified in the regulatory permits.
 4. Cleanup, inspection and approval.
 5. Guarantee of all plantings per the warranty.
 6. All work of every description mentioned in the 100% construction plans, grading and planting plan and Specifications and/or addenda thereto.
 7. Installation of wetland preservation signage as shown in the planting plan. Shop drawings of the wetland preservation signage must be provided to the PROJECT CONSULTANT for approval prior to installation.
 8. Vegetative maintenance and associated activities as described below in maintenance specification.
- B. Phasing of Project: CONTRACTOR shall perform planting work on designated wetland restoration and transitional buffer area after completion of earthwork, preparation and installation of planting substrate and finish grading work has been completed and approved by the CONSULTANT and OWNER. As-builts of the earthwork must be performed by the contractor and approved by the OWNER and PROJECT CONSULTANT prior to planting the material in the wetland restoration and transitional buffer area.
- C. Review of Existing Conditions: These construction documents and plans provide the design and guidelines for planting installation of a twelve (12) inch layer of planting substrate based on their general hydrologic requirements (zonation). It is the CONTRACTOR'S responsibility to review the existing field conditions prior to planting and installing the planting substrate and to call to the attention of the OWNER or PROJECT CONSULTANT any adjustment in location or elevation of a plant species to match "as-built" field elevations and conditions, to guarantee survival of the planted species as specified in the reference permits.
- D. Maintenance: CONTRACTOR shall maintain all plantings and miscellaneous planting materials including replacement of dead or non-performing plants and the

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removal/treatment of exotics to a level less than 2% vegetative coverage during construction and warranty period specified in this specification.

- E. Final Completion of planting activities: Final completion to be determined by the OWNER or PROJECT CONSULTANT at the end of the Project Warranty period for installed material. Final completion to include satisfactory completion of the scope, specifications and individual tasks.

1.04 QUALITY ASSURANCE

- A. Qualifications: All planting work and planting substrate installation shall be undertaken by a licensed CONTRACTOR specializing in wetland mitigation construction. The CONTRACTOR shall employ a competent, experienced superintendent on the job to supervise all planting work and substrate installation. To demonstrate ability and experience necessary for this project, contractor shall submit, prior to award of contract, the following:

A list of three (3) projects completed in the last two (2) years of similar complexity to this project. Description of projects shall include:

1. Name of Project
 2. Location
 3. Owner's name, address and business phone number
 4. Scope of work and contract amount Remove guys, stakes, and other supports at end of maintenance service.
 5. Consultant or project designer
 6. Regulatory agencies and permit numbers
- B. Source Quality Control: All planting materials shall be shipped with certificates of inspection required by governing authorities.
- C. Substitutions: Prior to bidding, the CONTRACTOR shall verify that all wetland species and transitional buffer species, sizes, quantity and quality of plants can be supplied. If specified planting material is not obtainable, the CONTRACTOR shall submit written proof of non-availability to the OWNER or PROJECT CONSULTANT, together with a proposal for use of equivalent native material. No substitutions shall be made without the written approval of the OWNER or PROJECT CONSULTANT.
- D. Unsupervised Project: This contract is subject to the rules and regulations of Grades and Standards for Nursery Plants as published by the Division of Plant Industry, Florida Department of Agriculture and Consumer Services.
- E. At the conclusion of this planting, if the OWNER or PROJECT CONSULTANT has reason to believe that the plants are not of the specified grade, the OWNER will request a grading inspection by the Division of Plant Industry, and such evidence will be the basis for

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requesting replacement of plants and for legal or other action taken by the Division of Plant Industry according to law, should this become necessary.

F. Field Inspections:

1. Plant Material: Inspection and approval of plant materials at source of supply will not impair the right of the OWNER or PROJECT CONSULTANT to inspect plant material at the site before planting commences. Any materials planted prior to approval are subject to rejection. Inspection of materials may be sequenced by major planting areas to accommodate efficient planting operations. All rejected materials shall be removed from the site, replaced and re-inspected before any additional sequenced inspections are made.
2. On-Site Observation: At any time during the planting and planting substrate installation work by the CONTRACTOR, the OWNER or PROJECT CONSULTANT may visit the site to observe work underway. Upon request, the CONTRACTOR shall be required to exhibit work as directed by the OWNER or PROJECT CONSULTANT without compensation. Should the materials or workmanship not meet the standard specifications herein, the Contractor shall correct the problem at CONTRACTOR'S own expense.
3. Progress Status: The CONTRACTOR shall keep a progress record of planting substrate installation and planting activity on site at all times. This record shall be made available to the OWNER or PROJECT CONSULTANT at all times.

G. Project Warranty: The project warranty is as defined in section 3.09.

H. Survivorship: A minimum 100% survivorship is required and guaranteed by the CONTRACTOR through the project warranty.

I. Approval Requirements: All submittals shall be approved by the OWNER or PROJECT CONSULTANT in writing, before any planting commences.

J. Construction and Planting Schedule: The CONTRACTOR shall submit a construction schedule for the OWNER or PROJECT CONSULTANT approval prior to commencing work, showing scheduled dates for all work to be done. The location of all plantings shall be field staked by the CONTRACTOR and approved or modified by the OWNER or PROJECT CONSULTANT prior to installing plant materials. The CONTRACTOR shall notify the OWNER or PROJECT CONSULTANT at least forty-eight (48) hours in advance of this work.

K. Record Drawings: Submit drawings clearly showing all changes made during the execution of the work on electronically in PDF and AutoCAD 2018.

1.05 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. Packaged Materials: The CONTRACTOR shall deliver packaged materials in containers showing weight, analysis, and name of manufacturer. Material shall be protected from deterioration during delivery and while stored at the site. Storage of materials shall be in

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areas designated on the drawings or as approved by the OWNER or PROJECT CONSULTANT.

- B. Transportation: Care shall be taken by the CONTRACTOR to avoid damaging plants being moved from the nursery(s) to the planting site. Plants shall be protected from drying out. Plants shall not be handled by the trunk or stems. Plants shall be "puddled" when removed from the heeling-in bed to protect the roots from drying out. Plants shall be protected from freezing or drying out by a covering of burlap, tarpaulin, or mulching material during transportation. Damaged plants shall be rejected by the CONTRACTOR and shall be removed from the site.
- C. Delivery Schedule: The CONTRACTOR shall arrange for delivery of plants to the job site only after preparations for planting have been completed, including OWNER or PROJECT CONSULTANT approval of as-built surveys and field-staked planting locations. Plants shall be installed no longer than 24 hours after delivery to site. If planting is delayed more than 6 hours after delivery, trees and shrubs shall be placed in shade, protected from weather and mechanical damage, and the roots kept moist by covering with mulch, burlap, or other acceptable means of retaining moisture. Receipts of all delivered plant material is to be provided to the OWNER or PROJECT CONSULTANT at the time of delivery to the project site. Receipts to include the source, species name and quantity received for installation.
- D. Plant trees and shrubs after final grades are established and before planting of lawns or grasses.

1.06 JOB CONDITIONS

- A. Excavation will be conducted as per section 2.01 and the grading and planting plan. When conditions detrimental to plant growth are encountered, such as unsuitable planting substrate, adverse conditions or obstructions, notify OWNER or PROJECT CONSULTANT before planting.
- B. Landscape Areas: Do not intrude into existing landscape areas with any equipment, materials, supplies, fuel, offices, staging areas or any other activity. If planting occurs adjacent to existing landscape areas, existing landscape areas shall be protected and any damage to these areas shall be repaired promptly at CONTRACTOR's expense.

PART 2 – MATERIALS

2.01 EARTHWORK

- A. Provide all labor, materials, necessary equipment and services to complete the earthwork as indicated on the grading and planting plan.
- B. Clearing and grubbing: Completely remove and dispose of all timber, brush, stumps, roots, rubbish, debris, and all other obstructions resting on or protruding through the surface of excavated areas, and all other structures or obstruction necessary to be removed.
- C. Planting substrate: Planting substrate shall be placed over the subgrade to a minimum depth of 12" evenly over the wetland restoration area including side slopes of buffer areas.

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The planting substrate shall be placed in a manner that avoids compacting or driving equipment over the final planting substrate.

The planting substrate shall be a well-drained blend of native sand/limestone backfill and native organic muck soil so that the final organic content is not less than 15% dry weight. The Backfill shall be suitable native material that does not contain materials from prior excavations or recycled materials of any type. The Organic Muck shall be imported from areas similar to the project site and may be recovered from excavations of previous wetland areas at other sites in South Florida. The Organic Muck will not include mulch materials.

The planting substrate mixing operation shall be completed using a screener and will result in a uniform material where Organic Muck is distributed evenly throughout the backfill to create a uniform planting substrate material. The planting substrate shall be screened to a particle size no greater than 1/4 inch and be free of wood, scrap material, vegetation, refuse, deleterious, or objectionable materials.

Planting substrate installation must be completed, as-built surveyed, and approved by OWNER or PROJECT CONSULTANT prior to planting. Should the CONTRACTOR encounter material and/or specific areas without sufficient and/or suitable planting substrate, it is the CONTRACTOR'S responsibility to inform the OWNER or PROJECT CONSULTANT prior to plant installation in the area(s) in question.

- D. Grading: Uniformly grade areas to a smooth surface, free of irregular surface changes. Grade to cross sections, lines, and elevations indicated.
1. Provide a smooth transition between adjacent existing grades and new grades with specified slopes.
 2. Cut out soft spots, fill spots, and trim high spots to comply with required surface tolerances.
 3. Finished grades to required elevations within a tolerance of plus or minus 1 inch.
 4. Protect newly graded areas from traffic, freezing, and erosion. Keep free of trash and debris.
 5. Repair and reestablish grades to specified tolerances where completed or partially completed surfaces become eroded, rutted, settled due to subsequent construction operations or weather conditions.
- E. As Built: At the completion of the grading of subgrade and planting substrate, the CONTRACTOR shall provide the Engineer with an as-built topographic survey made by a registered Surveyor, of the State of Florida.

The surveyor is to certify on the survey whether the as-built conditions conform to the elevations shown on the Drawings to within plus or minus one-tenth (0.1) of a foot. The survey deliverables are to be in the coordinate system(s) determined by the OWNER.

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As built surveys must be approved by the OWNER, PROJECT CONSULTANT, and County regulatory staff before planting can occur.

2.02 MISCELLANEOUS PLANTING MATERIALS.

- A. Water: Water shall be potable and not contain any elements toxic to plant life.
- B. Fertilizer: A controlled time release fertilizer such as Osmocote Pro or equivalent shall be placed in the planting holes at the time of planting. CONTRACTOR shall submit specifications of type and quantity of fertilizer to be used for each plant two (2) weeks prior to installation.
- C. Mulch: No mulch shall be used within the mitigation area unless otherwise notified by the OWNER or PROJECT CONSULTANT.

2.03 PLANT MATERIALS

- A. Plants Required: The CONTRACTOR shall furnish all plants of the species and in the quantities necessary to fill areas shown on the planting and grading plan at the spacing required and within the designated planting elevation ranges. Substitutions only as noted in 1.4(C) above.
- B. Nomenclature: All trees, shrubs, and plants shall be true to name, size, genus, species, and variety shown as established by the American Joint Committee on Horticultural Nomenclature publication "Standard Plant Names" and as per the recommendations and requirements of ANSI Z60.1, "American Standard for Nursery Stock." The designated authority for the identification of all material shall be the two publications of L.H. Bailey, "Hortus II" and "Manual of Cultivated Plants", and all specimens shall be true to type, name, etc., as described herein.
- C. Grades Standards and Quality:
 - 1. All non-woody wetland plants will meet all specifications for "Wetland Plants" found in the Florida Grades and Standards Manual published by the Florida Department of Agriculture and Consumer Services, Division of Plant Industry. Since the plants used in the project will be containerized, the standards for containerized wetland plants will be required. Containerized specimens shall exhibit a healthy, well-distributed root system which extensively penetrates the soil such that 90% of the soil mass remains intact when the plant is removed from the container. In addition, containerized specimens shall exhibit vigorous growth with a base diameter at least 50% of the diameter of the container. Plants deemed unacceptable per the Wetland Plants section of the Florida Grades and Standards Manual will be rejected for use in the project by OWNER's Contract Administrator and/or PROJECT CONSULTANT. If OWNER or PROJECT CONSULTANT has reason to believe that the plants are not of the specified grade, they may request a grading inspection by the Division of Plant Industry, and such evidence will be the basis for requesting replacement of plants and for legal or other action taken by the Division of Plant Industry according to law, should this become necessary.

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2. For woody wetland plants, the Florida Grades and Standards Manual, latest addition, should be followed with Florida #1 - Type One matrix spreading form a requirement.
- D. All plants shall be sound, healthy and vigorous, well branched and shaped within normal habit of growth, of proper color, and densely foliated when in leaf. They shall have healthy, well developed root systems and shall be free of disease and insect pests, eggs or larvae.
 - E. Minimum Acceptable Sizes: All plants, measured before pruning and with branches in a normal position, shall conform to the measurements indicated on the grading and planting plan. Plants larger in size than specified may be used with the approval of the OWNER or PROJECT CONSULTANT, with no change in the contract price. If larger plants are used, the ball of earth or spread of roots shall be increased in accordance with ANSI Z60.1 as well as the proportionate tree or shrub pit dimensions.
 - F. Ball Size and Wrapping: Balled and Burlapped (B&B) and Balled and Potted (B&P) plants shall have ball sizes and ratios conforming to ANSI Z60.1. Plants shall be balled with firm, natural balls of soil. B&B soils shall be wrapped firmly with burlap and tied.
 - G. Container Grown Plants: Shall have sufficient root growth to hold the earth intact when removed from containers and shall have been growing in containers for at least six (6) months and for not more than 2 years prior to delivery. Stock shall not be rootbound or have hardened-off root systems.
 - H. Sunlight acclimation: Acclimation to full sun conditions is a requirement to ensure a successful transition from nursery to field. Shade-grown nursery plants planted in full sun field conditions may undergo stress, leaf loss and mortality. For this reason, all plants used in the project will be fully sunlight acclimated prior to planting. Plants will be grown in full sun for a minimum of 90 days prior to planting, and 100% sun grown plants are preferable to shade house plants.
 - I. Transitional Buffer Material: The objective of the buffer plantings is to provide soil stabilization and foliar cover over the sloped transitional buffers adjacent to the wetland restoration areas. Stability and vegetative cover are paramount relative to aesthetics. Trees used in the buffer areas should be Florida #1 based on the Florida Grades and Standards Manual meaning all branches are more or less equally dominant. The Type One matrix with a desired spreading form should be followed for plant grading and utilization in the buffer areas.
- 2.04 SIGNAGE
- A. Signage designating the preserve status of the wetland restoration area and buffer zones as shown in the grading and planting plan shall be placed around the entire perimeter of the mitigation area a maximum 200 feet apart. The signs shall be maintained in perpetuity.

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PART 3 - EXECUTION**3.01 SITE PREPERATION**

- A. **Underground Obstructions:** The CONTRACTOR shall be fully acquainted with the related utilities to preclude any misunderstanding and to facilitate a trouble-free installation. It shall be the responsibility of the Contractor to obtain all such information as it is made available. **Nondormant Plants:** Prior to digging, spray foliage with antidesiccant, as recommended by manufacturer.
- B. **Layout:** Plant material locations of individual plant pits and trenches and bed outlines shall be staked on the project site by the CONTRACTOR. Locations may be altered as necessary to avoid overhead and underground obstructions only as directed by OWNER or PROJECT CONSULTANT. Locate and mark all underground utilities encountered. Request in writing to the OWNER or PROJECT CONSULTANT the approval of the field staked plant locations before any plant holes or beds are dug. The OWNER or PROJECT CONSULTANT may adjust plant material locations to meet field conditions and the intent of the plan. Water plants as often as necessary to prevent drying until planted.
- C. **Planting:** Begin planting when other divisions of the work have been sufficiently completed, the OWNER or PROJECT CONSULTANT'S approval of field staked locations has been obtained, as-builts of the earthwork have been approved and planting may be conducted under favorable weather and seasonal conditions as are normal and proper for such work. All setting of plants shall be by experienced work persons, per the best trade practice and as specified herein.
- D. **Damage to Utility Lines:** Shall be repaired at the CONTRACTOR'S expense. Existing trees, shrubbery, and beds that are to be preserved shall be barricaded in a manner that will effectively protect them during planting operations.
- E. **Dewatering** to perform the earthwork within the project site must be approved by the OWNER prior to commencement. If a dewatering plan must be submitted to OWNER or PROJECT CONSULTANT for approval, CONTRACTOR is responsible for obtaining all appropriate approvals for dewatering at own expense.

3.02 EXCAVATION FOR TREES AND SHRUBS

- A. **Excavating:** Excavate holes, pits, beds, and trenches with vertical sides and with bottom of excavation slightly raised at center to provide proper drainage. Scarify any glazed surfaces.
- B. **For Container Grown Stock:** Excavate as specified on construction documents, adjusted to size of container width and depth.

3.03 PLANTING

- A. **Planting Trees and Shrubs:**
 - 1. **Balled and Burlapped (B&B) Stock:** Set balled and burlapped (B&B) stock plumb and in center of pit or trench with top of ball at same elevation as adjacent finished

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landscape grades. Remove all burlap, ropes, wires, and other packing material from sides of balls; retain on bottoms. When set, place additional backfill around base and sides of ball, and work each layer to settle backfill and eliminate voids and air pockets. When excavation is approximately ½ full, water thoroughly before placing remainder of backfill. Repeat watering until no more is absorbed. Water again after placing final layer of backfill. After settlement, crown of plant shall remain 1-inch above average finished grade with compacted planting soil sloping away from trunk or stem and blended with finished grade.

2. Container Grown Stock: Set container grown stock as specified for balled burlapped stock, except cut cans on 2 sides with an approved can cutter and remove entire container.
3. Watering Ring: Dish top of backfill. A 3" water ring shall be formed around the outside edge of the root ball from existing planting soil to adequately contain water.

3.04 WATERING

- A. Temporary watering shall be started immediately after planting. Water shall be applied to the areas at a rate sufficient to insure thorough wetting of the soil to a depth of at least 4 inches. Watering operations shall be properly supervised to prevent runoff. The contractor shall supply all pumps, hoses, pipelines, sprinkling equipment, and/or water truck. All areas damaged by the CONTRACTOR'S watering operations shall be repaired at no cost to the OWNER. Temporary watering shall continue until final acceptance of work by the OWNER as per specifications and plans. Temporary irrigation material (pumps, hoses, sprinkler material etc.) shall be removed by CONTRACTOR within 30 days of the end of the Project Warranty as defined in 3.09.

3.05 FERTILIZING

- A. A controlled time release fertilizer such as Osmocote Pro or equivalent shall be placed in the planting holes at the time of planting.

3.06 MULCHING

- A. No mulch shall be placed within the creation area and mitigation area unless otherwise notified by the OWNER or PROJECT CONSULTANT.

3.07 MAINTENANCE

- A. Maintenance of exotics will be required of the CONTRACTOR for the entire construction period and warranty period.
- B. Plants shall be kept in a healthy, growing condition by watering and any other necessary operations of maintenance during this period.
- C. Exotic and nuisance plant species shall constitute no more than 2% of the total cover of the creation area and mitigation area, including all sub-habitats and buffer area(s).

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3.08 INSPECTION AND ACCEPTANCE

- A. Final Acceptance of all work and materials under this section shall be at such a time as all work has been completed, field inspected, and approved by the OWNER.
- B. As-built surveys shall be submitted for review prior to planting. As-built surveys shall include a minimum of a 20' x 20' foot grid and provided in AutoCAD format and signed and sealed by the surveyor of record for approval by the OWNER or PROJECT CONSULTANT.

3.09 PROJECT WARRANTY

- A. The CONTRACTOR shall warranty all plant materials to have acceptable appearance, to be alive and healthy, and to have exhibited normal growth 90 days after planting.
- B. Loss through CONTRACTOR negligence, however, shall require replacement in kind and size per specification and shall be at the CONTRACTOR'S expense.
- C. A preliminary inspection by the CONTRACTOR and the PROJECT CONSULTANT will be held prior to end of the warranty period to determine plant acceptability, the number of replacements and production of a punch list. Replacement plants and planting operations shall be in accordance with the original plans and specifications.
- D. Dead, missing, and defective plant material shall be replaced immediately during the warranty period or as directed by the OWNER or PROJECT CONSULTANT. Replacements shall be in the same manner as specified for the original planting at no cost to the OWNER. Damage to other planting areas or preserve areas during plant replacements shall be repaired at no cost to the OWNER. Otherwise, final acceptance will be delayed until such replacements have been satisfactorily accomplished.

END OF SECTION

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SECTION 03290
JOINTS IN CONCRETE

PART 1 – GENERAL

1.01 THE REQUIREMENT

- A. The Contractor shall construct all joints in concrete at the locations shown on the Drawings. Joints required in concrete structures are of various types and will be permitted only where shown on the Drawings, unless specifically accepted by the Engineer.
- B. Construction joints, expansion joints, contraction joints and control joints shall be provided at the locations shown and formed in accordance with the details shown on the Drawings.
- C. Waterstops shall be provided where shown on the Drawings, and in all waterbearing joints in hydraulic structures.

1.02 RELATED WORK SPECIFIED ELSEWHERE

- A. Section 03100 - Concrete Formwork
- B. Section 03200 - Concrete Reinforcement
- C. Section 03300 - Cast in Place Concrete.
- D. Section 03315 - Grout
- E. Section 03350 - Concrete Finishes
- F. Section 03370 - Concrete Curing

1.03 REFERENCE SPECIFICATIONS, CODES AND STANDARDS

- A. Without limiting the generality of other requirements of these Specifications, all work specified herein shall conform to or exceed the applicable requirements of the following documents to the extent that the provisions therein are not in conflict with the requirements of this Section.
 - 1. Federal Specifications:
 - a. TT S 00227E(3) Sealing Compound, Elastomeric Type, Multi component (For Caulking, Sealing, And Glazing Buildings And Other Structures).
 - 2. U.S. Army Corps of Engineers Standard Specifications
 - a. CRD C572
 - 3. Commercial Standards:

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- a. ASTM C 920 Specification for Elastomeric Joint Sealants.
- b. ASTM D 624 Test Method for Rubber Property Tear Resistance.
- c. ASTM D 638 Test Method for Tensile Properties of Plastics.
- d. ASTM D 746 Test Method for Brittleness Temperature of Plastics and Elastomers by Impact.
- e. ASTM D 747 Test Method for Apparent Bending Modules of Plastics by Means of a Cantilever Beam.
- f. ASTM D 1752 Specification for Preformed Sponge Rubber and Cork Expansion Joint Fillers for Concrete Paving and Structural Construction.
- g. ASTM D 2240 Test Method for Rubber Property Durometer Hardness.

1.04 TYPES OF JOINTS

- A. Construction Joints: When fresh concrete is placed against a hardened concrete surface, the joint between the two pours is called construction joint. Unless noted otherwise, all joints in water bearing structures shall be provided with a waterstop of the shape specified herein or shown on the Drawings.
- B. Contraction Joints: Contraction joints are similar to construction joints except that the fresh concrete shall not bond to the hardened surface of the first pour, which shall be coated with a bond breaker. The slab reinforcement shall be stopped 4 1/2 inches from the joint; which is provided with a sleeve type dowel, to allow shrinkage of the concrete of the second pour. Waterstop and/or sealant groove shall also be provided when specified on the Drawings.
- C. Expansion Joints: To allow the concrete to expand freely, a space is provided between the two pours, the joint shall be formed as detailed on the Drawings. This space is obtained by placing a preformed joint filler against the first pour, which acts as a form for the second pour. Unless noted otherwise, all expansion joints in water bearing members shall be provided with a 9-inch wide waterstop. Preformed joint filler shall be installed with the edge at the indicated distance below or back from finished concrete surface, and shall have a slightly tapered, dressed, and oiled wood strip secured to or placed at the edge thereof during concrete placement, which shall later be removed to form space for sealing material. The space so formed shall be filled with a joint sealant material as specified herein. The joint sealant shall be isolated from the filler using a bond breaker.
- D. Control Joints: The function of the control joint is to provide a weaker plane in the concrete, where shrinkage cracks will probably occur. A groove, of the shape and dimensions shown on the Drawing, is formed or saw cut in the concrete. This groove shall be filled with a joint sealant.

1.05 SUBMITTALS

- A. Waterstops: Prior to production of the material required under this contract, qualification samples shall be submitted. Such samples shall consist of extruded or molded sections of each size or shape to be used, and shall be accomplished so that the material and workmanship represents in all respects the material to be

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furnished under this contract. The balance of the material to be used under this contract shall not be produced until after the Engineer has reviewed the qualification samples. The samples shall be delivered to a location on site indicated by the Engineer.

- B. Joint Sealant: Prior to ordering the sealant material, the Contractor shall submit to the Engineer for the Engineer's review, sufficient data to show general compliance with the requirements of the Contract Documents.
- C. Contractor shall submit product data sheets of all materials proposed under this section.
- D. Shipping Certification: The Contractor shall provide written certification from the manufacturer as an integral part of the shipping form, to show that all of the material shipped to this project meets or exceeds the physical property requirements of the Contract Documents. Contractor certificates are not acceptable.
- E. The Contractor shall submit placement Shop Drawings showing the location and type of all joints for each structure.

1.06 QUALITY ASSURANCE

A. Waterstop

- 1. Review: It is required that all waterstop field joints shall be subject to review inspection, and no such work shall be scheduled or started without having made prior arrangements with the Engineer to provide for the required reviews. Not less than 24 hours' notice shall be provided to the Engineer for scheduling such reviews.
- 2. All field joints in waterstops will be subject to rigid review for misalignment, bubbles, inadequate bond, porosity, cracks, offsets, and other defects which would reduce the potential resistance of the material to water pressure at any point. All defective joints shall be replaced with material which will pass said review, and all faulty material shall be removed from the site and disposed of by the Contractor at its own expense.
- 3. The following defects represent a partial list of defects which shall be grounds for rejection:
 - a. Offsets at joints greater than 1/16 inch or 15 percent material thickness, at any point, whichever is less.
 - b. Exterior crack at joint, due to incomplete bond, deeper than 1/16 inch or 15 percent of material thickness, at any point, whichever is less.
 - c. Any combination of offset or exterior crack which will result in a net reduction in the cross section of the waterstop in excess of 1/16 inch or 15 percent of material thickness at any point, whichever is less.
 - d. Misalignment of joint which result in misalignment of the waterstop in excess of 1/2 inch in 10 feet.
 - e. Porosity in the welded joint as evidenced by visual inspection.

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- f. Bubbles or inadequate bonding which can be detected with pen knife test. (If, while prodding the entire joint with the point of a pen knife, the knife breaks through the outer portion of the weld into a bubble, the joint shall be considered defective.)

1.07 GUARANTEE

- A. The Contractor shall provide a two year written guarantee of the entire sealant installation against faulty and/or incompatible materials and workmanship, together with a statement that it agrees to repair or replace, to the satisfaction of the City, at no additional cost to the City, any such defective areas which become evident within said two year guarantee period.

PART 2 – PRODUCTS

2.01 PVC WATERSTOPS

- A. General: Waterstops shall be extruded from an elastomeric polyvinylchloride compound containing the plasticizers, resins, stabilizers, and other materials necessary to meet the requirements of these Specifications. No reclaimed or scrap material shall be used. The Contractor shall obtain from the waterstop manufacturer and shall furnish to the Engineer for review, current test reports and a written certification of the manufacturer that the material to be shipped to the job meets the physical requirements as outlined in the U.S. Army Corps of Engineers Specification CRD C572 and listed in Paragraph C. below.
- B. Multi Rib Waterstops: All PVC waterstops shall be of Multi rib construction. Waterstops for construction joints shall be serrated style 732 by Greenstreak or equal. Waterstops for expansion joints shall be Style 738 by Greenstreak or equal. T type waterstops installed against existing concrete shall be Style 609 by Greenstreak, or equal. Compatible baten bars and anchor bolts shall be supplied by the same manufacturer. Prefabricated joint fittings (90° bends and tees) shall be used at all intersections of the ribbed type waterstops.
- C. Waterstop Testing Requirements: When tested in accordance with the specified test standards, the waterstop material shall meet or exceed the following requirements:

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	<u>Value</u>	<u>ASTM Std.</u>
Tensile Strength-min (psi)	1750	D 638, Type IV
Ultimate Elongation-min (percent)	350	D 638, Type IV
Low Temp. Brittleness-Max (degrees F)	-35	D 746
Stiffness in Flexure-min (psi)	400	D 747
Accelerated Extraction (CRD-C572)		
Tensile Strength-min (psi)	1500	D 638, Type IV
Ultimate Elongation-min (percent)	300	D 638, Type IV
<u>Effect of Alkalies (CRD-C572)</u>		
Ultimate Elongation-min (percent)	300	D 638, Type IV
Change in Weight (percent)	+0.25/-0.10	----
Change in Durometer, Shore A	+5	D 2240
<u>Finish Waterstop</u>		
Tensile Strength-min (psi)	1400	D 638, Type IV
Ultimate Elongation-min (percent)	280	D 638, Type IV

2.02 CHEMICAL RESISTANT WATERSTOPS

- A. General: Waterstops shall be manufactured from thermoplastic elastomeric rubber material. The synthetic rubber shall be provide a high resistance to acids, bases, alcohols, oils, solvents or chemicals. No reclaimed material shall be used. The Contractor shall obtain from the waterstop manufacturer and furnish to the Engineer for review, current test reports and a written certification of the manufacturer that the material to be shipped to the job meets the physical requirements outlined herein. Waterstop connections shall be heat welded. All waterstop corners, intersections, and directional changes shall be miter cut, heat welded, factory fabricated. Only straight butt splices shall be allowed in the field.
- B. Multi-Rib Waterstops: All chemical resistant waterstops shall be of multi-rib construction. Waterstops for expansion joints shall be 9"x3/16" ribbed with a center bulb. Waterstops for construction joints shall be 6"x3/16" ribbed with a center bulb. Chemical resistant waterstops shall be Westec Type TPE-R synthetic rubber, manufactured by Westec Barrier Technologies, St. Louis, MO, or equal.
- C. Waterstop Physical Properties: When tested in accordance with the specified test standards, the waterstop material shall meet or exceed the following requirements:

<u>Physical Property</u>	<u>Value</u>	<u>ASTM Std.</u>
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Tensile Strength	1800 psi	D-412
Ultimate Elongation	450%	D-412
100% Modulus	1000 psi	D-412
Shore A Hardness	85 units \pm 5 units	D-2240
Brittle Point	-70°F	D-746
Ozone Resistance	450 pphm passed	D-1171

D. Weathering Performance: When tested in accordance with the specified test standards, the waterstop material shall meet or exceed the following requirements:

<u>Physical Property</u>	<u>Value</u>	<u>ASTM Std.</u>
Tensile Strength (% Retention)	87%	D-412
Ultimate Elongation (% Retention)	84%	D-412
Shore A Hardness (units change)	7 units	D-2240

E. Chemical Resistance Properties: When tested in accordance with ASTM D-471 after 166 hours of full immersion at 73.4oF (23oC), the waterstop material shall meet or exceed the following requirements:

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<u>Fluid</u>	<u>Physical Property</u>	<u>Value</u>
Sulfuric Acid 98%	Ultimate Elongation	77% Retention
	Ultimate Tensile	82% Retention
	100% Modulus	108% Retention
	Hardness Change Shore A	-1 Unit
	Weight Change	2.1%
Sodium Hydroxide 50%	Ultimate Elongation	101% Retention
	Ultimate Tensile	107% Retention
	100% Modulus	104% Retention
	Hardness Change Shore A	-4 Unit
	Weight Change	-0.1%

2.03 HYDROPHILIC WATERSTOPS

- A. Hydrophilic waterstops shall be designed to expand and seal under hydrostatic conditions. At construction joints, the waterstops shall be Adeka Ultraseal MC 2010 M for wall/slab thickness greater than 9 inches, and Adeka Ultraseal KBA-1510FF for wall/slab thickness less than 9 inches or equal. At expansion joints, the waterstops shall be Adeka Ultraseal KM-3030M or equal.
- B. Plate fabrications used to plug flow channels for future expansion or otherwise to close wall openings shall be caulked using hydrophilic waterstops designed for the application. Caulking agents shall be Adeka Ultraseal P201 or equal.

2.04 JOINT SEALANT

- A. Joint sealant shall comply with Section 07920 entitled "Sealants and Caulking".

2.05 EXPANSION JOINT MATERIAL

- A. Preformed expansion joint material shall be non-extruding, and shall be one of the following types:
1. Type I – Sponge rubber, conforming to ASTM D1752, Type I
 2. Type II – Cork, conforming to ASTM D1752, Type II
 3. Type III – Self-expanding cork, conforming to ASTM D1752, Type III
 4. Type IV – Bituminous fiber, conforming to ASTM Designation D1752

2.06 BACKER ROD

- A. Backer rod shall comply with Section 07920 entitled "Sealants and Caulking".

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2.07 BOND BREAKER

- A. Bond breaker shall be Super Bond Breaker as manufactured by Burke Company, San Mateo, California; Hunt Process 225 TU as manufactured by Hunt Process Co., Santa Fe Springs, CA; Select Cure CRB as manufactured by Select Products Co., Upland, CA; or equal. It shall contain a fugitive dye so that areas of application will be readily distinguishable.

2.08 CONTRACTION JOINT INSERTS

- A. Contraction joint inserts shall be Transverse-Control Joints by Greenstreak Plastic Products or equal.

PART 3 – EXECUTION**3.01 GENERAL**

- A. Unless otherwise shown on the Drawings, waterstops of the type specified herein shall be embedded in the concrete across joints as shown. All waterstops shall be fully continuous for the extent of the joint. Splices necessary to provide such continuity shall be accomplished in conformance to printed instructions of manufacturer of the waterstops. The Contractor shall take suitable precautions and means to support and protect the waterstops during the progress of the Work and shall repair or replace at its own expense any waterstops damaged during the progress of the Work. All waterstops shall be stored so as to permit free circulation of air around the waterstop material.
- B. When any waterstop is installed in the concrete on 1 side of a joint, while the other half or portion of the waterstop remains exposed to the atmosphere for more than 14 days, suitable precautions shall be taken to shade and protect the exposed waterstop from direct rays of the sun during the entire exposure and until the exposed portion of the waterstop is embedded in concrete.

3.02 CONSTRUCTION JOINTS

- A. Construction joints shall be as shown on the Drawings. Otherwise, Contractor shall submit description of the joint and its location to Engineer for approval.
- B. Unless noted otherwise on the Drawings, construction joints shall be located near the middle of the spans of slabs, beams, and girders unless a beam intersects a girder at this point. In this case, the joints in the girders shall be offset a distance equal to twice the width of the beam. Joints in walls and columns shall be at the underside of floors, slabs, beams, or girders and the top of footings or floor slabs unless noted otherwise on Drawings. Beams, girders, brackets, column capitals, haunches, and drop panels shall be placed at the same time as slabs. Joints shall be perpendicular to the main reinforcement.
- C. Unless noted otherwise on the Drawings, maximum Maximum1 distance between horizontal joints in slabs and vertical joints in walls shall be 45' 0". For exposed walls with fluid or earth on the opposite side, the spacing between vertical and horizontal joints shall be a maximum of 25'-0" unless noted otherwise on the Drawings1.

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- D. All corners shall be part of a continuous placement, and should a construction joint be required, the joint shall not be located closer than five feet from a corner.
- E. All reinforcing steel and welded wire fabric shall be continued across construction joints. Keys and inclined dowels shall be provided as shown on the Drawings or as directed by the Engineer. Longitudinal keys shall be provided in all joints in walls and between walls and slabs or footings, except as specifically noted otherwise on the Drawings. Size of keys shall be as shown on the Drawings.
- F. All joints in water bearing structures shall have a waterstop. All joints below grade in walls or slabs which enclose an accessible area shall have a waterstop.

3.03 SPLICES IN PVC WATERSTOPS

- A. Splices in waterstops shall be performed by heat sealing the adjacent waterstop sections in accordance with the manufacturer's printed recommendations. It is essential that:
 - 1. The material not be damaged by heat sealing.
 - 2. The splices have a tensile strength of not less than 60 percent of the unspliced materials tensile strength.
 - 3. The continuity of the waterstop ribs and of its tubular center axis be maintained.
- B. Butt joints of the ends of 2 identical waterstop sections may be made while the material is in the forms.
- C. All joints in waterstop involving more than 2 ends to be joined together, and all joints which involve an angle cut, alignment change, or the joining of 2 dissimilar waterstop sections shall be factory fabricated with not less than 24-inch long strips of material beyond the joint. Upon being inspected and accepted, such prefabricated waterstop joint assemblies shall be installed in the forms and the ends of the 24 inch strips shall be butt welded to the straight run portions of waterstop in place in the forms.

3.04 JOINT CONSTRUCTION

- A. Setting PVC Waterstops: In order to eliminate faulty installation that may result in joint leakage, particular care shall be taken of the correct positioning of the waterstops during installation. Adequate provisions must be made to support the waterstops during the progress of the Work and to insure the proper imbedment in the concrete. The symmetrical halves of the waterstops shall be equally divided between the concrete pours at the joints. The center axis of the waterstops shall be coincident with the joint openings. Maximum density and imperviousness of the concrete shall be insured by thoroughly working it in the vicinity of all joints.
- B. In placing PVC waterstops in the forms, means shall be provided to prevent them from being folded over by the concrete as it is placed. Unless otherwise shown, all waterstops shall be held in place with light wire ties on 12 inch centers which shall be passed through the edge of the waterstop and tied to the curtain of reinforcing steel. Horizontal waterstops, with their flat face in a vertical plane, shall be held in place with continuous supports to which the top edge of the waterstop shall be tacked. In placing concrete around horizontal waterstops, with their flat face in a

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horizontal plane, concrete shall be worked under the waterstops by hand so as to avoid the formation of air and rock pockets.

- C. Joint Location: Construction joints, and other types of joints, shall be provided where shown on the Drawings. When not shown on the Drawings, maximum distance between horizontal joints in slabs and vertical joints in walls shall be 45-feet, and maximum distance between vertical and horizontal joints for earth or water retaining walls shall be 25-feet, unless noted otherwise. The location of all joints, of any type, shall be submitted for review by the Engineer.
- D. Joint Preparation: Special care shall be used in preparing concrete surfaces at joints where bonding between two sections of concrete is required. Unless otherwise shown on the Drawings, such bonding will be required at all horizontal joints in walls. Surfaces shall be prepared in accordance with the requirements of Section 03300 entitled "Cast in Place Concrete."
- E. Adequate means shall be provided for anchoring the waterstop in concrete. Waterstops shall be positioned so that they are equally embedded in the concrete on each side of the joint.
- F. Sealant application shall be in accordance with the manufacturer's printed instructions. The surfaces of the groove for the sealant shall not be coated. Concrete next to waterstops shall be placed in accordance with the requirements of Section entitled, "Cast in Place Concrete."
- G. The primer and sealant shall be placed strictly in accordance with the printed recommendations of the manufacturer, taking special care to properly mix the sealant prior to application. All sealant shall cure at least 7 days before the structure is filled with water.
- H. All sealant shall be installed by a competent waterproofing specialty contractor who has a successful record of performance in similar installations. Before work is commenced, the crew doing the Work shall be instructed as to the proper method of application by a representative of the sealant manufacturer.
- I. Thorough, uniform mixing of 2 part, catalyst cured materials is essential; special care shall be taken to properly mix the sealer before its application. Before any sealer is placed, the Contractor shall arrange to have the crew doing the Work carefully instructed as to the proper method of mixing and application by a representative of the sealant manufacturer.
- J. Any joint sealant which, after the manufacturer's recommended curing time for the job conditions of the Work hereunder, fails to fully and properly cure shall be completely removed; the groove shall be thoroughly sandblasted to remove all traces of the uncured or partially cured sealant and primer, and shall be re sealed with the specified joint sealant. All costs of such removal, joint treatment, re sealing, and appurtenant work shall be at the expense of the Contractor.

3.05 INSTALLATION OF EXPANSION JOINT MATERIAL AND SEALANTS

- A. Type I, II, or III shall be used in all expansion joints in structures and concrete pavements unless specifically shown otherwise on the Drawings. Type IV shall be used in sidewalk and curbing and other locations specifically shown on the Drawings.

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- B. All expansion joints exposed in the finish work, exterior and interior, shall be sealed with the specified joint sealant. Expansion joint material and sealants shall be installed in accordance with manufacturer's recommended procedures and as shown on the Drawings.
- C. Expansion joint material that will be exposed after removal of forms shall be cut and trimmed to ensure a neat appearance and shall completely fill the joint except for the space required for the sealant. The material shall be held securely in place and no concrete shall be allowed to enter the joint or the space for the sealant and destroy the proper functions of the joint.
- D. A bond breaker shall be used between expansion joint material and sealant. The joint shall be thoroughly clean and free from dirt and debris before the primer and the sealant are applied. Where the finished joint will be visible, masking of the adjoining surfaces shall be carried out to avoid their discoloration. The sealant shall be neatly tooled into place and its finished surfaces shall present a clean and even appearance.
- E. Type 1 joint sealant shall be used in all expansion and contraction joints in concrete, except where Type 7 or Type 8 is required as stated below, and wherever else specified or shown on the Drawings. It shall be furnished in pour grade or gun grade depending on installation requirements. Primers shall be used as required by the manufacturer. The sealant shall be furnished in colors as directed by the Engineer.
- F. Type 8 joint sealant shall be used in all concrete pavements and floors subject to heavy traffic and wherever else specified or shown on the Drawings.
- G. Type 7 joint sealant shall be used for all joints in chlorine contact tanks and wherever specified or shown on the Drawings.

END OF SECTION

SECTION 03300**CAST-IN-PLACE CONCRETE****PART 1 - GENERAL**1.01 SUMMARY

- A. This Section specifies cast-in place concrete, including formwork, reinforcement, concrete materials, mixture design, placement procedures, and finishes.
- B. See Division 31 Section "Earth Moving" for drainage fill under slabs-on-grade.

1.02 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Design Mixtures: For each concrete mixture.
- C. Shop Drawings: For steel reinforcement **and formwork**.

1.03 QUALITY ASSURANCE

- A. Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C 94/C 94M requirements for production facilities and equipment.
- B. ACI Publications: Comply with the following unless modified by requirements in the Contract Documents:
 - 1. ACI 117, "Specifications for Tolerances for Concrete Construction and Materials."

PART 2 - PRODUCTS2.01 FORM-FACING MATERIALS

- A. Smooth-Formed Finished Concrete: Form-facing panels that will provide continuous, true, and smooth concrete surfaces. Furnish in largest practicable sizes to minimize number of joints.
- B. Rough-Formed Finished Concrete: Plywood, lumber, metal, or another approved material. Provide lumber dressed on at least two edges and one side for tight fit.

2.02 STEEL REINFORCEMENT

- A. Reinforcing Bars: ASTM A 615/A 615M, Grade 60 deformed.
- B. Deformed-Steel Welded Wire Reinforcement: ASTM A 497, flat sheet.

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- C. Galvanized-Steel Welded Wire Reinforcement: ASTM A 185, plain, fabricated from galvanized steel wire into flat sheets.
- D. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded wire reinforcement in place. Manufacture bar supports from steel wire, plastic, or precast concrete according to CRSI's "Manual of Standard Practice."

2.03 CONCRETE MATERIALS

- A. Cementitious Material: Use the following cementitious materials, of the same type, brand, and source, throughout Project:
 - 1. Portland Cement: ASTM C 150, Type I/II
- B. Normal-Weight Aggregates: ASTM C 33, graded, **3/4-inch** nominal maximum coarse-aggregate size.
- C. Water: ASTM C 94/C 94M
- D. Chemical Admixtures: Provide admixtures certified by manufacturer to be compatible with other admixtures and that will not contribute water-soluble chloride ions exceeding those permitted in hardened concrete. Do not use calcium chloride or admixtures containing calcium chloride.
 - 1. Water-Reducing Admixture: ASTM C 494/C 494M, Type A.
 - 2. Retarding Admixture: ASTM C 494/C 494M, Type B.
 - 3. Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type D.
 - 4. High-Range, Water-Reducing Admixture: ASTM C 494/C 494M, Type F.
 - 5. High-Range, Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type G.
 - 6. Plasticizing and Retarding Admixture: ASTM C 1017/C 1017M, Type II.

2.04 CURING MATERIALS

- A. Evaporation Retarder: Waterborne, monomolecular film forming, manufactured for application to fresh concrete.
- B. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. when dry.
- C. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.
- D. Water: Potable.

2.05 CONCRETE MIXTURES

- A. Prepare design mixtures for each type and strength of concrete, proportioned on the basis of laboratory trial mixture or field test data, or both, according to ACI 301.

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- B. Cementitious Materials: Use fly ash, pozzolan, ground granulated blast-furnace slag, and silica fume as needed to reduce the total amount of portland cement, which would otherwise be used, by not less than 40 percent.
- C. Proportion normal-weight concrete mixture as follows:
 - 1. Minimum Compressive Strength: **3000 psi**
 - 2. Maximum Water-Cementitious Materials Ratio: **0.50**
 - 3. Slump Limit: **5 inches**, plus or minus 1 inch

2.06 FABRICATING REINFORCEMENT

- A. Fabricate steel reinforcement according to CRSI's "Manual of Standard Practice."

2.07 CONCRETE MIXING

- A. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete according to ASTM C 94/C 94M, and furnish batch ticket information.
 - 1. When air temperature is between 85 and 90 deg F reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 90 deg F reduce mixing and delivery time to 60 minutes.

PART 3 - EXECUTION

3.01 FORMWORK

- A. Design, erect, shore, brace, and maintain formwork according to ACI 301 to support vertical, lateral, static, and dynamic loads, and construction loads that might be applied, until structure can support such loads.
- B. Construct formwork so concrete members and structures are of size, shape, alignment, elevation, and position indicated, within tolerance limits of ACI 117.

3.02 EMBEDDED ITEMS

- A. Place and secure anchorage devices and other embedded items required for adjoining work that is attached to or supported by cast-in-place concrete. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.

3.03 STEEL REINFORCEMENT

- A. General: Comply with CRSI's "Manual of Standard Practice" for placing reinforcement.
 - 1. Do not cut or puncture vapor retarder. Repair damage and reseal vapor retarder before placing concrete.

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3.04 CONCRETE PLACEMENT

- A. Before placing concrete, verify that installation of formwork, reinforcement, and embedded items is complete and that required inspections have been performed.
- B. Deposit concrete continuously in one layer or in horizontal layers of such thickness that no new concrete will be placed on concrete that has hardened enough to cause seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as indicated. Deposit concrete to avoid segregation.
 - 1. Consolidate placed concrete with mechanical vibrating equipment according to ACI 301.
- C. Hot-Weather Placement: Comply with ACI 301.

3.05 FINISHING FORMED SURFACES

- A. Rough-Formed Finish: As-cast concrete texture imparted by form-facing material with tie holes and defects repaired and patched. Remove fins and other projections that exceed specified limits on formed-surface irregularities.

3.06 CONCRETE PROTECTING AND CURING

- A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 306.1 for cold-weather protection and ACI 301 for hot-weather protection during curing.
- B. Evaporation Retarder: Apply evaporation retarder to unformed concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 lb/sq. ft. x h (1 kg/sq. m x h) before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete, but before float finishing.
- C. Cure concrete according to ACI 308.1, by one or a combination of the following methods:
 - 1. Moisture Curing: Keep surfaces continuously moist for not less than seven days.
 - 2. Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches (300 mm), and sealed by waterproof tape or adhesive. Cure for not less than seven days. Immediately repair any holes or tears during curing period using cover material and waterproof tape.
 - 3. Curing Compound: Apply uniformly in continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Maintain continuity of coating and repair damage during curing period.

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3.07 CONCRETE SURFACE REPAIRS

- A. Defective Concrete: Repair and patch defective areas when approved by Architect. Remove and replace concrete that cannot be repaired and patched to Architect's approval.

3.08 FIELD QUALITY CONTROL

- A. Testing and Inspecting: Owner will engage a qualified independent testing and inspecting agency to perform field tests and inspections and prepare test reports.
1. Testing Services: Tests shall be performed according to ACI 301.

END OF SECTION

**SECTION 03301
REINFORCED CONCRETE**

PART 1 - GENERAL

1.01 REFERENCES

- A. The following is a list of standards which may be referenced in this section:
1. American Concrete Institute (ACI):
 - a. 301, Specifications for Structural Concrete for Buildings.
 - b. 305R, Hot Weather Concreting.
 - c. 306R, Cold Weather Concreting.
 - d. 318/318R, Building Code Requirements for Reinforced Concrete.
 - e. 347, Formwork for Concrete.
 2. ASTM International (ASTM):
 - a. A497, Standard Specification for Steel Welded Wire Fabric, Deformed, for Concrete Reinforcement.
 - b. A615, Standard Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement.
 - c. C31, Standard Practice for Making and Curing Concrete Test Specimens in the Field.
 - d. C39, Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens.
 - e. C94, Standard Specification for Ready-Mixed Concrete.
 - f. C150, Standard Specification for Portland Cement.
 - g. C260, Standard Specification for Air-Entraining Admixtures for Concrete.
 - h. C309, Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete.
 - i. C494, Standard Specification for Chemical Admixtures for Concrete.
 - j. C618, Standard Specification for Fly Ash and Raw or Calcined Natural Pozzolan for Use as a Mineral Admixture in Portland Cement Concrete.
 - k. D994, Standard Specification for Preformed Expansion Joint Filler for Concrete (Bituminous Type).
 3. Concrete Reinforcing Steel Institute (CRSI):
 - a. Manual of Standard Practice.
 - b. Recommended Practice for Placing Reinforcing Bars.

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1.02 SUBMITTALS**A. Action Submittals:**

1. Reinforcing steel in accordance with CRSI Manual of Standard Practice.
2. Curing compound data.
3. Complete data on the concrete mix, including aggregate gradations and admixtures, in accordance with ASTM C94.

B. Informational Submittals:

1. Manufacturer's application instructions for curing compound.
2. Ready-mix delivery tickets for each truck in accordance with ASTM C94.

1.03 QUALITY ASSURANCE

- A. Formwork: Unless otherwise specified, follow the recommendations of ACI 347.
- B. Concrete and Reinforcement: Unless otherwise specified, meet the requirements of ACI 301 and ACI 318/318R.
- C. Hot Weather Concreting: Conform to ACI 305R.

1.04 ENVIRONMENTAL REQUIREMENTS

- A. Do not use curing compound where solvents in the curing compounds are prohibited by state or federal air quality laws. Use only water curing methods.

PART 2 - PRODUCTS**2.01 CONCRETE**

- A. Ready-mixed meeting ASTM C94, Option A.
- B. Portland Cement: ASTM C150, Type I or II.
- C. Admixtures:
 1. Air-Entraining: ASTM C260.
 2. Water-Reducing: ASTM C494, Type A or Type D.
 3. Superplasticizers: ASTM C494, Type F or Type G.
 4. Fly Ash: ASTM C618, Class C or Class F.
 5. Color Pigments: Inert mineral or metaloxide pigments, either natural or synthetic; resistant to lime and other alkalies.
- D. Mix Design:
 1. Minimum Allowable 28-day Compressive Field Strength: 3,000 psi when cured

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and tested in accordance with ASTM C31 and ASTM C39.

2. Water-Cement Ratio: 0.48, maximum.
3. Cement Content: 540 pounds per cubic yard, minimum.
4. Coarse Aggregate Size: 3/4 inch(es) and smaller.
 5. Slump Range: 3 inches to 5 inches.
 6. Air Entrainment: Between 3 and 6 percent by volume. Use 4 percent minimum for concrete placed under requirements of cold weather concreting.
 7. Water Reducers: Use in concrete without plasticizers.
 8. Superplasticizers: Use for structures.
- E. Mixing: Minimum 70 and maximum 270 revolutions of mixing drum. Nonagitating equipment is not allowed.

2.02 REINFORCING STEEL

- A. Deformed Bars: ASTM A615, Grade 60.
- B. Welded Wire Fabric: ASTM A497.

2.03 ANCILLARY MATERIALS

- A. Expansion Joint Filler: ASTM D994, 1/2-inch thick, or as shown.
- B. Nonshrink Grout:
 1. Color: To match concrete.
 2. Manufacturers and Products:
 - a. Master Builder Co., Cleveland, OH; Master Flow 928.
 - b. Euclid Chemical Co., Cleveland, OH; Hi-flow Grout.
- C. Clear Floor Hardener (Surface-Applied): Colorless, aqueous solution of zinc and magnesium fluosilicate with a minimum 2 pounds of crystals per gallon.
 1. Manufacturers:
 - a. Master Builders, Co., Cleveland, OH.
 - b. Tamms Industries, Inc., Kirkland, IL.
 - c. Sonneborn, Minneapolis, MN.

PART 3 - EXECUTION

3.01 FORMWORK

- A. Form Materials:
 1. Use hard plastic finished plywood for exposed areas, and new shiplap or plywood for unexposed areas.
 2. Earth cuts may be used for forming footings.

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- B. Form Ties:
1. Fixed conical or spherical type inserts that remain in contact with forming material and allow for dry packing of form tie holes.
 2. Ties shall withstand pressures and limit deflection of forms to acceptable limits.
 3. Wire ties are not acceptable.
- C. Construction:
1. In accordance with ACI 347.
 2. Make joints tight to prevent escape of mortar and to avoid formation of fins.
 3. Brace as required to prevent distortion during concrete placement.
 4. On exposed surfaces locate form ties in uniform pattern or as shown.
 5. Construct so ties remain embedded in the wall with no metal within 1 inch of concrete surface when forms, inserts, and tie ends are removed.
- D. Form Removal:
1. Remove after concrete has attained 28-day strength, or approval is obtained in writing from ENGINEER.
 2. Remove forms with care to prevent scarring and damaging the surface.
 3. Prior to form removal, provide thermal protection for concrete being placed under the requirements of cold weather concreting.

3.02 PLACING REINFORCING STEEL

- A. Unless otherwise specified, place reinforcing steel in accordance with CRSI Recommended Practice for Placing Reinforcing Bars.
- B. Splices and Laps:
1. Top Bars: Horizontal bars placed such that 12 inches of fresh concrete is cast below in single placement.
 2. Horizontal wall bars are considered top bars.
 3. Lap top bars 42 diameters or minimum 24 inches.
 4. Lap all other bars 30 diameters or minimum 18 inches.
 5. Tie splices with 18-gauge annealed wire as specified in CRSI Standard.

3.03 PLACING CONCRETE

- A. Place concrete in accordance with ACI 301.
- B. Prior to placing concrete, remove water from excavation and debris and foreign material from forms. Check reinforcing steel for proper placement and correct discrepancies.

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- C. Before depositing new concrete on old concrete, clean surface using sandblast or bushhammer or other mechanical means to obtain a 1/4-inch rough profile, and pour a cement-sand grout to minimum depth of 1/2 inch over surface. Proportion 1 part cement to 2.5 parts sand by weight.
- D. Place concrete as soon as possible after leaving mixer, without segregation or loss of ingredients, without splashing forms or steel above, and in layers not over 2 feet deep. Place within 1-1/2 hours after adding cement to mix.
- E. Eight feet maximum vertical drop to final placement, when not guided with chutes or other devices to prevent segregation due to impact with reinforcing.

3.04 COMPACTION

- A. Vibrate concrete as follows:
 - 1. Apply approved vibrator at points spaced not farther apart than vibrator's effective radius.
 - 2. Apply close enough to forms to vibrate surface effectively but not damage form surfaces.
 - 3. Vibrate until concrete becomes uniformly plastic.
 - 4. Vibrator must penetrate fresh placed concrete and into previous layer of fresh concrete below.

3.05 CONSTRUCTION JOINTS

- A. Locate as shown or as approved.
- B. Maximum Spacing between Construction Joints: 40 feet.

3.06 FINISHING

- A. Floor Slabs and Tops of Walls:
 - 1. Screed surfaces to true level planes.
 - 2. After initial water has been absorbed, float with wood float and trowel with steel trowel to smooth finish free from trowel marks.
 - 3. Do not absorb wet spots with neat cement.
- B. Unexposed Slab Surfaces: Screed to true surface, bull float with wood float, and wood trowel to seal surface.
- C. Tolerances: Floors shall not vary from level or true plane more than 1/4 inch in 10 feet when measured with a straightedge.
- D. Exterior Slabs and Sidewalks:
 - 1. Bull float with wood float, wood trowel, and lightly trowel with steel trowel.
 - 2. Finish with broom to obtain nonskid surface.
 - 3. Finish exposed edges with steel edging tool.

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4. Mark walks transversely at 5-foot intervals, or in pattern shown on Drawings, with jointing tool.

3.07 FINISHING AND PATCHING FORMED SURFACES

- A. Cut out honeycombed and defective areas.
- B. Cut edges perpendicular to surface at least 1 inch deep. Do not feather edges. Soak area with water for 24 hours.
- C. Patch with shotcrete or low pressure mortar as specified in Section 03720, Vertical and Overhead Concrete Surface Repair Systems.
- D. Finish surfaces to match adjacent concrete.
- E. Keep patches damp for minimum 7 days or spray with curing compound to minimize shrinking.
- F. Fill form tie holes with nonshrink grout.

3.08 PROTECTION AND CURING

- A. Protect fresh concrete from direct rays of sunlight, drying winds, and wash by rain.
- B. Keep concrete slabs continuously wet for a 7-day period. Intermittent wetting is not acceptable.
- C. Use curing compound only where approved by ENGINEER. Cure formed surfaces with curing compound applied in accordance with manufacturer's directions as soon as forms are removed and finishing is completed.
- D. Remove and replace concrete damaged by freezing.

3.09 FLOOR HARDENER

- A. Use where noted or scheduled.
- B. Follow manufacturer's application instructions.

3.10 FIELD TESTS

- A. Evaluation of Concrete Field Strength: In accordance with ACI 318/318R.

END OF SECTION

SECTION 03400
PRECAST CONCRETE, GENERAL

PART 1 – GENERAL

1.01 REQUIREMENTS

- A. The Contractor shall construct all precast concrete items as required in the Contract Documents, including all appurtenances necessary to make a complete installation.

1.02 RELATED WORK SPECIFIED ELSEWHERE

- A. Section 03200 – Concrete Reinforcement
B. Section 03230 – Stressing Tendons
C. Section 03300 – Cast-in-Place Concrete
D. Section 03350 – Concrete Finishes
E. Section 03370 – Concrete Curing
F. Section 03315 – Grout
G. Section 05500 – Metal Fabrications

1.03 REFERENCE SPECIFICATIONS, CODES AND STANDARDS

- A. Without limiting the generality of other requirements of these Specifications, all work specified herein shall conform to the applicable requirements of the following documents. All referenced specifications, codes, and standards refer to the most current issue available at the end of the Bid.
1. Florida Building Code
 2. ACI 318-Building Code Requirements for Reinforced Concrete
 3. PCI Standard MNL-116 - Manual for Quality Control for Plants and Production of Precast and Prestressed Concrete Products
 4. PCI Design Handbook

1.04 SUBMITTALS

- A. The Contractor shall submit the following for review in accordance with Section 01300 entitled "Submittals".
1. Shop drawings for all precast concrete items showing all dimensions, locations, and type of lifting inserts, and details of reinforcement and joints.

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2. A list of the design criteria used by the manufacturer for all manufactured, precast items.
3. Design calculations, showing at least the design loads and stresses on the item, shall be submitted. Calculations shall be signed and sealed by a Professional Engineer registered in the State of Florida.
4. Certified reports for all lifting inserts, indicating allowable design loads.
5. Information on lifting and erection procedures.

1.05 QUALITY ASSURANCE

- A. All manufactured precast concrete units shall be produced by an experienced manufacturer regularly engaged in the production of such items. All manufactured precast concrete and site-cast units shall be free of defects, checks, and cracks. Care shall be taken in the mixing of materials, casting, curing and shipping to avoid any of the above. The Engineer may elect to examine the units at the casting yard or upon arrival of the same at the site. The Engineer shall have the option of rejecting any or all of the precast work if it does not meet with the requirements specified herein or on the Drawings. All rejected work shall be replaced at no additional cost to the City.
- B. Manufacturer qualifications:
 1. The precast concrete manufacturing plant shall be certified by the Prestressed Concrete Institute, Plant Certification Program, prior to the start of production. Certification is only required for plants providing prestressed structural members such as hollow core planks, double T members, etc.
 2. In lieu of such certification, the manufacturer shall, at his expense, meet the following requirements:
 - a. Retain independent testing or consulting firm approved by the architect/engineer and/or City.
 - b. The basis of inspection shall be the Prestressed Concrete Institute Manual for Quality Control for Plants and Production of Precast and Prestressed Concrete Products, MNL-116.
 - c. This firm shall inspect the precast plant at two-week intervals during production and issue a report, certified by a registered engineer verifying that materials, methods, products and quality control meet all the requirements of the specifications, drawings, and MNL-116. If the report indicates to the contrary, the engineer, at the precaster's expense, will inspect and may reject any or all products produced during the period of non-compliance with the above requirements.
- C. Plant production and engineering must be under direct supervision and control of an Engineer who possesses a minimum of five (5) years' experience in precast concrete work.

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PART 2 – PRODUCTS**2.01 CONCRETE**

- A. Concrete materials including Portland cement, aggregates, water, and admixtures shall conform to Section 03300 entitled "Cast-in-Place Concrete".
- B. For prestressed concrete items, minimum compressive strength of concrete at 28 days shall be 5,000 psi unless otherwise specified. Minimum compressive strength of concrete at transfer of prestressing force shall be 3,500 psi.
- C. For non-prestressed concrete items, minimum compressive strength of concrete at 28 days shall be 4,000 psi unless otherwise specified.

2.02 GROUT

- A. Grout for joints between panels shall be a non-shrink, non-metallic grout in conformance with Section 03315 entitled "Grout".
- B. Minimum compressive strength of grout at 7 days shall be 3,000 psi.

2.03 REINFORCING STEEL

- A. Reinforcing steel used for precast concrete construction shall conform to Section 03200 entitled "Concrete Reinforcement".

2.04 PRESTRESSING STRANDS

- A. Prestressing strands shall be 7-wire, stress-relieved, high-strength strands Grade 250K or 270K.

2.05 STEEL INSERTS

- A. Steel inserts shall be in accordance with Section 05500 entitled "Metal Fabrications".
- B. All steel inserts protruding from or occurring at the surface of precast units shall be galvanized in accordance with Section 05035 entitled "Galvanizing".

2.06 WELDING

- A. Welding shall conform to Section 05500 entitled "Metal Fabrications".

2.07 BEARING PADS

- A. Plastic bearing pads shall be multi-monomer plastic strips which are non-leaching and support construction loads with no visible overall expansion, manufactured specifically for the purpose of bearing precast concrete.

PRECAST CONCRETE, GENERAL

03401-3

Project No. 11419

PART 3 – EXECUTION**3.01 FABRICATION AND CASTING**

- A. All precast members shall be fabricated and cast to the shapes, dimensions and lengths shown on the Drawings and in compliance with PCI MNL-116. Precast members shall be straight, true and free from dimensional distortions, except for camber and tolerances permitted later in this clause. All integral appurtenances, reinforcing, openings, etc., shall be accurately located and secured in position with the form work system. Form materials shall be steel and the systems free from leakage during the casting operation.
- B. All cover of reinforcing shall be the same as detailed on the Drawings.
- C. Because of the critical nature of the bond development length in prestressed concrete panel construction, if the transfer of stress is by burning of the fully tensioned strands at the ends of the member, each strand shall first be burned at the ends of the bed and then at each end of each member before proceeding to the next strand in the burning pattern.
- D. The Contractor shall coordinate the communication of all necessary information concerning openings, sleeves, or inserts to the manufacturer of the precast members.
- E. Concrete shall be finished in accordance with Section 03350 entitled "Concrete Finishes". All recesses due to cut tendons shall be grouted.
- F. Curing of precast members shall be in accordance with Section 03370 entitled "Concrete Curing".
- G. The manufacturer shall provide lifting inserts.

3.02 HANDLING, TRANSPORTING AND STORING

- A. Precast members shall not be transported away from the casting yard until the concrete has reached the minimum required 28 day compressive strength and a period of at least five (5) days has elapsed since casting, unless otherwise permitted by the Engineer.
- B. No precast member shall be transported from the plant to the job site prior to approval of that member by the plant inspector. This approval will be stamped on the member by the plant inspector.
- C. During handling, transporting, and storing, precast concrete members shall be lifted and supported only at the lifting or supporting points as indicated on the shop drawings.
- D. All precast members shall be stored on solid, unyielding, storage blocks in a manner to prevent torsion, objectionable bending, and contact with the ground.
- E. Precast concrete members shall not be used as storage areas for other materials or equipment.
- F. Precast members damaged while being handled or transported will be rejected or shall be repaired in a manner approved by the Engineer.

PRECAST CONCRETE, GENERAL

03401-4

Project No. 11419

3.03 ERECTION

- A. Erection shall be carried out by the manufacturer or under his supervision using labor, equipment, tools and materials required for proper execution of the work.
- B. Contractor shall prepare all bearing surfaces to a true and level line prior to erection. All supports of the precast members shall be accurately located and of required size and bearing materials.
- C. Installation of the precast members shall be made by leveling the top surface of the assembled units keeping the units tight and at right angles to the bearing surface.
- D. Connections which require welding shall be properly made in accordance with Section 05050 entitled "Metal Fastening".
- E. Grouting between adjacent precast members and along the edges of the assembled precast members shall be accomplished as indicated on the drawings, care being taken to solidly pack such spaces and to prevent leakage or droppings of grout through the assembled precast members. Any grout which seeps through the precast members shall be removed before it hardens.
- F. In no case shall concentrated construction loads, or construction loads exceeding the design loads, be placed on the precast members. In no case shall loads be placed on the precast members prior to the welding operations associated with erection, and prior to placing of topping (if required).
- G. No Contractor, Subcontractor or any of his employees shall arbitrarily cut, drill, punch or otherwise tamper with the precast members.
- H. Precast members damaged while being erected will be rejected or shall be repaired in a manner approved by the Engineer.

END OF SECTION

PRECAST CONCRETE, GENERAL

03401-5

SECTION 06100
ROUGH CARPENTRY

PART 1 – GENERAL1.01 THE REQUIREMENT

- A. Furnish labor, materials, equipment and appliances required for complete execution of Work shown on the Drawings and specified herein.
- B. Principal items of work include:
1. Wood blocking, nailers, grounds, furring, ties, centering, etc., necessary or required for attachment or support of work under this Section, and other Sections.
 2. Fasteners, including nails, screws, bolts, anchors and other fastenings, required to secure work under this Section.
 3. Temporary enclosures and protective boarding.
 4. Wood preservative treatment for all wood members in contact with roofing, masonry, concrete, and exposed to the elements.

1.02 REFERENCE SPECIFICATIONS, CODES AND STANDARDS

- A. Without limiting the generality of these specifications Work shall conform to the applicable requirements of the following documents:
1. AWPA CA Preservative Standards, Lumber and Plywood.
 2. AWPA C20 Structural Lumber Fire-Retardant Treatment by Pressure Process.
 3. AWPC C27 Plywood Fire-Retardant Treatment by Pressure Process.
 4. AWPA M4 Standards for Care of Preservative Treated Wood Products.
 5. APAG Guide to Plywood Grades.
 6. FM 1-49 Perimeter Flashing

1.03 SUBMITTALS

- A. In accordance with the procedures and requirements set forth in Section 01300 - Submittals, submit the following:
1. Certifications of Preservative and Fire Retardant Treatment.

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2. Warranty of treatment manufacturer.
3. Certification of type and grade of lumber to be used.
4. Certification of type, rating and conformance to APA Standards.

1.04 DELIVERY AND STORAGE

- A. Take all measures necessary to protect products against damage during delivery and storage.
- B. Store lumber in enclosed places in such a manner to provide ventilation and protection from the weather.

PART 2 – PRODUCTS

2.01 MATERIALS

- A. Blocking, nailers, grounds and the like: Pressure treated southern yellow pine No. 2 Dimension Lumber or Construction Grade, with a moisture content not to exceed 19%.
- B. Plates, blocking, and nailers in contact with concrete or masonry: Pressure treated southern yellow pine No .2.
- C. Structural Framing Lumber: Pleasure treaded southern pine No.2 grade with 19 percent moisture content.
- D. Fasteners: Provide clamps, connectors, straps, nails, bolts, screws, anchors, ties and other accessories and fasteners shown or required to properly secure all rough carpentry. Fasteners and accessories shall be stainless steel, galvanized, or other noncorrosive metal recommended for use. Fasteners used with pressure treated wood shall be compatible with the wood preservative treatment to prevent corrosion of fasteners.
- E. Wood Preservative Treatment: Waterborne pressure treatment in conformance with the American Wood Preservers' Association standard P5. Retention shall be in accordance with AWWPA Standards and be a minimum of 0.40 pounds per cubic foot for contact with or below ground, concrete, or masonry and 0.25 pounds per cubic foot for above ground. Stamp each piece of treated wood with a trademark identifying the classification of the treatment or a certificate from the processor for each shipment.
- F. Fire Retardant Treatment: Fire-retardant lumber and plywood must have an Underwriters Laboratories stamp signifying a FR-S rating and certifying a 25 or less flame spread and smoke developed value, when tested in accordance to UL 723, ASTM E 84, and NFPA 255 "Tunnel Test", and when the test is extended for 20 additional minutes. Treatment formulation shall contain no halogens, sulfates, chlorides or ammonium phosphate. Smoke toxicity shall be no more than that of untreated wood.

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G. Connecting Hardware

1. Nails shall be stainless steel common wire for exterior work.
2. Screws shall be standard domestic manufacture, stainless steel for exterior use and of brass, bronze, aluminum or stainless steel when used to attach items made of those materials.
3. Bolts shall be machine bolts (or carriage bolts if called for on Drawings) of Series 300 stainless steel with hexagon nuts, of sizes noted on Drawings. Wood fascia fasteners shall be galvanized steel and conform to the requirements of ASTM Designation A 307.
4. Steel plates and angles shall be carbon steel, ASTM A 36, galvanized after fabrication for temporary items and stainless steel for permanent items as shown on the Drawings.
5. Lag screws, shear plates and split ring connectors shall conform to the requirements of the "National Design Specifications for Wood Construction from the National Forest Products Association and shall be stainless steel.
6. Power actuated fasteners shall conform to Federal Specification GGG-D-777a, and shall be installed as per manufacturer's printed directions. Power charge shall be powerful enough to prevent spalling of concrete.

PART 3 – EXECUTION3.01 COORDINATION

- A. Coordinate with all trades as to nailers, blocking, grounds and the like required for the attachment of their work and other items requiring same. Carry out all work as required to cooperate work of other trades.

3.02 INSTALLATION

- A. Perform work in conformance manufacturer's recommendations and specifications, industry, national and local standards and codes.
- B. Layout, cut, fit and erect rough blocking, nailers, furring and other rough carpentry. Do cutting work in connection with carpentry and finish for other trades. Brace plumb and level all members in true alignment and rigidly secure in place with sufficient nails, spikes, screws and bolts. Defects which render any piece or part unable to serve its intended purpose shall be discarded or, cut out and replaced.
- C. Provide all bracing, supports and shoring required to support construction.
- D. Protect all masonry including edges of concrete platforms and similar items. Remove protective covering when directed. Take special precautions at masonry openings and corners of the building.

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- E. Set all rough hardware, such as plates, spikes, bolts, nails, lag screws, lagging bolts, anchors, etc., as required to hold woodwork together or to anchor or secure it to other materials and construction.
- F. Provide wood grounds, nailing strips and similar items wherever necessary or required throughout the project for the support, proper erection or installation of the work and support of mirrors, cabinets, shelf cleats, base and similar items. Thoroughly secure in place by approved means.
- G. Construct joints to support dead loads, live loads, wind loads, or combinations in conformance with "National Design Specifications for Stress Grade Lumber and its Fastenings", recommended by National Forest Products Association.

3.03 TEMPORARY PROTECTION

- A. Provide and install all temporary protection in accordance with applicable provisions of the Contract Documents, OSHA regulations, and as follows:
 - 1. Temporary protection shall include wood doors, railings, protection of floor openings, temporary partitions, and the like; adequately maintained in good repair during the life of the Contract.

3.04 REMOVAL OF TEMPORARY WORK

- A. Remove all temporary protection when so directed, or prior to acceptance of this project.

- END OF SECTION -

SECTION 061063
EXTERIOR ROUGH CARPENTRY

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:

1. Elevated decks including wood decking and support framing.
2. Wood benches.

1.02 SUBMITTALS

A. Product Data: For preservative-treated wood products metal framing anchors.

B. LEED Submittal:

1. Certificates for Credit MR 7: Chain-of-custody certificates certifying that wood products comply with forest certification requirements. Include evidence that manufacturer is certified for chain of custody by an FSC-accredited certification body.

C. Material Certificates:

1. For lumber specified to comply with minimum allowable unit stresses. Indicate species and grade selected for each use and design values approved by ALSC's Board of Review.
2. For preservative-treated wood products. Indicate type of preservative used and net amount of preservative retained.

D. Evaluation Reports: For the following:

1. Preservative-treated wood products.
2. Plastic decking.
3. Expansion anchors.
4. Metal framing anchors.
5. Decking fasteners.

1.03 QUALITY ASSURANCE

- A. Forest Certification: Provide wood products obtained from forests certified by an FSC-accredited certification body to comply with FSC STD-01-001, "FSC Principles and Criteria for Forest Stewardship."

PART 2 - PRODUCTS**2.01 LUMBER, GENERAL**

- A. Lumber: Comply with DOC PS 20 and with applicable rules of grading agencies indicated. If no grading agency is indicated, provide lumber that complies with the applicable rules of any rules-writing agency certified by ALSC's Board of Review. Provide lumber graded by an agency certified by ALSC's Board of Review to inspect and grade lumber under the rules indicated.
1. Factory mark each item with grade stamp of grading agency.
 2. For items that are exposed to view in the completed work, mark grade stamp on end or back of each piece or omit grade stamp and provide certificates of grade compliance issued by grading agency.

2.02 DIMENSION LUMBER

- A. Maximum Moisture Content: 19 percent
- B. Deck Framing: Select Structural No. 2 of the following species:
1. Southern pine; SP.
- C. Dimension Lumber Posts: No. 2 grade and the following species:
1. Mixed southern pine; SP.
- D. Dimension Lumber Decking: No. 1 grade and the following species:
1. Mixed southern pine; SP.
- E. Dimension Lumber Decking Deck Common or Construction Common redwood; RIS.

2.03 BOARDS

- A. Maximum Moisture Content: 19 percent.
- B. Railing Boards: Any of the following species and grades:
1. Southern pine, B & B finish; SPIB.

2.04 TIMBER

- A. Maximum Moisture Content: 19 percent

2.05 PRESERVATIVE TREATMENT

- A. Pressure treat boards and dimension lumber with waterborne preservative according to AWPA C2.

Project No.11419

- B. Pressure treat timber with waterborne preservative according to AWPA C15 requirements for "sawn building poles and posts as structural members."
 - 1. Treatment with CCA shall include post-treatment fixation process.
- C. Preservative Chemicals: Acceptable to authorities having jurisdiction.
 - 1. Do not use chemicals containing arsenic or chromium except for timber posts.
- D. Use process that includes water-repellent treatment.
- E. Use process that does not include water repellents or other substances that might interfere with application of indicated finishes.
- F. After treatment, re-dry to 19 percent maximum moisture content.
- G. Mark treated wood with treatment quality mark of an inspection agency approved by ALSC's Board of Review.
- H. Application: Treat all exterior rough carpentry unless otherwise indicated.

2.06 FASTENERS

- A. General: Provide fasteners of size and type indicated that comply with requirements specified in this article for material and manufacture. Provide nails or screws, in sufficient length, to penetrate not less than 1-1/2 inches into wood substrate.
 - 1. For pressure-preservative-treated wood, use stainless-steel fasteners.
- B. Post installed Anchors: Stainless-steel, anchors with capability to sustain, without failure, a load equal to six times the load imposed when installed in unit masonry assemblies and equal to four times the load imposed when installed in concrete as determined by testing per ASTM E 488 conducted by a qualified independent testing and inspecting agency.
 - 1. Stainless-steel bolts and nuts complying with ASTM F 593 and ASTM F 594

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Set exterior rough carpentry to required levels and lines, with members plumb, true to line, cut, and fitted. Fit exterior rough carpentry to other construction; scribe and cope as needed for accurate fit.
- B. Framing Standard: Comply with AF&PA's "Details for Conventional Wood Frame Construction" unless otherwise indicated.
- C. Do not splice structural members between supports.

EXTERIOR ROUGH CARPENTRY

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- D. Comply with AWPA M4 for applying field treatment to cut surfaces of preservative-treated lumber.
- E. Securely attach exterior rough carpentry work to substrate by anchoring and fastening as indicated.
- F. Railings: Fasten freestanding railings to posts as indicated on the construction documents.

END OF SECTION

PROJECT 11419

SECTION 061500**WOOD DECKING****PART 1 - GENERAL**1.01 SUMMARY

A. Section Includes:

1. Solid-sawn floor decking.

B. Related Sections:

1. Division 06 Section "Rough Carpentry" for dimension lumber items associated with wood decking.
2. Division 06 Section "Exterior Rough Carpentry" for wood decking for elevated decks.

1.02 SUBMITTALS

- A. Product Data: For each type of product indicated.

1.03 QUALITY ASSURANCE

- A. Standard for Solid-Sawn Wood Decking: Comply with AITC 112.
- B. Forest Certification: Provide wood decking produced from wood obtained from forests certified by an FSC-accredited certification body to comply with FSC STD-01-001, "FSC Principles and Criteria for Forest Stewardship."

1.04 DELIVERY, STORAGE, AND HANDLING

- A. Schedule delivery of wood decking to avoid extended on-site storage and to avoid delaying the Work.

PART 2 - PRODUCTS2.01 WOOD DECKING, GENERAL

- A. General: Comply with DOC PS 20 and with applicable grading rules of inspection agencies certified by ALSC's Board of Review.

PROJECT 11419

- B. Moisture Content: Provide wood decking with 19 percent maximum moisture content at time of dressing.

2.02 SOLID-SAWN WOOD DECKING

- A. Decking Species: Balsam fir, Douglas fir-larch, Douglas fir-larch (North), hem-fir, hem-fir (North), southern pine, spruce pine-fir (North), western hemlock, or western hemlock (North).
- B. Decking Species: Southern pine
- C. Decking Nominal Size: 2x6
- D. Grade Stamps: Factory mark each item with grade stamp of grading agency. Apply grade stamp to surfaces that will not be exposed to view.
- E. Face Surface and Edge Pattern: Smooth face

2.03 ACCESSORY MATERIALS

- A. Fastener Material: Hot-dip galvanized
- B. Sealant: Latex sealant compatible with substrates

PART 3 - EXECUTION**3.01 INSTALLATION**

- A. Install solid-sawn wood decking to comply with referenced decking standard.
 - 1. Locate end joints for controlled random lay-up
- B. Anchor wood decking, where supported on walls, with stainless steel wood screws as indicated.

END OF SECTION

APPENDIX A

GEOTECHNICAL REPORT BY RADISE INTERNATIONAL



October 29, 2018

Craven Thompson & Associates, Inc.
3563 N.W. 53rd Street
Fort Lauderdale, FL 33309

Attn: **Mr. Donnelly Chin**

RE: City of Fort Lauderdale
River Oaks Park Preserve
Boardwalk Design & Permitting
Fort Lauderdale, Broward County, Florida
RADISE Project No: 180925

As per Craven Thompson & Associates, Inc. (Craven Thompson) request, RADISE International, LC (RADISE) performed geotechnical engineering services for the proposed boardwalk at the River Oaks Park Preserve. The results of analysis are presented in subsequent sections of this report.

BACKGROUND

RADISE prepared a Geotechnical Engineering Services Report, dated August 1, 2018 at the request of Hazen and Sawyer for the Stormwater Master Plan Modeling and Design Implementation project. As part of that study, a series of Standard Penetration Test (SPT) borings were performed to explore the subsurface conditions for the various aspects of the project. It is our understanding that a new part of the project involves the design of a 15 feet high boardwalk structure in the River Oaks Park Preserve, which will reportedly be supported on 12-inch diameter timber piles. The allowable lateral load is 1,500 pounds, the allowable axial compression load is 6,000 pounds, and the allowable axial tension load is 2,500 pounds. Subsurface information from soil borings R-5, R-9, and R-10 were used to evaluate the pile capacity using FB Deep and LPile software developed by Bridge Software Institute and Ensoft, Inc., respectively.

GEOTECHNICAL EVALUATION AND CONCLUSION

Based on the review of the soil borings, R-5 encountered sands in the upper 8 feet and is underlain by limestone; and R-9 and R-10 encountered sands throughout the explored depths (50 feet) with the exception of a 2 to 4 feet thick layer of organic sands at depths ranging from 2 to 5 feet below the existing ground surface.

The standard penetration resistance or “N” value information collected during performance of the soil borings indicate that the sands and limestone are loose to medium dense in terms of relative density. This stratigraphy information and the soil density information was used to determine the lateral and axial capacities of the proposed piles.

The results of the analysis indicate that the proposed 12-inch butt diameter timber piles should be installed to depths of approximately 15 feet below existing grade in order to develop the design capacities. The analysis incorporates a factor of safety of 2 for both the side friction and the mobilized end bearing.

The piles should be driven sufficiently deep to develop the required allowable capacities. The actual final pile depth will need to be determined during driving. Pile lengths will be variable; therefore, piles should be supplied to drive below estimated tip elevations to account for variability and unknowns relative to soil conditions and to reduce the need to add piles to provide the required resistance to structural loads.

Pile Installation Recommendations

The proposed timber piles should meet the requirements of Florida Department of Transportation (FDOT) Specification Section 953 and be treated according to the applicable provisions of Section 955. As specified in Section 455, timber piles should not be driven beyond a practical refusal, blowcount of 20 blows per inch. Preforming or predrilling may be needed to penetrate through poor limestone layers such as encountered in boring R-5.

Piles should be driven with a steam, air, or diesel hammer delivering not less than the appropriate minimum rated energy per blow. At all times, the hammer should be operated at the chamber pressure and speed recommended by the manufacturer. Pile driving should be as continuous an operation as possible and should proceed without stopping over the last 5-feet of penetration.

The piles should be driven with a cap block to prevent pile head brooming. If hard driving is encountered, pre-punching or pre-forming will be required to achieve the necessary embedment depth.

During driving, pile driving records should be kept for each pile detailing pertinent information such as the pile type, pile length, date driven and driving blow count per foot. The capacity of each pile should be reviewed based on its final tip elevation and driving record. For this project, we recommend that pile acceptance be based on driving below the minimum pile tip elevation and attaining capacity based on the Engineering News Record (ENR) formula:

$$P_a = \frac{W_r h}{F (s+0.1)}$$

where: P_a Allowable Pile Load
 W_r Hammer Ram Weight
 h Hammer Stroke (the distance the hammer falls)
 F Factor of Safety
 s Pile Set (penetration) per Blow in Inches



City of Fort Lauderdale
River Oaks Park Preserve
Boardwalk Design & Permitting
Fort Lauderdale, Broward County, Florida

We note that the ENR formula incorporates a relatively high safety factor for axial capacity analysis. A representative of RADISE should monitor the installation of the piles.

LIMITATIONS


This review and evaluation has been performed for Craven Thompson to aid in the construction of the planned project. RADISE International warrants that the recommendations and professional opinion presented in this report are based upon recognized practices and the discipline of soil mechanics, foundation engineering, and engineering geology at this location and time. No other warranties are expressed or implied.


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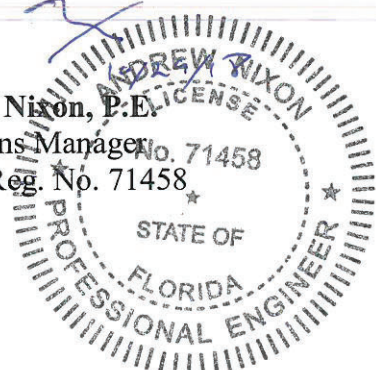
RADISE appreciate the opportunity to assist you with this project as your geotechnical consultant. Please feel free to call us at 561-841-0103 if you have any questions regarding the contents of this report.

Sincerely,

RADISE International, L.C.
Florida Certificate of Authorization No. 8901


Akash Bissoon, P.E.
Project Engineer
Florida Reg. No. 74582


Andrew Nixon, P.E.
Operations Manager
Florida Reg. No. 71458





November 17, 2017

Hazen and Sawyer
4000 Hollywood Blvd., Suite 750N
Hollywood, Florida 33201

Attn: Mr. Robert B. Taylor, Jr., P.E.
Office: (954) 987- 0066
Cell: (772) 595- 2535
Email: rbtaylor@hazenandsawyer.com

**RE: Geotechnical Services Report
City of Fort Lauderdale
Stormwater Master Plan Modeling and Design Implementation -
7 Neighborhoods and 12 Seawalls Improvement Projects
Broward County, Florida
RADISE Project No: 170901**

Dear Mr. Taylor,

RADISE International, LC (RADISE) is pleased to submit this *Geotechnical Services Report* for the above-referenced projects. The purpose of this report is to provide geotechnical information and recommendations to aid in the design and construction of the projects. This report describes the field exploration and laboratory testing performed, presents the data obtained, and provides our recommendations regarding geotechnical aspects of the of the proposed projects.

The study was performed in general accordance with our agreement executed on August 30, 2017, our scope of work for geotechnical services.

We appreciate the opportunity to work with Hazen and Sawyer on this project, and trust that the information presented is clear. Should you have any questions with this report, or if we can be of additional assistance as this project develops, please contact us at (561) 841-0103.

Sincerely,

RADISE International
Infrastructure Engineers & Software Developers

DRAFT

Akash Bissoon, P.E.
Project Engineer
Florida Registration No. 74582

DRAFT

Thomas F. Mullin, P.E.
Chief Engineer &
Geotechnical Services Group Manager
Florida Registration No. 34466

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Table A-1 – Laboratory Test Results Summary

Grain Size Distribution



1.0 INTRODUCTION

RADISE understands that the City of Fort Lauderdale is performing a study for seawall replacement designs, stormwater master plan modeling, and design implementation within the City of Fort Lauderdale. To aid in the evaluation and design of the project, RADISE was requested to provide subsoil investigation and evaluation services that included drilling of exploratory borings to determine the subsurface stratigraphy, groundwater levels and physical properties of the soils underlying the site.

The information presented in this report is based upon our interpretation of the subsurface information revealed by the test borings. The report does not reflect variations in subsurface conditions that may exist between or beyond these borings. Variations in soil and groundwater conditions should be expected, the nature and extent of which might not become evident until construction is undertaken. If variations are encountered, and/or the scope of the project altered, we should be consulted for additional recommendations.

2.0 PROJECT DESCRIPTION

The projects are located in the City of Fort Lauderdale, Florida and includes seven (7) neighborhoods and twelve (12) seawall segments located east of interstate highway (I-95) and between the Port Everglades Expressway and Sunrise Boulevard. The approximate locations and limits of the seawall and neighborhood projects are shown on the attached *Vicinity Map*, Sheet 1.

Seawall and neighborhood boring location information is summarized in following Table 1 and Table 2.

Table 1 – Seawall Location Information

Seawall	Boring No.	Boring Location Remarks	Asphalt Thickness (inches)	Base Course Thickness (inches)
Seawall 9	S-28	Inside Victoria Park. At the intersection of Broward Boulevard and North Victoria Park Road.	-	-
Seawall 10	S-29	At the intersection of SE 23 rd Avenue and Del Mar Place. Approximately 450 feet north of E Las Olas Boulevard.	3.75	4.5
Seawall 12	S-15	South side of E Las Olas Boulevard, between Lido Drive and San Marco Drive.	-	-
Seawall 13	S-14	South side of E Las Olas Boulevard, between San Marco Drive and Coral Way.	-	-
Seawall 14	S-13	South side of E Las Olas Boulevard, between Coral Way and Royal Plaza Drive.	-	-

Geotechnical Services Report
 City of Fort Lauderdale
 Stormwater Master Plan Modeling and Design Implementation -
 7 Neighborhoods and 12 Seawalls Improvement Projects
 Broward County, Florida

Page 2

Seawall	Boring No.	Boring Location Remarks	Asphalt Thickness (inches)	Base Course Thickness (inches)
Seawall 15	S-9	On the east side of Isle of Palms Drive. Approximately 800 feet south of E Las Olas Boulevard.	4.5	6.0
	S-10	On the east side of Isle of Palms Drive. Approximately 570 feet south of E Las Olas Boulevard.	5.25	4.0
	S-11	On the east side of Isle of Palms Drive. Approximately 350 feet south of E Las Olas Boulevard.	5.75	6.0
	S-12	On the east side of Isle of Palms Drive. Approximately 120 feet south of E Las Olas Boulevard.	6.25	6.0
Seawall 17	S-8	On the south side of SE 5 th Street. Approximately 75 feet west of the intersection of Riviera Isle Drive and SE 5 th Street.	6.5	6.0
Seawall 29	S-17	On the east side of Cordova Road. Between SE 7 th Street and SE 8 th Street. Approximately 230 feet south of the intersection of Cordova Road and SE 7 th Street.	12.0	6.0
	S-18	On the east side of Cordova Road. Between SE 8 th Street and SE 9 th Street. Approximately 175 feet south of the intersection of Cordova Road and SE 8 th Street.	9.5	5.0
	S-19	On the east side of Cordova Road. Between SE 8 th Street and SE 9 th Street. Approximately 400 feet south of the intersection of Cordova Road and SE 8 th Street.	8.25	6.0
	S-20	On the east side of Cordova Road. Between SE 8 th Street and SE 9 th Street. Approximately 175 feet south of the intersection of Cordova Road and SE 8 th Street.	9.0	5.0
	S-21	On the east side of Cordova Road. Between SE 8 th Street and SE 9 th Street. Approximately 220 feet south of the intersection of Cordova Road and SE 9 th Street.	5.75	6.0
	S-22	On the east side of Cordova Road. Between SE 10 th Street and SE 11 th Street. Approximately 215 feet south of the intersection of Cordova Road and SE 10 th Street.	5.0	5.0
	S-23	On the east side of Cordova Road. Between SE 11 th Street and SE 12 th Street. Approximately 160 feet south of the intersection of Cordova Road and SE 11 th Street.	5.0	8.0
Seawall 30	S-26	On the south side of SE 10 th Street. Approximately 2,000 feet east of the intersection of Cordova Road and SE 10 th Street.	5.25	6.0
	S-27	On the south side of SE 10 th Street. Approximately 2,250 feet east of the intersection of Cordova Road and SE 10 th Street.	3.75	5.0



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Seawall	Boring No.	Boring Location Remarks	Asphalt Thickness (inches)	Base Course Thickness (inches)
Seawall 32	S-16	On Mola Avenue. Approximately 775 feet south of the intersection of SE 17 th Way and Mola Avenue.	-	-
Seawall 34	S-30	Located on the north side of Barcelona Drive. At the north east quadrant of Barcelona Drive and NE 26 th Terrace.	3.5	6.0
Seawall 35	S-24	Located on the south side of SE 8 th Street. Approximately 1,000 feet east of Cordova Road.	4.5	6.0
	S-25	Located on the south side of SE 8 th Street. Approximately 1,335 feet east of Cordova Road.	4.5	6.0

Table 2 – Neighborhood Location Information

Neighborhood	Boring No.	Boring Location Remarks	Asphalt Thickness (inches)	Base Course Thickness (inches)
Durrs	D-1	Intersection of NW 9 th Street and NW 17 th Avenue.	4.0	5.0
	D-2	Intersection of NW 16 th Avenue and NW 8 th Street.	7.0	3.0
	D-3	On NW 19 th Avenue. Approximately 60 feet south of the intersection of NW 19 th Avenue and NW 7 th Street.	4.0	8.0
	D-4	Intersection of NW 8 th Street and NW 13 th Terrace.	1.3	3.0
	D-5	On the west side of NW 14 th Way. Approximately 170 feet north of the intersection of NW 14 th Way and NW 6 th Street.	3.2	3.0
Dorsey Riverbend	DR-1	Approximately 160 feet north of NW 5 th Street, between NW 15 th Terrace and NW 15 th Avenue.	-	-
	DR-2	On the east side of NW 15 th Avenue. Approximately 200 feet north of the intersection of NW 15 th Street and NW 15 th Avenue.	-	-
	DR-3	Intersection of NW 4 th Street and NW 15 th Avenue.	5.0	6.0
	DR-4	Approximately 75 feet north of the intersection of NW 4 th Street and NW 18 th Avenue.	5.2	1.0
	DR-5	On the west side of NW 18 th Avenue, approximately 130 feet south of the intersection of NW 6 th Street and NW 18 th Avenue.	1.0	2.0
Edgewood	E-1	Intersection of SW 15 th Avenue and SW 32 nd Court.	1.2	4.0

	E-2	Intersection of SW 15th Avenue and SW 31 st Street.	3.7	4.0
	E-3	Intersection of SW 15th Avenue and SW 29 th Street.	2.2	4.0
	E-4	On SW 30 th Street. Approximately 400 feet east of the intersection of SW 15 th Avenue and SW 30 th Street.	3.2	4.0
	E-5	On SW 32 nd Street. Approximately 400 feet east of the intersection of SW 15 th Avenue and SW 32 nd Street.	2.0	6.0
	E-6	Intersection of SW 14th Avenue and SW 28th Street.	1.7	9.0
	E-7	On SW 28th Street. Approximately 620 feet east of the intersection of SW 12th Avenue and SW 28 th Street.	4.7	6.0
	E-8	On SW 12 th Avenue, between SW 31 st Street and SW 32 nd Street.	1.5	4.0
	E-9	On SW 29 th Street. Approximately 240 feet east of the intersection of SW 12 th Avenue and SW 29 th Street.	-	-
	E-10	On SW 9th Avenue, between SW 30 st Street and SW 31 st Street.	6.0	3.0
	E-11	Intersection of SW 8 th Avenue and SW 30 th Street.	3.7	4.0
	E-12	Intersection of SW 8th Avenue and SW 28th Street.	5.0	4.0
	E-13	On SW 9th Avenue, between SW 26 th Court and SW 27 th Court.	1.7	6.0
	E-14	On the west side of S Andrews Avenue. Near the intersection of S Andrews Avenue and SE 26 th Street.	3.5	4.0
	E-15	On S Andrews Avenue. Between SE 30 th Street and SE 31 st Street.	3.0	4.0
Progresso	P-1	On the east side of SW 4 th Avenue. Approximately 100 feet north of the intersection of Himmarshee Street and SW 4 th Avenue.	3.0	4.0
	P-2	On NW 5th Avenue. Approximately 150 feet north of the intersection of Broward Boulevard and NW 5th Avenue.	3.2	2.0
	P-3	Intersection of NW 2 nd Street and NW 4 th Avenue.	2.7	6.0
	P-4	Intersection of NW 7 th Street and NW 3 rd Avenue.	1.2	8.0
	P-5	Intersection of NW 7th Street and NW 3rd Avenue.	-	-
	P-6	Approximately 130 feet north of NW 8 th Street and between NW 4 th Avenue and NW 3 rd Avenue.	-	-
	P-7	On NW 7 th Avenue. Between NW 5 th Street and NW 4 th Street.	2.0	7.0
	P-8	Intersection of NW 7 th Street and NW 7 th Terrace.	1.7	7.0

River Oaks	R-1	On SW 15 th Avenue. Approximately 100 feet north of the intersection of SW 15 th Avenue and Marina Boulevard.	2.7	6.0
	R-2	On SW 15 th Avenue. Between SW 22 nd Avenue and SW 23 rd Street.	1.5	8.0
	R-3	On SW 24 th Street. Between SW 18 th Terrace and SW 24 th Street.	1.5	6.0
	R-4	At the intersection of SW 17 th Avenue and SW 22 nd Street.	1.0	6.0
	R-5	On SW 19 th Avenue. Between SW 21 st Street and SW 22 nd Street.	1.7	6.0
	R-6	On SW 20 th Street. Between SW 15 th Avenue and Coconut Drive.	5.0	10.0
	R-7	At the intersection of SW 18 th Court and SW 14 th Avenue.	2.0	8.0
	R-8	At the intersection of SW 17 th Street and SW 13 th Avenue.	1.2	9.0
	R-9	Approximately 610 feet west of the intersection of SW 19 th Avenue and SW 21 st Street. Near a wooded area.	-	-
	R-10	Approximately 550 feet west of the intersection of SW 19 th Avenue and SW 21 st Street. Near a wooded area.	-	-
	R-11	Approximately 150 feet north west of the intersection of SW 19 th Avenue and SW 23 rd Court.	-	-
	R-12	Approximately 240 feet north west of the intersection of SW 19 th Avenue and SW 23 rd Court.	-	-
	R-13	Intersection of SW 18 th Court and SW 10 th Avenue.	1.7	9.0
Southeast Isles	S-1	Approximately 65 feet west of the intersection of SE 17 th Way and Mola Avenue.	-	-
	S-2	On the south side of E Las Olas Boulevard, between SE 18 th Avenue and Lido Drive.	-	-
	S-3	On the west side of Lido Drive, approximately 130 feet south of the intersection of E Las Olas Boulevard and Lido Drive.	-	-
	S-4	On the south side of E Las Olas Boulevard, between Royal Plaza Drive and Isle of Palms Drive.	-	-
	S-5	On the south side of E Las Olas Boulevard. Approximately 100 feet west of the intersection of E Las Olas Boulevard and Sunset Drive.	-	-
	S-6	In the south east quadrant of the intersection of E Las Olas Boulevard and Poinciana Drive.	-	-
	S-7	In the south east quadrant of the intersection of E Las Olas Boulevard and Poinciana Drive.	-	-



Victoria Park	V-1	Intersection of NE 6 th Street and NE 10 th Avenue.	3.0	7.0
	V-2	Intersection of NE 6 th Street and NE 16 th Avenue.	7.0	4.0
	V-3	Intersection of NE 9 th Street and NE 15 th Avenue.	2.0	6.0
	V-4	Intersection of NE 8 th Street and NE 16 th Terrace.	3.8	3.0
	V-5	Intersection of NE 7 th Street and NE 17 th Way.	1.0	7.0
	V-6	On Victoria Trace. Approximately 250 feet north of the intersection of NE 5 th Street and Victoria Way.	2.0	7.0
	V-7	Intersection of NE 20 th Avenue and NE 19 th Avenue.	3.0	6.0
	V-8	Intersection of NE 20 th Avenue and NE 7 th Street.	5.0	6.0
	V-9	Approximately 160 feet east of the intersection of NE 20 th Avenue and NE 7 th Street.	-	-
	V-10	On NE 20 th Avenue. Approximately 900 feet north of the intersection of NE 20 th Avenue and NE 7 th Street.	2.2	9.0

3.0 PURPOSE AND SCOPE OF WORK

The purpose of this study was to perform a limited exploration of the subsurface conditions within the project proposed areas, to aid in the planning and design of the overall neighborhood site drainage infrastructure and seawalls.

More specifically, the purpose of the work included the following:

- Development of the anticipated soil profiles and the subsurface conditions within the depth of influence at the seawall structure locations and anticipated stormwater management infrastructure improvements.
- Identification of critical geotechnical design or construction considerations based on the soil and groundwater conditions encountered in the borings.

RADISE performed the following services in accordance with the proposed scope of work:

1. Visited the sites to field mark (paint or/and stake) the planned soil boring test locations and observe existing site conditions.
2. Contacted Sunshine 811 to request the field location and clearance of underground utilities in the areas of the proposed borings, as per Florida Statutes.

3. Set up Maintenance of Traffic (MOT) safety controls prior to and during the field drilling operations.
4. Mobilized drilling equipment to the site to perform:
 - Fifty (50) Standard Penetration Test (SPT) soil borings to depths of fifteen (15) feet below the existing ground surface within the various seven (7) neighborhoods.
 - Thirty six (36) SPT borings to depths of 50 feet within the seawall and pump station locations.
 - Asphalt pavement cores at sixty eight (68) of the SPT boring locations.

Samples of the subsurface soils encountered in the SPT borings were obtained and the depth to the groundwater level was measured in each of the borings. Following completion of the testing, the boreholes were backfilled with neat cement grout.

5. Visually classified the SPT soil samples retrieved from the soil borings in accordance with the Unified Soil Classification System (USCS) using the Visual-Manual Procedure in general accordance with the American Society of Testing and Materials (ASTM) test method D 2488, *Description and Identification of Soils*.
6. Performed a limited laboratory testing program for soil index property determinations on selected SPT samples to aid in the classification process in general accordance with the ASTM test method D 2487, *Classification of Soils for Engineering Purposes*.
7. Prepared this Geotechnical Services Report to summarize the results of the field exploration and laboratory testing, and to present our findings, evaluations and design recommendations.

4.0 FIELD EXPLORATION

During this work phase, MOT was used to protect our field personnel, equipment, and the general public. The MOT was designed and set up in accordance with the FDOT Design Standards.

4.1 CORING

The field exploration program to evaluate the existing asphalt pavement thicknesses consisted of a total of sixty eight (68) Pavement Cores, sampled at each of the sixty eight of the SPT borings locations. The approximate boring locations are shown on the attached *Boring Location Plan*, Sheets 2A through 2Q. Tables 1 and 2 in the previous Section 1.0 presents a summary of the measured asphalt section thickness and the base thickness at the boring locations. Latitude and Longitude coordinates of the boring locations were obtained by the field crew using hand-held GPS equipment.

Pavement Core samples were obtained at sixty eight (68) locations using a portable electric stand-up core drill with a 6-inch diameter diamond tipped core drill bit. Upon removal of the asphalt core, a hand-held power auger and a hand operated bucket-type auger were used to loosen the base course material and to clean out the borehole. Subsequent down-hole field measurements were made using a surveyors tape to document the thickness and composition of the encountered pavement base course materials.

Representative samples of the base course, obtained from the hand bucket-type auger, were placed in moisture proof bags and transported to our laboratory. The samples were then examined by a geotechnical engineer in the lab to confirm the field classifications.

4.2 SOIL BORINGS

The field exploration program to evaluate the existing subsurface conditions consisted of drilling eighty six (86) SPT borings. Fifty (50) of the SPT soil borings were drilled to depths of fifteen (15) feet below the existing ground surface within the various seven (7) neighborhoods and thirty six (36) of the SPT borings were drilled to depths of 50 feet in the vicinity of the seawall and pump station locations. The approximate locations of the SPT borings are depicted on the attached Boring Location Plan, Sheets 2A through 2Q. Latitude and Longitude coordinates of the test locations were obtained by the field crew using hand-held GPS equipment and are listed on the attached Subsurface Profiles, Sheets 3A through 10D.

The SPT borings were performed in general accordance with ASTM D 1586, "Standard Test Method for the Standard Penetration Test and Split-Barrel Sampling". Upon retrieval, the split-spoon, soil samples were visually classified and placed in moisture proof containers for transportation to our laboratory. Each borehole was backfilled with neat cement grout to the ground surface after the completion of drilling, sampling and monitoring operations.

4.3 GROUNDWATER LEVEL MEASUREMENTS

After completion of the borings and after a short stabilization period, the depth to the groundwater was measured from the existing ground surface in each boring. The measured groundwater depth/elevation is plotted adjacent to the soil profiles shown on the attached Subsurface Profiles, Sheets 3A through 10D.

5.0 LABORATORY TESTING

5.1 GENERAL

Representative soils samples collected from the borings were visually reviewed in the laboratory by a RADISE Geotechnical Engineer to confirm field classifications. The samples were classified in general accordance with the Unified Soil Classification System (USCS). The classifications were based on visual observations supplemented by laboratory test results performed on selected representative SPT samples. Laboratory index tests consisting of Full Sieve Analysis, Percent Passing No. 200 Sieve, Moisture, Atterberg limits, and Organics Content tests were performed on selected samples to further confirm and finalize field soils classifications.

5.2 LABORATORY TEST RESULTS

Test assignments were provided by a geotechnical engineer during the laboratory review of secured soil samples. Laboratory assignments were made to supplement and confirm soil classification at each general boring location.

The following list summarizes the types and numbers of laboratory tests performed.

- Ninety six (96) Moisture Content Tests (ASTM D 2216).
- Sixty two (62) Organics Content Tests (ASTM 2216 D).
- Twenty six (26) Full Sieve Analysis Test (ASTM D422).
- Fifteen (15) Percent Passing No. 200 Sieve Tests (ASTM D 1140).
- Three (3) Atterberg limits tests (ASTM D 4318).

All of the laboratory test results are presented on the attached *Subsurface Profiles*, Sheet 3A through 10D, and in the attached Table A-1 - *Laboratory Test Results Summary*.

6.0 SURFACE AND SUBSURFACE EXPLORATION

6.1 STRATIGRAPHY

Stratification of the explored soils is based on visual examination of the recovered soil samples, index testing, laboratory classification and interpretation of the field boring logs by a geotechnical engineer in accordance with the Unified Soil Classification System (USCS). Subsurface profiles showing the soil stratification at the boring locations were developed and are presented on the attached *Subsurface Profiles*, Sheets 3A through 10D. Stratification lines represent approximate boundaries between soil types, but the actual transition between layers may be gradual or abrupt. Additionally, soil and groundwater conditions will vary between boring locations.

The soils encountered in all eighty six (86) of the soil borings generally consist of sand with varying amounts of silt and limestone fragments mostly underlain by limestone. Some of the borings encountered a layer of soil containing appreciable amounts of organic matter. Generalized descriptions of the soil stratigraphy are provided in the following Table 3:

TABLE 3 - STRATIGRAPHY

Stratum No.	Description	USCS Class.
1	Brown, fine to medium SAND, occasionally with Gravel, Limestone fragments, and Silt	SP, SP-SM
2	Gray, fine to medium Silty SAND, occasionally with Gravel and Limestone fragments	SM
3	Gray, Sandy SILT	ML
4	Tan to gray, LIMESTONE	-
5	Tan, Sandy LIMESTONE	-
6	Dark Brown Organic Material	PT

It is noted that the Layer 6 Dark Brown Organic Material were primarily encountered in the borings performed in the River Oaks, Seven Isles, and Victoria Park neighborhoods. Review of the boring logs and boring locations for the River Oaks neighborhood area indicates organic material was encountered in the borings performed in an undeveloped, wooded area adjacent to the east side of Interstate I-95 and just south of the South Fork New River. It appears this area contains a layer of fill soils placed over organic soils along the south side of the South Fork New River. Review of the boring logs and boring locations for the Seven Isles and Victoria Park neighborhood areas indicates there appear to be layers of fill soils which were placed over remnant buried mangrove preserve areas along the Intracoastal Waterway. This land reclamation occurred during early development periods in the history of the coastal Ft. Lauderdale area.

The following Table 4 summarizes the borings, depths and thickness of the Stratum 6 soils that contain 5.3 to 67.3 percent organics encountered:

TABLE 4 – STRATUM 6 SOILS (PEAT)

Boring No.	Depth from (feet)	Depth to (feet)	Organic layer thickness (feet)
R-9	2	6	4
R-10	2	4	2
R-12	4	6	2
S-2	4	10	6
S-3	6	8	2
S-4	4	8	4
S-5	4	10	6
S-8	2	6	4
S-14	4	9	5
S-15	4	9	5
S-16	4	6	2
S-17	4	12	8
S-18	4	12	8
S-19	4	12	8
S-20	4	8	4
S-21	4	6	2
S-22	8	12	4
S-23	8	12	4
S-23	8	10	2
S-27	8	10	2
S-28	0	2	2
S-29	6	10	4
S-30	2	6	4
S-30	10	15	5
V-1	4	8	4
V-7	4	8	4
V-8	4	10	6
V-10	8	10	2

6.2 GROUNDWATER LEVELS

Groundwater was encountered in each of the SPT boring. The groundwater level varied between 0.5 to 6.5 feet below the existing ground surface. However, the groundwater levels will fluctuate with the seasons and variations of precipitation. It is our recommendation that the seasonal high groundwater table levels along the various project infrastructure alignments, be based on the normal high tide water levels of the adjacent waterways existing near the various neighborhood project areas and with additional geotechnical explorations. In inland areas not directly influenced by the water levels in the adjacent waterways and canals, normal high groundwater levels can be expected to be on the order of as much as 2 to 3 feet above currently measured and reported levels herein.

7.0 ENGINEERING CONSIDERATIONS AND RECOMMENDATIONS

Generally speaking, the soils encountered in the majority of the borings performed for this study will be suitable for the proposed construction. However, it was previously noted that the River Oaks, Victoria Park and Seven Isles areas are likely a historical land reclamation areas. These areas as well as several others in the surrounding region, were infilled sometime in the historical past to facilitate the construction of the present residential communities.

The presence of the buried organics will be problematic to the installation of underground utilities especially when the inverts of such systems are founded in the organic layers. Such organics have very low shear strengths and will not support significant excavations made within or through them. As such, it is anticipated that the significant use of sliding trench boxes/shoring/sheet piling will be required to install infrastructure systems in this area.

Lift station structures are anticipated to be constructed well into the underlying sands and limestones. The buried organics encountered are expected to have little effect on the stability of the wet well structures in the ground since the bottom of the wet wells will be bearing in the sand and limestone layers. Sheet piling will likely be required to support excavations for these deep structures.

Valve vault and pavement structures are anticipated to be constructed above the buried organics. The Organic material can remain in-place and a geogrid layer can be placed below the bottom of the valve vault and pavement bedding materials during construction.

7.1 SEAWALL STRUCTURE DESIGN RECOMMENDATIONS

We understand new seawalls are proposed on to be constructed within 18 inches on the water side of the existing seawalls. A #57 stone backfill is proposed for filling between the existing seawalls and the new seawalls. Twelve (12) separate seawall segments are proposed. Twenty three (23) SPT borings were performed for the seawall structures. The adjacent roadway or park, approximate wall length, and borings performed for each wall are presented in the following Table 5:

Table 5 – Sea Wall Locations and Lengths

Seawall Number	Adjacent to	Approximate Length of Wall (feet)	Borings
Seawall 9	Victoria Park	110	S-28
Seawall 10	NE 23 rd Avenue	275	S-29
Seawall 12	E Las Olas Boulevard	90	S-15
Seawall 13	E Las Olas Boulevard	80	S-14
Seawall 14	E Las Olas Boulevard	90	S-13
Seawall 15	Isle of Palms Drive	910	S-9 through S-12
Seawall 17	SE 5 th Street	170	S-8
Seawall 29	Cordova Road	2,440	S-17 through S-23
Seawall 30	SE 10 th Street	360	S-26 and S-27
Seawall 32	Mola Avenue	215	S-16
Seawall 34	Barcelona Drive	110	S-30
Seawall 35	SE 8 th Street	550	S-24 and S-25

7.1.1 SOIL DESIGN PARAMETERS FOR SEAWALLS

Geotechnical soil design parameters for the seawall systems were derived based on field data, laboratory test data, established empirical correlations based on SPT N-values, and our experience. The design soil parameters were developed on an average boring soil profile/per wall basis.

The proposed seawalls will be subjected to lateral earth pressures. The final design elevation of the wall base was not decided and provided at the time of this study. The seawalls will be subjected to lateral at-rest or active earth pressures acting in the direction of the adjacent canal. We have also assumed that adequate drainage provisions will be incorporated into the wall design as needed to prevent hydrostatic build up behind the walls where practical.

The lateral active earth pressures acting on the roadway side of the seawalls, will primarily be resisted by the lateral wall resistance resulting from the wall embedment below the canal side ground elevation exterior face of the wall. The recommend soil parameters with respect to strata are presented in the following Tables 6 through 17.

Table 6 – Recommended Soil Parameters for Seawall #9 (Boring S-28)

Depth ¹ (ft. – ft.)	Average NES	Recommended Values					Earth Pressure (Rankine's) Coefficients			LPILE Parameters			Soil Class. (USCS/ Soil Type)
		Friction Angle (Degrees)	Total Unit Weight (pcf)	Submerged Unit Weight (pcf)	Wall Friction Angle (Degrees)		Active, Ka	Passive, Kp	At rest, Ko	Cohesion (psf)	Subgrade Modulus (k, pci)	E50 ²	
					with Steel	with Concrete							
0 – 2	4	22	75	13	11	14	0.455	2.198	0.625	–	5	–	PT
2 – 4	4	29	102	40	16	22	0.347	2.882	0.515	–	10	–	SM
4 – 6	14	36	110	48	19	26	0.260	3.852	0.412	–	30	–	Limestone
6 – 10	6	30	105	43	16	23	0.333	3.000	0.500	–	12	–	Limestone
10 – 20	15	37	110	48	20	26	0.249	4.023	0.398	–	35	–	Limestone
20 – 25	1	28	105	43	15	21	0.361	2.770	0.531	–	5	–	Limestone
25 – 30	29	40	115	53	22	26	0.217	4.599	0.357	4,000	1,000	0.004	Limestone ³
30 – 40	76	38	115	53	17	22	0.238	4.204	0.384	–	125	–	SP
40 – 45	4	29	105	43	16	22	0.347	2.882	0.515	–	10	–	Limestone
45 – 50	12	36	110	48	19	26	0.260	3.852	0.412	–	25	–	Limestone

Note: 1. Depth below the existing ground surface.

2. E50 is soil stain parameters for LPILE software analysis.

3. Hard Limestone layer should be modeled as Hard to Stiff Clay in LPILE software analysis.

4. Wall friction angle is based on Table 3-3 in the US Army Corps of Engineers Manual (Design of Sheet Pile Walls, EM 1110-2-2504).

Table 7 – Recommended Soil Parameters for Seawall #10 (Boring S-29)

Depth ¹ (ft. – ft.)	Average NES	Recommended Values					Earth Pressure (Rankine's) Coefficients			LPILE Parameters			Soil Class. (USCS/ Soil Type)
		Friction Angle (Degrees)	Total Unit Weight (pcf)	Submerged Unit Weight (pcf)	Wall Friction Angle (Degrees)		Active, Ka	Passive, Kp	At rest, Ko	Cohesion (psf)	Subgrade Modulus (k, pci)	E50 ²	
					with Steel	with Concrete							
0 – 6	17	32	114	52	17	22	0.307	3.255	0.470	–	40	–	SP, SP-SM
6 – 10	11	24	82	20	12	15	0.422	2.371	0.593	–	10	–	PT
10 – 40	18	38	110	48	21	26	0.238	4.204	0.384	–	45	–	Limestone
40 – 50	34	40	115	53	22	26	0.217	4.599	0.357	4,000	1,000	0.004	Limestone ³

Note: 1. Depth below the existing ground surface.

2. E50 is soil stain parameters for LPILE software analysis.

3. Hard Limestone layer should be modeled as Hard to Stiff Clay in LPILE software analysis.

4. Wall friction angle is based on Table 3-3 in the US Army Corps of Engineers Manual (Design of Sheet Pile Walls, EM 1110-2-2504).

Table 8 – Recommended Soil Parameters for Seawall #12 (Boring S-15)

Depth ¹ (ft. – ft.)	Average NES	Recommended Values					Earth Pressure (Rankine's) Coefficients			LPILE Parameters			Soil Class. (USCS/ Soil Type)
		Friction Angle (Degrees)	Total Unit Weight (pcf)	Submerged Unit Weight (pcf)	Wall Friction Angle (Degrees)		Active, Ka	Passive, Kp	At rest, Ko	Cohesion (psf)	Subgrade Modulus (k, pci)	E50 ²	
					with Steel	with Concrete							
0 – 4	14	31	110	48	17	22	0.320	3.124	0.485	–	30	–	SP, SP-SM
4 – 9	5	22	75	13	11	14	0.455	2.198	0.625	–	5	–	PT
9 – 50	17	37	110	48	20	26	0.249	4.023	0.398	–	40	–	Limestone

- Note: 1. Depth below the existing ground surface.
 2. E50 is soil stain parameters for LPILE software analysis.
 3. Wall friction angle is based on Table 3-3 in the US Army Corps of Engineers Manual (Design of Sheet Pile Walls, EM 1110-2-2504).

Table 9 – Recommended Soil Parameters for Seawall #13 (Boring S-14)

Depth ¹ (ft. – ft.)	Average NES	Recommended Values					Earth Pressure (Rankine's) Coefficients			LPILE Parameters			Soil Class. (USCS/ Soil Type)
		Friction Angle (Degrees)	Total Unit Weight (pcf)	Submerged Unit Weight (pcf)	Wall Friction Angle (Degrees)		Active, Ka	Passive, Kp	At rest, Ko	Cohesion (psf)	Subgrade Modulus (k, pci)	E50 ²	
					with Steel	with Concrete							
0 – 4	14	32	114	52	17	22	0.307	3.255	0.470	–	30	–	SP, SP-SM
4 – 9	6	22	75	13	11	14	0.455	2.198	0.625	–	5	–	PT
9 – 50	15	37	110	48	20	26	0.249	4.023	0.398	–	35	–	Limestone

- Note: 1. Depth below the existing ground surface.
 2. E50 is soil stain parameters for LPILE software analysis.
 3. Wall friction angle is based on Table 3-3 in the US Army Corps of Engineers Manual (Design of Sheet Pile Walls, EM 1110-2-2504).



Table 10 – Recommended Soil Parameters for Seawall #14 (Boring S-13)

Depth ¹ (ft. – ft.)	Average NES	Recommended Values					Earth Pressure (Rankine's) Coefficients			LPILE Parameters			Soil Class. (USCS/ Soil Type)
		Friction Angle (Degrees)	Total Unit Weight (pcf)	Submerged Unit Weight (pcf)	Wall Friction Angle (Degrees)		Active, Ka	Passive, Kp	At rest, Ko	Cohesion (psf)	Subgrade Modulus (k, pci)	E50 ²	
					with Steel	with Concrete							
0 – 2	17	32	114	52	17	22	0.307	3.255	0.470	–	40	–	SP
2 – 8	10	30	106	44	16	22	0.333	3.000	0.500	–	20	–	SP-SM (Gravelly Sand)
8 – 10	6	30	106	44	16	22	0.333	3.000	0.500	–	12	–	SM
10 – 35	18	38	110	48	21	26	0.238	4.204	0.384	–	45	–	Limestone
35 – 40	10	30	105	43	16	22	0.333	3.000	0.500	–	20	–	Limestone
40 – 50	26	40	115	53	22	26	0.217	4.599	0.357	4,000	1,000	0.004	Limestone ³

- Note: 1. Depth below the existing ground surface.
 2. E50 is soil stain parameters for LPILE software analysis.
 3. Hard Limestone layer should be modeled as Hard to Stiff Clay in LPILE software analysis.
 4. Wall friction angle is based on Table 3-3 in the US Army Corps of Engineers Manual (Design of Sheet Pile Walls, EM 1110-2-2504).

Table 11 – Recommended Soil Parameters for Seawall #15 (Boring S-10)

Depth ¹ (ft. – ft.)	Average NES	Recommended Values					Earth Pressure (Rankine's) Coefficients			LPILE Parameters			Soil Class. (USCS/ Soil Type)
		Friction Angle (Degrees)	Total Unit Weight (pcf)	Submerged Unit Weight (pcf)	Wall Friction Angle (Degrees)		Active, Ka	Passive, Kp	At rest, Ko	Cohesion (psf)	Subgrade Modulus (k, pci)	E50 ²	
					with Steel	with Concrete							
0 – 4	17	32	114	52	17	22	0.307	3.255	0.470	–	40	–	SP-SM
4 – 8	9	30	106	44	16	22	0.333	3.000	0.500	–	17	–	SP
8 – 20	15	37	110	48	20	26	0.249	4.023	0.398	–	35	–	Limestone
20 – 25	10	30	105	43	16	22	0.333	3.000	0.500	–	20	–	Limestone
25 – 45	13	36	110	48	19	26	0.260	3.852	0.412	–	30	–	Limestone
9 – 50	10	30	105	43	16	22	0.333	3.000	0.500	–	20	–	Limestone

- Note: 1. Depth below the existing ground surface.
 2. E50 is soil stain parameters for LPILE software analysis.
 3. Wall friction angle is based on Table 3-3 in the US Army Corps of Engineers Manual (Design of Sheet Pile Walls, EM 1110-2-2504).
 4. Wall friction angle is based on Table 3-3 in the US Army Corps of Engineers Manual (Design of Sheet Pile Walls, EM 1110-2-2504).

Table 12 – Recommended Soil Parameters for Seawall #17 (Boring S-8)

Depth ¹ (ft. – ft.)	Average NES	Recommended Values					Earth Pressure (Rankine's) Coefficients			LPILE Parameters			Soil Class. (USCS/ Soil Type)
		Friction Angle (Degrees)	Total Unit Weight (pcf)	Submerged Unit Weight (pcf)	Wall Friction Angle (Degrees)		Active, Ka	Passive, Kp	At rest, Ko	Cohesion (psf)	Subgrade Modulus (k, pci)	E50 ²	
					with Steel	with Concrete							
0 – 2	14	31	110	48	17	22	0.320	3.124	0.485	–	32	–	SP
2 – 6	5	22	75	13	11	14	0.455	2.198	0.625	–	5	–	PT
6 – 10	10	30	106	44	16	22	0.333	3.000	0.500	–	20	–	SP-SM
10 – 15	19	31	110	48	11	14	0.320	3.124	0.485	–	30	–	ML
15 – 40	17	37	110	48	20	26	0.249	4.023	0.398	–	40	–	Limestone
40 – 50	33	40	115	53	22	26	0.217	4.599	0.357	4,000	1,000	0.004	Limestone ³

- Note: 1. Depth below the existing ground surface.
 2. E50 is soil stain parameters for LPILE software analysis.
 3. Hard Limestone layer should be modeled as Hard to Stiff Clay in LPILE software analysis.
 4. Wall friction angle is based on Table 3-3 in the US Army Corps of Engineers Manual (Design of Sheet Pile Walls, EM 1110-2-2504).

Table 13 – Recommended Soil Parameters for Seawall #29 (Boring S-22)

Depth ¹ (ft. – ft.)	Average NES	Recommended Values					Earth Pressure (Rankine's) Coefficients			LPILE Parameters			Soil Class. (USCS/ Soil Type)
		Friction Angle (Degrees)	Total Unit Weight (pcf)	Submerged Unit Weight (pcf)	Wall Friction Angle (Degrees)		Active, Ka	Passive, Kp	At rest, Ko	Cohesion (psf)	Subgrade Modulus (k, pci)	E50 ²	
					with Steel	with Concrete							
0 – 4	11	31	110	48	17	22	0.320	3.124	0.485	–	22	–	SP
4 – 12	1	20	66	70	8	14	0.490	2.040	0.658	–	2	–	PT/CL
12 – 20	20	38	110	48	21	26	0.238	4.204	0.384	–	50	–	Limestone
20 – 25	10	30	105	43	16	23	0.333	3.000	0.500	–	20	–	Limestone
25 – 38	11	31	110	48	17	22	0.320	3.124	0.485	–	22	–	SP
38 – 50	14	36	110	48	19	26	0.260	3.852	0.412	–	32	–	Limestone

- Note: 1. Depth below the existing ground surface.
 2. E50 is soil stain parameters for LPILE software analysis.
 3. Wall friction angle is based on Table 3-3 in the US Army Corps of Engineers Manual (Design of Sheet Pile Walls, EM 1110-2-2504).



Table 14 – Recommended Soil Parameters for Seawall #30 (Boring S-26)

Depth ¹ (ft. – ft.)	Average NES	Recommended Values					Earth Pressure (Rankine's) Coefficients			LPILE Parameters			Soil Class. (USCS/ Soil Type)
		Friction Angle (Degrees)	Total Unit Weight (pcf)	Submerged Unit Weight (pcf)	Wall Friction Angle (Degrees)		Active, Ka	Passive, Kp	At rest, Ko	Cohesion (psf)	Subgrade Modulus (k, pci)	E50 ²	
					with Steel	with Concrete							
0 – 4	26	35	120	58	17	22	0.271	3.690	0.426	–	68	–	SP
4 – 8	15	32	114	52	17	22	0.307	3.255	0.470	–	35	–	SP-SM
8 – 10	4	22	75	13	11	14	0.455	2.198	0.625	–	5	–	PT
10 – 20	27	40	115	53	22	26	0.217	4.599	0.357	4,000	1,000	0.004	Limestone ³
20 – 25	4	29	105	43	16	22	0.347	2.882	0.515	–	10	–	Limestone
25 – 35	14	37	110	48	20	26	0.249	4.023	0.398	–	32	–	Limestone
35 – 40	10	30	105	43	16	23	0.333	3.000	0.500	–	20	–	Limestone
40 – 50	12	36	110	48	19	26	0.260	3.852	0.412	–	25	–	Limestone

- Note: 1. Depth below the existing ground surface.
 2. E50 is soil stain parameters for LPILE software analysis.
 3. Hard Limestone layer should be modeled as Hard to Stiff Clay in LPILE software analysis.
 4. Wall friction angle is based on Table 3-3 in the US Army Corps of Engineers Manual (Design of Sheet Pile Walls, EM 1110-2-2504).

Table 15 – Recommended Soil Parameters for Seawall #32 (Boring S-16)

Depth ¹ (ft. – ft.)	Average NES	Recommended Values					Earth Pressure (Rankine's) Coefficients			LPILE Parameters			Soil Class. (USCS/ Soil Type)
		Friction Angle (Degrees)	Total Unit Weight (pcf)	Submerged Unit Weight (pcf)	Wall Friction Angle (Degrees)		Active, Ka	Passive, Kp	At rest, Ko	Cohesion (psf)	Subgrade Modulus (k, pci)	E50 ²	
					with Steel	with Concrete							
0 – 4	12	31	110	48	17	22	0.320	3.124	0.485	–	25	–	SP
4 – 6	9	24	82	20	12	15	0.422	2.371	0.593	–	10	–	PT
6 – 10	6	30	106	44	16	22	0.333	3.000	0.500	–	12	–	SP
10 – 30	16	37	110	48	20	26	0.249	4.023	0.398	–	38	–	Limestone
30 – 35	29	40	115	53	22	26	0.217	4.599	0.357	4,000	1,000	0.004	Limestone ³
35 – 50	20	38	110	48	21	26	0.238	4.204	0.384	–	50	–	Limestone

- Note: 1. Depth below the existing ground surface.
 2. E50 is soil stain parameters for LPILE software analysis.
 3. Hard Limestone layer should be modeled as Hard to Stiff Clay in LPILE software analysis.
 4. Wall friction angle is based on Table 3-3 in the US Army Corps of Engineers Manual (Design of Sheet Pile Walls, EM 1110-2-2504).



Table 16 – Recommended Soil Parameters for Seawall #34 (Boring S-30)

Depth ¹ (ft. – ft.)	Average NES	Recommended Values					Earth Pressure (Rankine’s) Coefficients			LPILE Parameters			Soil Class. (USCS/ Soil Type)
		Friction Angle (Degrees)	Total Unit Weight (pcf)	Submerged Unit Weight (pcf)	Wall Friction Angle (Degrees)		Active, Ka	Passive, Kp	At rest, Ko	Cohesion (psf)	Subgrade Modulus (k, pci)	E50 ²	
					with Steel	with Concrete							
0 – 2	16	32	114	52	17	22	0.307	3.255	0.470	–	37	–	SP
2 – 6	12	24	82	20	11	14	0.422	2.371	0.593	–	10	–	PT
6 – 10	4	29	102	40	16	22	0.347	2.882	0.515	–	10	–	SP
10 – 15	21	25	86	24	11	14	0.406	2.464	0.577	–	15	–	PT
15 – 20	15	37	110	48	20	26	0.249	4.023	0.398	–	35	–	Limestone
20 – 30	26	40	115	53	22	26	0.217	4.599	0.357	4,000	1,000	0.004	Limestone ³
30 – 50	19	38	110	48	21	26	0.238	4.204	0.384	–	47	–	Limestone

- Note: 1. Depth below the existing ground surface.
 2. E50 is soil stain parameters for LPILE software analysis.
 3. Hard Limestone layer should be modeled as Hard to Stiff Clay in LPILE software analysis.
 4. Wall friction angle is based on Table 3-3 in the US Army Corps of Engineers Manual (Design of Sheet Pile Walls, EM 1110-2-2504).

Table 17 – Recommended Soil Parameters for Seawall #35 (Boring S-25)

Depth ¹ (ft. – ft.)	Average NES	Recommended Values					Earth Pressure (Rankine’s) Coefficients			LPILE Parameters			Soil Class. (USCS/ Soil Type)
		Friction Angle (Degrees)	Total Unit Weight (pcf)	Submerged Unit Weight (pcf)	Wall Friction Angle (Degrees)		Active, Ka	Passive, Kp	At rest, Ko	Cohesion (psf)	Subgrade Modulus (k, pci)	E50 ²	
					with Steel	with Concrete							
0 – 4	17	32	114	52	17	22	0.307	3.255	0.470	–	40	–	SP
4 – 10	11	31	110	48	17	22	0.320	3.124	0.485	–	22	–	SP
10 – 50	16	37	110	48	20	26	0.249	4.023	0.398	–	37	–	Limestone

- Note: 1. Depth below the existing ground surface.
 2. E50 is soil stain parameters for LPILE software analysis.
 3. Wall friction angle is based on Table 3-3 in the US Army Corps of Engineers Manual (Design of Sheet Pile Walls, EM 1110-2-2504).



7.2 FOUNDATION RECOMMENDATIONS FOR LIFT STATIONS

Based on the geotechnical exploration and providing the subgrade preparation procedures presented below are followed, it is our opinion that the site is suitable for the planned lift station construction. The proposed structures may be supported on a mat foundation.

Following the in-situ foundation preparation recommendations below, the proposed structure foundations may bear within the prepared existing sands and limestones beneath the organic materials. The net allowable soil bearing pressures are provided the following Tables 18 through 29. The net bearing pressure is defined as the soil bearing pressure at the foundation bearing level in excess of the natural overburden pressure at that level. To verify suitable bearing, we recommend that the foundation excavation subgrade be checked by a geotechnical engineer just prior to mat rebar placement. The excavation bottom should be kept as dry as practically possible during construction.

Resistance to lateral loads can be derived from 1) passive pressure acting on the sides of the foundations and any grade beams, and 2) lateral resistance along the base of the foundations. Lateral resistance derived from friction between the soil and the bases of the footings should be calculated based on a friction factor of 0.35 times the base contact bearing pressure. Passive resistance of the upper foot of soil should be neglected, unless it is confined by a slab or pavement. Passive resistance on the sides of the foundations should be ignored if these soils can be hypothetically washed away during a hurricane storm event.

A subgrade modulus of 250 psi/in may be used in the design of a mat/raft foundation provided that the subgrade and subsequent engineered granular fill is prepared as described below. A 6-inch leveling layer of clean (less than 5% passing a #200 sieve) granular fill is recommended to be placed directly below slab-on-grade floors where appropriate. The granular fill should be compacted until densities of at least 95% of the maximum dry density as determined by ASTM D1557, the Modified Proctor method. Based on our assumption of a structure supported on a shallow footing or mat foundation system, the total settlement should be less than 1.0 inches, and differential settlements should be less than 0.50 inches.

7.2.1 RECOMMENDED SOIL PARAMETERS FOR LIFT STATION DESIGN

Underground lift stations for this project should be designed to resist pressures exerted by the adjacent soils and hydrostatic head. For walls that are not restrained during backfilling but are free to rotate at the top, active earth pressure should be used in design. Walls that are restrained should be designed assuming at-rest pressures. Recommended soil parameters for the soils encountered at the sites are given in the following tables.

Table 18 – SPT BORING DR-1

Boring depth (ft - ft)	Average N _{AUTO}	Average N _{ES}	Recommended Values			Earth Pressure Coefficients			Bearing Capacity (psf)
			Friction Angle (Degrees)	Total Unit Weight (pcf)	Submerged Unit Weight (pcf)	Active, K _a	Passive, K _p	At rest, K _o	
0 - 8	7	8	30	108	46	0.333	3.000	0.500	1250
8 - 10	2	2	29	106	44	0.347	2.882	0.515	400
10 - 25	15	18	33	114	52	0.295	3.392	0.455	2500
25 - 30	13	16	32	112	50	0.307	3.255	0.470	3000
30 -50	28	34	40	128	66	0.217	4.599	0.357	4000

Table 19 – SPT BORING DR-2

Boring depth (ft - ft)	Average N _{AUTO}	Average N _{ES}	Recommended Values			Earth Pressure Coefficients			Bearing Capacity (psf)
			Friction Angle (Degrees)	Total Unit Weight (pcf)	Submerged Unit Weight (pcf)	Active, K _a	Passive, K _p	At rest, K _o	
0 - 2	7	9	30	108	46	0.333	3.000	0.500	1250
2 - 4	9	11	31	110	48	0.320	3.124	0.485	1800
4 - 6	6	7	30	108	46	0.333	3.000	0.500	1200
6 - 10	3	4	29	106	44	0.347	2.882	0.515	500
10 - 30	13	16	32	112	50	0.307	3.255	0.470	3000
30 - 50	23	29	40	128	66	0.217	4.599	0.357	4000

Table 20 – SPT BORING P-5

Boring depth (ft - ft)	Average N _{AUTO}	Average N _{ES}	Recommended Values			Earth Pressure Coefficients			Bearing Capacity (psf)
			Friction Angle (Degrees)	Total Unit Weight (pcf)	Submerged Unit Weight (pcf)	Active, K _a	Passive, K _p	At rest, K _o	
0 - 2	7	9	30	108	46	0.333	3.000	0.500	1200
2 - 4	11	14	31	110	48	0.320	3.124	0.485	2000
4 - 10	7	9	30	108	46	0.333	3.000	0.500	1500
10 - 30	13	16	32	112	50	0.307	3.255	0.470	3000
30 - 50	19	24	39	126	64	0.228	4.395	0.371	4000

Table 21 – SPT BORING P-6

Boring depth (ft - ft)	Average N _{AUTO}	Average N _{ES}	Recommended Values			Earth Pressure Coefficients			Bearing Capacity (psf)
			Friction Angle (Degrees)	Total Unit Weight (pcf)	Submerged Unit Weight (pcf)	Active, K _a	Passive, K _p	At rest, K _o	
0 - 2	4	5	29	106	44	0.347	2.882	0.515	750
2 - 4	9	11	31	110	48	0.320	3.124	0.485	1500
4 - 10	6	7	30	108	46	0.333	3.000	0.500	1000
10 - 30	13	16	32	112	50	0.307	3.255	0.470	3000
30 - 50	19	24	39	126	64	0.228	4.395	0.371	4000

Table 22 – SPT BORING R-9

Boring depth (ft - ft)	Average N _{AUTO}	Average N _{ES}	Recommended Values			Earth Pressure Coefficients			Bearing Capacity (psf)
			Friction Angle (Degrees)	Total Unit Weight (pcf)	Submerged Unit Weight (pcf)	Active, K _a	Passive, K _p	At rest, K _o	
0 - 2	9	11	31	110	48	0.320	3.124	0.485	1500
2 - 6	7	9	27	102	40	0.376	2.663	0.546	1000
6 - 8	3	4	29	106	44	0.347	2.882	0.515	500
8 - 15	7	9	30	108	46	0.333	3.000	0.500	1500
15 - 25	14	17	32	112	50	0.307	3.255	0.470	2500
25 - 30	7	9	30	108	46	0.333	3.000	0.500	2500
30 - 50	10	12	31	110	48	0.320	3.124	0.485	3000

Table 23 – SPT BORING R-10

Boring depth (ft - ft)	Average N _{AUTO}	Average N _{ES}	Recommended Values			Earth Pressure Coefficients			Bearing Capacity (psf)
			Friction Angle (Degrees)	Total Unit Weight (pcf)	Submerged Unit Weight (pcf)	Active, K _a	Passive, K _p	At rest, K _o	
0 - 2	9	11	31	110	48	0.320	3.124	0.485	1500
2 - 4	6	7	27	102	40	0.376	2.663	0.546	1000
4 - 6	9	11	31	110	48	0.320	3.124	0.485	1500
6 - 8	5	6	30	108	46	0.333	3.000	0.500	750
8 - 10	3	4	29	106	44	0.347	2.882	0.515	500
10 - 15	7	9	30	108	46	0.333	3.000	0.500	1250
15 - 20	9	11	31	110	48	0.320	3.124	0.485	1750
20 - 25	8	10	30	108	46	0.333	3.000	0.500	1750
25 - 50	11	14	31	110	48	0.320	3.124	0.485	2500



Table 24 – SPT BORING R-11

Boring depth (ft - ft)	Average N _{AUTO}	Average N _{ES}	Recommended Values			Earth Pressure Coefficients			Bearing Capacity (psf)
			Friction Angle (Degrees)	Total Unit Weight (pcf)	Submerged Unit Weight (pcf)	Active, K _a	Passive, K _p	At rest, K _o	
0 - 4	7	8	30	108	46	0.333	3.000	0.500	1100
4 - 6	3	4	29	106	44	0.347	2.882	0.515	500
6 - 15	7	9	30	108	46	0.333	3.000	0.500	1250
15 - 30	19	24	34	116	54	0.283	3.537	0.441	3000
30 - 40	28	35	37	122	60	0.249	4.023	0.398	4000
40 - 50	19	24	34	116	54	0.283	3.537	0.441	4000

Table 25 – SPT BORING R-12

Boring depth (ft - ft)	Average N _{AUTO}	Average N _{ES}	Recommended Values			Earth Pressure Coefficients			Bearing Capacity (psf)
			Friction Angle (Degrees)	Total Unit Weight (pcf)	Submerged Unit Weight (pcf)	Active, K _a	Passive, K _p	At rest, K _o	
0 - 4	8	10	30	108	46	0.333	3.000	0.500	1500
4 - 6	2	2	10	68	6	0.704	1.420	0.826	0
6 - 8	9	11	31	110	48	0.320	3.124	0.485	1500
8 - 15	6	7	30	108	46	0.333	3.000	0.500	1000
15 - 35	20	25	34	116	54	0.283	3.537	0.441	3000
35 - 40	29	36	35	118	56	0.271	3.690	0.426	4000
40 - 50	20	25	34	116	54	0.283	3.537	0.441	4000

Table 26 – SPT BORING S-6

Boring depth (ft - ft)	Average N _{AUTO}	Average N _{ES}	Recommended Values			Earth Pressure Coefficients			Bearing Capacity (psf)
			Friction Angle (Degrees)	Total Unit Weight (pcf)	Submerged Unit Weight (pcf)	Active, K _a	Passive, K _p	At rest, K _o	
0 - 2	5	6	30	108	46	0.333	3.000	0.500	800
2 - 6	12	15	32	112	50	0.307	3.255	0.470	2100
6 - 8	7	9	30	108	46	0.333	3.000	0.500	1250
8 - 10	2	2	29	106	44	0.347	2.882	0.515	250
10 - 35	26	32	35	118	56	0.271	3.690	0.426	3000
35 - 50	6	7	30	108	46	0.333	3.000	0.500	2000

Table 27 – SPT BORING S-7

Boring depth (ft - ft)	Average N _{AUTO}	Average N _{ES}	Recommended Values			Earth Pressure Coefficients			Bearing Capacity (psf)
			Friction Angle (Degrees)	Total Unit Weight (pcf)	Submerged Unit Weight (pcf)	Active, K _a	Passive, K _p	At rest, K _o	
0 - 2	5	6	30	108	46	0.333	3.000	0.500	800
2 - 6	10	12	31	110	48	0.320	3.124	0.485	1750
6 - 10	6	7	30	108	46	0.333	3.000	0.500	1000
10 - 20	31	38	40	128	66	0.217	4.599	0.357	3500
20 - 25	9	11	31	110	48	0.320	3.124	0.485	2500
25 - 35	15	19	38	124	62	0.238	4.204	0.384	2750
35 - 40	7	9	30	108	46	0.333	3.000	0.500	2500
40 - 50	12	15	37	122	60	0.249	4.023	0.398	3000

Table 28 – SPT BORING V-8

Boring depth (ft - ft)	Average N _{AUTO}	Average N _{ES}	Recommended Values			Earth Pressure Coefficients			Bearing Capacity (psf)
			Friction Angle (Degrees)	Total Unit Weight (pcf)	Submerged Unit Weight (pcf)	Active, K _a	Passive, K _p	At rest, K _o	
0 - 4	14	17	32	112	50	0.307	3.255	0.470	2500
4 - 10	3	4	10	68	6	0.704	1.420	0.826	0
10 - 20	10	12	36	120	58	0.260	3.852	0.412	1500
20 - 30	12	15	32	112	50	0.307	3.255	0.470	2500
30 - 50	35	43	40	128	66	0.217	4.599	0.357	4000

Table 29 – SPT BORING V-9

Boring depth (ft - ft)	Average N _{AUTO}	Average N _{ES}	Recommended Values			Earth Pressure Coefficients			Bearing Capacity (psf)
			Friction Angle (Degrees)	Total Unit Weight (pcf)	Submerged Unit Weight (pcf)	Active, K _a	Passive, K _p	At rest, K _o	
0 - 6	3	3	29	106	44	0.347	2.882	0.515	400
6 - 8	11	14	31	110	48	0.320	3.124	0.485	1500
8 - 15	6	7	30	108	46	0.333	3.000	0.500	1000
15 - 35	7	9	30	108	46	0.333	3.000	0.500	1500
35 - 50	11	14	36	120	58	0.260	3.852	0.412	2000

Design should incorporate hydrostatic effects. In order to avoid wall damage due to excessive compaction, hand operated mechanical tampers should be used to densify backfill soils. Heavy vibratory compaction equipment should not be allowed within five feet of walls. The soils behind walls should consist of clean sands as described in the Select Fill Composition, Placement and Compaction section of this report and should be compacted to approximately 95 percent of the material's modified Proctor (ASTM D-1557) maximum dry density.

7.3 PAVEMENT DESIGN CONSIDERATIONS

The following information is provided and intended as a guideline only, as the roadway or any replacements/repairs thereof, should be designed specifically for the vehicle load intensities for the respective roadways and frequencies anticipated during the life of the project. Flexible pavement systems in this south Florida geographic area, typically consist of an asphaltic concrete wearing course, limerock base course and a stabilized pavement subgrade. Based on our preliminary findings and analysis and experience in the area, the typical pavement section thicknesses shown in the following Table 30, are commonly used by local pavement design engineers.

TABLE 30: TYPICAL FLEXIBLE AND RIGID PAVEMENT DESIGN

TYPE OF PAVEMENT	LAYER	MATERIAL DESCRIPTION	LAYER THICKNESS		
			LIGHT DUTY	MEDIUM DUTY	HEAVY DUTY
Flexible	Asphaltic concrete	Florida DOT Asphalt Type S	1.5	1.75	2.0
	Base course	Crushed limerock with minimum LBR of 100, compacted to 98% of the Modified Proctor maximum dry density	6.0	7.0	8.0
	Stabilized subbase	Stabilized sub-base fill with a minimum LBR of 40 compacted to 95% of the Modified Proctor maximum dry density	12.0	12.0	12.0
Rigid	Concrete	Florida DOT Portland Cement Concrete	6.0	7.0	8.0
	Compacted subgrade	Natural in place soils compacted to at least 95 percent of the materials Modified Proctor maximum dry density	12.0	12.0	12.0

Comparison of the above typical design thicknesses with asphalt pavement measurements provided in Tables 1 and 2, Pages 1 through 6, indicates that most of the asphalt cores measured thickness would comply with or exceed the above typical design thicknesses for light duty pavements. The asphalt cores that do not comply with the above typical asphalt design thickness for light duty asphalt pavement were encountered at borings D-4, DR-5, E-1, P-4, R-4, R-8, and V-5.

From a base thickness perspective, thirty eight (38) of the sixty eight (68) base rock thickness measurements meet or exceeds a base rock thicknesses of 6 inches and are considered acceptable for light duty pavement design and use in light duty trafficked areas. From a subgrade perspective, in our opinion the nature and composition of the subgrade soils at the location of the borings performed for this study would essentially be in compliance with typical pavement construction designs for light duty pavement section design.

Any new or re-constituted base course material should consist of crushed limestone having a minimum Limerock Bearing Ratio (LBR) of 100. Base materials should meet the requirements presented in the latest revisions of the Florida Department of Transportation "Specifications for Road and Bridge



Construction", Section 911 (limestone). The base course should be compacted to at least ninety-eight (98) percent of its maximum dry modified proctor density (AASHTO T 180).

We recommend that any new pavement subgrade be stabilized to a depth of twelve (12) inches to achieve a minimum LBR of 40. If necessary, this LBR value can be achieved by blending base material (limerock) with the existing sandy subgrade soils. The required mixing ratio should be determined by laboratory testing. The stabilized subgrade should be compacted to at least ninety-eight (98) percent of its maximum dry as determined per ASTM D 1557, the Modified Proctor Method.

A Portland concrete pavement thickness in the range of eight (8) inches would also be recommended for the project if a rigid pavement is to be employed (the thickness would depend on specific pavement use). Any concrete pavement should be reinforced to withstand the anticipated traffic loadings and jointed to reduce the chances for rigid pavement crack development. The minimum rigid pavement thickness recommended above is based upon concrete with an unconfined compressive strength of at least 3,000 psi and a modulus of rupture of at least 450 psi. It should be noted that this recommendation is intended for the street pavement and not for concrete driveway aprons or sidewalks.

Actual pavement section thickness should be determined by the Design Civil Engineer based on traffic loads, volume, and the Owner's design life requirements. The above sections represent minimum thickness representative of typical local construction practices and, as such, periodic maintenance should be anticipated. All pavement materials and construction procedures should conform to FDOT, American Concrete Institute (ACI), and/or appropriate City or County requirements for roadway pavement construction.

7.4 CLEARING AND GRUBBING

Clearing and grubbing may be required in some of the proposed construction areas. Clearing and grubbing where required should include the complete removal and disposal of surficial grasses, associated root systems, topsoil, rubbish, debris, any demolition material/pavement and all other obstructions resting on or protruding through the surface of the existing ground and the surface of excavated areas.

7.5 UNDERGROUND UTILITIES

Existing underground utilities and structures are likely to be present in the proposed construction areas. These utilities need to be properly identified, and located and/or relocated as necessary to construct the new components of the project. The excavation bottoms of any relocated or replacement utilities should be cleaned of any undesirable materials prior to placing any engineered backfill.

Site preparation, excavation, and backfilling for new utilities or re-aligned utilities should follow all of the applicable recommendations of this report.

7.6 EXCAVATIONS

The project construction Contractor is solely responsible for making any utility or other excavations in a safe manner and to provide appropriate measures to retain side slopes to ensure that persons working in or near the excavation are protected. Any structural retaining walls shall be designed and sealed by a structural engineer registered in the State of Florida.

Excavations shall comply with Occupational Health and Safety Administration (OHSA) stipulations for Trench Excavation Safety including all temporary design and safety requirements. The soils encountered in the majority borings outside of the Victoria Park and Seven Isles area, generally consist of relatively clean sands. OSHA 29 CFR part 1926 (Subpart P, Excavations) defines such soils as Type C soils. As such, the granular deposits encountered in the borings are readily capable of being excavated to a depth of several feet with standard backhoe construction equipment. As such, temporary side slopes in fully dewatered excavations could be made at a 1½H:1V inclination or flatter. Adjustment to this inclination and/or the use of sheeting, shoring or sliding trench boxes should be evaluated by the Contractor if other soil strata are encountered.

It is noted that in the Victoria Park and Seven Isles area, that significant Muck deposits were encountered in the borings. Utilities installed in this area are likely to encounter organic Muck deposits during the utility excavation and installation process.

7.7 DEWATERING

At the time of the field exploration (September and October, 2017), the groundwater encountered varied between 0.5 to 6.5 feet below the existing ground surface. In-the-dry construction of the underground utilities may require groundwater lowering and control of groundwater seepage depending on the design installation depths. Dewatering of the excavations may necessitate the use of sumps, wells, wellpoints or combinations thereof. Control of groundwater should be accomplished in a manner that preserves the integrity of the in-situ soils and limestones and does not cause instability of the excavation sidewalls. The dewatering system employed should be capable of maintaining a pre-drained surface a minimum of 24 inches below the excavation bottoms.

7.8 PIPE BEDDING

Most of the sands encountered in the borings are expected to provide good support for utility pipelines without the need for bedding when the invert elevations are at least 24 inches above the groundwater level (natural or pre-drained by dewatering). Should or where organics or other deleterious materials be encountered at or within 2 feet below the pipe invert, such soils shall be considered compressible and unsuitable for pipe support. These soils should be over-excavated and replaced with compacted clean sand or FDOT No. 57 coarse aggregate or an approved equivalent. If FDOT No. 57 stone or an approved equivalent is utilized, such stone material will need to be encapsulated and/or covered with a geosynthetic fabric especially beneath pavement areas. Such fabric material is needed to prevent granular excavation soils and trench backfill from

penetrating/settling into the void volumes of the open stone resulting in loss of ground and eventual settlement of the ground surface above the piping.

The bedding surface should be uniformly compacted to a density of not less than 95 percent of the maximum dry density in accordance with ASTM D 1557, the Modified Proctor Method.

7.9 TRENCH BACKFILL AND COMPACTION

Soils used to backfill utility excavations should consist of clean sands having no materials larger than one inch in size, not more than ten (10) percent passing the U.S. Standard No. 200 sieve, and not more than three (3) percent organics or other deleterious materials by weight. Some of the subsurface soils encountered at these neighborhood sites appear to meet these criteria and are suitable for reuse as backfill once inspected, tested and approved.

Granular backfill should be placed at a moisture content within three (3) percent of its ASTM D 1557 determined optimum moisture and in level lifts whose thickness does not exceed eight (8) inches. Each fill lift should be stable, unyielding and uniformly compacted to at least 95 percent of the maximum dry density in accordance with ASTM D 1557, the Modified Proctor Method. We recommend the use of only relatively light, hand-held compaction equipment in the densification operations around utilities to limit the potential damage to the pipelines and buried structures.

7.10 SITE PREPARATION

The site preparation for any roadway modifications should consist of necessary clearing and grubbing in general accordance with Section 110 of the FDOT Standard Specifications for Road and Bridge Construction or any similar City/County standard design criteria applicable to the project. Any topsoil or other deleterious material encountered in proposed pavement areas, will need to be stripped, removed and replaced with embankment or roadway fill. If buried organic soils, debris or other unsuitable materials are encountered during the construction, which are or are not disclosed by the borings, they should be removed and replaced with a backfill material as described in following sections.

The Stratum 1 soils are select granular soils and are satisfactory to use in the subgrade and embankment when utilized in general accordance with FDOT Standard Index 505 or any similar City/County standard design criteria applicable to the project. Soils exposed at the stripped grades will require moisture conditioning to near the optimum moisture content prior to initiating the densification operations. In residential areas, the use of such heavy vibratory compaction equipment may prove problematic and disruptive or even damaging to existing/adjacent home owner's properties. In such cases, the compaction will need to be performed and achieved with lighter weight, less vibration generation capable equipment such as walk behind (e.g. Whacker) ground pounder or small vibratory rolling equipment.

Each section of the stripped grade should be subjected to multiple, overlapping coverages of the compactor as it operates at a travel speed of no more than 1.5 miles per hour (normal walking speed). Compaction should be continued until no further settlement can be visually discerned at

the ground surface. The densified areas should include a 3-foot perimeter along proposed new pavement areas.

Density control should be exercised for the exposed subgrade for any roadway repairs. Soils in this interval should be compacted to not less than 95 percent of the maximum dry density in accordance with ASTM D 1557, the Modified Proctor Method. Subgrade soils that noticeably pump or deflect under the weight of the passing compaction equipment, could indicate the presence of soft, weak, overly saturated soils or compressible and loose soil zones existing in the near surface subgrade within the depth of influence of the roller. In such cases, those areas should be remedied by appropriate means to be determined by the inspecting field representative in consultation with representatives of the design team.

7.11 SELECT FILL COMPOSITION, PLACEMENT AND COMPACTION

Site structural and pavement embankment fill and backfill required for construction should consist of clean, granular materials that are free of debris, cinders, combustibles and organic matter. The fines content (i.e., material passing U.S. Standard No. 200 sieve) should not be more than ten (10) percent by weight, no particle sizes larger than one (1) inches in any direction and the organic content should not exceed three (3) percent by dry weight. The on-site sand soils appear to meet the above criteria and are suitable for use as structural fill and backfill material. Organic laidened soils encountered in several of the borings soils beneath the upper sand layer such as those encountered in the River Oaks, Victoria Park and Seven Isles area, will not be suitable for use of Select Fill.

The granular fill should be placed at a moisture content within three (3) percent of its Modified Proctor (ASTM D 1557) determined optimum in level lifts whose loose thickness does not exceed twelve (12) inches. In areas where heavy equipment cannot be operated for compaction, the fill should be placed in six (6) inch thick level lifts. Each fill lift should be stable, unyielding and uniformly compacted to 95 percent of the ASTM D 1557 maximum dry density, as verified by the designated site construction inspecting representative.

Select fill soils will require moisture conditioning to near the optimum moisture content prior to initiating the densification operations. Similar to the subgrade preparation, the fill densification should normally be accomplished using a self-propelled vibratory compactor which imparts a dynamic drum force of not less than 44,000 pounds. However, in residential areas, the use of such heavy vibratory compaction equipment may prove problematic and disruptive or even damaging to existing/adjacent home owner's properties. In such cases, the compaction will need to be performed and achieved with lighter weight, less vibration generation capable equipment such as walk behind (e.g. Whacker) ground pounder or small vibratory rolling equipment.

7.12 OBSERVATION AND TESTING

It is recommended that a geotechnical engineer be retained to provide soil engineering inspection services during the construction excavation phase of the project. This is to observe compliance with the design concept, specifications and recommendations, and to allow design changes in the event subsurface conditions differ from those anticipated. In addition, an inspection and testing representative of a geotechnical engineer should be present to provide monitoring and testing of both fill and concrete placement during the construction phase of the project.

8.0 EXISTING UTILITIES

Existing utilities could potentially be present within or near the proposed seawalls. Precautionary measures should be taken to identify and locate any such systems impacted by the planned construction. Where encountered, mitigative design details should be provided accordingly. Consideration should be given as to what kind of utilities are present (i.e. nature and composition), and what the utility or other owner's guidelines and specifications are regarding their re-location etc. Utility locates should be in general accordance with the FDOT Plans Preparation Manual, Section 5.3 – Utility Locates.

9.0 PROTECTION OF EXISTING STRUCTURES

Ground vibrations induced upon adjacent structures, primarily by soil compaction equipment or any other construction activities such as pile driving, should be monitored to assure that they do not reach levels which prove damaging to any adjacent/nearby structures. Vibration Monitoring should be performed in general accordance with "Section 108, Protection of Existing Structures" of the current FDOT Standard Specifications for Road and Bridge Construction or other similar local City/County regulations or ordinances.

Vibration levels on adjacent facilities should generally be maintained below a 0.25 ips peak particle velocity level however, more restrictive/lessor levels may be specified for highly sensitive residential or commercial areas. The construction Contractor will need to inventory and provide a pre-construction inspection of adjacent structures and determine suitable vibration monitoring programs and impact limits for their construction activities. Such monitoring will be particularly important for the Victoria Park and Seven Isles area as the ground conditions will have a higher tendency and capability to transmit vibrations horizontally from the construction activities. It is noted that the residential homes in this area are all likely founded on short driven piles installed to sound bearing conditions beneath the buried organics. Vibrations in the lower soil/rock layers beneath the organics, from construction activities such as sheet piling installation, will have the potential to be transmitted into the residences via the piling foundations installed for the structures.

10.0 LIMITATIONS

This report is intended for geotechnical purposes only, and not to document or detect the presence, or absence of any environmental conditions at the site, or to perform an environmental assessment of the site.

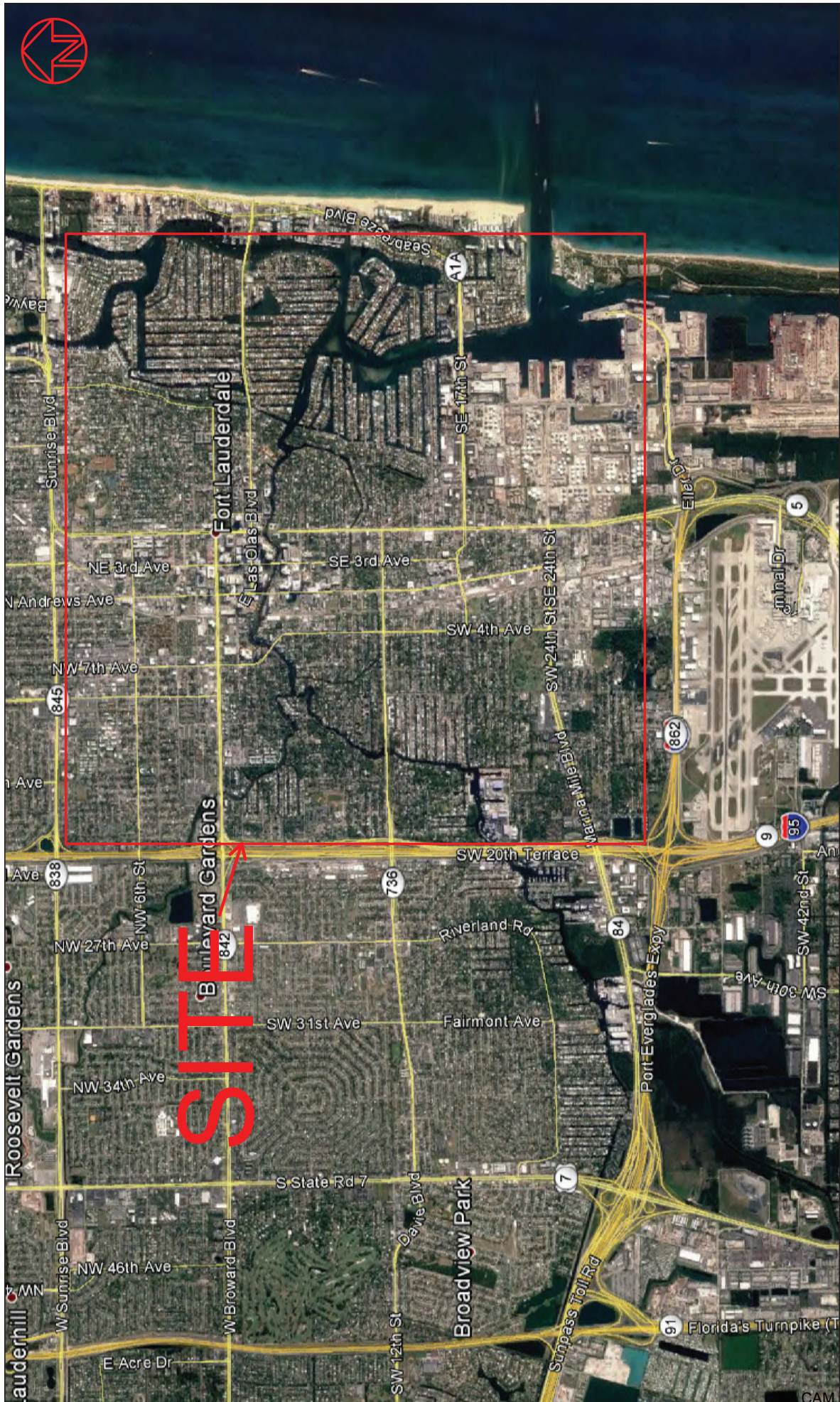
The analysis and recommendations presented in this report are based upon our interpretation of the subsurface information revealed by the test borings. The report does not reflect variations in subsurface conditions that may exist between or beyond these borings. Variations in soil and groundwater conditions should be expected, the nature and extent of which might not become evident until construction is undertaken. If variations are encountered, and/or the scope of the project altered, we should be consulted for additional recommendations.

RADISE International warrants that the professional services performed and presented in this report are prepared for Hazen and Sawyer, and are based upon typical standard of care recognized principles and practices in the discipline of geotechnical engineering and hydrogeology at this place and point in time, for this project site. No other warranties are expressed or implied.

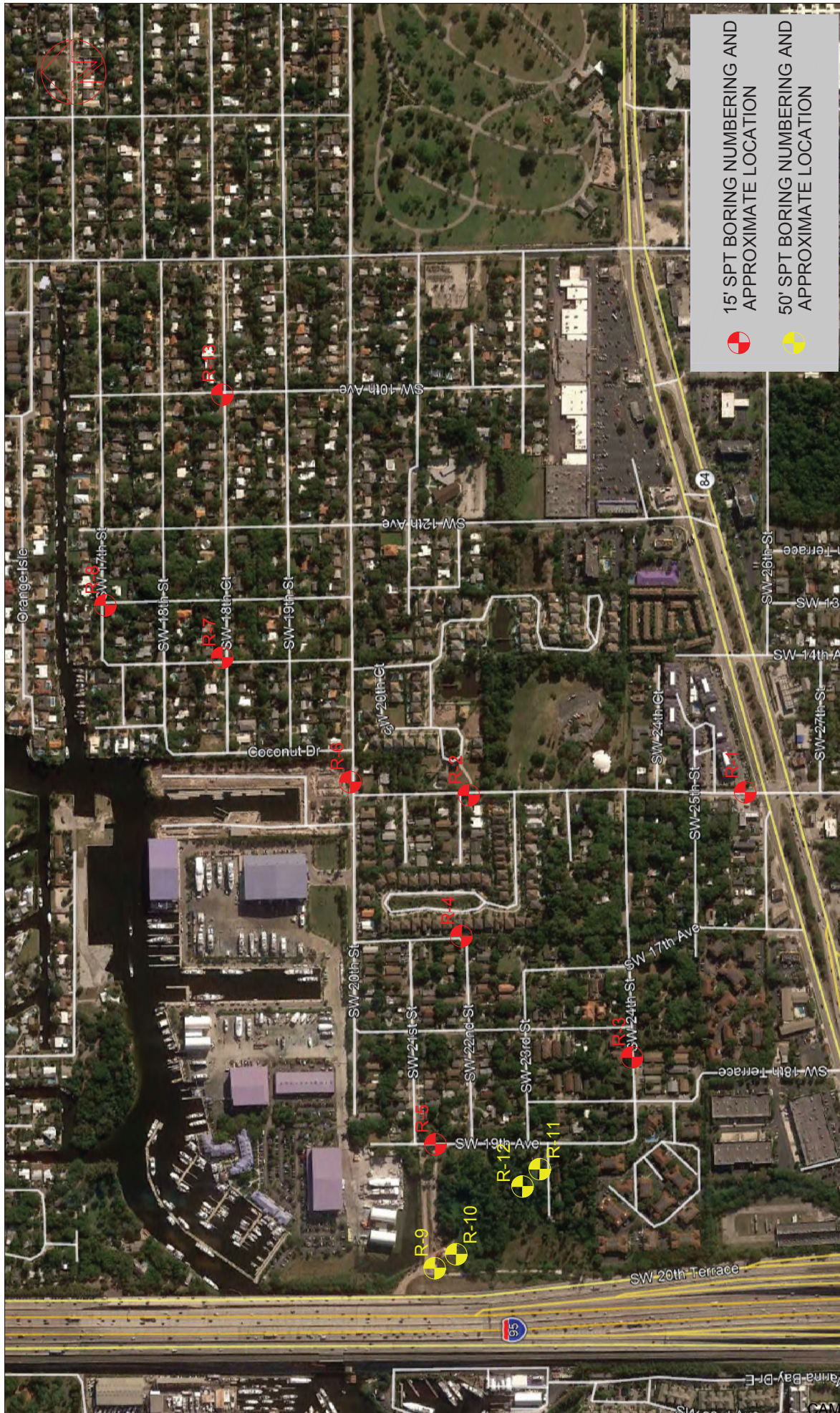
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RADISE appreciates the opportunity to be of service to you. Please feel free to contact us at 561-841-0103 if you have any questions or comments regarding this report.

**Respectfully submitted
RADISE International, L.C.**



REVISIONS No. Description Date _____ _____ _____ _____ _____ _____ _____ _____ _____		Names Drawn by: KA Checked by: AB Designed by: Approved by:		Dates 11/16/17 11/16/17		LICENSE NO. - 8901 		ENGINEER OF RECORD RADISE International 4152 West Blue Heron Boulevard, Suite 1114 Fort Lauderdale, FL 33309 TEL 954-344-0103 FAX 954-344-0104 URL: http://www.radise.net		CITY OF FORT LAUDERDALE PUBLIC WORKS DEPARTMENT COUNTY: BROWARD CLIENT: HAZEN AND SAWYER		SCALE: VERTICAL: N.T.S. HORIZONTAL: N.T.S.		SHEET TITLE: VICINITY MAP PROJECT NAME: 7 NEIGHBORHOODS AND 12 SEAWALLS IMPROVEMENT PROJECTS		SHEET NO.: 1 RADISE PROJECT NO.: 170901	
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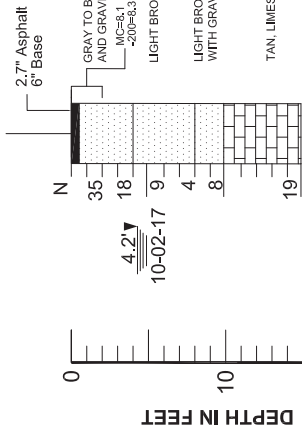


15' SPT BORING NUMBERING AND APPROXIMATE LOCATION

50' SPT BORING NUMBERING AND APPROXIMATE LOCATION

ENGINEER OF RECORD RADISE International 4152 West Blue Heron Boulevard, Suite 1114 TEL 861-841-0103 FAX 861-841-0104 URL: http://www.radise.net LICENSE NO. - 8801		CITY OF FORT LAUDERDALE PUBLIC WORKS DEPARTMENT COUNTY BROWARD CLIENT HAZEN AND SAWYER	SHEET NO. 2P RADISE PROJECT NO. 170901
DATES 11/14/17 11/15/17	NAMES KA AB	SCALE VERTICAL: N.T.S. HORIZONTAL: N.T.S.	SHEET TITLE BORING LOCATION PLAN (RIVER OAKS) PROJECT NAME 7 NEIGHBORHOODS AND 12 SEAWALLS IMPROVEMENT PROJECTS
DRAWN BY CHECKED BY DESIGNED BY APPROVED BY	DESCRIPTIONS DESCRIPTIONS	REVISIONS No. By Description	CAM 111115

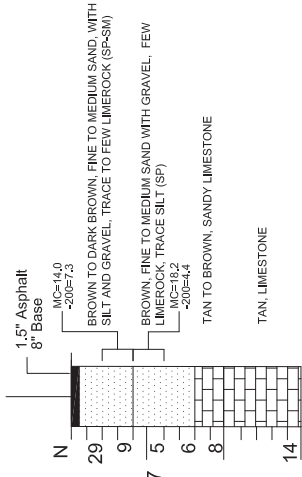
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LATITUDE: 26.0909°
LONGITUDE: -80.1608°
DATE: 10/02/2017
DRILLER: P. RAMSEWACK
RIG: CME 45



B.T. @ 15'

BELOW EXISTING GRADES

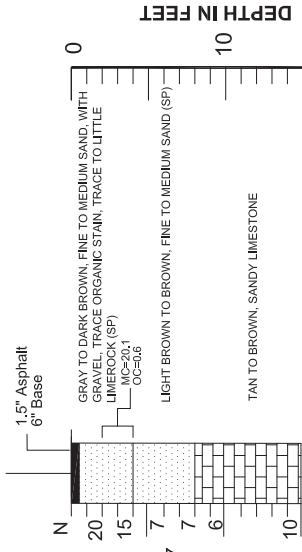
R-2
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10/02/2017
P. RAMSEWACK
CME 45



B.T. @ 15'

BELOW EXISTING GRADES

R-3
N/A
26.0924°
-80.1648°
10/03/2017
P. RAMSEWACK
CME 45



B.T. @ 15'

BELOW EXISTING GRADES

LEGEND

- ASPHALT AND BASE
- SAND
- SILTY SAND
- LIMESTONE
- GRAVEL
- ORGANIC MATERIAL
- GROUNDWATER DEPTH IN FEET
- AND DRILLING DATE
- STANDARD PENETRATION RESISTANCE - BLOWS PER FOOT USING AUTOMATIC HAMMER

SP, SP-SM, PT UNIFIED SOIL CLASSIFICATION SYSTEM GROUP SYMBOL (ASTM D 2488)
 R-1 STANDARD PENETRATION TEST (SPT) BORING AND NUMBER
 MC MOISTURE CONTENT (%)
 -200 AMOUNT PASSING US STANDARD # 200 SIEVE (%)
 OC ORGANIC CONTENTS (%)
 LL LIQUID LIMIT (%)
 PI PLASTICITY INDEX (%)
 B.T. @ 15' BORING TERMINATED AT 15 FEET BELOW THE EXISTING GROUND SURFACE

- NOTES**
- (1) BORING WERE DRILLED ON OCTOBER, 2017 USING A CENTRAL MINING EQUIPMENT MODEL 45 (CME 45) AUTOMATIC HAMMER DRILL RIG.
 - (2) STRATA BOUNDARIES ARE APPROXIMATE AND REPRESENT SOIL AND REPRESENT SOIL STRATA AT EACH TEST HOLE LOCATION ONLY. SOIL TRANSITIONS MAY BE MORE GRADUAL THAN IMPLIED.
 - (3) GROUNDWATER LEVELS SHOWN ON THE SUBSURFACE PROFILES REPRESENT GROUNDWATER SURFACES ON THROUGHOUT THE YEAR.
 - (4) LONGITUDE AND LATITUDE COORDINATES WERE MEASURED IN THE FIELD USING A HAND HELD GPS UNIT.
 - (5) ELEVATIONS WERE NOT AVAILABLE
 - (6) AFTER COMPLETION OF DRILLING BOREHOLES WERE BACK FILLED WITH GROUT.

GRANULAR MATERIALS

RELATIVE DENSITY
 VERY LOOSE 1-3
 LOOSE 3-8
 MEDIUM DENSE 8-24
 VERY DENSE GREATER THAN 40

AUTOMATIC HAMMER
 SPT N-VALUE
 BLOWS/FOOT
 LESS THAN 3
 3-8
 8-24
 GREATER THAN 40

STANDARD PENETRATION TEST DATA
 SPOON INSIDE DIA. 1.375 INCH
 SPOON OUTSIDE DIA. 2.0 INCHES
 AVG. HAMMER DROP 30 INCHES
 HAMMER WEIGHT 140 POUNDS

REVISIONS

By	Descriptions	Date	By	Descriptions	Date
KA		11/09/17			
AB		11/09/17			

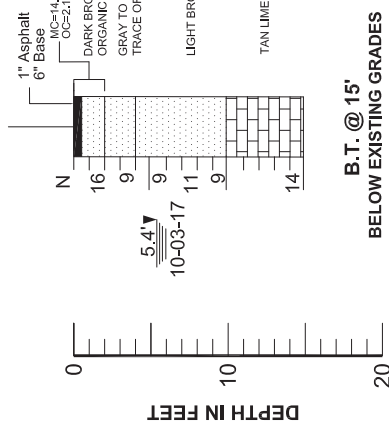
RADISE
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 RADISE International
 4152 West Blue Heron Boulevard, Suite 1114
 Fort Lauderdale, FL 33309
 TEL 561-541-4163 FAX 561-544-4104
 URL: <http://www.radise.net>
 LICENSE NO. - 8901

CITY OF FORT LAUDERDALE
PUBLIC WORKS DEPARTMENT
 COUNTY BROWARD
 CLIENT HAZEN AND SAWYER

SUBSURFACE PROFILES
(RIVER OAKS)
7 NEIGHBORHOODS AND 12 SEAWALLS
IMPROVEMENT PROJECTS

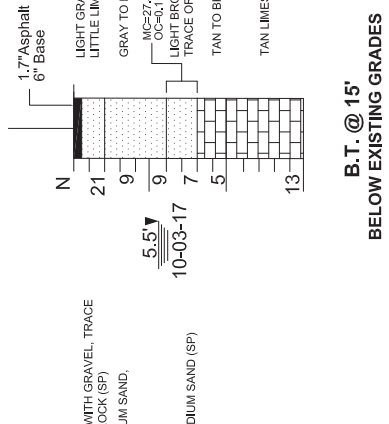
SHEET NO. 7A
RADISE PROJECT NO. 170901

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LONGITUDE: -80.1630°
DATE: 10/03/2017
DRILLER: P. RAMSEWACK
RIG: CME 45



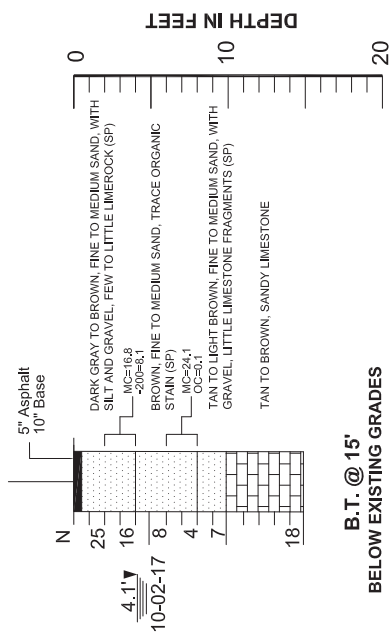
B.T. @ 15'
 BELOW EXISTING GRADES

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ELEVATION (NAVD 88): N/A
LATITUDE: 26.0950°
LONGITUDE: -80.1661°
DATE: 10/03/2017
DRILLER: T. FICKLING
RIG: CME 45



B.T. @ 15'
 BELOW EXISTING GRADES

BORING NO. R-6
ELEVATION (NAVD 88): N/A
LATITUDE: 26.0961°
LONGITUDE: -80.1608°
DATE: 10/02/2017
DRILLER: T. FICKLING
RIG: CME 45



B.T. @ 15'
 BELOW EXISTING GRADES

LEGEND

[Symbol]	ASPHALT AND BASE
[Symbol]	SAND
[Symbol]	SILTY SAND
[Symbol]	GRAVEL
[Symbol]	ORGANIC MATERIAL
[Symbol]	LIMESTONE
[Symbol]	GROUNDWATER DEPTH IN FEET
[Symbol]	AND DRILLING DATE
[Symbol]	STANDARD PENETRATION RESISTANCE-
[Symbol]	BLOWS PER FOOT USING AUTOMATIC HAMMER

SP, SP-SM, PT

UNIFIED SOIL CLASSIFICATION SYSTEM GROUP SYMBOL (ASTM D 2488)	R-1
STANDARD PENETRATION TEST (SPT) BORING AND NUMBER	MC
MOISTURE CONTENT (%)	-200
AMOUNT PASSING US STANDARD # 200 SIEVE (%)	OC
ORGANIC CONTENTS (%)	LL
LIQUID LIMIT (%)	PI
PLASTICITY INDEX (%)	B.T. @ 15'

BORING TERMINATED AT 15 FEET BELOW THE EXISTING GROUND SURFACE

NOTES

- BORING WERE DRILLED ON OCTOBER, 2017 USING A CENTRAL MINING EQUIPMENT MODEL 45 (CME 45) AUTOMATIC HAMMER DRILL RIG.
- SOIL AND REPRESENT SOIL STRATA AT EACH TEST HOLE LOCATION ONLY. SOIL TRANSITIONS MAY BE MORE GRADUAL THAN IMPLIED.
- GROUNDWATER LEVELS SHOWN ON THE SUBSURFACE PROFILES REPRESENT GROUNDWATER SURFACES ON THROUGHOUT THE YEAR.
- LONGITUDE AND LATITUDE COORDINATES WERE MEASURED IN THE FIELD USING A HAND HELD GPS UNIT.
- ELEVATIONS WERE NOT AVAILABLE
- AFTER COMPLETION OF DRILLING BOREHOLES WERE BACK FILLED WITH GROUT.

GRANULAR MATERIALS

RELATIVE DENSITY	AUTOMATIC HAMMER
VELOCITY	SPT N-VALUE
LOGS	BLOWS/FOOT
MEDIUM DENSE	LESS THAN 3
VERY DENSE	3 - 8
	8 - 24
	24 - 40
	GREATER THAN 40

STANDARD PENETRATION TEST DATA
 SPOON INSIDE DIA. 1.375 INCH
 SPOON OUTSIDE DIA. 2.0 INCHES
 AVG. HAMMER DROP 30 INCHES
 HAMMER WEIGHT 140 POUNDS

REVISIONS

No.	By	Descriptions	Date	By	Descriptions	Date
1	KA		11/09/17			
2	AB		11/09/17			

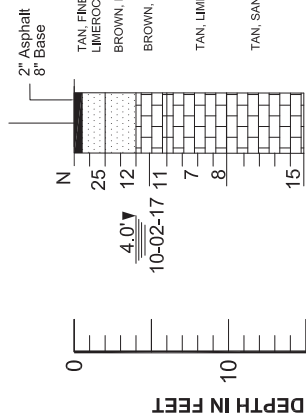
ENGINEER OF RECORD
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CITY OF FORT LAUDERDALE
PUBLIC WORKS DEPARTMENT
 COUNTY BROWARD
 CLIENT HAZEN AND SAWYER

SUBSURFACE PROFILES
(RIVER OAKS)
7 NEIGHBORHOODS AND 12 SEAWALLS
IMPROVEMENT PROJECTS

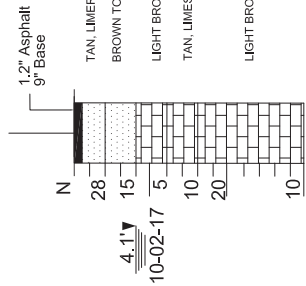
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CLIENT: HAZEN AND SAWYER
PROJECT NO.: 170901
SHEET NO.: 7B
RADISE PROJECT NO.: 170901

BORING NO. R-7
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LONGITUDE: -80.1589°
DATE: 10/02/2017
DRILLER: P. RAMSEWACK
RIG: CME 45



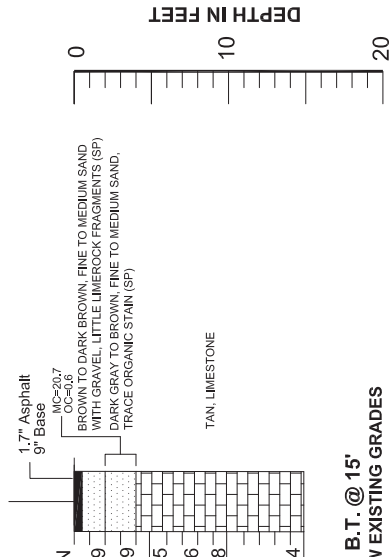
B.T. @ 15'
 BELOW EXISTING GRADES

R-8
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 10/02/2017
 P. RAMSEWACK
 CME 45



B.T. @ 15'
 BELOW EXISTING GRADES

R-13
 N/A
 26.0979°
 -80.1550°
 10/02/2017
 P. RAMSEWACK
 CME 45



B.T. @ 15'
 BELOW EXISTING GRADES

LEGEND

- ASPHALT AND BASE
- SAND
- SILTY SAND
- GROUNDWATER DEPTH IN FEET
- AND DRILLING DATE
- STANDARD PENETRATION RESISTANCE - BLOWS PER FOOT USING AUTOMATIC HAMMER
- LIMESTONE
- GRAVEL
- ORGANIC MATERIAL

- SP, SP-SM, PT UNIFIED SOIL CLASSIFICATION SYSTEM GROUP SYMBOL (ASTM D 2488)
- R-1 STANDARD PENETRATION TEST (SPT) BORING AND NUMBER
- MC MOISTURE CONTENT (%)
- 200 AMOUNT PASSING US STANDARD # 200 SIEVE (%)
- OC ORGANIC CONTENTS (%)
- LL LIQUID LIMIT (%)
- PI PLASTICITY INDEX (%)
- B.T. @ 15' BORING TERMINATED AT 15 FEET BELOW THE EXISTING GROUND SURFACE

- NOTES**
- BORING WERE DRILLED ON OCTOBER, 2017 USING A CENTRAL MINING EQUIPMENT MODEL 45 (CME 45) AUTOMATIC HAMMER DRILL RIG.
 - STRATA BOUNDARIES ARE APPROXIMATE AND REPRESENT SOIL AND REPRESENT SOIL STRATA AT EACH TEST HOLE LOCATION ONLY. SOIL TRANSITIONS MAY BE MORE GRADUAL THAN IMPLIED.
 - GROUNDWATER LEVELS SHOWN ON THE SUBSURFACE PROFILES REPRESENT GROUNDWATER SURFACES ON THE DATES SHOWN. GROUNDWATER LEVEL THROUGHOUT THE YEAR.
 - LONGITUDE AND LATITUDE COORDINATES WERE MEASURED IN THE FIELD USING A HAND HELD GPS UNIT.
 - ELEVATIONS WERE NOT AVAILABLE
 - AFTER COMPLETION OF DRILLING BOREHOLES WERE BACK FILLED WITH GROUT.

GRANULAR MATERIALS

- RELATIVE DENSITY
- VERY LOOSE
- LOOSE
- MEDIUM DENSE
- VERY DENSE
- AUTOMATIC HAMMER
- SPT N-VALUE
- BLOWS/FOOT
- LESS THAN 3
- 3 - 8
- 8 - 24
- 24 - 40
- GREATER THAN 40

- STANDARD PENETRATION TEST DATA
- SPOON INSIDE DIA. 1.375 INCH
- SPOON OUTSIDE DIA. 2.0 INCHES
- AVG. HAMMER DROP 30 INCHES
- HAMMER WEIGHT 140 POUNDS

REVISIONS

No.	By	Descriptions	Date	By	Descriptions

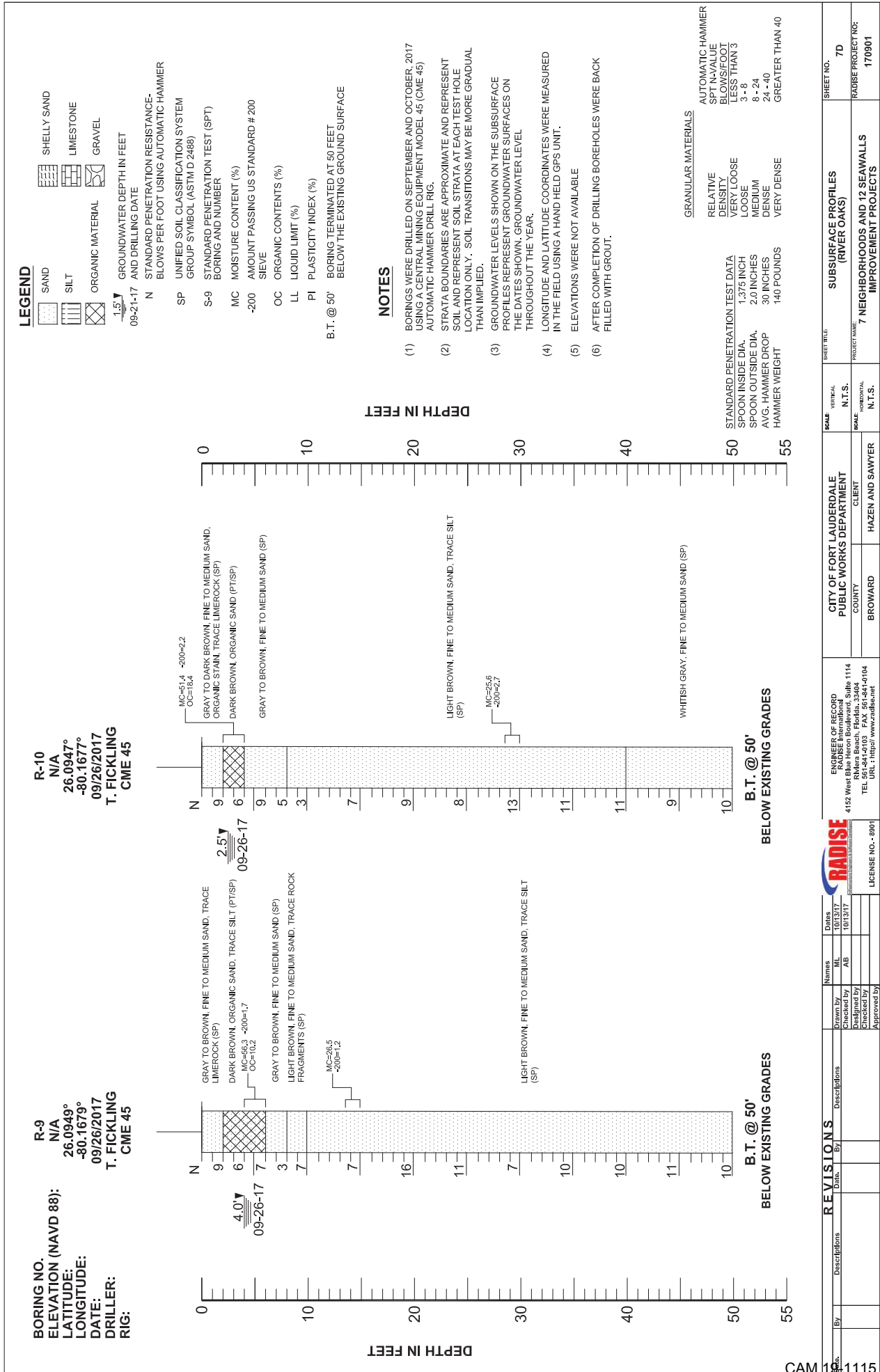
ENGINEER OF RECORD
RADISE International
 4152 West Blue Heron Boulevard, Suite 1114
 Broward County, Florida 33411
 TEL: 561-841-4103 FAX: 561-841-4104
 URL: http://www.radise.net
 LICENSE NO. - 8901

CITY OF FORT LAUDERDALE
PUBLIC WORKS DEPARTMENT
 COUNTY CLIENT
 BROWARD HAZEN AND SAWYER

SCALE
 VERTICAL N.T.S.
 HORIZONTAL N.T.S.

SUBSURFACE PROFILES
(RIVER OAKS)
 PROJECT NAME: 7 NEIGHBORHOODS AND 12 SEAWALLS IMPROVEMENT PROJECTS

SHEET NO. 7C
RADISE PROJECT NO. 170901



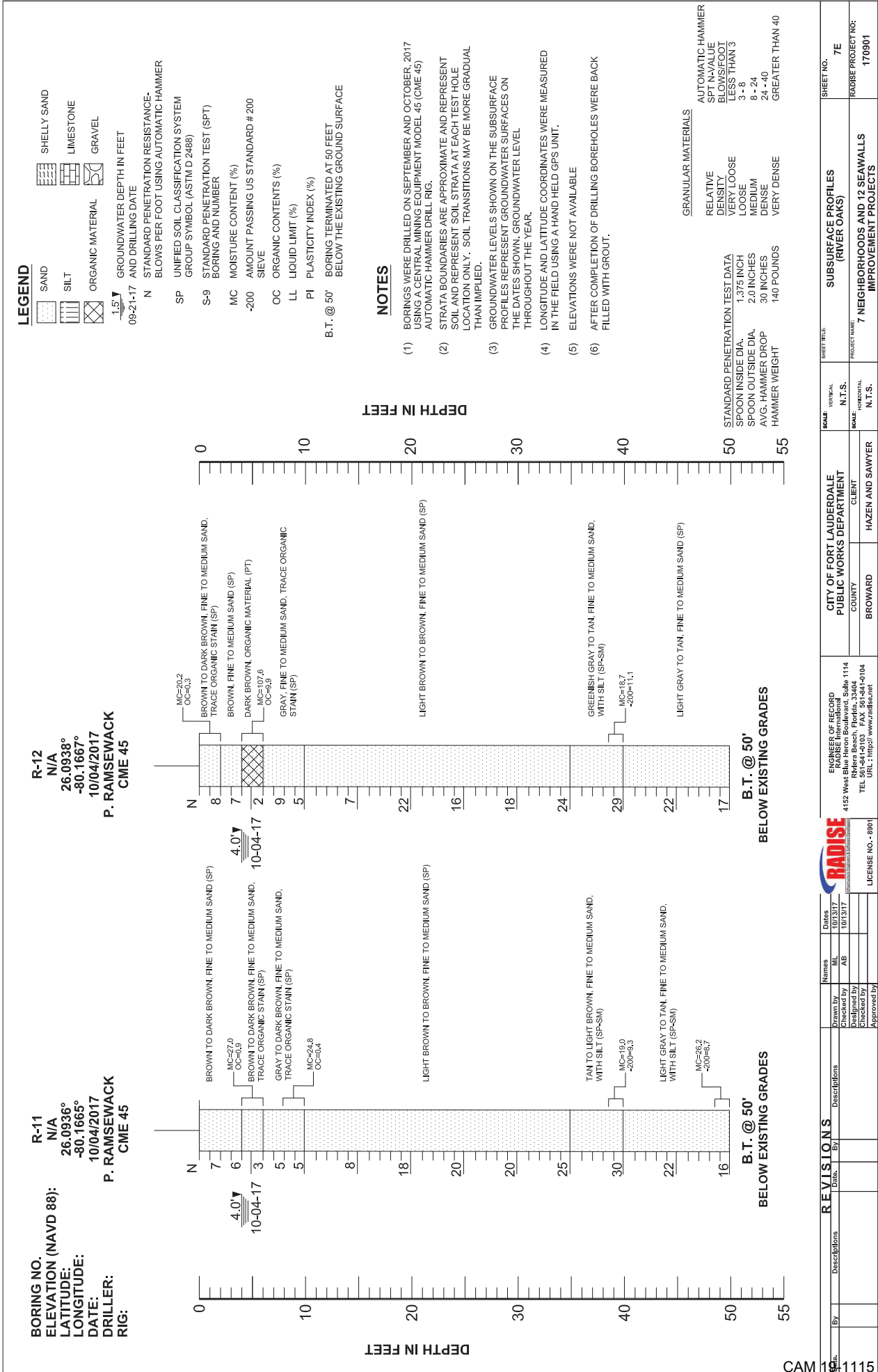


Table A: Laboratory Test Results Summary

7 Neighborhoods and 12 Seawalls Improvement Projects

170901

Project Name:

Project ID:

Boring No	Sample Depth	Soil Classification	Moisture Content (%)	Organic Content (%)	-200	ATTERBERG LIMITS			GRAIN SIZE ANALYSIS														
						LL (%)	PL (%)	PI	U.S STANDARD SIEVE SIZE (% Passing)														
									3"	1.5"	1"	3/4"	3/8"	#4	#10	#20	#40	#50	#60	#100	#140	#200	
V-8	8' - 10'	PT	440.5	60.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
V-9	2' - 4'	SP-SM	22.2	-	11.2	-	-	100	100	100	100	92.3	90.1	88.7	87.5	79.6	67.1	56.9	21.2	12.5	11.2	-	
V-9	8' - 10'	SP	40.1	3.1	4.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
V-10	8' - 10'	PT	71.3	6.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
E-11	2' - 4'	SP	17.8	0.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
R-1	0' - 2'	SP-SM	8.1	-	8.3	-	-	100	100	100	95.1	80.3	75.2	72.1	70.3	62.8	52.1	43.5	15.6	9.7	8.3	-	
R-2	2' - 4'	SP-SM	14.0	-	7.3	-	-	100	100	100	90.7	78.8	70.6	64.6	61.1	54.8	46.5	40.1	15.8	9.2	7.3	-	
R-2	4' - 6'	SP	18.2	-	4.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
R-3	2' - 4'	SP	20.1	0.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
R-4	0' - 2'	SP	14.5	2.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
R-5	6' - 8'	SP	27.4	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
R-6	2' - 4'	SP-SM	16.8	-	8.1	-	-	100	100	100	93.0	87.2	82.5	80.4	78.5	72.6	62.3	52.7	17.5	10.3	8.1	-	
R-6	6' - 8'	SP	24.1	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
R-9	4' - 6'	SP	56.3	10.2	1.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
R-9	13.5' - 15'	SP	26.5	-	1.2	-	-	100	100	100	100	100	100	100	100	95.4	79.9	64.3	8.8	1.6	1.2	-	
R-10	2' - 4'	SP	51.4	18.4	2.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
R-10	28.5' - 30'	SP	25.6	-	2.7	-	-	100	100	100	100	100	100	100	99.1	77.8	55.0	43.5	13.8	3.5	2.7	-	
R-11	4' - 6'	SP	27.0	0.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
R-11	8' - 10'	SP	24.8	0.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	

Table A: Laboratory Test Results Summary

7 Neighborhoods and 12 Seawalls Improvement Projects

170901

Project Name:

Project ID:

Boring No	Sample Depth	Soil Classification	Moisture Content (%)	Organic Content (%)	-200	ATTERBERG LIMITS			GRAIN SIZE ANALYSIS														
						LL (%)	PL (%)	PI	U.S STANDARD SIEVE SIZE (% Passing)														
									3"	1.5"	1"	3/4"	3/8"	#4	#10	#20	#40	#50	#60	#100	#140	#200	
R-11	38.5' - 40'	SP-SM	19.0	-	9.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
R-11	48.5' - 50'	SP-SM	26.2	-	8.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
R-12	0' - 2'	SP	20.2	0.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
R-12	4' - 6'	PT	107.6	9.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
R-12	38.5' - 40'	SP-SM	18.7	-	11.1	-	-	-	100	100	100	100	100	100	100	98.4	81.6	64.5	54.8	28.0	14.5	11.1	
R-13	2' - 4'	SP	20.7	0.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S-2	6' - 8'	PT	494.0	76.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S-3	6' - 8'	SP	27.8	1.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S-4	6' - 8'	PT	110.6	12.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S-5	4' - 6'	PT	399.1	63.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S-8	4' - 6'	PT/SP-SM	119.1	11.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S-8	6' - 8'	SP-SM	33.4	1.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S-8	13.5' - 15'	ML	27.6	-	69.3	NP	NP	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S-9	0' - 2'	SP-SM	14.9	-	7.1	-	-	-	100	100	100	100	96.8	90.6	85.9	82.0	71.8	61.2	52.1	30.2	12.1	7.1	
S-9	6' - 8'	SP	21.3	-	2.6	-	-	-	100	100	-	100	99.6	99.2	98.7	97.7	81.9	57.4	42.2	6.3	3.1	2.6	
S-10	4' - 6'	SP	21.3	0.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S-10	6' - 8'	SP	18.9	0.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S-11	2' - 4'	SP-SM	18.9	-	11.3	-	-	-	100	100	-	92.5	81.2	77.9	74.8	71.7	62.0	49.1	39.5	15.1	11.7	11.3	
S-11	4' - 6'	SP	19.9	0.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table A: Laboratory Test Results Summary

Project Name: 7 Neighborhoods and 12 Seawalls Improvement Projects

Project ID: 170901

Boring No	Sample Depth	Soil Classification	Moisture Content (%)	Organic Content (%)	-200	ATTERBERG LIMITS			GRAIN SIZE ANALYSIS U.S STANDARD SIEVE SIZE (% Passing)																									
						LL (%)	PL (%)	PI	3"	1.5"	1"	3/4"	3/8"	#4	#10	#20	#40	#50	#60	#100	#140	#200												
S-30	13.5' - 15'	PT/SP	58.7	7.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Notes:

Moisture Content tested in accordance ASTM-D2216,
 Organic Content tests are performed with furnace temperature @450 Celsius and tested accordance ASTM-D2974,
 Plasticity Index Properties tested with accordance to ASTM-D4318,. LL=Liquid Limit, PL=Plasticity Limit and PI=Plasticity Index and NP=Non-Pastic
 Soil Classification tested with accordance to ASTM D 2487,
 Grain Size Analysis was tested in general accordance with ASTM-D422



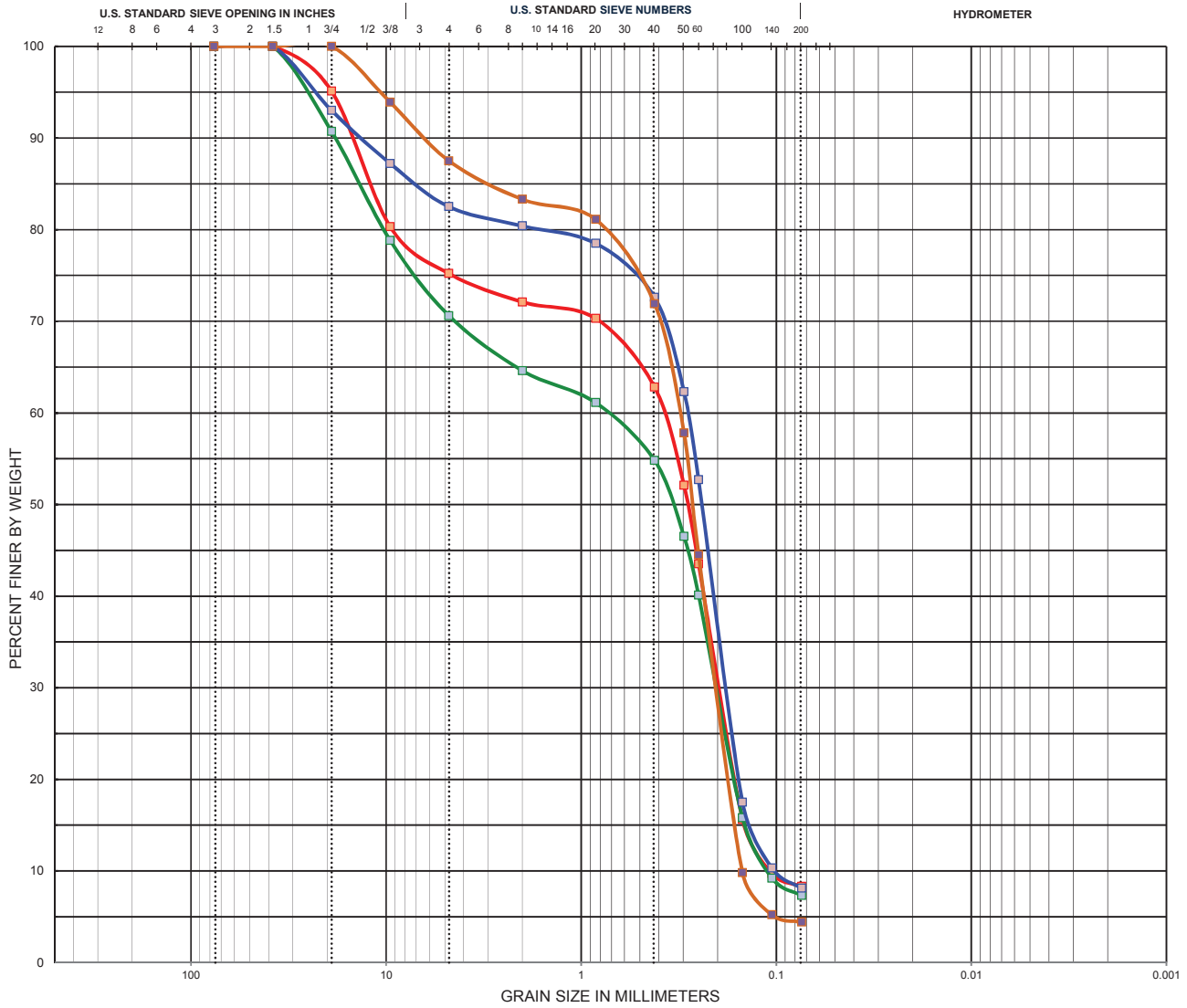


GRAIN SIZE DISTRIBUTION

CLIENT NAME Hazen and Sawyer, P.C.

PROJECT NAME FLL Seawalls and 7 Neighborhoods - Hazen and Sawyer - GEO

PROJECT NUMBER 170901



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Boring No., Depth	Classification	LL	PL	PI	C _c	C _u
R-1, 0' - 2'	Poorly-graded sand with silt and gravel (SP-SM)	NP	NP	NP	0.93	3.55
R-2, 2' - 4'	Poorly-graded sand with silt and gravel (SP-SM)	NP	NP	NP	0.52	7
R-6, 2' - 4'	Poorly-graded sand with silt and gravel (SP-SM)	NP	NP	NP	1.12	2.9
P-4, 6' - 8'	Poorly-graded sand (SP)	NP	NP	NP	0.92	2.13

Boring No., Depth	D100	D60	D30	D10	% Cobble	%Gravel	%Sand	%Silt	%Clay
R-1, 0' - 2'	38.1	0.39	0.2	0.11	0	24.8	66.9	8.3	
R-2, 2' - 4'	38.1	0.77	0.21	0.11	0	29.4	63.3	7.3	
R-6, 2' - 4'	38.1	0.29	0.18	0.1	0	17.5	74.4	8.1	
P-4, 6' - 8'	19	0.32	0.21	0.15	0	12.5	83.1	4.4	

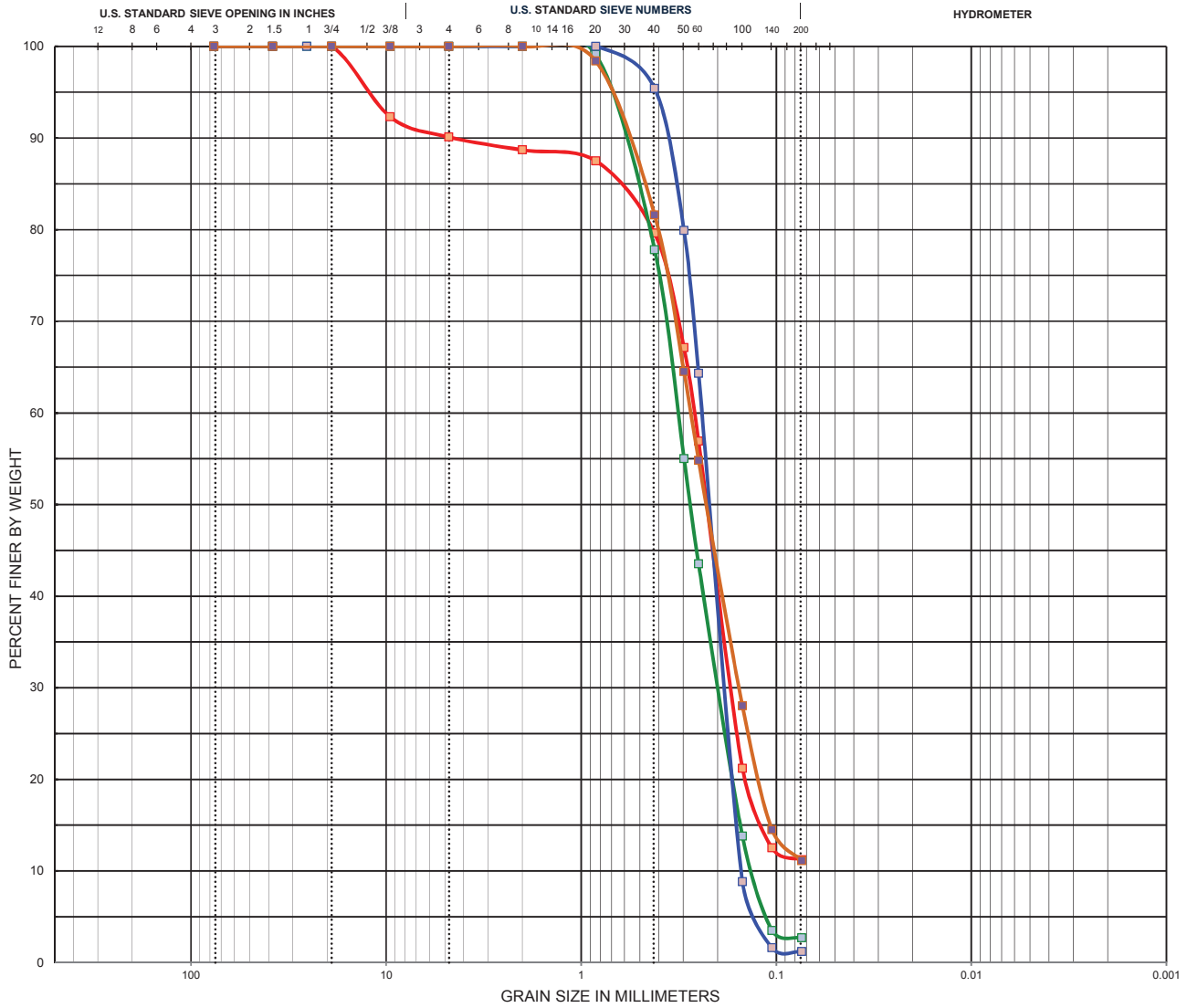


GRAIN SIZE DISTRIBUTION

CLIENT NAME Hazen and Sawyer, P.C.

PROJECT NAME FLL Seawalls and 7 Neighborhoods - Hazen and Sawyer - GEO

PROJECT NUMBER 170901



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Boring No., Depth	Classification	LL	PL	PI	Cc	Cu
V-9 , 2-4	Poorly-graded sand with silt (SP-SM)	NP	NP	NP	0	0
R-10 , 28.5-30	Poorly-graded sand (SP)	NP	NP	NP	0.96	2.46
R-9 , 13.5-15	Poorly-graded sand (SP)	NP	NP	NP	1	1.6
R-12 , 38.5' - 40'	Poorly-graded sand with silt (SP-SM)	NP	NP	NP	0	0

Boring No., Depth	D100	D60	D30	D10	% Cobble	%Gravel	%Sand	%Silt	%Clay
V-9 , 2-4	19	0.26	0.17	0	0	9.9	78.9	11.2	
R-10 , 28.5-30	2	0.32	0.2	0.13	0	0	97.3	2.7	
R-9 , 13.5-15	0.84	0.24	0.19	0.15	0	0	98.8	1.2	
R-12 , 38.5' - 40'	2	0.28	0.16	0	0	0	88.9	11.1	