

Solicitation 12222-993

SW 3rd Avenue On-Street Parking Improvements

Bid Designation: Public



City of Fort Lauderdale

Bid 12222-993

SW 3rd Avenue On-Street Parking Improvements

Bid Number 12222-993
 Bid Title SW 3rd Avenue On-Street Parking Improvements

Bid Start Date Nov 19, 2018 5:53:13 PM EST
 Bid End Date Jan 3, 2019 2:00:00 PM EST
 Question & Answer End Date Dec 11, 2018 5:00:00 PM EST

Bid Contact Jim Hemphill
 Sr. Procurement Specialist
 Procurement Department
 954-828-5143
 jhemphill@fortlauderdale.gov

Contract Duration One Time Purchase
 Contract Renewal Not Applicable
 Prices Good for 30 days
 Pre-Bid Conference Nov 29, 2018 11:00:00 AM EST
 Attendance is optional
 Location: City of Fort Lauderdale Transportation and Mobility Building
 290 NE 3rd Ave. - Fort Lauderdale FL 33301 1st floor Conf. Room

Bid Comments The City of Fort Lauderdale, Florida (City) is seeking bids from qualified bidders, hereinafter referred to as the Contractor, to provide repaving and restriping portion of the existing road on SW 3rd Avenue between Broward Boulevard and SW 2nd Street that includes 18 standard parking spaces, 1 accessible parking space and 9 motorcycle parking spaces with solar panel pedestrian lights on both side of the street and related services for the City's Transportation and Mobility Department, in accordance with the terms, conditions, and specifications contained in this Invitation To Bid (ITB).

Added on Dec 14, 2018:
Addendum 1 has been added to the Documents Page
Added on Dec 17, 2018:
Addendum 2 has been added to the Documents page
Added on Dec 27, 2018:
Addendum 3 has been added to the Documents Page.

Addendum # 1

| | | | |
|-------------------|-----------------------------|--------------|-----------------------------|
| New Documents | Addendum 1.pdf | | |
| Previous End Date | Dec 18, 2018 2:00:00 PM EST | New End Date | Dec 27, 2018 2:00:00 PM EST |

Addendum # 2

| | |
|---------------|----------------|
| New Documents | Addendum 2.pdf |
|---------------|----------------|

Addendum # 3New Documents **Addendum 3.pdf**

Previous End Date Dec 27, 2018 2:00:00 PM EST

New End Date Jan 3, 2019 2:00:00 PM EST

Item Response FormItem **12222-993--01-01 - BASE BID: 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**

Mobilization, Demobilization, Project signage. Must not exceed 5% of bid total.

Item **12222-993--01-02 - BASE BID: Maintenance of Traffic**

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**

Furnish all labor, material and equipment to provide all vehicular and pedestrian maintenance of traffic for duration of the project.

Item **12222-993--01-03 - BASE BID: Sawcut and Remove Existing Asphalt and Concrete**

Lot Description BASE BID

Quantity **200 square yard**Unit Price Delivery Location **City of Fort Lauderdale**[See ITB Specifications](#)

See ITB Specifications

Fort Lauderdale FL 33301

Qty 200**Description**

Furnish all materials, labor and equipment to sawcut, remove and properly dispose existing concrete new construction per plans and specifications.

Item **12222-993--01-04 - BASE BID: Sawcut and Remove Existing Asphalt and Concrete**
Lot Description **BASE BID**
Quantity **130 square yard**
Unit Price
Delivery Location **City of Fort Lauderdale**
[See ITB Specifications](#)
[See ITB Specifications](#)
Fort Lauderdale FL 33301
Qty 130

Description

Furnish all materials, labor and equipment to sawcut, remove and properly dispose existing asphalt to accommodate new construction per plans and specifications.

Item **12222-993--01-05 - BASE BID: 6-inch Concrete Sidewalk**
Lot Description **BASE BID**
Quantity **3000 square foot**
Unit Price
Delivery Location **City of Fort Lauderdale**
[See ITB Specifications](#)
[See ITB Specifications](#)
Fort Lauderdale FL 33301
Qty 3000

Description

Furnish all materials, labor and equipment to install 6-inch thick concrete sidewalk per plans and specifications; this item include grading to match proposed and existing elevations; this items also includes harmonization of the surrounding areas by restoring it to existing or better condition and ADA tactile domes as shown on the plans.

Item **12222-993--01-06 - BASE BID: Type F Curb and Gutter**
Lot Description **BASE BID**
Quantity **350 linear foot**
Unit Price
Delivery Location **City of Fort Lauderdale**
[See ITB Specifications](#)
[See ITB Specifications](#)
Fort Lauderdale FL 33301
Qty 350

Description

Furnish all materials, labor and equipment to install Type F curb and gutter per plans and specifications.

Item **12222-993--01-07 - BASE BID: Valley Gutter**
Lot Description **BASE BID**
Quantity **160 linear foot**
Unit Price
Delivery Location **City of Fort Lauderdale**
[See ITB Specifications](#)
[See ITB Specifications](#)
Fort Lauderdale FL 33301

Qty 160

Description

Furnish all materials, labor and equipment to install valley gutter per plans and specifications.

Item **12222-993--01-08 - BASE BID: Milling and Resurfacing (Up to 1-inch depth) - SP-9.5**
 Lot Description **BASE BID**
 Quantity **2000 square yard**
 Unit Price
 Delivery Location **City of Fort Lauderdale**
[See ITB Specifications](#)
 See ITB Specifications
 Fort Lauderdale FL 33301
 Qty 2000

Description

Furnish all materials, labor and equipment to mill and resurface up to 1-inch depth of asphalt per plans and specifications. This item includes installation of Type SP 9.5 - Super Pave asphalt, up to 1-inch thick

Item **12222-993--01-09 - BASE BID: Milling and Resurfacing Up to Various Depth**
 Lot Description **BASE BID**
 Quantity **83 square yard**
 Unit Price
 Delivery Location **City of Fort Lauderdale**
[See ITB Specifications](#)
 See ITB Specifications
 Fort Lauderdale FL 33301
 Qty 83

Description

Furnish all materials, labor and equipment to mill and resurface existing asphalt at various depths to achieve proper slopes and match existing elevations as noted on the plans . This item includes installation of Type SP 9.5 - Super Pave asphalt (1-inch thick typ., 3-inch max)

Item **12222-993--01-10 - BASE BID: 6-inch Wide Thermoplastic Yellow Pavement Markings**
 Lot Description **BASE BID**
 Quantity **250 linear foot**
 Unit Price
 Delivery Location **City of Fort Lauderdale**
[See ITB Specifications](#)
 See ITB Specifications
 Fort Lauderdale FL 33301
 Qty 250

Description

Furnish all materials, labor and equipment to install 6-inch wide thermoplastic solid yellow or 10-30 skips pavement markings per plans and specifications; this item includes temporary paint.

Item **12222-993--01-11 - BASE BID: 6-inch Wide Thermoplastic Single White Pavement Markings**
 Lot Description **BASE BID**

Quantity **1500 linear foot**
Unit Price
Delivery Location **City of Fort Lauderdale**
[See ITB Specifications](#)
See ITB Specifications
Fort Lauderdale FL 33301
Qty 1500

Description

Furnish all materials, labor and equipment to install 6-inch wide thermoplastic solid or 6-10 skips or 2-4 skips white pavement markings per plans and specifications; this item includes temporary paint.

Item **12222-993--01-12 - BASE BID: 24-inch Wide Thermoplastic Solid White Pavement Markings**
Lot Description **BASE BID**
Quantity **12 linear foot**
Unit Price
Delivery Location **City of Fort Lauderdale**
[See ITB Specifications](#)
See ITB Specifications
Fort Lauderdale FL 33301
Qty 12

Description

Furnish all materials, labor and equipment to install 24-inch wide thermoplastic solid white pavement markings per plans and specifications; this item includes temporary paint.

Item **12222-993--01-13 - BASE BID: 6-inch Wide Thermoplastic Double Yellow Pavement Markings**
Lot Description **BASE BID**
Quantity **75 linear foot**
Unit Price
Delivery Location **City of Fort Lauderdale**
[See ITB Specifications](#)
See ITB Specifications
Fort Lauderdale FL 33301
Qty 75

Description

Furnish all materials, labor and equipment to install 6-inch wide thermoplastic double yellow pavement markings per plans and specifications; this item includes temporary paint.

Item **12222-993--01-14 - BASE BID: Thermoplastic Pavement Symbols**
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 all materials, labor and equipment to install special pavement marking thermoplastic symbols (i.e. Turn Arrows, Handicap Parking Symbols, etc.) per plans and specifications; this item includes temporary paint

Item **12222-993--01-15 - BASE BID: Various Color Raised Pavement Markings (RPMs)**
 Lot Description **BASE BID**
 Quantity **15 each**
 Unit Price
 Delivery Location **City of Fort Lauderdale**
[See ITB Specifications](#)
[See ITB Specifications](#)
 Fort Lauderdale FL 33301
 Qty 15

Description

Furnish all materials, labor and equipment to install various color raised pavement markings per plans and specifications.

Item **12222-993--01-16 - BASE BID: Signage**
 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 all materials, labor and equipment to install signage per plans, specifications, and Broward County Standards; this item includes post, sign, and mounting assembly.

Item **12222-993--01-17 - BASE BID: Solar Pedestrian Lights**
 Lot Description **BASE BID**
 Quantity **15 each**
 Unit Price
 Delivery Location **City of Fort Lauderdale**
[See ITB Specifications](#)
[See ITB Specifications](#)
 Fort Lauderdale FL 33301
 Qty 15

Description

Furnish all materials, labor and equipment to install complete solar lighting system (luminaire, battery, hardware/mount, pole, solar panel, charge controller, warranty) per plans and details. This item includes associated pole foundation per details or manufacturers specifications.

Item **12222-993--01-18 - BASE BID: Manhole Adjustment (frame & lid)**
 Lot Description **BASE BID**
 Quantity **3 each**
 Unit Price

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

Description

Furnish all materials, labor and equipment required to adjust existing manholes to new finished pavement elevations.

Item **12222-993--01-19 - BASE BID: Utility Valve Box Adjustment**
 Lot Description **BASE BID**
 Quantity **3 each**
 Unit Price
 Delivery Location **City of Fort Lauderdale**
See ITB Specifications
 See ITB Specifications
 Fort Lauderdale FL 33301
 Qty 3

Description

Furnish all materials, labor and equipment required to adjust existing utilities valve boxes/covers to new finished pavement elevations.

Item **12222-993--01-20 - BASE BID: Water Meter Box Adjustment**
 Lot Description **BASE BID**
 Quantity **3 each**
 Unit Price
 Delivery Location **City of Fort Lauderdale**
See ITB Specifications
 See ITB Specifications
 Fort Lauderdale FL 33301
 Qty 3

Description

Furnish all materials, labor and equipment required to adjust water meter boxes in proposed sidewalk to new finished walkway elevations. City will provide new meter boxes and covers if existing box is damaged prior to construction.

Item **12222-993--01-21 - BASE BID: Relocate Existing Sign**
 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 all materials, labor and equipment to relocate existing signs; this item includes patching sidewalk, installation in new location per plans and specification or as directed by City.

| | |
|-------------------|---|
| Item | 12222-993--01-22 - BASE BID: Remove Existing Striping |
| Lot Description | BASE BID |
| Quantity | 1 lump sum |
| Unit Price | <input type="text"/> |
| Delivery Location | City of Fort Lauderdale |
| | See ITB Specifications |
| | See ITB Specifications |
| | Fort Lauderdale FL 33301 |
| | Qty 1 |

Description

Furnish all materials, labor and equipment to remove existing striping; this item includes removal of existing on-street parking striping, where shown on plans, with non-destructive methods such as water-blasting.

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

BID NO.12222-993

PROJECT NO. P12376

**SW 3RD AVENUE ON-STREET
PARKING IMPROVEMENTS**



Fort Lauderdale, Florida 33301

**Shiau Ching Low, EIT, PMP, Parking Services Project Manager II
Jeffery T Davis, Parking Services Manager**

Khant Myat, P.E. Public Works Project Manager II

**James T. Hemphill
Assistant Manager, Procurement and Contract
Telephone: (954) 828-5143**

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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 Local Business Price Preference Certification](#)
[CITB Trench Safety](#)
[CITB Non-Collusion](#)
[Non-Discrimination Certification](#)
[CITB Contract Payment Method](#)
[CITB Construction Bid Certification](#)

INVITATION TO BID

Sealed bids will be received electronically until 2:00 P.M., local time, on **TUESDAY , DECEMBER 18TH**, 2018, and opened immediately thereafter in the 5th Floor Conference Room, City Hall, 100 North Andrews Avenue, Fort Lauderdale, Florida, 33301, for **BID NO: 12222-993 PROJECT NO. P12376, SW 3rd Avenue On-Street Parking Improvements**

This project consists of Drawing File No. 4-140-90, six sheets (w/one cover).

This project is located at SW 3rd Avenue between Broward Boulevard and SW 2nd Street, in the City of Fort Lauderdale. The work includes repaving and restriping portion of the existing road on SW 3rd Avenue between Broward Boulevard and SW 2nd Street that includes 18 standard parking spaces, 1 accessible parking space and 9 motorcycle parking spaces with solar panel pedestrian lights on both side of the street

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

Licensing Requirements: Bidder shall be licensed as a Certified General Contractor in the State of Florida including capability to produce MOT and maintain OSHA regulations and Engineering Specification for this project at all time.

Pre-Bid Meeting/Site visit: A pre-bid meeting and/or site visit will be held on **THURSDAY, NOVEMBER 29TH, 2018**, at 14:00 a.m., local time, at Transportation and Mobility Department Building - 290 NE 3rd Ave, Fort Lauderdale FL 33301 (1st Floor Conference Room).

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

Bidding blanks may be obtained **free of charge** at BIDSYNC.COM.

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.

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

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

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

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

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

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

INSTRUCTIONS TO BIDDERS (continued)

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

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

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

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

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

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

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

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

INSTRUCTIONS TO BIDDERS (continued)

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

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

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

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

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

BID PROTEST PROCEDURE: Any proposer or bidder who is not recommended for award of a contract and who alleges a failure by the City to follow the City's procurement ordinance or any applicable law may protest to the Procurement Division – Procurement Manager, by delivering a letter of protest within five (5) days after a Notice of Intent to award is posted on the City's website at the following link: <http://www.fortlauderdale.gov/departments/finance/procurement-services/notices-of-intent-to-award>. The complete protest ordinance may be found on the City's website at the following link: https://library.municode.com/fl/fort_lauderdale/codes/code_of_ordinances?nodeId=COOR_CH2AD_ARTVFI_DIV2PR_S2-182DIREPR

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

CONTRACT - The bidder to whom award is made shall execute a written contract to do the work and maintain the same in good repair until final acceptance by the proper authorities, and shall furnish

good and sufficient bonds as specified within ten (10) days after receiving such contract for execution. If the bidder to whom the first award is made fails to enter into a contract as provided, the award may be annulled and the contract let to the next lowest bidder who is reliable, responsible, and responsive 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.

PROJECT: P12376.461

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 SW 3rd Avenue On-Street Parking Improvements 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 James Hemphill, Asst. Manager, Procurement and Contracts, at (954) 828-5143 or email at Jhemphill@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 **30** calendar days of the date of the Notice to Proceed.

SC-1

SPECIAL CONDITIONS (continued)

- 5.2 The Work shall be Substantially Completed within **180** calendar days after the date when the Contract Time commences to run as provided in the Notice to Proceed.
- 5.3 The Work shall be finally completed on the Final Completion Date and ready for final payment in accordance with this Agreement within **210** calendar days after the date when the Contract Time commences to run as provided in the Notice to Proceed.

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

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

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

06. BID SECURITY

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

07. REQUIRED LICENSES/CERTIFICATIONS

Contractor shall be licensed as a Certified General Contractor in the State of Florida Including capability to produce MOT and maintain OSHA regulations and Engineering Specification at all time.

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 **public Right-Of-Way with repaving and restriping**, in the State of Florida within the last ten (10) years. Bidder shall submit proof of construction experience for a minimum of three (3) projects of similar scope and scale (or larger) and shall, for each project listed, identify location; dates of construction; project name and overall scope; scope of work that was self-performed by Contractor; and client's name, address, telephone number and e-mail address.

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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 | \$ |
|--------------------------|-------------------|
| Permit fee allowance | \$2,000.00 |
| Other: Utility Allowance | \$3,000.00 |
| TOTAL | \$5,000.00 |

Note: *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 the Contractor's sole expense, shall provide insurance of such types and with such terms and limits as noted below. Providing proof of and maintaining adequate insurance coverage are material obligations of the Contractor. The Contractor shall provide the City a certificate of insurance evidencing such coverage. The Contractor's insurance coverage shall be primary insurance for all applicable policies. The limits of coverage under each policy maintained by the Contractor shall not be interpreted as limiting the Contractor's liability and obligations under this Agreement. All insurance policies shall be from insurers authorized to write insurance policies in the State of Florida and that possess an A.M. Best rating of A-, VII or better. All insurance policies are subject to approval by the City's Risk Manager.

The coverages, limits, and endorsements required herein protect the interests of the City, and these coverages, limits, and endorsements may not be relied upon by the Contractor for assessing the extent or determining appropriate types and limits of

coverage to protect the Contractor against any loss exposure, whether as a result of this Agreement or otherwise. The requirements contained herein, as well as the City's review or acknowledgement, are not intended to and shall not in any manner limit or qualify the liabilities and obligations assumed by the Contractor under this Agreement.

The following insurance policies and coverages are required:

10.1.1 Commercial General Liability

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

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

Policy must include coverage for Contractual Liability and Independent Contractors.

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

10.1.2 Business Automobile Liability

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

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

10.1.3 Workers' Compensation and Employer's Liability

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

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

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

Insurance Certificate Requirements

- a. The Contractor shall provide the City with valid Certificates of Insurance (binders are unacceptable) no later than thirty (30) days prior to the start of work contemplated in this Agreement.

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

The Certificate Holder should read as follows:

City of Fort Lauderdale
100 N. Andrews Avenue
Fort Lauderdale, FL 33301

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

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

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

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

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

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

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

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

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

11. PERFORMANCE AND PAYMENT BOND: 100%

Number of awards anticipated: One

12. CITY PROJECT MANAGER

The Project Manager is hereby designated by the City as Shiau Ching Low, Parking Services Div. - Project Manager II whose address is Transportation and Mobility Department Building 290 NE 3rd Ave, Fort Lauderdale FL 33301, telephone number: (954) 828-3779, and email address is slow@fortlauderdale.gov. The Project Manager will assume all duties and responsibilities and will have the rights and authorities assigned to the Project Manager in the Contract Documents in connection with completion of the Work in accordance with this Agreement.

13. LIQUIDATED DAMAGES *(See Article 16, Liquidated Damages, of the Contract for details)*

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

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

The City shall make payment to the Contractor through utilization of the City's P-Card Program. The City has implemented a Purchasing Card (P-Card) Program utilizing both VISA and MASTERCARD networks. Purchases from this contract will be made

utilizing the City's Purchasing Card. Contractor will receive payment from the purchasing card in the same manner as other credit card purchases. Accordingly, bidders must presently have the ability to accept these credit cards or take whatever steps necessary to implement the ability before the start of the contract term, or contract award by the City. The City reserves the right to revise this program as necessary. All costs associated with the Contractor's participation in this purchasing program shall be borne by the Contractor. The City reserves the right to revise this program as necessary.

- 15. WORK SCHEDULE (including overtime hours):** Cost should include weekend and after hours within the work hours limit stated in the City's ordinance, therefore no overtime is included. Work schedule should minimize the impact to the local businesses. Contractor must remove all equipment during City's approved events.

Regular work hours: **8:00 am to 5:00 pm, Monday through Friday.**

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

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

- 16. INSPECTION OVERTIME COST:** \$219.00

CITY OF FORT LAUDERDALE
CONSTRUCTION AGREEMENT – **DRAFT DOCUMENT**

THIS AGREEMENT made and entered into this _____ day of _____, 20____, 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:

PROJECT NAME
ITB # PROJECT #

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

PROJECT DESCRIPTION

[Need brief description of project including but not limited to:

- **Location**
- **Components**
- **Intent**

- 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 _____, whose address is _____, telephone number: (954) 828-_____, and email address is _____@fortlauderdale.gov. The Project Manager will assume all duties and responsibilities and will have the rights and authorities assigned to the Project Manager in the Contract Documents in connection with completion of the Work in accordance with this Agreement.

ARTICLE 4 – CONTRACT DOCUMENTS

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

- 4.1 This Agreement.
- 4.2 The Contract Documents may only be altered, amended, or repealed in accordance with the specific provisions of the terms of this Agreement.
- 4.3 Exhibits to this Agreement: (Plans sheets [] to [] inclusive).

- 4.4 Public Construction Bond, Performance Bond, Payment Bond and Certificates of Insurance.
- 4.5 Notice of Award and Notice to Proceed.
- 4.6 General Conditions as amended by the Special Conditions.
- 4.7 Technical Specifications.
- 4.8 Plans/Drawings.
- 4.9 Addenda number _____ through _____, inclusive.
- 4.10 Bid Form and supplement Affidavits and Agreements.
- 4.11 All applicable provisions of State and Federal Law.
- 4.12 Invitation to Bid No., _____, Instructions to Bidders, and Bid Bond.
- 4.13 Contractor's response to the City's Invitation to Bid No., _____, dated _____.
- 4.14 Schedule of Completion and Schedule of Values.
- 4.15 All amendments, modifications and supplements, change orders and work directive changes issued on or after the Effective Date of the Agreement.
- 4.16 Any additional documents that are required to be submitted under the Agreement.
- 4.17 Permits on file with the City and or those permits to be obtained shall be considered directive in nature and will be considered a part of this Agreement. A copy of all permits shall be given to the City for inclusion in the Contract Documents. Terms of permits shall be met prior to acceptance of the Work and release of the final payment.

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

- a. Specific direction from the City Manager (or designee).
- b. Approved change orders, addenda or amendments.
- c. Specifications (quality) and Drawings (location and quantity).
- d. Supplemental conditions or special terms.
- e. General Terms and Conditions.
- f. This Agreement dated _____ and any attachments.
- g. Invitation to Bid No., _____, and the specifications prepared by the City.

- h. Contractor's response to the City's Invitation to Bid No., _____, dated _____.
- i. Schedule of Values.
- j. Schedule of Completion.

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

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

ARTICLE 5 – CONTRACT TIME

- 5.1 The Contractor recognizes that **TIME IS OF THE ESSENCE**. The Work shall commence within _____ calendar days of the date of the Notice to Proceed.
- 5.2 The Work shall be Substantially Completed within _____ calendar days after the date when the Contract Time commences to run as provided in the Notice to Proceed.
- 5.3 The Work shall be finally completed on the Final Completion Date and ready for final payment in accordance with this Agreement within _____ calendar days after the date when the Contract Time commences to run as provided in the Notice to Proceed.

ARTICLE 6 – CONTRACT PRICE

- 6.1 City shall pay Contractor for performance of the Work in accordance with Article 7, subject to additions and deletions by Change Order, as provided for in this Agreement.
- 6.2 The parties expressly agree that the Contract Price, which shall not exceed the amount of \$_____, constitutes the total maximum compensation payable to Contractor for performing the Work, plus any Work done pursuant to a Change Order. The Contract Price is in accordance with the line item unit prices listed in the Bid. Line items are based on a unit price cost multiplied by a defined quantity. Any

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

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

ARTICLE 7 – PAYMENT

- 7.1 Contractor shall submit Applications for Payment in accordance with the Contract Documents. Applications for Payment will be processed by City as provided in the General Conditions.
- 7.2 Progress Payments. City shall make progress payments on account of the Contract Price on the basis of Contractor's monthly Applications for Payment, which shall be submitted by the Contractor between the first (1st) and the tenth (10th) day after the end of each calendar month for which payment is requested. All progress payments will be made on the basis of the progress of the Work completed.
- 7.3 Prior to Final Completion, progress payments will be made in an amount equal to ninety percent (90%) of the value of Work completed less in each case the aggregate of payments previously made.
- 7.4 Final Payment. Upon final completion of the Work in accordance with the General Conditions, as may be supplemented, the City shall pay Contractor an amount sufficient to increase total payments to one-hundred percent (100%) of the Contract Price. However, not less than ten percent (10%) of the Contract Price shall be retained until Record Drawings (as-builts), specifications, addenda, modifications and shop drawings, including all manufacturers' instructional and parts manuals are delivered to and accepted by the City.
- 7.5 City may withhold, in whole or in part, payment to such extent as may be necessary to protect itself from loss on account of:
- 7.5.1 Defective work not remedied.
 - 7.5.2 Claims filed or reasonable evidence indicating probable filing of claims by other parties against Contractor or City because of Contractor's performance.
 - 7.5.3 Failure of Contractor to make payments properly to Subcontractors or for material or labor.
 - 7.5.4 Damage to another contractor not remedied.
 - 7.5.5 Liquidated damages and costs incurred by Consultant for extended construction administration, if applicable.
 - 7.5.6 Failure of Contractor to provide any and all documents required by the Contract Documents.

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

- 7.6 The City shall make payment to the Contractor in accordance with the Florida Prompt Payment Act, Section 218.70, Florida Statutes.
- 7.7 The City shall make payment to the Contractor through utilization of the City's P-Card Program. The City has implemented a Purchasing Card (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 6:00 p.m., Monday through Friday. The Contractor will not permit overtime work or the performance of work on Saturday, Sunday or any legal holiday (designated by the City of Fort Lauderdale) without the Project Manager's written consent at least seventy-two (72) hours in advance of starting such work. If the Project Manager permits overtime work, the Contractor shall pay for the additional charges to the City with respect to such overtime work. Such additional charges shall be a subsidiary obligation of the Contractor and no extra payment shall be made to the Contractor for overtime work. It shall be noted that the City's Inspector work hours are from 8:00 a.m. to 4:30 p.m. and any Work requiring inspection oversight being performed outside of this timeframe shall be paid for by the Contractor as Inspector overtime. The cost to the Contractor to reimburse the City for overtime inspection is established at direct-labor and overtime costs for each person or inspector required. Incidental overtime costs for engineering, testing and other related services will also be charged to the Contractor at the actual rate accrued.
- 8.11 Patent Fee and Royalties: The Contractor shall pay all license fees and royalties and assume all costs incident to the use in the performance of the Work or the incorporation in the Work, or any invention, design, process, product or device which is the subject of patent rights or copyrights held by others. The Contractor hereby expressly binds himself or itself to indemnify and save harmless the City from all such claims and fees and from any and all suits and action of every name and description that may be brought against City on account of any such claims, fees, royalties, or costs for any such invention or patent, and from any and all suits or actions that may be brought against said City for the infringement of any and all patents or patent rights claimed by any person, firm corporation or other entity.
- 8.12 Permits: The Contractor shall obtain and pay for all permits and licenses. There shall be no allowance for Contractor markup, overhead or profit for permits and licenses. The Contractor shall pay all government charges which are applicable at the time of opening of proposals. It shall be the responsibility of the Contractor to secure and pay for all necessary licenses and permits of a temporary nature necessary for the prosecution of Work.
- 8.13 Law and Regulations: The Contractor shall give all notices and comply with all laws, ordinances, rules and regulations applicable to the Work. If the Contractor observes that the specifications or plans are at variance therewith, the Contractor shall give the Project Manager prompt written notice thereof, and any necessary changes shall be adjusted by any appropriate modifications. If the Contractor performs any work knowing or having reason to know that it is contrary to such laws, ordinances, rules and regulations, and without such notice to the Project Manager, the Contractor shall bear all costs arising therefrom; however, it shall not be the Contractor's primary responsibility to make certain that the specifications and plans are in accordance with such laws, ordinances, rules and regulations.

- 8.14 Taxes: The Contractor shall pay all sales, consumer, use and other similar taxes required to be paid by him in accordance with the laws of the City of Fort Lauderdale, County of Broward, State of Florida.
- 8.15 Contractor Use of Premises: The Contractor shall confine construction equipment, the storage of materials and equipment and the operations of workmen to areas permitted by law, ordinances, permits and/or the requirements of the Contract Documents, and shall not unreasonably encumber the premises with construction equipment or other materials or equipment.

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

The Contractor shall conduct his work in such a manner as to avoid damage to adjacent private or public property. Any damage to existing structures or 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, under, from, to, or about the Premises. This indemnity is intended to be operable under 42 U.S.C. sections 9607, as amended, and any successor section.

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

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

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

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

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

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

event a Hurricane Warning is issued. The plan shall detail how the Contractor will secure the Premises, equipment and materials in a manner as to prevent damage to the Work and prevent materials and equipment from becoming a hazard to persons and property on and around the Premises. The plan shall include a time schedule required to accomplish the hurricane preparations and a list of emergency contacts that will be available and in the City before, during and immediately after the storm. Upon issuance of a Hurricane Warning by the National Weather Service, if the Contractor has not already done so, the Contractor shall implement its hurricane preparedness plan. Cost of development and implementation of the hurricane preparedness plan shall be considered as incidental to construction. Cost of any clean up and rework required after the storm will be considered normal construction risk within Florida and shall not entitle the Contractor to any additional compensation. Contractor shall be entitled to request an extension in time for completion of the Work, in accordance with the provisions of Article 15 of this Agreement, equal to the time he is shut down for implementation of the preparedness plan, the duration of the storm and a reasonable period to restore the Premises.

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

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

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

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

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

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

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

ARTICLE 9 – CITY’S RESPONSIBILITIES

- 9.1 The City shall furnish the data required of the City under the Contract Documents promptly and shall make payments to the Contractor promptly after they are due as provided in Article 7.
- 9.2 The City’s duties in respect of providing lands and easements and providing engineering surveys to establish reference points are set forth in the Contract Documents.
- 9.3 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

- i. 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.
- j. 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.
- k. 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.
- l. 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.
- m. 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.
- n. The City shall be named as an Additional Insured on all liability policies, with the exception of Workers' Compensation.
- o. The City shall be granted a Waiver of Subrogation on the Contractor's Workers' Compensation insurance policy.
- p. 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 OPTIONAL COVERAGES (for specialty contracts as determined by Risk Management)

10.3.5.1 Aircraft Liability

Coverage must be afforded in an amount not less than \$5,000,000 per occurrence for any aircraft operations.

10.3.5.2 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.

10.3.5.3 Cyber Liability

Coverage must be afforded in an amount not less than \$1,000,000 per loss for negligent retention of data as well as notification and related costs for actual or alleged breaches of data.

10.3.5.4 Fidelity/Dishonesty and/or Commercial Crime

Coverage must be afforded in an amount not less than \$1,000,000 per loss for dishonest acts of the Contractor's employees, including but not limited to theft of money, personal property, vehicles, materials, supplies, equipment, tools, etc. Third-party coverage must be included under the policy.

10.3.5.5 Garage Keepers Legal Liability

Coverage shall be purchased for the Contractor's liability for damage or other loss, including comprehensive and collision risks, to the vehicles while in the care, custody, and control of the Contractor. Coverage form must be on a direct primary basis with limits equal to the highest possible replacement cost value of vehicles in the care, custody, and control of the Contractor at any one time.

10.3.5.6 Garage Liability

Coverage must be afforded in an amount not less than \$1,000,000 per occurrence and must cover the Contractor and the Contractor's employees for the Contractor's garage and related operations while any and all vehicles covered under this Agreement are in the care, custody, and control of the Contractor.

10.3.5.7 Liquor Liability

Contractor shall provide evidence of coverage for liquor liability in an amount not less than \$1,000,000 per occurrence. If the Commercial General Liability policy covers liquor liability (e.g. host or other coverage), the Contractor shall provide written documentation to confirm that coverage already applies to this Agreement.

10.3.5.8 Physical Abuse, Sexual Misconduct, and Sexual Molestation

Contractor shall provide evidence of coverage in an amount not less than \$500,000 per occurrence.

10.3.5.9 Pollution and Remediation Legal Liability (Hazardous Materials)

For the purpose of this section, the term "hazardous materials" includes all materials and substances that are designated or defined as hazardous by Florida or federal law or by the rules or regulations of Florida or any federal agency. If work being performed involves hazardous materials, the Contractor shall procure and maintain any or all of the following coverage, which will be specifically addressed upon review of exposure.

10.3.5.10 Contractors Pollution Liability Coverage

For sudden and gradual occurrences and in an amount not less than \$1,000,000 per claim arising out of this Agreement, including but not limited to, all hazardous materials identified under the Agreement.

10.3.5.11 Asbestos Liability Coverage

For sudden and gradual occurrences and in an amount not less than \$1,000,000 per claim arising out of work performed under this Agreement.

10.3.5.12 Disposal Coverage

The Contractor shall designate the disposal site and furnish a Certificate of Insurance from the disposal facility for Environmental Impairment Liability Insurance, covering liability for sudden and accidental occurrences in an amount not less than \$1,000,000 per

claim and shall include liability for non-sudden occurrences in an amount not less than \$1,000,000 per claim.

10.3.5.13 Hazardous Waste Transportation Coverage

The Contractor shall designate the hauler and furnish a Certificate of Insurance from the hauler for Automobile Liability insurance with Endorsement MCS90 for liability arising out of the transportation of hazardous materials in an amount not less than \$1,000,000 per claim limit and provide a valid EPA identification number.

10.3.5.14 Professional Liability and/or Errors and Omissions

Coverage must be afforded for Wrongful Acts in an amount not less than \$1,000,000 each claim and \$2,000,000 aggregate.

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

10.3.5.15 Property Coverage (Builder's Risk)

Coverage must be afforded in an amount not less than 100% of the total project cost, including soft costs, with a deductible of no more than \$25,000 each claim. Coverage form shall include, but not be limited to:

- All Risk Coverage including Flood and Windstorm with no coinsurance clause
- Guaranteed policy extension provision
- Waiver of Occupancy Clause Endorsement, which will enable the City to occupy the facility under construction/renovation during the activity
- Storage and transport of materials, equipment, supplies of any kind whatsoever to be used on or incidental to the project
- Equipment Breakdown for cold testing of all mechanized, pressurized, or electrical equipment

This policy shall insure the interests of the owner, contractor, and subcontractors in the property against all risk of physical loss and damage, and name the City as a loss payee. This insurance shall remain in effect until the work is completed and the property has been accepted by the City.

10.3.5.16 Property Coverage (on-going basis)

Coverage must be afforded in an amount not less than 100% of the replacement value of the property with a deductible of no more than \$25,000 each claim. Coverage form shall include, but not be limited to:

- All Risk Coverage including Flood and Windstorm with no coinsurance clause
- Any separate Flood and/or Windstorm deductibles are subject to approval by the City

This policy shall insure the interests of the owner and Lessee in the property against all risk of physical loss and damage, and name the City as a loss payee.

The Contractor shall, at the Contractor's own expense, take all reasonable precautions to protect the Premises from damage or destruction.

10.3.5.17 Watercraft Liability

Coverage must be afforded in an amount not less than \$1,000,000 per occurrence and must cover the utilization of watercraft, including Bodily Injury and Property Damage arising out of ownership, maintenance, or use of any watercraft, including owned, non-owned, and hired.

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.

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 **Hundred/Thousand Dollars (\$ 00.00)** 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 Contactor files a voluntary petition under 11 U.S.C. 301 or 302, or an order for relief is entered under 11 U.S.C. 303, the Contractor shall acknowledge the extent, validity, and priority of the lien recorded in favor of the City. The Contractor further agrees that in the event of this default, the City shall, at its option, be entitled to seek relief from the automatic stay pursuant to 11 U.S.C. 362. The City shall be entitled to relief from the automatic stay pursuant to 11 U.S.C. 362(d) (1) or (d) (2), and the Contactor agrees to waive the notice provisions in effect pursuant to 11 U.S.C. 362 and any applicable Local Rules of the United States Bankruptcy Court. The Contactor acknowledges that such waiver is done knowingly and voluntarily.

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

17.4.1.3 In the event the Contractor files for bankruptcy under Chapter 13 of Title 11, United States Code in 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.

Project Name
(Contractor)
Project #

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: _____
LEE R. FELDMAN, City Manager

(CORPORATE SEAL)

ATTEST:

By: _____
JEFFREY A. MODARELLI
City Clerk

Approved as to Legal Form:

By: _____
RHONDA MONTOYA HASAN
Assistant City Attorney

CONTRACTOR

WITNESSES:

CONTRACTOR.,
a Florida corporation.

By _____

Print Name_____
PRINT NAME_____
Title

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 _____, 2018, by
 _____ (Name), as _____ (Title) of _____ (CONTRACTOR), a
 Florida corporation, on behalf of the Corporation.

SEAL

Notary Public, State of Florida_____
Name of Notary Typed, Printed or Stamped☐ Personally Known or ☐ Produced Identification:

Type of Identification Produced: _____

GENERAL CONDITIONS

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

"Owner" - shall mean the City of Fort Lauderdale.

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

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

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

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

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

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

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

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

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

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

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

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

1. Requests for substitution shall reach the Public Works Director no less than ten (10) Working Days prior to the date set for opening of Bids; and
2. Requests for substitution shall be accompanied by such technical data, as the party making the request desires to submit. The Public Works Director will consider reports from reputable independent testing laboratories, verified experience records from previous users and other written information valid in the circumstances; and
3. Requests for substitution shall completely and clearly indicate in what respects the materials and/or products differ from those indicated in the Contract Documents; and
4. Requests for substitution shall be accompanied by the manufacturer's printed recommendations clearly describing the installation, use and care, as applicable, of the proposed substitutions; and
5. Requests for substitution shall be accompanied by a complete schedule of changes in the Contract Documents, if any, which must be made to permit the use of the proposed substitution; 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.

SECTION 01001 - GENERAL REQUIREMENTS

PART 1 PROJECT DESCRIPTION

1.1 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 City of Fort Lauderdale (City). Work will be authorized by a Notice to Proceed (NTP) 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 CITY'S PROJECT MANAGER, as stated in the Instructions to Bidders. 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 City'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.
- E. Contractor shall be required to submit a Maintenance of Traffic (MOT) plan for work in the county and state highways and City streets. Contractor shall coordinate with MOTs for nearby or highway work and obtain approval for all traffic control as required by the permits contained elsewhere in this Section.

PART 2 SEQUENCE OF OPERATIONS

2.1 SCHEDULING

- A. General: Prepare and submit schedule in accordance with the provisions of Section 01311, Construction Progress Documentation.
- B. Plan the work and carry it out with minimum interference to the operation of the existing facilities. Prior to starting the work, confer with the CITY'S 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 City. 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,

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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 CITY'S 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 CITY'S ENGINEER.

2.2 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.

2.3 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 CITY'S ENGINEER.

2.5 OPERATION OF EXISTING SYSTEM PROHIBITED

- A. At no time is the Contractor to undertake to close off any utility lines or open valves or take any other action, which would affect the operation of existing systems. The City's operations crew will operate all valves. Provide at least one business day notice to City prior to any operations.

PART 3 SITE CONDITIONS

3.1 SITE INVESTIGATION AND REPRESENTATION

- A. The Contractor acknowledges satisfaction as to the general nature and location of the work, the general and local conditions, particularly those bearing upon availability of transportation, availability of labor, water, electric power, roads, and uncertainties of weather, river stages, or similar physical conditions, the character of equipment and facilities needed preliminary to and during the prosecution of the work, and all other matters which can in any way affect the work or the cost thereof under this Contract.
- B. Failure by the Contractor to become acquainted with the physical conditions and all the available information will not relieve the Contractor from responsibility for properly estimating the difficulty or cost of successfully performing the Work.
- C. The Contractor warrants that as a result of examination and investigation of all the aforesaid data, the Contractor can perform the work

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in a good and workmanlike manner and to the satisfaction of the City. The City 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 City.

3.2 INFORMATION ON SITE CONDITIONS

- A. General: Information obtained by the CITY'S ENGINEER regarding site conditions, subsurface information, groundwater elevations, existing construction of site facilities, as applicable, and similar data will be available for inspection at the office of the CITY'S ENGINEER upon request. Such information is offered as supplementary information only. The CITY'S ENGINEER does not assume any responsibility for the completeness or interpretation of such supplementary information.

3.3 UTILITIES

- A. The Contractor shall be responsible for determining and/or confirming, at his cost, the locations of all utilities within the project area, and shall be responsible for contacting each utility for location and notification prior to commencing work.
- B. The Contractor shall contact potentially affected utilities as provided in Section 01060, Regulatory Requirements & Permits.
- C. The Contractor shall contact Sunshine State One Call at 811 or visit www.callsunshine.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.

3.4 CONTRACTOR'S RESPONSIBILITY FOR UTILITY PROPERTIES AND SERVICE

- A. Where the Contractor's operations could cause damage or inconvenience to utilities, telephone, television, power, water, or sewer systems, the operations shall be suspended until all arrangements necessary for the protection of these utilities and services have been made by the Contractor with the owner of the utility affected.
- B. Notify all utility offices, which are affected by the construction operation at least 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

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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, and the CITY'S 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 City's 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.
 - a. Damaged cable shall be replaced as an entire run, from junction box to junction box.
 - b. Notify Broward County Engineering two business days in advance of the need to remove traffic detection loops.
 - c. Contractor shall verify marked cables and signal systems prior to excavation.

3.5 INTERFERING STRUCTURES

- A. Take necessary precautions to prevent damage to existing structures whether on the surface, aboveground, or underground.
- B. Protect underground and aboveground existing structures from damage, whether or not they lie within the limits of the easements obtained by the City. 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 City of any damaged underground structure, and make repairs or replacements before backfilling.
- C. Without additional compensation, the Contractor may remove and shall replace in a condition as good as or better than original, such small miscellaneous structures as fences, mailboxes, and signposts that interfere with the Contractor's operations.

3.6 EASEMENTS 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 City, 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

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upon request to the City. 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 City 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 City's Engineer, the Contractor will be required to furnish the City 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 City 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.
- 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

4.1 SAFETY AND ACCESS

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

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lights shall be regularly maintained, and in a fully operational state at all times.

- C. The Contractor shall notify all residences and businesses of planned construction at least 5 (five) business days prior to the start of work in the block where they are located. Such notices shall be brochures or door-hangers with sufficient information to describe the extent and duration of the planned work. Notification activities shall be coordinated with the CITY'S ENGINEER.
- D. Homeowners and business owners shall be provided reasonable access. The Contractor shall provide temporary sidewalks, bridges or driveway access, including safe passage over open excavations as required.

4.2 ACCIDENT REPORTS

- A. In addition, the Contractor must promptly report in writing to the CITY'S 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 CITY'S ENGINEER, giving full details of the claim.

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

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

4.4 PROTECTION OF PROPERTY

- A. Protect stored materials located adjacent to the proposed work. Notify property owners affected by the construction at least two business days in advance of the time construction begins. During construction operations, construct and maintain such facilities as may be required to provide access by all property owners to their property. No person shall be cut off from access to his residence or place of business for a period exceeding 2 hours, unless the Contractor has made special arrangements with the affected persons.
- B. The Contractor shall identify and isolate his active work zone in such a manner as to exclude all personnel not employed by him, the CITY'S ENGINEER, and the City.

4.5 FIRE PREVENTION AND PROTECTION

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

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4.6 ACCESS FOR POLICE, FIRE, AND POSTAL SERVICE

- A. Notify the fire department and police department before closing any street or portion thereof. No closing shall be made without the Owner's approval of MOT plan. Notify said departments when the streets are again passable for emergency vehicles. Do not block off emergency vehicle access to consecutive arterial crossings or dead-end streets, in excess of 300 linear feet, without special written permission from the fire department. Conduct operations with the least interference to fire equipment access, and at no time prevent such access. 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.
- C. Maintain postal service facilities in accordance with the requirements of the U.S. Postal Service. Move mailboxes to temporary locations designated by the U.S. Postal Service, and at the completion of the work in each area, replace them in their original location and in a condition satisfactory to the U.S. Postal Service.

PART 5 PRESERVATION, RESTORATION, AND CLEANUP

5.1 SITE RESTORATION AND CLEANUP

- A. At all times during the work, keep the premises clean and orderly, and upon completion of the Work, repair all damage caused by equipment and leave the project free of rubbish or excess materials of any kind.
- B. Stockpile excavated materials in a manner that will cause the least damage to adjacent lawns, grassed areas, 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 02221, Trench Excavation and Backfill, raked and graded to conform to their original contours.

5.2 FINISHING OF SITE, BORROW, AND STORAGE AREAS

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

5.3 HISTORIC PRESERVATION

- A. The Contractor shall coordinate with the historic preservation representative supplied by the owner for initial excavation operations. If the

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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

6.1 GENERAL

- A. City has prepared the following application for the Contractor to submit and obtain Permit:
 - a. Not Applicable for this project.
- B. Permits to be obtained by the Contractor include, but are not limited to the following:
 - a. Local, County, and State contracting licenses as required.
 - b. MOT approval from local, county, and state agencies as required.
 - c. Broward County Planning and Environmental Regulation Division (BCPERD): Dewatering permit, including National Pollution Discharge Elimination System (NPDES) permit if required.
 - d. Environmental Recourse Permit if necessary.
- C. The Contractor shall comply with all applicable permit conditions.

END OF SECTION

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SECTION 01005 - TECHNICAL PROVISIONS

PART 1 GENERAL

1.1 SCOPE

- A. Work under this contract includes furnishing materials, labor, tools equipment, supervision and incidentals necessary to construct infrastructure improvements.

1.2 ITEMS SPECIFIED ON DRAWINGS

- A. Items of material, equipment, machinery and the like may be specified on the Drawings and not in the Technical Specifications. The CONTRACTOR shall provide such items in accordance with the General Notes on the Drawings.

1.3 FIELD LAYOUT OF THE WORK AND RECORD DRAWINGS

- A. After completion of construction, the CONTRACTOR shall provide three (3) sets of signed & sealed. As-Built Drawings with all the As-Built information; all locations, coordinates, dimensions and elevations of the constructed facilities, certified, signed and sealed thereon by a Land Surveyor registered in the State of Florida. All elevations shall refer to N.G.V.D. 29 (National Geodetic Vertical Datum of 1929) and all state plane coordinates shall be NAD 83 (with 1990 adjustment). The cost of such field layout and recording work shall be the responsibility of the CONTRACTOR. The As-Built utility information shall meet the requirements of the City of Fort Lauderdale and any other permitting agencies having jurisdiction on this project.

1.4 SALVAGE

- A. Any existing equipment or material, including but not limited to valves, pipes, fittings, couplings, etc., which is removed as a result of construction under this project may be designated as salvage by the CONTRACT ADMINISTRATOR, and if so, shall be delivered clean to the CITY at a location directed by the CONTRACT ADMINISTRATOR. Any equipment or material not worthy of salvaging shall be disposed of by the CONTRACTOR at a suitable location in accordance with all applicable regulations, ordinances and laws at no additional cost to the CITY.

1.5 POWER

- A. The CONTRACTOR shall furnish and pay for all electrical power required for the construction, testing and trial operation, prior to final acceptance by the CITY.

1.6 WATER SUPPLY

- A. All water required for testing, flushing, and construction shall be furnished by the CITY and paid for by the CONTRACTOR. The purchase price shall be the prevailing rate as published by the CITY. The quantity of water used shall be determined by reading the meter at the start and at the finish of construction. The CONTRACTOR shall make all arrangements and incur all expense involved in having the CITY provided with a vacuum relief or backflow preventer which shall meet the requirements of ASA A40.6, latest revision, and the local administrative authority.

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1.7 MAINTENANCE

- A. The CONTRACTOR shall fully cooperate at all times with the CITY in order to maintain the operation of the existing water and/or sewer system with the least amount of interference and interruption possible. The schedule plans and work of the CONTRACTOR shall at all times be subject to alteration and revision if necessary for public health and safety considerations. The creation of a public nuisance will not be permitted.
- B. It may be necessary to interrupt the operation of the existing water and/or sewer system. In all cases where the CONTRACTOR must cause an interruption, CONTRACTOR shall prepare and submit to the CITY'S ENGINEER four (4) working days prior to commencing the work, a complete description of the proposed procedure and a time schedule, which CONTRACTOR will guarantee. At least forty-eight (48) hours prior to the time proposed for starting the work, the CITY'S ENGINEER will notify the CONTRACTOR whether or not the work will be permitted as proposed.
 - a. The CITY'S ENGINEER reserves the right to require the CONTRACTOR to work 24 hours per day in all cases where, in ENGINEER'S opinion, interference with operation of the system may result in dangerous health hazards or offensive conditions.
 - b. In no case will the CONTRACTOR be permitted to interfere with the existing system until all materials, supplies, equipment, tools and incidentals necessary to complete the work are on the site. Backup equipment on key equipment items shall be required on work necessitating interference with the existing system.

1.8 SITE RESTORATION

- A. The CONTRACTOR shall remove all excess material and shall clean up and restore the site to its original condition or better. All damage, as a result of work under this Contract, done to existing structures, pavement, driveways, paved areas, curbs and gutters, sidewalks, shrubbery, grass, trees, utility poles, utility pipe lines, conduits, drains, catch basins, flagstones, rocked, graveled, or stabilized areas of driveways, and including all obstructions not specifically named herein, shall be repaired, or replaced, as determined by the CITY'S ENGINEER. Site restoration shall be done in a timely manner as the work progresses. Site restoration work shall be completed on private property within 30 days after being disturbed.

1.9 SANITARY FACILITIES

- A. The CONTRACTOR shall provide temporary facilities at the site as directed by the CITY'S ENGINEER.

1.10 STANDARDS

- A. Wherever in these TECHNICAL SPECIFICATIONS or in the drawings name and/or number refer to certain standards or regulations, the applicable publication

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shall be the latest revision thereof. Reference by abbreviation is made in accordance with the Section 01070, "Abbreviations of Institutions."

1.11 QUALITY OF ITEMS

- A. All material furnished for this project shall be new and unused. Any material, which has become excessively weathered or damaged since manufacture, shall not be considered as new. CITY'S ENGINEER shall be the sole judge as to what constitutes excessive weathering or damage.

1.12 TESTING

- A. The City of Fort Lauderdale Engineering Minimum Design and Construction Standards may require that materials and equipment supplied meet given standards and testing to demonstrate conformance to the standards is a part of those standards. The cost of these tests shall be the obligation of the CONTRACTOR and no extra charge shall be made to the CITY on account of such testing.
- B. The CONTRACTOR shall select a recognized, independent testing laboratory to make tests on concrete, asphalt, soils and other materials for the construction phase, to test for conformity with the TECHNICAL SPECIFICATIONS, FDOT and BROWARD COUNTY Construction Standards, and any other applicable testing/Quality control standards as required by all permitting agencies having jurisdiction over this project. The CONTRACTOR shall supply the necessary samples for this testing without cost to the CITY. The costs for actual testing shall be paid by the CONTRACTOR and scheduling of all required tests will be the responsibility of the CONTRACTOR.
- C. Construction in areas where installation and restoration must satisfy the additional requirements of a local, state or federal authority may require testing to demonstrate conformance. The CONTRACTOR shall ascertain the extent of testing required by regulatory agencies within these areas. The CONTRACTOR is responsible for performing such tests, including but not limited to, tests of compaction, and all costs for these tests shall be the obligation of the CONTRACTOR and no extra charge shall be made to the CITY on account of such testing.

1.13 UTILITY CROSSINGS

- A. It is intended that wherever existing utilities must be crossed that the pipe may be deflected up to 75% of the manufacturer's recommended limits, but shall not exceed the allowable limits of the CITY. Adequate cover shall be used to adequately clear the obstruction. However, when in the opinion of the CITY'S ENGINEER, this procedure is not feasible CITY'S ENGINEER may direct the use of fittings to clear a utility crossing as detailed on the Drawings. The cost of such crossing including joint restraints shall be on the basis of the schedule of pay items applied.
- B. Deflections and adjustments of the proposed water and/or sewer mains to avoid all other existing utilities shall be verified/determined in the field during construction.

1.14 BASIS OF MEASUREMENT

- A. Where mains are to be paid for on a unit price per linear foot basis, the number of

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linear feet will be determined by measurement along the centerline of the pipe in place, including fittings. Square yardage will be determined by the actual number of square yards installed.

1.15 ADJUSTMENT AND RELOCATION OF EXISTING LINES

- A. When the drawings indicate that existing lines must be deflected, the pipe may be deflected up to 75% of the manufacturer's recommended limits but shall not exceed the allowable limits of the CITY. The CONTRACTOR will need to be directed by the ENGINEER. If the ENGINEER determines that the use of new pipe and fittings is required for deflection, the CONTRACTOR will be directed to use this method. The price for either method shall be based upon the unit prices bid. This does not apply to connections to existing system (Paragraph 1.17, this Section).

1.16 CONNECTION TO EXISTING SYSTEM

- A. The CONTRACTOR shall perform all work necessary to locate, excavate and prepare for connection to the existing mains as shown on the Drawings. The cost of this work and for the actual connection to the existing main shall be based upon the unit prices for installing the pipe and appurtenances and shall not result in any additional cost to the CITY. The cost of ductile iron sleeves shall be included in the fittings unit price.
- B. Additional valves used for the CONTRACTOR's convenience shall not be considered as an extra cost payable by the CITY for the tie-in to the existing system.
- C. During all phases of the work, (i.e. installation, testing and restoration), the CONTRACTOR shall ensure at all times the safe operation of the existing water and/or sewage systems. Service to the customers shall be maintained with the least amount of interference and interruption as possible.

1.17 RELOCATIONS

- A. The CONTRACTOR shall be responsible for the relocation of structures that are shown on the drawings, including, but not limited to, light poles, signs, fences, piping, conduits and drains that interfere with the proposed positioning of the water/sewer mains. The cost of all such relocations shall be included in the prices bid for the appropriate items.

1.18 UTILITIES

- A. Existing utilities are shown on the Drawings insofar as information is reasonably available; however, it will be the responsibility of the CONTRACTOR to preserve all existing utilities whether shown on the Drawings or not. If utility conflicts are encountered by the CONTRACTOR during construction, CONTRACTOR shall give sufficient notice to the CITY so that they may make the necessary adjustments. Damage to any utility, which in the opinion of the CITY is caused by carelessness on the part of the CONTRACTOR, shall be repaired at the expense of the CONTRACTOR.

1.19 GUARANTEE

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- A. The CONTRACTOR shall guarantee the equipment, material and labor performed under the Contract against any and all failures in proper use and operation for a period of one (1) year from date of written acceptance by the CITY.
- B. The CONTRACTOR shall also obtain warranties from manufacturers for each piece of equipment furnished so that the manufacturer's warranty fully covers the equipment for a period of one (1) year from the date of written acceptance by the CITY, unless otherwise specified in the specifications.

1.20 PERFORMANCE OF WORK

- A. The CONTRACTOR shall provide all personnel and equipment required to complete all work specified herein and on the Drawings. In an emergency situation, if the CITY determines that it must provide staff and/or equipment to assist the CONTRACTOR in the satisfactory performance of the Contract terms and conditions, the CONTRACTOR at the applicable prevailing wage rates shall reimburse the CITY.
- B. CONTRACTOR shall provide forty-eight (48) hours advance written notice to the CITY for approval of CONTRACTOR'S intention to work overtime on weekdays or to work on the weekends.

1.21 BARRICADING (SAFETY)

- A. The CONTRACTOR shall be responsible for the furnishing and maintaining of all required barricades, either the lighted or the reflector type, to ensure the public's safety during open trench work or for any other potentially unsafe or hazardous construction activities. Barricades shall be located and displayed in conformance with the most stringent regulations required by the governing agencies. All costs for barricading, including any permits, shall be the responsibility of the CONTRACTOR.
- B. All work in public rights-of-way and on private property shall be done in strict compliance with these specifications and Florida Department of Transportation Minimum Standards. Failure to so comply will result in cessation of operations and the removal of project related obstructions from the right-of-way until compliance is achieved.

1.22 EMERGENCY ACCESS AND SECURITY

- A. In order to provide protection to the workers and residents, the CONTRACTOR shall maintain emergency access to the property at all times during construction. These access ways shall be protected and delineated with lighted barricades or other such devices as approved by the regulatory agency. Both ends of the emergency access way shall be blocked in accordance with the MOT permit approved by the CITY with signage indicating that this access way is to be used by emergency vehicles only.
- B. No trenches or holes shall be left open after working hours. In the event a trench must be left open after hours, it shall be done so only with the express written permission from the ENGINEER, and it shall be the CONTRACTOR'S responsibility to provide proper protection of the open trench or hole as required by the regulatory agency. In addition, the CONTRACTOR shall provide a security guard at the site whenever the CONTRACTOR'S personnel are not present, 24 hours per day/ 7 days

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per week. It shall be the Security Guard's responsibility to protect the open trench or hole from trespassers and to direct emergency personnel on site. The Security Guard shall not have any other responsibilities such as operating pumps or equipment but shall be dedicated to protecting the trench or open hole. The Security Guard shall be equipped with a wireless telephone capable of calling 911 to report an emergency and shall keep that telephone on their person at all times. In addition to this provision the CONTRACTOR shall maintain trench safety and comply with current OSHA regulations and the Trench Safety Act. The CONTRACTOR shall maintain and keep all safety barricades, signage, flashers, and detours, in operating condition. A copy of the approved MOT plans, and details, shall be on site at all times.

- C. All roads are to be maintained during the described construction as to always allow Emergency Access. This item will be paid for under the bid item for Mobilization as named in the Bid Schedule.

1.23 VIBRATORY COMPACTION

- A. The use of vibratory compaction equipment shall be limited to a total gross weight of three (3) tons. The use of vibratory equipment shall be limited to compacting backfill of utility trenches and subgrade of paved areas only. If approved in writing by the ENGINEER, larger vibratory compaction equipment may be allowed if operated in a static mode only.

1.24 REPORTING OF DAMAGE CLAIMS

- A. The CONTRACTOR shall keep the CITY informed of any damage claims made against the CONTRACTOR during the construction period. All claims for automobile damage, property damage/bodily injury will be reported to the CONTRACT ADMINISTRATOR within 24 hours of receipt of notice. CONTRACTOR will conduct a timely investigation of the claim and determine if they will honor the claim and/or report to their insurance carrier. CONTRACTOR will advise the City of Fort Lauderdale in writing of their decision/referral to carrier.

PART 2 PRODUCTS (Not Applicable)**PART 3 EXECUTION (Not Applicable)****END OF SECTION**

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SECTION 01010 - SUMMARY OF WORK

PART 1 GENERAL

1.1 SCOPE

- A. City: City of Fort Lauderdale
 - a. City's Representative/Engineer: *Shiau Ching Low, Project Manager II*, or designated representative.

1.2 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.

1.3 SITE INVESTIGATION

- A. The CONTRACTOR, by virtue of signing the Contract, 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.
- B. Soil boring information will not be furnished to the CONTRACTOR. The CONTRACTOR, by virtue of signing the Contract, 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.

1.4 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

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interference with said relocation, altering, or other rearranging of facilities.

1.5 WORK SEQUENCE

- A. 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 the parking lot and park facilities, roadways, driveways, and utilities. Utilities shall include but not be limited to water, sewerage, drainage structures, ditches and canals, gas, electric, television and telephone. Prior to commencing with the WORK, CONTRACTOR shall perform a location investigation of existing underground utilities and facilities in accordance with Section 01530 entitled "Protection of Existing Facilities" and shall have obtained all required permits and permissions, CONTRACTOR shall also deliver written notice to the CITY, 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.

1.6 WORK SCHEDULE

- A. Time is of the essence in completing this project. 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 construction schedule submitted by the CONTRACTOR. If the ENGINEER determines that the CONTRACTOR does not meet the Critical Path Method (CPM) 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 measure to complete the work in timely manner will be borne by the CONTRACTOR at no additional cost to the OWNER.

B. REQUIRED PERIODS OF WORK SUSPENSION

- a. 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; 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.
- b. The CONTRACTOR shall include these provisions in the schedule required in 01311 and there shall be no additional time granted for these work suspensions.
- c. No additional compensation shall be granted for demobilization, cleaning and remobilization as a result of these work suspensions.

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- d. 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

- a. CONTRACTOR shall submit scheduling information for the work as required in Section 01311 "Construction Progress Documentation".
- b. No separate payment shall be made for preparation and/or revision of the schedule.

- D. On-Site Work Hours: Work hours shall be defined at the pre-construction meeting and shall comply with all permit conditions. Except otherwise indicated, work shall be performed during normal business working hours of 7:30 a.m. to 4:00 p.m., Monday through Friday.

1.7 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 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 ENGINEER 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.

1.8 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.

1.9 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.

1.10 UTILITY LOCATIONS

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- 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 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 State One Call Center, which has a free locating service for CONTRACTORS and excavators. Within forty-eight hours before excavating, dial toll free 1-800-432-4770, and a locator will be dispatched to the work location. CONTRACTOR shall reasonably notify other utility companies not notified by Sunshine State One Call Center.
- F. The permits listed below will be obtained for the project by the CITY prior to beginning construction. 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.
 - a. BCPGMD : Surface Water License.
 - b. BCHED : General Permit
 - c. FDOT : Driveway Connection Permit
 - d. DEP/SWFPWMD : Contractor's Erosion Control Plan
 - e. DEP/SWFWMD : Stormwater Pollution Prevention Plan
- G. Permits to be obtained by the CONTRACTOR include, but are not limited to the following:

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- a. Local, County, and State contracting licenses.
- b. BCEPGMD: Dewatering permit, including NPDES permit if required.
- c. MOT from Broward County for Broward Boulevard/SE 1st Street intersection, MOT from City of Fort Lauderdale for SE 1st Avenue/SE 1st Street intersection and MOT from City of Fort Lauderdale for SE 1st Avenue.

1.11 LINE AND GRADE

- A. The ENGINEER has provided vertical and horizontal control for layout of the work in the form of benchmarks and reference points located adjacent to the work. From these controls provided, the CONTRACTOR shall develop and make all detailed surveys needed for construction as-built purposes and shall establish all working points, lines and elevations necessary to perform the work. A Professional Land Surveyor registered in the State of Florida shall supervise this surveying work.

1.12 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.

1.13 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.

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

1.15 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.

1.16 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

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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.

1.17 AUDIO-VISUAL PRECONSTRUCTION RECORD

A. General

- a. The CONTRACTOR shall engage the services of a professional electrographer. A responsible commercial firm known to be skilled and regularly engaged in the business of preconstruction color audio-video documentation shall prepare the color audio-video dvd's. The electrographer shall furnish to the ENGINEER a list of all equipment to be used for the audio-video recording i.e., manufacturer's name, model number, specifications and other pertinent information. Additional information to be furnished by the electrographer are the names and addresses of two references that the electrographer has performed color audio-video recording for on projects of a similar nature within the last 12 months.
- b. Prior to beginning the work, the CONTRACTOR shall have a continuous color audio-video recording taken along the entire length of the project to serve as a record of preconstruction conditions. No construction shall begin prior to review and approval of the video covering the construction area by the ENGINEER. The ENGINEER shall have the authority to reject all or any portion of the videos not conforming to the specifications and order that it be redone at no additional charge. The CONTRACTOR shall reschedule unacceptable coverage within five days after being notified. The ENGINEER shall designate those areas, if any, to be omitted from or added to the audio-video coverage.

B. Digital Video Disk (DVD):

- a. DVD's shall be new. Reprocessed dvd's will not be acceptable. They shall be interchangeable with the color dvd player and shall be compatible for playback with a standard player-receiver, DVD format. Any other format must be approved by ENGINEER.
- b. CONTRACTOR shall provide the ENGINEER and the CITY with one complete set of dvd's for the project area.

1.21 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

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prevention shall be in accordance with NPDES requirements with no additional cost to the CITY.

1.22 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.

a. Construction Phasing Requirements

- i. Contractor shall arrange the schedule to maintain minimum of 11' travel lane for each direction at all time.

B. TRAFFIC CONTROL

- a. 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.
- b. 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.
- c. 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 ENGINEER.
- d. 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.
- e. All existing stop and street name signs will be maintained as long as deemed necessary by the ENGINEER.
- f. 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.

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- g. 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.

1.23 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.

1.24 APPLICATION FOR PAYMENT FOR STORED MATERIALS

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

1.25 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**

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SECTION 01025 - MEASUREMENT AND PAYMENT

PART 1 GENERAL

1.1 SUBMITTALS

- A. See Section 01340, Submittal Procedures, and all other references to document submittals. Submittals shall include, but are not limited to:
 - a. Schedule of Values: Submit schedule on OWNER's form.
 - b. Application for Payment.
 - c. Final Application for Payment.

1.2 SCHEDULE OF VALUES

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

1.3 APPLICATION FOR PAYMENT

- A. Transmittal Summary Form: Attach one Summary Form with each detailed Application for Payment and include Request for Payment of Materials and Equipment on Hand as applicable. Execute certification by authorized officer of CONTRACTOR.
- B. Use detailed Application for Payment Form provided by OWNER.
- C. Include accepted schedule of values for 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:

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- a. Round values to nearest dollar.
- b. 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.
- c. Submit Application for Payment, including a Transmittal Summary Form and detailed Application for Payment Form, a listing of materials on hand as applicable, and such supporting data as may be requested by OWNER.

1.4 MEASUREMENT - GENERAL

- A. Weighing, measuring, and metering devices used to measure quantity of materials for Work shall be suitable for purpose intended and conform to tolerances and Specifications as specified in National Institute of Standards and Technology, Handbook 44.
- B. Whenever pay quantities of material are determined by weight, material shall be weighed on scales furnished by CONTRACTOR and certified accurate by state agency responsible. Weight or load slip shall be obtained from weigher and delivered to CONSTRUCTION MANAGER 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 CONSTRUCTION MANAGER. Each vehicle shall bear a plainly legible identification mark.
- E. Materials that are specified for measurement by the cubic yard measured in the vehicle shall be hauled in vehicles of such type and size that actual contents may be readily and accurately determined. Unless all vehicles are of uniform capacity, each vehicle must bear a plainly legible identification mark indicating its water level capacity. Vehicles shall be loaded to at least their water level capacity. Loads hauled in vehicles not meeting above requirements or loads of a quantity less than the capacity of the vehicle, measured after being leveled off as above provided, will be subject to rejection, and no compensation will be allowed for such material.
- F. Where measurement of quantities depends on elevation of existing ground, elevations obtained during construction will be compared with those shown on Drawings. Variations of 1 foot or less will be ignored, and profiles shown on Drawings will be used for determining quantities.
- G. Units of measure shown on Bid Form shall be as follows, unless specified otherwise. All methods of measurement shall be approved by the CONSTRUCTION MANAGER.

| <u>Item</u> | <u>Method of Measurement</u> |
|-------------|------------------------------|
|-------------|------------------------------|

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| | |
|-----|---|
| AC | Acre - Field Measure |
| 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) |

1.5 PAYMENT

A. General:

- a. Progress payments will be made monthly.
- b. The date for CONTRACTOR's submission of monthly Application for Payment.

1.6 NONPAYMENT FOR REJECTED OR UNUSED PRODUCTS

A. Payment will not be made for following:

- a. Loading, hauling, and disposing of rejected or unused material.
- b. Quantities of material wasted or disposed of in manner not called for under Contract Documents.
- c. 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.
- d. Material not unloaded from transporting vehicle.
- e. Defective Work not accepted by OWNER.
- f. Material remaining on hand after completion of Work.

1.7 MOBILIZATION

- A. See Section 01505, Mobilization, for payment limitations. All environmental compliance matters except for erosion control system shall be included in Mobilization.
- B. Payment for mobilization will be made at an allowance price named in the Bid Schedule. Payment for mobilization will be made in equal monthly amounts during the duration of the original contract time.

1.8 MAINTENANCE OF TRAFFIC (M.O.T.)

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- A. See Section 01570, Traffic Regulations, and all other references to traffic control and maintenance, as well as parking control and maintenance in this document and any regulatory requirements.
- B. Payment for maintenance of traffic will be made at an allowance price named in the Bid Schedule. Payment for maintenance of traffic and parking activities will be made in equal monthly amounts during the duration of the original contract time.

1.9 HARDSCAPE DEMOLITION

- A. Measurement for payment to remove and dispose of existing hardscape elements will be based on a lump sum inclusive of all work on the Demolition drawings.
- B. This lump sum for removal and disposal of existing hardscape elements as indicated on the Design Drawings shall constitute full compensation for the removal and disposal of all concrete, asphalt or structures. This includes, but is not limited to sidewalks, curbs, aprons, concrete collars, brick pavers, and all other miscellaneous concrete as directed by the ENGINEER. Existing structures will not be compensated under this line item.

1.10 PAVING AND DRAINAGE

- A. Measurement for payment to furnish and install drainage structures, inlets or top slabs, connections, and paving in addition to all required connections, modifications and cleaning of drainage facilities will be based on the line items provided for each item of work for all work to be performed on the applicable drawings, all in accordance with the requirements of the Contract Documents.
- B. Payment for furnishing and installing, modifying or cleaning all drainage appurtenances in the design drawings which price shall constitute full compensation for the completed installation of the structure including but not limited to excavation, backfill, compaction, modifications, disposal, cleaning, all required dewatering and full compliance with the Trench Safety Act.

1.11 WATER AND SEWER

- A. Measurement for payment to furnish and install all water and sewer items will be lump sum for all work to be performed on the applicable drawings, all in accordance with the requirements of the Contract Documents.
- B. Payment for furnishing and installing all water and sewer items shall constitute full compensation for the completed installation of the structure including but not limited to excavation, backfill, compaction, modifications, disposal, cleaning, all required dewatering and full compliance with the Trench Safety Act.

1.12 STRUCTURES

- A. Measurement for payment to furnish and install all shade structures and other structures, will be lump sum for all work to be performed on the applicable drawings, all in accordance with the requirements of the Contract Documents.

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- B. Payment for furnishing and installing shade structures and other structures shall constitute full compensation for the completed installation of the structure including but not limited to excavation, dewatering, backfill, compaction, modifications, disposal and cleaning.

1.13 AMENITIES

- A. Measurement for payment to furnish and install all amenities will be lump sum for all work to be performed on the applicable drawings, all in accordance with the requirements of the Contract Documents.
- B. Payment for furnishing and installing all amenities shall constitute full compensation for the completed installation of the structure including but not limited to excavation, dewatering, backfill, compaction, modifications, disposal and cleaning.

1.14 LANDSCAPING

- A. Measurement for payment to furnish and install trees, sod, groundcover and irrigations will be lump sum for all work to be performed on the applicable drawings, all in accordance with the requirements of the Contract Documents.
- B. Payment for furnishing and installing all trees, sod, groundcover and irrigations, shall constitute full compensation for the completed installation of the structure including but not limited to excavation, dewatering, backfill, compaction, modifications, disposal and cleaning.

1.15 ELECTRICAL

- A. Measurement for payment to furnish and install all electrical equipment and conduits will be lump sum for all work to be performed on the applicable drawings, all in accordance with the requirements of the Contract Documents.
- B. Payment for furnishing and installing all electrical equipment and conduits shall constitute full compensation for the completed installation of the structure including but not limited to excavation, dewatering, backfill, compaction, modifications, disposal and cleaning.

1.16 PERMIT FEES

- A. Measurement for 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, all in accordance with the Contract Documents. The allowance for permit fee amounts shown on the bid schedule is an estimate of permit fees required for the project and is a cost pass through item. The permit fees are based on allowances and OWNER will reconcile the actual cost with the CONTRACTOR by change order. The CONTRACTOR shall produce documentation upon request verifying actual cost. Only permit fees substantiated and approved by the ENGINEER will be paid as part of this bid item.

- B. Because payment for permit fees will be paid as part of this

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bid item, payment for permit fees will not be paid as part of mobilization.

1.17 CONSIDERATION FOR INDEMNIFICATION (OWNER/ENGINEER)

- A. Measurement for payment for indemnification of the OWNER and ENGINEER will be based upon the sum named for such work, all in accordance with the requirements of the contract documents.
- B. Payment will be twenty-five dollars for consideration for indemnification named in the bid schedule and shall constitute full compensation for indemnifying the OWNER and ENGINEER as specified in the contract documents.

1.18 ALLOWANCE FOR FPL/COMCAST/AT&T

- A. Not applicable for this project.

PART 2 PRODUCTS (Not Applicable)**PART 3 EXECUTION (Not Applicable)****END OF SECTION**

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SECTION 01031 – ALTERATION PROJECT PROCEDURES

PART 1 GENERAL

1.1 REQUIREMENTS

- A. Coordinate work of trades and schedule elements of alterations and renovation work by procedure and methods to expedite completion of the work.
- B. In addition to demolition and that specifically shown, cut, move or remove items necessary to provide access or to allow alterations and new work to proceed. Include such items as:
 - a. Repair or removal of hazardous or unsanitary conditions.
 - b. Removal of abandoned items and items serving no useful purpose, such as abandoned piping, conduit and wiring.
 - c. Removal of unsuitable or extraneous materials not marked for salvage, such as abandoned furnishings and equipment, and debris such as rotted wood, rusted metals and deteriorated concrete, shall be removed from the site expeditiously.
 - d. Cleaning of surfaces and removal of surface finished as needed to install new work and finishes.
 - e. Protection as required for existing trees to remain.
 - f. For purposes of all existing underground utilities work, coordinate as required by use of special telephone number shown on engineering drawings.
 - g. Site storage for all existing benches, signals, signs, light poles, fire hydrants, manhole covers and grates to be relocated.
- C. Patch, repair and refinish existing items to remain, to the specified condition for each material, with a professional transition to adjacent new items of construction.

1.2 RELATED REQUIREMENTS

- A. All applicable sections of the Specifications.
- B. Conditions of the Contract.

1.3 ALTERATIONS, CUTTING AND PROTECTION

- A. Assign the work of moving, removal, cutting, patching and protection to trades qualified to perform the work in a manner to cause least damage to each type of work, and provide means of returning surfaces to appearance of new work.
- B. Perform cutting and removal work to remove minimum necessary, and in a manner to avoid damage to adjacent work.

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- a. Cut finish surfaces such as paving, masonry, tile, plaster or metals, by methods to terminate surfaces in a straight line at a natural point of division.
- C. Perform cutting and patching as specified in Section 01045.
- D. Protect existing finishes, equipment, and adjacent work which are scheduled to remain, from damage.
 - a. Protect existing and new work from weather and extremes of temperature.

PART 2 PRODUCTS

2.1 PRODUCTS FOR PATCHING, EXTENDING AND MATCHING

- A. General Requirements that work be complete:
 - a. Provide same products or types of construction as that in existing structure, as needed to patch, extend or match existing work.
 - i. Generally Contract Documents will not define products or standards of working conduct present in existing construction; CONTRACTOR shall determine products in inspection and any necessary testing by use of the existing as a sample of comparison.
 - b. Presence of a product, finish, or type of construction, requires that patching, extending or matching shall be performed as necessary to make work complete and consistent to existing identical standards of quality.

PART 3 EXECUTION

3.1 PERFORMANCE

- A. Patch and extend existing work using skilled mechanics who are capable of matching existing quality. Quality of patched or extended work shall be not less than that specified for new work.

3.2 DAMAGED SURFACES

- A. Patch and replace any portion of an existing finished surface with the exception of concrete curb or gutter which is found to be damaged, lifted, discolored, or shows other imperfections. Damaged curbing shall be replaced in sections as directed by the engineer.
 - a. Provide adequate support of substrate prior to patching the finish.
 - b. Refinish patched portions of painted or coated surfaces in a manner to produce uniform color and texture over entire surface.
 - c. When existing surface finish cannot be matched, refinish entire surface to nearest intersections.

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3.3 TRANSITION FROM EXISTING TO NEW WORK

- A. When new work abuts or is finished flush with existing work, make a smooth transition. Patched work shall match existing adjacent work in texture and appearance so that the patch of transition is invisible at a distance of five feet.
 - a. When finished surfaces are cut in such a way that a smooth transition with new work is not possible, terminate existing surface in a neat manner along a straight line at a natural line of division, and provide trim appropriate to finished surface.

3.4 CLEANING

- A. Perform periodic and final cleaning as specified in Section 01710.
 - a. Clean OWNER occupied areas daily.
 - b. Clean spillage, overspray, and heavy collection of dust in OWNER occupied areas immediately.
- B. At completion of work of each trade, clean area and make surfaces ready for work of successive trades.
- C. At completion of alterations work in each area, provide final cleaning and return space to a condition suitable for use by OWNER.

3.5 MEASUREMENT AND PAYMENT

- A. There shall be no special measurement or payment for the work in this section. Payment for work shall be included in all other work.

END OF SECTION

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SECTION 01040 - COORDINATION

PART 1 GENERAL

1.1 SUBMITTALS

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

1.2 UTILITY NOTIFICATION AND COORDINATION

- A. Coordinate the Work with various utilities within Project limits. Notify applicable utilities prior to commencing Work.
- B. Contact the City of Fort Lauderdale Public Services Department at 954-828-8000 for water and sewer utility locations.
- C. Contact Sunshine State One Call at 1-800-432-4770 at least 2 business days prior to any excavation.
- D. If damage occurs, or if conflicts or emergencies arise during Work, contact the appropriate utility.
 - a. Electricity Company: Florida Power and Light.
 - Contact Person: Trouble Center (or police/fire – 911).
 - Telephone: 954-797-5000.
 - b. Telephone Company: Bell South.
 - Contact Person: Jason Boschen.
 - Telephone: 954-316-4005 or 954-605-1121.
 - c. Water and Sewer Department: Fort Lauderdale Public Services Department.
 - Contact Person: Emergency Hotline.
 - Telephone: 954-828-8000.
 - d. Gas Company: TECO Peoples Gas.
 - Contact Person: Dispatch.
 - Telephone: 305-957-3857, ext. 7490 or 1-877-

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832-6747.

- e. Telecom: AT&T – Broadband/Comcast.
 - Contact: Andy Vaspasiano.
 - Telephone: 954-266-6589 or 954-444-2833.
- f. Telecom: FP&L FiberNet.
 - Contact: Noel R. Reese.
 - Telephone: 305-552-3249 or 305-205-1283.
- g. Broward County Traffic Engineering Division (For Traffic Signal Communications Systems Underground Cable and Traffic Loops):
 - Contact: Keith Smith.
 - Telephone: 954-484-9600, ext. 227.

1.3 PROJECT MEETINGS

A. General

- a. Contract: Schedule physical arrangements for meetings throughout progress of Work, prepare meeting agenda with City/Construction Manager 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.
- b. Representatives of City/Construction Manager, Contractor, and Subcontractors shall attend meetings as needed.

B. Preconstruction Conference

- i. Contractor shall be prepared to discuss the following subjects, as a minimum:
 - i. Required schedules.
 - ii. Status of Bonds and insurance.
 - iii. Sequence of critical path work items.
 - iv. Project changes and clarification procedures.
 - v. Use of site, access, office and storage areas, security and temporary facilities.
 - vi. Major project delivery and priorities.
 - vii. Contractor's safety plan and representative.
 - viii. Progress payment procedures.
- ii. Attendees may include but not limited to:

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- i. City's representatives
 - ii. Contractor's office representative
 - iii. Contractor's resident superintendent
 - iv. Contractor's quality control representative
 - v. Subcontractor's representatives whom Contractor may desire or City may request to attend.
 - vi. Engineer's representatives.
 - vii. Others as appropriate.
 - c. Preliminary Schedules Acceptability Review Meeting: As required to review and finalize Preliminary Schedule.
- C. Progress Meetings
- a. Contactor 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.
 - b. Attendees will include
 - i. City's representatives, as appropriate.
 - ii. Contractor, Subcontractors and Suppliers, as appropriate.
 - iii. Others as appropriate.
 - c. On a monthly basis, the 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.
- D. Pre-installation Meetings
- a. When required in individual Specification sections or as necessary to coordinate the Work, convene at site prior to commencing Work of that section.
 - b. Require attendance of entities directly affecting, or affected by, Work of that section.
 - c. Notify City/Construction Manager 4 days in advance of meeting date.

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- d. Provide suggested agenda to City/Construction Manager to include reviewing conditions of installation, preparation and installation or application procedures, and coordination with related Work and work of others.

- E. Other Meetings

- a. In accordance with the Contract Documents and as may be required by the City and Engineer.

1.4 FACILITY OPERATIONS

- A. Continuous operation of City's facilities is of critical importance. Schedule and conduct activities to enable existing facilities to operate continuously, unless otherwise specified.
- B. Perform Work continuously during critical connections and changeovers, and as required to prevent interruption of City's operations.
- C. When necessary, plan, design, and provide various temporary services, utilities, connections, temporary piping and heating, access, and similar items to maintain continuous operations of City's facilities.
- D. Do not close lines, open or close valves, or take other action which would affect the operation of existing systems, except as specifically required by the Contract Documents and after authorization by City and Engineer. Such authorization will be considered within 48 hours after receipt of Contractor's written request.
- E. Provide **7** days advance written request for approval of need to shut down a process or facility to City/Construction Manager.
- F. Power outages will be considered upon 48 hours written request to City. Describe the reason, anticipated length of time, and areas affected by the outage. Provide temporary provisions for continuous power supply to critical facility components.
- G. Do not proceed with Work affecting a facility's operation without obtaining City's advance approval of the need for and duration of such Work.
- H. Relocation of Existing Facilities:
 - a. During construction, it is expected that minor relocations of Work will be necessary.
 - b. If Contractor determines that in order to expedite construction of new water and or sewer mains it would be necessary to temporarily remove and replace existing water services and/or sewer service connections, he will be responsible for the removal and replacement of such service connections at his own cost and effort. The City will not provide additional compensation for any costs associated with such effort. All labor and material costs associated with means and methods of construction will be compensated as part of the bid item(s) cost submitted by the Contractor. Additionally, the Contractor will have to coordinate and inform utility owner(s) and any City resident(s) impacted by such activities and must repair such utilities in a timely manner to minimize

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disruption of service.

- c. Provide complete relocation of existing structures and Underground Facilities, including piping, utilities, equipment, structures, electrical conduit wiring, electrical duct bank, traffic loop detectors and other necessary items.
- d. Use only new materials for relocated facility. Match materials of existing facility, unless otherwise shown or specified.
- e. Perform relocations to minimize downtime of existing facilities.
- f. Install new portions of existing facilities in their relocated position prior to removal of existing facilities, unless otherwise accepted by City.

1.5 BYPASS PUMPING

- A. Where the Work includes connections or modifications to existing sanitary sewer systems, wastewater flows shall be controlled through the pipeline sections and pump stations where work is being performed. Under no circumstances, can portions of the system be removed from service for periods of time in excess of that approved by the City. The Contractor shall be responsible to assess conditions and capacities of the existing sewer lines and pump stations in order to implement an acceptable bypass plan at no additional cost to the City. Bypass pumping will be required for all sewers and pump station construction that would result in shutdown of existing facilities. The Contractor shall supply the necessary pumps, conduits, and other equipment to not only divert flow around the pump station, manhole, or pipe section in which work is to be performed, but also to transmit the flow in downstream sewer lines and/or pump stations without surcharge. The bypass systems shall be of sufficient capacity to handle existing flows plus additional flows that may occur during periods of high tide or rainfall. Emergency backup pumping capability must be available in addition to the primary bypass system. The Contractor will be responsible for furnishing the necessary labor, power, and supervision to set up and operate the pumping and bypass systems. When pumping is in operation, all engines shall be equipped in a manner to keep the pump noise to a minimum and to comply with applicable noise ordinances.
- B. Contractor shall be responsible for any damage to properties or buildings connected to the sewer system, and to the pipeline, which result from the flow control activities.
- C. Contractor shall submit a bypass pumping plan for all proposed bypass pumping operations.

1.6 PHYSICAL CONDITIONS

- A. Exercise reasonable care to verify locations of existing subsurface structures and underground facilities.
- B. Thoroughly check immediate and adjacent areas subject to excavation by visual examination (and by electronic metal and pipe detection equipment, as necessary) for indications of subsurface structures and underground facilities.
- C. Make exploratory excavations where existing underground

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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.

1.7 ADJACENT FACILITIES AND PROPERTIES

A. Examination

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

B. Documentation

- a. Record and submit documentation of observations made on examination inspections in accordance with paragraphs Construction Photographs and Audio-Video Recordings.
- b. Upon receipt, Engineer will review, sign, and return one record copy of documentation to Contractor to be kept on file in field office.
- c. 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 City.

1.8 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 and Engineer shall have the right to select the subject matter and vantage point from which photographs are to be taken.
- D. Construction Progress Photos
 - a. Photographically demonstrate progress of construction, showing every aspect of site and adjacent properties as well as interior and exterior of new or impacted structures.
 - b. Monthly: Take 24 exposures using 35 mm color film or digital photographs of comparable quality, unless otherwise approved by the PCM.
- E. Color Prints

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

1.9 AUDIO-VIDEO RECORDINGS

- A. Prior to beginning Work on construction site or of a particular area of the Work, and again within 10 days following date of Substantial Completion, videograph construction site and property adjacent to construction site.
- B. In the case of preconstruction recording, no Work shall begin in the area prior to City/Construction Manager's review and approval of content and quality of video for that area.
- C. Particular emphasis shall be directed to physical condition of existing vegetation, structures, and pavements within pipeline alignment and areas adjacent to and within the right-of-way or easement, and on Contractor storage and staging areas.
- D. City/Construction Manager and 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
 - a. DVD format, with sound.
 - b. Video
 - i. Produce bright, sharp, and clear images with accurate colors, free of

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distortion and other forms of picture imperfections.

- ii. Electronically, and accurately display the month, day, year, and time of day of the recording.

c. Audio

- i. Audio documentation shall be done clearly, precisely, and at a moderate pace.
- ii. Indicate date, Project name, and a brief description of the location of taping, including
 - a. Facility name;
 - b. Street names or easements;
 - c. Addresses of private property; and
 - d. Direction of coverage, including engineering stationing, if applicable.

G. Documentation

- a. Provide two copies to the City.
- b. DVD Label:
 - i. DVD number (numbered sequentially, beginning with 001).
 - ii. Project Name.
 - iii. Name of street(s) or easement(s) included.
 - iv. Applicable location by engineering stationing.
 - v. Date and time of coverage.
- c. 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

- a. Coverage is required within and adjacent to the rights-of-way, easements, storage, and staging areas where the work is being constructed.
- b. Documentation of the conditions of the adjacent properties or any affected structures as a result of the impending construction.
- c. Certification as to date work done and by whom.

- d. All videos shall be keyed to the construction drawings,

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provided with an index and a written narrative.

- I. Preconstruction and Post-Construction Videos Shall be Submitted as follows:
 - a. Preconstruction videos shall be presented to the City at the preconstruction conference.
 - b. 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.

1.10 REFERENCE POINTS, SURVEYS, AND RECORD DRAWINGS

- A. Location and elevation of benchmarks are shown on Drawings.
- B. Contractor's Responsibilities:
 - a. Provide all survey efforts required to layout the Work.
 - b. Check and establish exact location of existing facilities prior to construction of new facilities and any connections thereto.
 - c. In event of discrepancy in data or benchmarks, request clarification before proceeding with Work.
 - d. Retain a professional land surveyor or civil engineer registered in the State of Florida who shall perform or supervise all surveying necessary for construction staking and layout and obtaining record information for as-built and record drawing preparation.
 - e. 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.
 - f. On request of City/Construction Manager, submit documentation.
 - g. Provide competent employee(s), tools, stakes, and other equipment and materials as City/Construction Manager may require to:
 - i. Establish control points, lines, and easement boundaries.
 - ii. Check layout, survey, and measurement Work performed by others.
 - iii. Measure quantities for payment purposes.

PART 2 PRODUCTS (NOT USED)**PART 3 EXECUTION**

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3.1 CUTTING, FITTING, AND PATCHING

- A. Cut, fit, adjust, or patch Work and work of others, including excavation and backfill as required, to make Work complete.
- B. Obtain prior written authorization of Engineer before commencing Work to cut or otherwise alter:
 - a. Structural or reinforcing steel, structural column or beam, elevated slab, trusses, or other structural member.
 - b. Weather - or moisture-resistant elements.
 - c. Efficiency, maintenance, or safety of element.
 - d. Work of others.
- C. Refinish surfaces to provide an even finish.
 - a. Refinish continuous surfaces to nearest intersection.
 - b. Refinish entire assemblies.
 - c. Finish restored surfaces to such planes, shapes, and textures that no transition between existing work and Work is evident in finished surfaces.
 - i. 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.
 - ii. 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.

END OF SECTION

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SECTION 01045 – CUTTING AND PATCHING

PART 1 GENERAL

1.1 REQUIREMENTS INCLUDED

- A. CONTRACTOR shall be responsible for all cutting, fitting and patching, including attendant excavation and backfill, required to complete the work or to:
 - a. Make its several parts fit together properly.
 - b. Uncover portions of the work to provide for installation of ill-timed work.
 - c. Remove and replace defective work.
 - d. Remove and replace work not conforming to requirements of Contract Documents.
 - e. Remove samples of installed work as specified for testing.
 - f. Provide routine penetrations of nonstructural surfaces for installation of piping and electrical conduit.

1.2 RELATED REQUIREMENTS

- A. All applicable sections of the Specifications.
- B. Conditions of the Contract.

1.3 SUBMITTALS

- A. Submit a written request to ENGINEER well in advance of executing any cutting or alteration, which affects:
 - a. Work of the OWNER or any separate CONTRACTOR.
 - b. Structural value of integrity of any element of the project.
 - c. Integrity of effectiveness of weather-exposed or moisture-resistant elements or systems.
 - d. Efficiency, operational life, maintenance or safety of operational elements.
 - e. Visual qualities of sight-exposed elements.
- B. Request shall include:
 - a. Identification of the project.
 - b. Description of the affected work.

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- c. The necessity for cutting, alteration or excavation.
 - d. Effect on work of OWNER or any separate CONTRACTOR, or on structural or weatherproof integrity of project.
 - e. Description of proposed work
 - i. Scope of cutting, patching, alteration, or excavation.
 - ii. Trades who will execute the work.
 - iii. Products proposed to be used.
 - iv. Extent of refinishing to be done.
 - f. Alternatives to cutting and patching.
 - g. Cost proposal, when applicable.
 - h. Written permission of any separate CONTRACTOR whose work will be affected.
- C. Should conditions of work or the schedule indicate a change of products from original installation, CONTRACTOR shall submit request for substitution as specified in Section 01600, paragraph 1.08.
- D. Submit written notice to ENGINEER designating the date and time the work will be uncovered.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Comply with specifications and standards for each specific product involved.

PART 3 EXECUTION

3.1 INSPECTION

- A. Inspect existing conditions of project, including elements subject to damage or to movement during cutting and patching.
- B. After uncovering the work, inspect conditions affecting installation of products, or performance of work.
- C. Report unsatisfactory or questionable conditions affecting installation of products, or performance of work.

3.2 PREPARATION

- A. Provide adequate temporary support as necessary to assure structural value or integrity of affected portion of work.

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- B. Provide devices and methods to protect other portions of project from damage.
- C. Provide protection from elements for that portion of the project, which may be exposed by cutting and patching, work, and maintain excavations free from water.

3.3 PERFORMANCE

- A. Execute cutting and demolition by methods, which will prevent damage to other work, and will provide proper surfaces to receive installation of repairs.
- B. Execute excavating and backfilling by methods, which will prevent settlement or damage to other work.
- C. Employ original Installer or Fabricator to perform cutting and patching for:
 - a. Weather-exposed or moisture-resistant elements.
 - b. Sight-exposed finished surfaces.
- D. Execute fitting and adjustment of products to provide a finished installation to comply with specified product, functions, tolerances and finishes.
- E. Restore work which has been cut or removed; install new products to provide completed work in accordance with requirements of Contract Documents.
- F. Fit work airtight to pipes, sleeves, ducts, conduit and other penetrations through surfaces.
- G. Refinish entire surfaces as necessary to provide an even finish to match adjacent finishes:
 - a. For continuous surfaces, refinish to nearest intersection.
 - b. For an assembly, refinish entire unit.

3.4 MEASUREMENT AND PAYMENT

- A. There shall be no special measurement or payment for the work under this section, it shall be included in the unit price bid of any item requiring cutting and patching, including pavement restoration.

END OF SECTION

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SECTION 01050 – PROJECT MANAGEMENT

PART 1 GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes administrative provisions for coordinating construction operations on Project including, but not limited to, the following:
 - a. Coordination Drawings.
 - b. Special Project Procedures
 - c. Administrative and supervisory personnel.
 - d. Project meetings.
 - e. Requests for Information (RFIs).
- B. Related Sections include the following:
 - a. Section 01200, "Project Meetings"
 - b. Section 01311, "Construction Progress Documentation"
 - c. Section 01340, "Submittal Procedures"
 - d. Section 01780, "Contract Closeout "

1.3 DEFINITIONS

- A. RFI: Request from Contractor seeking interpretation or clarification of the Contract Documents.

1.4 COORDINATION

- A. Coordination. Coordinate construction operations included in different Sections of the Specifications to ensure efficient and orderly installation of each part of the Work. Coordinate construction operations, included in different Sections that depend on each other for proper installation, connection, and operation.
 - a. Schedule construction operations in sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.

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- b. Coordinate installation of different components with other contractors to ensure maximum accessibility for required maintenance, service, and repair.
- c. Make adequate provisions to accommodate items scheduled for later installation.
- d. Where availability of space is limited, coordinate installation of different components to ensure maximum performance and accessibility for required maintenance, service, and repair of all components, including mechanical and electrical.

B. Memoranda.

- a. Prepare memoranda for distribution to each party involved, outlining special procedures required for coordination. Include such items as required notices, reports, and list of attendees at meetings.
 - i. Prepare similar memoranda for City and separate contractors if coordination of their Work is required.

C. Administrative Procedures

- a. Coordinate scheduling and timing of required administrative procedures with other construction activities and activities of other contractors to avoid conflicts and to ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:
 - i. Preparation of Contractor's Construction Schedule.
 - ii. Preparation of the Schedule of Values.
 - iii. Installation and removal of temporary facilities and controls.
 - iv. Delivery and processing of submittals.
 - v. Progress meetings.
 - vi. Project closeout activities.

1.5 SUBMITTALS

A. Key Personnel Names

- a. Within 5 days of notice to proceed, submit a list of key personnel assignments, including superintendent and other personnel in attendance at Project site including:
 - i. Identify individuals and their duties and responsibilities; list addresses and telephone numbers, including home and office telephone numbers.
 - ii. Provide names, addresses, and telephone numbers of individuals

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assigned as standbys in the absence of individuals assigned to Project.

1.6 SPECIAL PROJECT PROCEDURES

A. Discrepancies, Errors

- a. Should discrepancies or errors appear in the drawings or specifications concerning materials, workmanship, or quantity of work to be performed, the Contractor will be required to immediately notify the City before proceeding with the work.
- b. If the Contractor fails to notify the City and proceeds with the work, Contractor will be required to correct the errors at his/her own expense. In the event of a conflict between the drawings and specifications, the City will decide on the way to perform the work or supply the materials.

B. Dimensions and Measurements

- a. The figured dimensions on the drawings or notes including dimensions shall be used for construction instead of measurements of the drawings by scale. No scale measurements shall be used as a dimension for construction.
- b. Dimensions on all drawings as well as the detail drawings themselves are subject in every case to measurements of adjacent or previously completed work. All such measurements necessary shall be taken before undertaking any work dependent upon such data.
- c. Field verification of dimensions on plans is mandatory since actual locations, distances, and levels will be governed by actual field conditions.

C. Discrepancies or Inconsistencies:

- a. Should any discrepancy or inconsistency appear between larger and smaller scale drawings in any of the divisions of the specifications or in any of the contract documents, such discrepancy shall be immediately submitted to the City for correction before proceeding with the work in question. In no case shall the Contractor make any alterations, erasures, changes or modifications in the drawings or specifications.
 - i. Should it appear that any of the work as specified or shown by the drawings is not sufficiently detailed or explained, the Contractor shall apply to the City for such further details or information as may be necessary for full understanding of the work in question.
 - ii. The data set forth in these specifications and indicated on the drawings are as accurate as can be obtained, but their extreme accuracy is not guaranteed. Final application thereto shall be determined on the job as conditions may demand and subject to the approval of the City.

D. Plans and Specifications Acknowledgment by Subcontractors and Suppliers

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- a. All Subcontractors and Suppliers must submit, through the General Contractor to the City's Engineer, a statement on their individual letterhead stationary, signed and sealed with their corporate seal, or a notarized statement on their letterhead stationery in the absence of a corporate seal, that the individual Subcontractor or Supplier:
 - i. Has received or reviewed a FULL set of approved plans and specifications for the project,
 - ii. Is aware that items concerning their particular trade may be shown and/or detailed in other trades or sections of the plans and specifications, and
 - iii. Will comply with said plans, specifications and all applicable codes and permit requirements.
- E. In the event a Subcontractor or Supplier notes a mistake or details appear incomplete, or if there are questions or concerns with the plans and specifications, the Subcontractor or Supplier will immediately notify the General Contractor. No work will proceed until such conflicts or questions are resolved in writing.
- F. The Subcontractor will not be permitted to start work, nor will any Shop drawings/submittals be accepted for review from a supplier until this letter of acknowledgment is received and approved by the General Contractor and City's Engineer. Also, the City will not process any pay request for the work of any Subcontractor or Supplier whose acknowledgment letter is not on file with the City.

1.7 REQUESTS FOR INTERPRETATION (RFIs)

A. Procedure

- a. Immediately on discovery of the need for interpretation of the Contract Documents, and if not possible to request interpretation at Project meeting, prepare and submit an RFI in the form specified.
 - i. RFIs shall originate with Contractor. RFIs submitted by entities other than Contractor will be returned with no response.
 - ii. Coordinate and submit RFIs in a prompt manner so as to avoid delays in Contractor's work or work of subcontractors.

B. Content of the RFI

- a. Include a detailed, legible description of item needing interpretation and the following:
 - i. City Project Number
 - ii. City Project Name.
 - iii. Date.

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- iv. Name of Contractor.
- v. RFI number, numbered sequentially.
- vi. Specification Section number and title and related paragraphs, as appropriate.
- vii. Drawing number and detail references, as appropriate.
- viii. Field dimensions and conditions, as appropriate.
- ix. Contractor's suggested solution(s). If Contractor's solution(s) impact the Contract Time or the Contract Sum, Contractor shall state impact in the RFI.
- x. Contractor's signature.
- xi. Attachments: Include drawings, descriptions, measurements, photos, Product Data, Shop Drawings, and other information necessary to fully describe items needing interpretation.
 - a. Supplementary drawings prepared by Contractor shall include dimensions, thicknesses, structural grid references, and details of affected materials, assemblies, and attachments.
- xii. Identify each page of attachments with the RFI number and sequential page number.

C. Software-Generated RFIs

- a. Software-generated form with substantially the same content as indicated above.
 - i. Word Template is available upon request from the City's Engineer's Office.
 - ii. Attachments shall be electronic files in Adobe Acrobat PDF format.

D. Engineer's Action. Engineer will review each RFI, determine action required, and return it. Allow seven working days for Engineer's response for each RFI. RFIs received after 1:00 p.m. will be considered as received the following working day.

- a. The following RFIs will be returned without action:
 - i. Requests for approval of submittals.
 - ii. Requests for approval of substitutions.
 - iii. Requests for coordination information already indicated in the Contract Documents.

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- iv. Requests for adjustments in the Contract Time or the Contract Sum.
 - v. Requests for interpretation of Engineer's actions on submittals.
 - vi. Incomplete RFIs or RFIs with numerous errors.
- b. Engineer's action may include a request for additional information, in which case Engineer's time for response will start again.
- c. Engineer's action on RFIs that may result in a change to the Contract Time or the Contract Sum may be eligible for Contractor to submit Change Proposal according to Division 01 Section "Contract Modification Procedures."
 - i. If Contractor believes the RFI response warrants change in the Contract Time or the Contract Sum, notify Engineer in writing within 10 days of receipt of the RFI response.
- E. On receipt of Engineer's action, update the RFI log and immediately distribute the RFI response to affected parties. Review response and notify Engineer within seven days if Contractor disagrees with response.
- F. RFI Log.
 - a. Prepare, maintain, and submit a tabular log of RFIs organized by the RFI number. Submit log bi-weekly. Include the following:
 - i. Project name.
 - ii. Name and address of Contractor.
 - iii. RFI number including RFIs that were dropped and not submitted.
 - iv. RFI description.
 - v. Date the RFI was submitted.
 - vi. Date Engineer's response was received.
 - vii. Identification of related Minor Change in the Work, Construction Change Directive, and Proposal Request, as appropriate.

PART 2 PRODUCTS (Not Applicable)**PART 3 EXECUTION (Not Applicable)****END OF SECTION**

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SECTION 01060 – REGULATORY REQUIREMENTS & PERMITS

PART 1 GENERAL

1.1 REQUIREMENTS INCLUDED

- A. CONTRACTOR shall comply with all building codes appropriate to the project, including those of:
 - a. National Electric Code.
 - b. Florida Building Code. (Latest Revision)
- B. CONTRACTOR shall comply with these codes, laws, regulations, rules, directives of all agencies, boards, districts, and governmental bodies having jurisdiction.
- C. CONTRACTOR shall obtain and pay the cost of all building permits, fees, tie-in or connection charges associated with the project.
- D. The CONTRACTOR shall obtain construction permits from Broward County Planning and Environmental Regulation Division license(s), Florida Department of Environmental Protection, Fort Lauderdale Building Department and file a NOI with FDEP for NPDES compliance. Fort Lauderdale Building Permit will be available for pickup by CONTRACTOR once Notice to Proceed has been granted.

1.2 RELATED REQUIREMENTS

- A. All applicable sections of the Specifications.
- B. Conditions of the Contract.

1.3 MEASUREMENT AND PAYMENT

- A. CONTRACTOR shall be reimbursed for permit fees as described in Section 01025.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION (Not Applicable)

END OF SECTION

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SECTION 01070 – ABBREVIATIONS OF INSTITUTIONS

PART 1 GENERAL

1.1 GENERAL

- A. Wherever in these Specifications references are made to the standards, specifications, or other published data of the various international, national, regional, or local organizations, such organizations may be referred to by their acronym or abbreviation only. As a guide to the user of these Specifications, the following acronyms or abbreviations, which may appear in these Specifications, shall have the meanings indicated herein.

1.2 ABBREVIATIONS

| | |
|--------|---|
| AAMA | Architectural Aluminum Manufacturer's Association |
| AAR | Association of American Railroads |
| AASHTO | American Association of State Highway and Transportation Officials |
| AATCC | American Association of Textile Chemists and Colorists |
| ACI | American Concrete Institute |
| AFBMA | Anti-Friction Bearing Manufacturer's Association, Inc. |
| AGA | American Gas Association |
| AGMA | American Gear Manufacturers Association |
| AHAM | Association of Home Appliance Manufacturers |
| AI | The Asphalt Institute |
| AIA | American Institute of Architects |
| AISC | American Institute of Steel Construction |
| AISI | American Iron and Steel Institute |
| AITC | American Institute of Timber Construction |
| AMCA | Air Moving and Conditioning Association |
| ANS | American Nuclear Society |
| ANSI | American National Standards Institute, Inc. |
| APA | American Plywood Association |
| API | American Petroleum Institute |
| APWA | American Public Works Association |
| ASA | American Standards Association |
| ASAE | American Society of Agricultural Engineers |
| ASCE | American Society of Civil Engineers |
| ASHRAE | American Society of Heating, Refrigerating, and Air Conditioning Engineers |
| ASLE | American Society of Lubricating Engineers |
| ASME | American Society of Mechanical Engineers |
| ASQC | American Society for Quality Control |
| ASSE | American Society of Sanitary Engineers |
| ASTM | American Society for Testing and Materials |
| AWPA | American Wood Preservers Association |
| AWPI | American Wood Preservers Institute |
| AWS | American Welding Society |
| AWWA | American Water Works Association |
| BBC | Basic Building Code, Building Officials & Code Administrators International |

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| | |
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| BCPERD | Broward County Planning and Environmental Regulation Division |
| BCHCED | Broward County Highway Construction and Engineering Division |
| BCHD | Broward County Health Department |
| BCTED | Broward County Traffic Engineering Division |
| BCWRMD | Broward County Water Resource Management Division |
| BCWWS | Broward County Water & Wastewater Services Division |
| BHMA | Builders Hardware Manufacturer's Association |
| CBM | Certified Ballast Manufacturers |
| CEMA | Conveyors Equipment Manufacturer's Association |
| CGA | Compressed Gas Association |
| CLFMI | Chain Link Fence Manufacturer's Institute |
| CMA | Concrete Masonry Association |
| CRSI | Concrete Reinforcing Steel Institute |
| DIPRA | Ductile Iron Pipe Research Association |
| EIA | Electronic Industries Association |
| ETL | Electrical Test Laboratories |
| EPA | Environmental Protection Agency |
| FBC | Florida Building Code |
| FDEP | Florida Department of Environmental Protection |
| FDOT | Florida Department of Transportation |
| FM | Factory Mutual System |
| FPL | Florida Power & Light |
| FS | Federal Specifications |
| HI | Hydraulics Institute |
| IAPMO | International Association of Plumbing and Mechanical Officials |
| ICBO | International Conference of Building Officials |
| IEEE | Institute of Electrical and Electronics Engineers |
| IES | Illuminating Engineering Society |
| IME | Institute of Makers of Explosives |
| IP | Institute of Petroleum (London) |
| IPC | Institute of Printed Circuits |
| IPCEA | Insulated Power Cable Engineers Association |
| ISA | Instrument Society of America |
| ISO | International Organization for Standardization |
| ITE | Institute of Traffic Engineers |
| MBMA | Metal Building Manufacturer's Association |
| MPTA | Mechanical Power Transmission Association |
| MSS | Manufacturers Standardization Society |
| MTI | Marine Testing Institute |
| NAAMM | National Association of Architectural Metal Manufacturer's |
| NACE | National Association of Corrosion Engineers |
| NBS | National Bureau of Standards |
| NCCLS | National Committee for Clinical Laboratory Standards |
| NEC | National Electrical Code |
| NEMA | National Electrical Manufacturer's Association |
| NFPA | National Fire Protection Association |
| NFPA | National Forest Products Association |
| NLGI | National Lubricating Grease Institute |
| NMA | National Microfilm Association |
| NSF | National Sanitation Foundation |
| NWMA | National Woodwork Manufacturers Association |

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| | |
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| OSHA | Occupational Safety and Health Administration |
| PCA | Portland Cement Association |
| PPI | Plastics Pipe Institute |
| RCRA | Resource Conservation and Recovery Act |
| RIS | Redwood Inspection Service |
| RVIA | Recreational Vehicle Industry Association |
| RWMA | Resistance Welder Manufacturer's Association |
| SAE | Society of Automotive Engineers |
| SAMA | Scientific Apparatus Makers Association |
| SB | Southern Bell |
| SFWMD | South Florida Water Management District |
| SMA | Screen Manufacturers Association |
| SMACCNA | Sheet Metal and Air Conditioning Contractors National Association |
| SPI | Society of the Plastics Industry, Inc. |
| SPIB | Southern Pine Inspection Bureau |
| SPR | Simplified Practice Recommendation |
| SSA | Swedish Standards Association |
| SSBC | Southern Standard Building Code, Southern Building Code Congress |
| SSPC | Steel Structures Painting Council |
| SSPWC | Standard Specifications for Public Works Construction |
| TAPPI | Technical Association of the Pulp and Paper Industry |
| TFI | The Fertilizer Institute |
| UL | Underwriters Laboratories, Inc. |
| WCLIB | West Coast Lumber Inspection Bureau |
| WCRSI | Western Concrete Reinforcing Steel Institute |
| WEF | Water Environment Federation |
| WIC | Woodwork Institute of California |
| WRI | Wire Reinforcement Institute, Inc. |
| WWPA | Western Wood Products Association |

PART 2 PRODUCTS (Not Applicable)**PART 3 EXECUTION (Not Applicable)****END OF SECTION**

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SECTION 01090 – REFERENCE STANDARDS

PART 1 GENERAL

1.1 GENERAL

A. Titles of Sections and Paragraphs

- a. Captions accompanying specification sections and paragraphs are for convenience of reference only, and do not form a part of the Specifications.

B. Applicable Publications

- a. Whenever in these Specifications references are made to published specifications, codes, standards, or other requirements, it shall be understood that wherever no date is specified, only the latest specifications, standards, or requirements of the respective issuing agencies which have been published as of the date that the WORK is advertised for bids, shall apply; except to the extent that said standards or requirements may be in conflict with applicable laws, ordinances, or governing codes. No requirements set forth herein or shown on the Drawings shall be waived because of any provision of, or omission from, said standards or requirements.

C. Specialists, Assignments

- a. In certain instances, specification text requires (or implies) that specific work is to be assigned to specialists or expert entities, who must be engaged for the performance of that work. Such assignments shall be recognized as special requirements over which the CONTRACTOR has no choice or option. These requirements shall not be interpreted so as to conflict with the enforcement of building codes and similar regulations governing the WORK; also they are not intended to interfere with local union jurisdiction settlements and similar conventions. Such assignments are intended to establish which party or entity involved in a specific unit of work is recognized as "expert" for the indicated construction processes or operations. Nevertheless, the final responsibility for fulfillment of the entire set of contract requirements remains with the CONTRACTOR.

1.2 REFERENCE SPECIFICATIONS, CODES, AND STANDARDS

- A. Without limiting the generality of other requirements of the Specifications, all work specified herein shall conform to or exceed the requirements of applicable codes and the applicable requirements of the following documents.
- B. References herein to "Building Code" shall mean "Florida Building Code". References to "Mechanical Code" or "Uniform Mechanical Code," "Plumbing Code" or "Uniform Plumbing Code," "Fire Code" or "Uniform Fire Code," shall mean Uniform Mechanical Code, Uniform Plumbing Code and Uniform Fire Code of the International Conference of the Building Officials (ICBO). "Electric Code" or "National Electric Code (NEC)" shall mean the National Electric Code of the National Fire Protection

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Association (NFPA). The latest edition of the codes as approved by the Municipal Code and used by the local agency as of the date that the WORK is advertised for bids, as adopted by the agency having jurisdiction, shall apply to the WORK herein, including all addenda, modifications, amendments, or other lawful changes thereto.

- C. In case of conflict between codes, reference standards, drawings and the other Contract Documents, the most stringent requirements shall govern. All conflicts shall be brought to the attention of the ENGINEER for clarification and directions prior to ordering or providing any materials or furnishing labor. The CONTRACTOR shall bid for the most stringent requirements.
- D. The CONTRACTOR shall construct the WORK specified herein in accordance with the requirements of the Contract Documents and the referenced portions of those referenced codes, standards, and specifications listed herein.
- E. References herein to "OSHA Regulations for Construction" shall mean Title 29, Part 1926, Construction Safety and Health Regulations, Code of Federal Regulations (OSHA), including all changes and amendments thereto.
- F. References herein to "OSHA Standards" shall mean Title 29, Part 1910, Occupational Safety and Health Standards, Code of Federal Regulations (OSHA), including all changes and amendments thereto.

1.3 SPECIFICATION FORMATS AND CONVENTIONS

- A. Specification Format. The Specifications are organized into Divisions and Sections using the CSI/CSC's "MasterFormat" numbering system.
 - a. Section Identification
 - i. The Specifications use Section numbers and titles to help cross-referencing in the Contract Documents. Sections in the Project Manual are in numeric sequence; however, the sequence is incomplete because all available Section numbers are not used. Consult the table of contents at the beginning of the Project Manual to determine numbers and names of Sections in the Contract Documents.
 - b. Division 01
 - i. Sections in Division 01 govern the execution of the Work of all Sections in the Specifications.
- B. Specification Content
 - a. The Specifications use certain conventions for the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows:
 - i. Abbreviated Language: Language used in the Specifications and other Contract Documents is abbreviated. Words and meanings shall be interpreted as appropriate. Words implied, but not stated, shall be

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inferred as the sense requires. Singular words shall be interpreted as plural and plural words shall be interpreted as singular where applicable as the context of the Contract Documents indicates.

- ii. Imperative mood and streamlined language are generally used in the Specifications. Requirements expressed in the imperative mood are to be performed by Contractor. Occasionally, the indicative or subjunctive mood may be used in the Section Text for clarity to describe responsibilities that must be fulfilled indirectly by Contractor or by others when so noted.
 - a. The words "shall," "shall be," or "shall comply with," depending on the context, are implied where a colon (:) is used within a sentence or phrase.

1.4 REGULATIONS RELATED TO HAZARDOUS MATERIALS

- A. The CONTRACTOR is responsible that all work included in the Contract Documents, regardless if shown or not, shall comply with all EPA, OSHA, RCRA, NFPA, and any other Federal, State, and Local Regulations governing the storage and conveyance of hazardous materials, including petroleum products.
- B. Where no specific regulations exist, all chemical, hazardous, and petroleum product piping and storage in underground locations must be installed with double containment piping and tanks, or in separate concrete trenches and vaults, or with an approved lining which cannot be penetrated by the chemicals, unless waived in writing by the OWNER.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION (Not Applicable)

END OF SECTION

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SECTION 01152 – APPLICATIONS FOR PAYMENT

PART 1 GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section specifies administrative and procedural requirements necessary to prepare and process Applications for Payment.
- B. Related Sections include the following:
 - a. Division 01 Section "Alteration Project Procedures" for administrative procedures for handling changes to the Contract.
 - b. Division 01 Section "Measurement and Payment" for administrative requirements governing use of unit prices.
 - c. Division 01 Section "Construction Progress Documentation" for administrative requirements governing preparation and submittal of Contractor's Construction Schedule and Submittals Schedule.

1.3 DEFINITIONS

- A. Schedule of Values. A statement furnished by Contractor allocating portions of the Contract Sum to various portions of the Work and used as the basis for reviewing Contractor's Applications for Payment.
 - a. Provide a breakdown of the Contract Sum in enough detail to facilitate continued evaluation of Applications for Payment and progress reports. Coordinate with the Project Manual table of contents. Provide several line items for principal subcontract amounts, where appropriate.
 - b. Round amounts to nearest whole dollar; total shall equal the Contract Sum.
 - c. Provide a separate line item in the Schedule of Values for each part of the Work where Applications for Payment may include materials or equipment purchased or fabricated and stored, but not yet installed.
 - i. Differentiate between items stored on-site and items stored off-site. For items stored off-site include evidence of insurance or bonded warehousing.
 - d. Provide separate line items in the Schedule of Values for initial cost of materials, for each subsequent stage of completion, and for total installed value of that part of the Work.

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- e. Allowances: Provide a separate line item in the Schedule of Values for each allowance. Show line-item value of unit-cost allowances, as a product of the unit cost, multiplied by measured quantity. Use information indicated in the Contract Documents to determine quantities.
- f. Each item in the Schedule of Values and Applications for Payment shall be complete. Include total cost and proportionate share of general overhead and profit for each item.
- g. Temporary facilities and other major cost items that are not direct cost of actual work-in-place may be shown either as separate line items in the Schedule of Values or distributed as General Condition's expense, at Contractor's option.
- h. Schedule Updating. Update and resubmit the Schedule of Values before the next Applications for Payment when Change Orders or Construction Change Directives result in a change in the Contract Sum.

1.5 APPLICATIONS FOR PAYMENT

- A. The General Contractor must meet with the City Representative on or about the 25th of each month. The City Representative will go over the pay items and agree on the quantities and the dollar amounts of the work completed during the month. A copy of the agreed amounts will be signed by the parties and a copy will be left with each representative.
- B. The General Contractor will make up a partial pay request using the City-supplied forms and submit the request to the City Representative before the first of the upcoming month.
- C. Each pay request must be accompanied by an update construction schedule.
- D. Each pay request must be accompanied by a partial release of lien by the General Contractor and by all Subcontractors, suppliers, and for all labor, as outlined below.
 - a. Starting with the second (2nd) pay request and for each and every pay request thereafter, the General Contractor shall submit partial release of liens from all Subcontractors, suppliers, and laborers covering the preceding month's request (SEE FOLLOWING EXAMPLE).
 - b. EXAMPLE:
 - i. In the first (1st) pay request, payment is requested by General Contractor for the asbestos contractor and the electrician. The General Contractor must attach his partial release of lien.
 - ii. For the second (2nd) pay request, the General Contractor must attach his partial release of lien from the asbestos contractor and the electrician for the amounts billed in the 1st pay request; i.e., the General Contractor will be running one (1) month behind with the releases from the Subcontractors, suppliers, etc., until the final pay

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request.

- E. For each payment application requesting payment for undergrounding allowance for undergrounding work for overhead utilities, written authorization of payment from each utility being requested must be received with payment application.
- F. For the final pay request, the General Contractor will be required to submit FINAL release of liens for ALL Subcontractors, suppliers, etc., and for ALL labor BEFORE FINAL PAYMENT WILL BE MADE.
- G. No partial payments, after the first payment, will be made until all partial release of liens are submitted for the preceding month's billing, as described
- H. Each Application for Payment shall be consistent with previous applications and payments as certified by and paid for by City.
- I. Payment Application Forms: Use City Form "PERIODIC ESTIMATE FOR PARTIAL PAYMENT" as form for Applications for Payment.
 - a. Application Preparation. Complete every entry on form. Notarize and execute by a person authorized to sign legal documents on behalf of Contractor. City will return incomplete applications without action.
 - b. Entries shall match data on the Schedule of Values and Contractor's Construction Schedule. Use updated schedules if revisions were made.
 - c. Include amounts of Change Orders and Construction Change Directives issued before last day of construction period covered by application.
- J. Release of Lien. With each Application for Payment, submit release of lien from every entity who is lawfully entitled to file a mechanic's lien arising out of the Contract and related to the Work covered by the payment.
 - a. Submit partial release of lien on each item for amount requested in previous application, after deduction for retainage, on each item.
 - b. When an application shows completion of an item, submit final release of lien.
 - c. City reserves the right to designate which entities involved in the Work must submit release of lien forms.
- K. Initial Application for Payment. Administrative actions and submittals that must precede or coincide with submittal of first Application for Payment include the following:
 - a. List of subcontractors.
 - b. Schedule of Values.
 - c. Contractor's Construction Schedule (preliminary if not final).
 - d. Products list.

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- e. Submittals Schedule (preliminary if not final).
- f. List of Contractor's staff assignments.
- g. Copies of building permits.
- h. Copies of authorizations and licenses from authorities having jurisdiction for performance of the Work.
- i. Initial progress report.
- j. Report of preconstruction conference.
- L. Final Payment Application. Submit final Application for Payment with releases and supporting documentation not previously submitted and accepted, including, but not limited, to the following:
 - a. Evidence of completion of Project closeout requirements.
 - b. Insurance certificates for products and completed operations where required and proof that taxes, fees, and similar obligations were paid.
 - c. Updated final statement, accounting for final changes to the Contract Sum.
 - d. Evidence that claims have been settled.
 - e. Final liquidated damages settlement statement.

PART 2 PRODUCTS (Not Applicable)**PART 3 EXECUTION (Not Applicable)****END OF SECTION**

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SECTION 01200 – PROJECT MEETINGS

PART 1 GENERAL

1.1 REQUIREMENTS INCLUDED

- A. Contractor shall schedule and administer a preconstruction meeting, progress meetings at a minimum of every two weeks on a day established by the CITY's Representative and specially called meetings throughout progress of the work.
 - a. Prepare agenda for meetings.
 - b. Distribute written notice of each meeting five (5) days in advance of meeting date.
 - c. Make physical arrangements for meetings.
 - d. Preside at meetings.
 - e. Record the minutes; include significant proceedings and decisions.
 - f. Reproduce and distribute copies of minutes within three days after each meeting.
 - i. To participants in the meeting.
 - ii. To parties affected by decisions made at the meeting.
 - iii. Furnish three copies of minutes to CITY's Representative.
- B. Representative of CONTRACTOR, subcontractor and suppliers attending meetings shall be qualified and authorized to act on behalf of the entity each represents.
- C. ENGINEER shall attend all meetings.

1.2 RELATED REQUIREMENTS

- A. All applicable sections of the Specifications.
- B. Conditions of the Contract.

1.3 PRE-CONSTRUCTION MEETING

- A. Schedule after date of Notice to Proceed.
- B. Location. A central site, convenient for all parties, designated by CITY's Representative.
- C. Attendance:
 - a. The CONTRACTOR and its superintendent.

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- b. CITY'S ENGINEER and CITY'S ENGINEER'S professional consultants.
 - c. Resident Project Representative.
 - d. Representatives of the OWNER.
 - e. Major subcontractors.
 - f. Major Suppliers.
 - g. Governmental representatives as appropriate.
 - h. Others as requested by CONTRACTOR, CITY or CITY'S ENGINEER.
- D. Suggested Agenda:
- a. Distribution and discussion of:
 - i. List of major subcontractors and suppliers.
 - ii. Projected Construction Schedules.
 - iii. Shop drawings and other submittals.
 - iv. Traffic maintenance plan.
 - v. Community Public Relations.
 - b. Critical work sequencing.
 - c. Procurement of major equipment and materials requiring a long lead time.
 - d. Project Coordination
 - i. Designation of responsible personnel.
 - e. Procedures and processing of:
 - i. Field decisions.
 - ii. Proposal requests.
 - iii. Submittals.
 - iv. Change Orders.
 - v. Applications for Payment
 - f. Adequacy of distribution of Contract Documents.
 - g. Procedures for maintaining Record Documents.

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- h. Use of premises:
 - i. Office, work and storage areas.
 - ii. CITY's requirements.
- i. Construction facilities, controls and construction aids.
- j. Temporary utilities.
- k. Safety procedures.
- l. Security procedures.
- m. Housekeeping procedures.

1.4 PROGRESS MEETINGS

- A. Contractor shall schedule regular biweekly meetings on a day established by the CITY's Representative as required.
- B. Hold called meetings as required by progress of the work.
- C. Location of the meetings. Project field office of CITY's Representative.
- D. Attendance:
 - a. CITY's Representative and CITY's professional consultants as needed.
 - b. ENGINEER.
 - c. Subcontractors as active on the site.
 - d. Suppliers as appropriate to the agenda.
 - e. Governmental representatives as appropriate.
 - f. Others, as requested by CONTRACTOR, CITY or CITY'S ENGINEER.
- E. Suggested Agenda:
 - a. Review, approval of minutes of previous meeting.
 - b. Review of work progress since previous meeting.
 - c. Field observations, problems, and conflicts.
 - d. Problems, which impeded Construction Schedule.
 - e. Review of off-site fabrication, delivery schedules.

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- f. Corrective measures and procedures to regain projected schedule.
- g. Revisions to Construction Schedule.
- h. Progress, schedule, during succeeding work period.
- i. Coordination of schedules.
- j. Community Public Relations.
- k. Review submittal schedules; expedite as required.
- l. Maintenance of quality standards.
- m. Pending changes and substitutions.
- n. Review proposed changes for:
 - i. Effect on Construction Schedule and on completion date.
 - ii. Effect on other contracts of the Project.
- o. Other business.

PART 2 PRODUCTS (Not Applicable)**PART 3 EXECUTION (Not Applicable)****END OF SECTION**

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SECTION 01311 – CONSTRUCTION PROGRESS DOCUMENTATION

PART 1 GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes administrative and procedural requirements for documenting the progress of construction during performance of the Work, including the following:
 - a. Preliminary Construction Schedule.
 - b. Contractor's Construction Schedule.
 - c. Submittals Schedule.
 - d. Daily construction reports.
 - e. Material location reports.
 - f. Field condition reports.
 - g. Special reports.
- B. Related Sections include the following:
 - a. Section 01152 – Applications for Payment
 - b. Section 01050 – Project Management
 - c. Section 01340 – Submittal Procedures
 - d. Section 01311 – Construction Photographs
 - e. Section 01400 – Quality Control

1.3 DEFINITIONS

- A. Activity. A discrete part of a project that can be identified for planning, scheduling, monitoring, and controlling the construction project. Activities included in a construction schedule consume time and resources.
 - a. Critical activities are activities on the critical path. They must start and finish on the planned early start and finish times.

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- b. Predecessor Activity. An activity that precedes another activity in the network.
- c. Successor Activity. An activity that follows another activity in the network.
- B. CPM. Critical path method, which is a method of planning and scheduling a construction project where activities are arranged based on activity relationships. Network calculations determine when activities can be performed and the critical path of Project.
- C. Critical Path. The longest connected chain of interdependent activities through the network schedule that establishes the minimum overall Project duration and contains no float.
- D. Event. The starting or ending point of an activity.
- E. Float. The measure of leeway in starting and completing an activity.
 - a. Float time is not for the exclusive use or benefit of either City or Contractor, but is a jointly owned, expiring Project resource available to both parties as needed to meet schedule milestones and Contract completion date.
 - b. Free float is the amount of time an activity can be delayed without adversely affecting the early start of the successor activity.
 - c. Total float is the measure of leeway in starting or completing an activity without adversely affecting the planned Project completion date.
- F. Fragnet. A partial or fragmentary network that breaks down activities into smaller activities for greater detail.
- G. Milestone. A key or critical point in time for reference or measurement.
- H. Network Diagram. A graphic diagram of a network schedule, showing activities and activity relationships.
- I. Resource Loading. The allocation of manpower and equipment necessary for the completion of an activity as scheduled.

1.4 SUBMITTALS

- A. Submittals Schedule. Submit three copies of schedule. Arrange the following information in a tabular format:
 - a. Scheduled date for first submittal.
 - b. Specification Section number and title.
 - c. Submittal category (action or informational).
 - d. Name of subcontractor.

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- e. Description of the Work covered.
- f. Scheduled date for Engineer's final release or approval.
- B. Preliminary Construction Schedule. Submit three opaque copies.
 - a. Approval of cost-loaded preliminary construction schedule will not constitute approval of Schedule of Values for cost-loaded activities.
- C. Preliminary Network Diagram. Submit three opaque copies, large enough to show entire network for entire construction period. Show logic ties for activities.
- D. Contractor's Construction Schedule. Submit three opaque copies of initial schedule, large enough to show entire schedule for entire construction period.
- E. CPM Reports. Concurrent with CPM schedule, submit three copies of each of the following computer-generated reports. Format for each activity in reports shall contain activity number, activity description, cost and resource loading, original duration, remaining duration, early start date, early finish date, late start date, late finish date, and total float in calendar days.
 - a. Activity Report. List of all activities sorted by activity number and then early start date, or actual start date if known.
 - b. Logic Report. List of preceding and succeeding activities for all activities, sorted in ascending order by activity number and then early start date, or actual start date if known.
 - c. Total Float Report. List of all activities sorted in ascending order of total float.
- F. Daily Construction Reports. Submit two copies at monthly intervals.
- G. Material Location Reports. Submit two copies at monthly intervals.
- H. Field Condition Reports. Submit two copies at time of discovery of differing conditions.
- I. Special Reports. Submit two copies at time of unusual event.

1.5 COORDINATION

- A. Coordinate Contractor's Construction Schedule with the Schedule of Values, list of subcontracts, Submittals Schedule, progress reports, payment requests, and other required schedules and reports.
 - a. Secure time commitments for performing critical elements of the Work from parties involved.
 - b. Coordinate each construction activity in the network with other activities and schedule them in proper sequence.

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2.1 SUBMITTALS SCHEDULE

- A. Preparation. Submit a schedule of submittals, arranged in chronological order by dates required by construction schedule. Include time required for review, resubmittal, ordering, manufacturing, fabrication, and delivery when establishing dates.
- a. Coordinate Submittals Schedule with list of subcontracts, the Schedule of Values, and Contractor's Construction Schedule.
- b. Initial Submittal. Submit concurrently with preliminary bar-chart schedule. Include submittals required during the first 20 days of construction. List those required to maintain orderly progress of the Work and those required early because of long lead time for manufacture or fabrication.
- i. At Contractor's option, show submittals on the Preliminary Construction Schedule, instead of tabulating them separately.
- c. Final Submittal. Submit concurrently with the first complete submittal of Contractor's Construction Schedule.

2.2 CONTRACTOR'S CONSTRUCTION SCHEDULE, GENERAL

- A. Procedures. Comply with procedures contained in AGC's "Construction Planning & Scheduling."
- B. Time Frame. Extend schedule from date established for the Notice to Proceed to date of Final Completion.
- C. Contract completion date shall not be changed by submission of a schedule that shows an early completion date, unless specifically authorized by Change Order.
- a. Activities. Treat each story or separate area as a separate numbered activity for each principal element of the Work. Comply with the following: The schedule shall clearly indicate the critical path and all activities associated with it. The dependencies shall be clearly delineated.
- b. All activities with a time duration exceeding five (5) days shall be shown as separate items.
- c. Include procurement process activities for the following long lead items and major items as separate activities in schedule. Procurement cycle activities include, but are not limited to, submittals, approvals, purchasing, fabrication, and delivery.
- d. Include review and resubmittal times indicated in Division 1 Section "Submittal Procedures" in schedule. Coordinate submittal review times in Contractor's Construction Schedule with Submittals Schedule.
- e. Where materials require more than one (1) week fabrication or order time, this order/fabrication time shall be shown.

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- D. Constraints. Include constraints and work restrictions indicated in the Contract Documents and as follows in schedule, and show how the sequence of the Work is affected.
- a. City-Furnished Products. Include a separate activity for each product. Include delivery date indicated in Division 01 Section "Summary." Delivery dates indicated stipulate the earliest possible delivery date.
 - b. Work Restrictions. Show the effect of the following items on the schedule:
 - i. Use of premises restrictions.
 - ii. Environmental control.
 - c. Work Stages. Indicate important stages of construction for each major portion of the Work, including, but not limited to, the following:
 - i. Subcontract awards.
 - ii. Submittals.
 - iii. Purchases.
 - iv. Fabrication.
 - v. Sample testing.
 - vi. Deliveries.
 - vii. Installation.
 - viii. Tests and inspections.
 - ix. Adjusting.
 - x. Curing.
- E. Milestones. Include milestones indicated in the Contract Documents in schedule, including, but not limited to, the Notice to Proceed, Substantial Completion, Final Completion, and Certificate of Occupancy.
- F. Contract Modifications. For each proposed contract modification and concurrent with its submission, prepare a time-impact analysis using fragnets to demonstrate the effect of the proposed change on the overall project schedule.
- G. Computer Software. Prepare schedules using a program that has been developed specifically to manage construction schedules.
- a. Microsoft Project 2000 or Oracle Primavera .

2.3 CONTRACTOR'S CONSTRUCTION SCHEDULE (GANTT CHART)

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- A. Gantt-Chart Schedule. Submit a comprehensive, fully developed, horizontal Gantt-chart-type, Contractor's Construction Schedule within 10 days of date established for the Notice to Proceed. Base schedule on the Preliminary Construction Schedule and whatever updating and feedback was received since the start of Project.
- B. Preparation. Indicate each significant construction activity separately. Identify first workday of each week with a continuous vertical line.

2.4 REPORTS

- A. Daily Construction Reports. Prepare a daily construction report recording the following information concerning events at Project site:
 - a. List of subcontractors at Project site.
 - b. List of separate contractors at Project site.
 - c. Approximate count of personnel at Project site.
 - d. Equipment at Project site.
 - e. Material deliveries.
 - f. High and low temperatures and general weather conditions.
 - g. Accidents.
 - h. Meetings and significant decisions.
 - i. Unusual events (refer to special reports).
 - j. Stoppages, delays, shortages, and losses.
 - k. Emergency procedures.
 - l. Orders and requests of authorities having jurisdiction.
 - m. Change Orders received and implemented.
 - n. Construction Change Directives received and implemented.
 - o. Services connected and disconnected.
 - p. Equipment or system tests and startups.
 - q. Partial Completions and occupancies.
 - r. Substantial Completions authorized.

- B. Material Location Reports. At weekly intervals, prepare and

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submit a comprehensive list of materials delivered to and stored at Project site. List shall be cumulative, showing materials previously reported plus items recently delivered. Include with list a statement of progress on and delivery dates for materials or items of equipment fabricated or stored away from Project site.

- C. Field Condition Reports. Immediately on discovery of a difference between field conditions and the Contract Documents, prepare and submit a detailed report. Submit with a request for interpretation. Include a detailed description of the differing conditions, together with recommendations for changing the Contract Documents.

2.5 SPECIAL REPORTS

- A. General. Submit special reports directly to City within one day of an occurrence. Distribute copies of report to parties affected by the occurrence.
- B. Reporting Unusual Events. When an event of an unusual and significant nature occurs at Project site, whether or not related directly to the Work, prepare and submit a special report. List chain of events, persons participating, response by Contractor's personnel, evaluation of results or effects, and similar pertinent information. Advise City in advance when these events are known or predictable.

PART 3 EXECUTION

3.1 CONTRACTOR'S CONSTRUCTION SCHEDULE

- A. Contractor's Construction Schedule Updating. At monthly intervals, update schedule to reflect actual construction progress and activities. Issue schedule one week before each regularly scheduled progress meeting.
- a. Revise schedule immediately after each meeting or other activity where revisions have been recognized or made. Issue updated schedule concurrently with the report of each such meeting.
 - b. Include a report with updated schedule that indicates every change, including, but not limited to, changes in logic, durations, actual starts and finishes, and activity durations.
 - c. As the Work progresses, indicate Actual Completion percentage for each activity.
- B. Distribution. Distribute copies of approved schedule to Engineer, City Representative, separate contractors, testing and inspecting agencies, and other parties identified by Contractor with a need-to-know schedule responsibility.
- a. Post copies in Project meeting rooms and temporary field offices.
 - b. When revisions are made, distribute updated schedules to the same parties and post in the same locations. Delete parties from distribution when they have completed their assigned portion of the Work and are no longer involved in performance of construction activities.

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END OF SECTION

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SECTION 01312 - FIELD ENGINEERING

PART 1 GENERAL

1.1 REQUIREMENTS INCLUDED

- A. CONTRACTOR shall provide and pay for field Engineering and Survey services required for the project.
- B. CITY PROJECT MANAGER will identify existing control points and property line corner stakes indicated on the DRAWINGS, as required.

1.2 QUALIFICATIONS OF SURVEYOR

- A. Qualified Registered Professional Surveyor & Mapper, acceptable to CITY PROJECT MANAGER.

1.3 SURVEY REFERENCE POINTS

- A. CITY PROJECT MANAGER will provide basic horizontal and vertical control points for the construction project including:
 - a. Permanent coordinate reference points with horizontal and vertical control, located and staked as shown on the plans.
- B. The CONTRACTOR shall locate and protect control points prior to starting site construction WORK, and preserve all permanent reference points during construction.
 - a. Make no changes or relocations without prior written notice to CITY PROJECT MANAGER.
 - b. Report to CITY PROJECT MANAGER when any reference point is lost or destroyed, or requires relocation because of necessary changes in grades or locations.
 - c. CONTRACTOR's surveyor shall replace project control points which may be lost or destroyed.
 - i. Establish replacements based on original survey control.

1.4 PROJECT SURVEY REQUIREMENTS

- A. CONTRACTOR's surveyor shall establish a minimum of two permanent benchmarks on site, referenced to data established by survey control points.
- B. CONTRACTOR shall establish lines and levels, locate and lay out, prepare a HORIZONTAL AND VERTICAL CONTROL PLAN for the purpose of construction staking by instrumentation and similar appropriate means:
 - a. Stakes for grading and fill placement.

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- b. Controlling lines and levels as required.
- C. From time to time, verify layouts by same methods.
- D. Horizontal and vertical control plan shall be made available to CITY PROJECT MANAGER in ACAD 2017 format or most current release.
- E. Any plan released to the CONTRACTOR via electronic media is for as-built use only. They have not been geometrically calculated by a Surveyor. This applies to all aspects of the plans including, but not limited to, right-of-way, road utilities and drainage.

1.5 RECORDS

- A. Maintain a complete, accurate log of all control and survey WORK as it progresses.
- B. On completion of construction WORK, prepare a certified survey showing all dimensions, locations and elevations of project.

1.6 SUBMITTALS

- A. Submit name and address of Professional Surveyor & Mapper and Professional Engineer to CITY PROJECT MANAGER.
- B. On request of CITY PROJECT MANAGER, submit documentation to verify accuracy of field Engineering WORK.
- C. Submit certificate signed by Registered Engineer or Professional Surveyor & Mapper certifying that elevation and locations of WORK are in conformance, or non-conformance, with Contract Documents.

PART 2 PRODUCTS (Not Applicable)**PART 3 EXECUTION (Not Applicable)****END OF SECTION**

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SECTION 01320 - PROJECT RECORD DOCUMENTS

PART 1 GENERAL

1.1 REQUIREMENTS INCLUDED

- A. Maintain at the site of the OWNER a record copy of:
 - a. DRAWINGS.
 - b. Specifications.
 - c. Addenda.
 - d. Change Orders and other modifications to the Contract.
 - e. Approved Shop DRAWINGS, Product Data and Samples.
 - f. Field Test Records.
 - g. Stormwater Pollution Prevention Plan (SWPPP)

1.2 MAINTENANCE OF DOCUMENTS AND SAMPLES

- A. Store documents and samples in CONTRACTOR's field office apart from documents used for construction:
 - a. Provide files and racks for storage of documents.
 - b. Provide locked cabinet or secure storage space for storage of samples.
- B. File documents and samples in accordance with CSI format.
- C. Maintain documents in a clean, dry, legible condition and in good order. Do not use record documents for construction purposes.
- D. Make documents and samples available at all times for inspection by OWNER and CITY PROJECT MANAGER.

1.3 MARKING DEVICES

- A. Provide felt tip marking pens for recording information in the color cod designated by CITY PROJECT MANAGER.

1.4 RECORDING

- A. Label each document, "PROJECT RECORD" in neat large printed letters, or by rubber stamp.
- B. Record information concurrently with construction progress. Do not conceal any WORK until required information is recorded.

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- C. DRAWINGS: Legibly mark to record actual construction: (hard copy and ACAD format)
 - a. Horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
 - b. Location of internal utilities and appurtenances concealed in the construction, referenced to visible and accessible features of the structure.
 - c. Field changes of dimension and detail.
 - d. Changes made by Field Order or by Change Order.
 - e. Details not on original Contract DRAWINGS.
- D. Specifications and Addenda; Legibly mark each Section to record:
 - a. Manufacturer, trade name, catalog number, and supplier of each produce and item of equipment actually installed.
 - b. Changes made by Field Order or by Change Order.

1.5 AS-BUILT AND RECORD DRAWINGS

- A. The term 'AS-BUILT DRAWING' refers to drawings signed and sealed by a Florida registered surveyor and mapper (PSM) provided by the CONTRACTOR. As-built information will be provided to the Engineer of Record who will prepare or have prepared record drawings based on as-built information provided by the PSM and from information provided by the engineer's staff.
- B. The as-built drawings cover sheet will be signed, sealed and dated by the PSM. The cover sheet will include the PSM's name, business name, PSM number, address and telephone number and contain the following statement:

"I hereby certify that the as-built location information of the potable water, reclaimed water, wastewater and drainage facilities shown on these drawings conforms to the minimum technical standards for land surveying in the State of Florida, Chapter 5J-17.050(10)(i) (Florida Administrative Code), as adopted by the Department of Agriculture and Consumer Services, Board of Professional Surveyors and Mappers, and that said as-builts are true and correct to the best of our knowledge and belief."
- C. As-builts will contain the information on the design drawings, plus the following additional requirements:
 - a. As-builts are to document changes between the design and construction. All information that is incorrect due to changes during construction will be corrected. Incorrect or no longer relevant information will be erased or struck through. Any facilities constructed in a horizontal or vertical location materially different (one-tenth foot horizontal, one-tenth foot vertical) than the design location will have their design location struck through and will be redrafted at the constructed location. Design drawing dimensioning to water and wastewater facilities will be corrected as necessary.

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- b. Drawings will be a complete set including cover sheet, index (if one was included in the approved design drawings) and any other sheets included in the approved design set. Standard detail sheets are not necessary.
- c. Drawings will include the MINIMUM AS-BUILT AND RECORD DRAWING CONTENTS described in the City of Fort Lauderdale minimum standards.
- D. The CONTRACTOR shall maintain full size (24"x36") field drawings to reflect the "as-built" items of WORK as the WORK progresses. Upon completion of the WORK, the CONTRACTOR shall prepare a record set of "AS-BUILT" DRAWINGS on full-size, reproducible material and an electronic file in .DWG format (AutoCAD, latest Version). One set of full size design DRAWINGS on reproducible material will be furnished to the CONTRACTOR by the design ENGINEER at the current square foot price. An electronic file of the design DRAWINGS on a compact disk will be furnished to the CONTRACTOR by the design ENGINEER at no additional cost (for as-built purposes only). No additional payment will be made for those "as-built" DRAWINGS.
- E. The cost of maintaining record changes, and preparation of the AS-BUILT DRAWINGS shall be included in the unit prices bid for the affected items. Upon completion of the WORK, the CONTRACTOR shall furnish the CITY PROJECT MANAGER the reproducible AS-BUILT DRAWINGS and electronic files. The completed AS-BUILT DRAWINGS shall be delivered to the CITY PROJECT MANAGER at least 48 hours prior to final inspection of the WORK. The Final Inspection will not be conducted unless the AS-BUILT DRAWINGS are in the possession of the CITY PROJECT MANAGER.
- F. The completed AS-BUILT DRAWINGS shall be certified by a Professional Surveyor and Mapper registered in the State of Florida. This certification shall consist of the surveyor's embossed seal bearing the registration number, the surveyor's signature and date on each sheet of the drawing set. In addition, the key sheet, cover sheet or first sheet of the plans set shall list the business address and telephone number of the surveyor. The final as-builts shall also be submitted using state plane coordinates. (NAVD 1988 for vertical; NAD '83 with '90 adjustment for horizontal).
- G. Representative items of WORK that should be shown on the record DRAWINGS as verified, changed or added are shown below:
 - a. Plans:
 - i. Structure types, location with grade of rim and flow-line elevations.
 - ii. Sewer type, length, size and elevations.
 - iii. Utility type, length, size and elevation in conflict structures.
 - iv. All maintenance access structures, valves and hydrants within right-of-way.
 - v. Spot (critical) elevations at plateaued intersections. (P.C., P.T., and mid point of all intersections, etc.)

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- vi. Sewer laterals shall be stationed between maintenance access structures.
- b. Pavement Marking and Signing Plans: Sign location where installed if different from plans.
- c. Water and Sewer Plans: Location (horizontal and vertical) of all pipe lines, structures, fittings, services, valves and appurtenances, and water main / sanitary sewer pipe crossings.
- H. The CONTRACTOR shall submit three sets of progress AS-BUILT DRAWINGS with each application for payment. These DRAWINGS shall accurately depict the WORK completed and for which payment is being requested.
- I. The term 'RECORD DRAWING' refers to the final drawing set signed and sealed by the Engineer of Record. The Engineer of Record will prepare or have prepared record drawings based on as-built information provided by a PSM and from information provided by the engineer's staff. The Engineer of Record shall retain the signed and sealed 'as-built' drawings provided by the PSM with the other project records for possible review by CITY upon request. RECORD DRAWING shall meet the requirements of the Contract Documents.
- J. AS-BUILT and RECORD DRAWINGS shall include the following contents at a minimum.
 - a. The amount of information required on as-built and record drawings will require the drawing author to organize its presentation in order to make the drawings readable. On occasion, it may be necessary to put water and wastewater information on separate sheets, and/or use a table to show coordinate information.
 - b. Show the location of easements used by the water and wastewater facilities.
 - c. Indicate pipe joint locations where water and wastewater or reclaimed water piping crosses.
 - d. Indicate the length of gravity wastewater piping and actual slope between manhole centers.
 - e. Show all abandoned in place facilities including the extent and method of abandonment.
 - f. Show elevations to the nearest tenth of a foot for:
 - i. Top of pipe for water mains, force mains and reclaimed water mains at vertical deflection points and every 200 feet along straight runs.
 - ii. Top of pipe of water or wastewater facilities where they cross all other facilities (drainage, telephone, cable TV, electric, etc.)
 - g. Show elevations to the nearest one hundredth of a foot for:
 - i. Manholes (MH) rims.

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- ii. Inverts of every gravity wastewater pipe and force main connections to MH.
- iii. Lift station top of slab, bottom of wet well, influent pipe invert and control set points.
- h. Coordinates will be provided for CITY maintained facilities, including:
 - i. Water mains, force mains and reclaimed water mains at deflection points and every 200 feet along straight runs.
 - ii. The center of each MH, fitting, valve, blow off, hydrant, water meter box, wastewater cleanout, lift station wetwell, double detector check or other non-pipe water or wastewater facility.
 - iii. The location of each connection to existing facilities.
 - iv. The corners (vertices) of all easements being granted to the CITY as a part of the project.
 - v. Other locations designated by CITY.
- i. Show the changed location of any non-water/wastewater features so they are at the visually correct location relative to CITY maintained facilities.
- j. Drawings shall include color photographs of all connections to existing CITY infrastructure as well as all critical utility crossings and where specifically required on the design drawings. The pictures will be taken with a GPS camera that automatically geotags the picture. A maximum of six photographs per sheet is acceptable. Each photograph shall have a minimum size of 8"x10". Photographs shall have a density of 3.0 megapixel or greater. Plot resolution is to be minimum 300 dots per inch. Photographs shall normally be taken from a point between four feet (4') and six feet (6') above the subject infrastructure and shall show good detail in both shadow and sunlit areas. Include a measuring device in the photo for scale and where applicable to indicate the depth or separation of the utilities. A symbol (i.e. an arrow) is to be used in the plan views indicating the location and direction of view for each photograph submitted. The symbol must include the photograph number. A caption under each photograph shall include the following information:
 - i. Photograph number
 - ii. Photograph description
 - iii. Date of photograph
 - iv. Location and direction of view (for example 201 NW 34 Street looking North)
 - v. State plane coordinates
 - vi. All photographs included in the drawings will also be provided to CITY in JPEG format on CD or DVD media. The CD or DVD will be labeled with the

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CITY project name and number. Individual photo files will be named using the same photograph number contained in the drawings.

- k. The size and material of the piping shall be verified by the survey crew at the time of as-built.
- l. As-builts of all drainage lines shall include the following information:
 - i. Rims, inverts, length of piping between structures, length of exfiltration trench, and weir elevations if applicable.
 - ii. The size and material of the piping shall be verified by the survey crew at the time of as-built.
- m. As-builts for the edge of pavement and sidewalk locations shall include horizontal locations and shall indicate all deviations from the design plans.
- n. All rock as-builts for parking lot, roadways and swales areas shall consist of the following:
 - i. Rock elevations at all high and low points, and at enough intermediate points to confirm slope consistency and every 50' for roadways.
 - ii. Rock as-builts shall be taken at all locations where there is a finish grade elevation shown on the design plans.
 - iii. All catch basin and maintenance access structure rim elevations shall be shown.
 - iv. Elevations around island areas will also be required.
 - v. As-builts shall be taken on all paved and unpaved swales prior to placement of asphalt and/or topsoil/sod, at enough intermediate points to confirm slope consistency and conformance to the plan details.
 - i. Note: Rock as-builts required prior to paving. Consultant shall review rock as-builts within five days of receipt.
- o. Lake and canal bank as-builts shall include a key sheet of the lake for the location of cross sections. Lake and canal bank cross sections shall be plotted at a minimum of every 100 lf, unless otherwise specified. As-builts shall consist of the location and elevation of the top of bank, edge of water and the deep cut line, with the distance between each shown on the drawing.
- p. Retention area as-built elevations shall be taken at the bottom of the retention area and at the top of bank. If there are contours indicated on the design plans, then they shall be as-built as well.
- q. If a change is made via field order or deviation to any structure, pipeline, etc., a new location shall be noted on the as-builts. The CITY PROJECT MANAGER may request additional as-built information to verify horizontal or vertical locations.

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1.6 SUBMITTAL

- A. Submittals of final AS-BUILT DRAWINGS shall be made at the completion of
- a. the water system;
 - b. the sewer system;
 - c. the entire project.

As-builts shall also be submitted with monthly pay requests. At Contract closeout, deliver all Record Documents to CITY PROJECT MANAGER, for presentation to the OWNER.

- B. A complete set of AS-BUILT DRAWINGS shall be prepared and delivered to the CITY PROJECT MANAGER. WORK shall be performed by a Registered Professional Surveyor and Mapper shall include, but not be limited to the following:
- a. Valve boxes, splice boxes, pull boxes, all underground utilities-waterlines, electrical runs, irrigation system, storm drainage pipe and structures, sanitary sewer lines and structures, finished necessary grades, benches, curbs, fences, walls, signs, light fixtures and other items as necessary in accordance with CITY Record Plan/As-built plan requirements.
- C. Accompany submittal with transmittal letter in duplicate, containing:
- a. Date.
 - b. Project title and number.
 - c. CONTRACTOR's name and address.
 - d. Title and number of each Record Document.
 - e. Signature of CONTRACTOR or authorized representative.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION (Not Applicable)

END OF SECTION

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SECTION 01340 – SUBMITTAL PROCEDURES

PART 1 GENERAL

1.3 RELATED DOCUMENTS

- E. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.4 SUMMARY

- A. This Section includes administrative and procedural requirements for submitting Shop Drawings, Product Data, Samples, and other submittals.
- B. Related Sections include the following:
 - a. Section 01152, Applications for Payment
 - b. Section 01050, Project Management
 - c. Section 01311, Construction Progress Documentation
 - d. Section 01340, Construction Photographs
 - e. Section 01400, Quality Control
 - f. Section 01700, Contract Closeout
 - g. Section 01720, Project Record Documents
 - h. Divisions 02 through 16 Sections for specific requirements for submittals in those Sections.

1.5 DEFINITIONS

- A. Action Submittals. Written and graphic information that requires Engineer's responsive action.
- B. Informational Submittals. Written information that does not require Engineer's responsive action. Submittals may be rejected for not complying with requirements.

1.6 SUBMITTAL PROCEDURES

- A. Coordination. Coordinate preparation and processing of submittals with performance of construction activities.
 - a. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
 - b. Coordinate transmittal of different types of submittals for related parts of the Work so processing will not be delayed because of need to review

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submittals concurrently for coordination.

- i. City reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.
- B. Submittals Schedule. Comply with requirements in Division 01 Section "Construction Progress Documentation" for list of submittals and time requirements for scheduled performance of related construction activities.
- C. Processing Time. Allow enough time for submittal review, including time for resubmittals, as follows. Time for review shall commence on Engineer's receipt of submittal. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing, including resubmittals.
 - a. Initial Review. Allow 10 days for initial review of each submittal. Allow additional time if coordination with subsequent submittals is required. Engineer will advise Contractor when a submittal being processed must be delayed for coordination.
 - b. Intermediate Review. If intermediate submittal is necessary, process it in same manner as initial submittal.
 - c. Resubmittal Review. Allow 10 days for review of each resubmittal.
- D. Identification. Place a permanent label or title block on each submittal for identification.
 - a. Indicate name of firm or entity that prepared each submittal on label or title block.
 - b. Provide a space approximately 6 by 8 inches (150 by 200 mm) on label or beside title block to record Contractor's review and approval markings and action taken by City.
 - c. Include the following information on label for processing and recording action taken:
 - i. Project name.
 - ii. Date
 - iii. Name and address of Contractor.
 - iv. Name and address of subcontractor.
 - v. Name and address of supplier.
 - vi. Name of manufacturer.
 - vii. Submittal number or other unique identifier, including revision identifier.
 - a. Submittal number shall use Specification Section number followed by a decimal point and then a sequential number (e.g.,

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061000.01). Resubmittals shall include an alphabetic suffix after another decimal point (e.g., 06100.01.A).

- viii. Number and title of appropriate Specification Section.
 - ix. Drawing number and detail references, as appropriate.
 - x. Location(s) where product is to be installed, as appropriate.
 - xi. General Contractor's stamp of approval must be on all submittals, indicating that the Contractor has reviewed and approved prior to submitting to the City.
- E. Deviations. Highlight, encircle, or otherwise specifically identify deviations from the Contract Documents on submittals.
- F. Additional Copies. Unless additional copies are required for final submittal, and unless Engineer observes noncompliance with provisions in the Contract Documents, initial submittal may serve as final submittal.
- G. Transmittal. Package each submittal individually and appropriately for transmittal and handling. Transmit each submittal using a transmittal form. Engineer will return submittals, without review, received from sources other than Contractor.
- a. Transmittal Form. Provide locations on form for the following information:
- i. Project name.
 - ii. Date.
 - iii. Destination (To:).
 - iv. Source (From:).
 - v. Names of subcontractor, manufacturer, and supplier.
 - vi. Category and type of submittal.
 - vii. Submittal purpose and description.
 - viii. Specification Section number and title.
 - ix. Drawing number and detail references, as appropriate.
 - x. Transmittal number, numbered consecutively.
 - xi. Remarks.
 - xii. Signature of transmitter.

- H. Resubmittals. Make resubmittals in same form and number of

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copies as initial submittal.

- a. Note date and content of previous submittal.
 - b. Note date and content of revision in label or title block and clearly indicate extent of revision.
 - c. Resubmit submittals until they are marked "Approved as submitted" or "Approved as noted".
-
- I. Distribution. Furnish copies of final submittals to manufacturers, subcontractors, suppliers, Fabricators, installers, authorities having jurisdiction, and others as necessary for performance of construction activities. Show distribution on transmittal forms.
 - J. Use for Construction. Use only final submittals with mark indicating "Approved as submitted" or "Approved as noted" by Engineer.

PART 2 PRODUCTS

2.1 ACTION SUBMITTALS

- A. General. Prepare and submit Action Submittals required by individual Specification Sections.
- B. Product Data. Collect information into a single submittal for each element of construction and type of product or equipment.
 - a. If information must be specially prepared for submittal because standard printed data are not suitable for use, submit as Shop Drawings, not as Product Data.
 - b. Mark each copy of each submittal to show which products and options are applicable.
 - c. Include the following information, as applicable:
 - i. Manufacturer's written recommendations.
 - ii. Manufacturer's product specifications.
 - iii. Manufacturer's installation instructions.
 - iv. Standard color charts.
 - v. Manufacturer's catalog cuts.
 - vi. Wiring diagrams showing factory-installed wiring.
 - vii. Printed performance curves.

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- viii. Operational range diagrams.
 - ix. Mill reports.
 - x. Standard product operation and maintenance manuals.
 - xi. Compliance with specified referenced standards.
 - xii. Testing by recognized testing agency.
 - xiii. Application of testing agency labels and seals.
 - xiv. Notation of coordination requirements.
 - d. Submit Product Data before or concurrent with Samples.
 - e. Number of Copies. Submit five copies of Product Data, unless otherwise indicated. Engineer will return two copies. Mark up and retain one returned copy as a Project Record Document.
- C. Shop Drawings. Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data.
- a. Preparation. Fully illustrate requirements in the Contract Documents. Include the following information, as applicable:
 - i. Dimensions.
 - ii. Identification of products.
 - iii. Fabrication and installation drawings.
 - iv. Roughing-in and setting diagrams.
 - v. Wiring diagrams showing field-installed wiring, including power, signal, and control wiring.
 - vi. Shopwork manufacturing instructions.
 - vii. Templates and patterns.
 - viii. Schedules.
 - ix. Design calculations.
 - x. Compliance with specified standards.
 - xi. Notation of coordination requirements.
 - xii. Notation of dimensions established by field measurement.

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- xiii. Relationship to adjoining construction clearly indicated.
 - xiv. Seal and signature of professional engineer if specified.
 - xv. Wiring Diagrams. Differentiate between manufacturer-installed and field-installed wiring.
- b. Sheet Size. Except for templates, patterns, and similar full-size drawings, submit Shop Drawings on sheets at least 8-1/2 by 11 inches (215 by 280 mm) but no larger than 24 by 36 inches (750 by 1000 mm).
- c. Number of Copies. Submit five opaque copies of each submittal. City will retain three copies; remainder will be returned.
- D. Samples. Submit Samples for review of kind, color, pattern, and texture for a check of these characteristics with other elements and for a comparison of these characteristics between submittal and actual component as delivered and installed.
- a. Transmit Samples that contain multiple, related components such as accessories together in one submittal package.
 - b. Identification. Attach label on unexposed side of Samples that includes the following:
 - i. Generic description of Sample.
 - ii. Product name and name of manufacturer.
 - iii. Sample source.
 - iv. Number and title of appropriate Specification Section.
 - c. Disposition. Maintain sets of approved Samples at Project site, available for quality-control comparisons throughout the course of construction activity. Sample sets may be used to determine final acceptance of construction associated with each set.
 - i. Samples that may be incorporated into the Work are indicated in individual Specification Sections. Such Samples must be in an undamaged condition at time of use.
 - ii. Samples not incorporated into the Work, or otherwise designated as City's property, are the property of Contractor.
 - d. Samples for Initial Selection. Submit manufacturer's color charts consisting of units or sections of units showing the full range of colors, textures, and patterns available.
 - i. Number of Samples. Submit two full set(s) of available choices where color, pattern, texture, or similar characteristics are required to be selected from manufacturer's product line. City will return submittal with

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options selected.

- e. Samples for Verification. Submit full-size units or Samples of size indicated, prepared from same material to be used for the Work, cured and finished in manner specified, and physically identical with material or product proposed for use, and that show full range of color and texture variations expected. Samples include, but are not limited to, the following: partial sections of manufactured or fabricated components; small cuts or containers of materials; complete units of repetitively used materials; swatches showing color, texture, and pattern; color range sets; and components used for independent testing and inspection.
- i. Number of Samples. Submit three sets of Samples. City will retain two Sample sets; remainder will be returned. Mark up and retain one returned Sample set as a Project Record Sample.
 - a. Submit a single Sample where assembly details, workmanship, fabrication techniques, connections, operation, and other similar characteristics are to be demonstrated.
 - b. If variation in color, pattern, texture, or other characteristic is inherent in material or product represented by a Sample, submit at least three sets of paired units that show approximate limits of variations.
- E. Product Schedule or List. As required in individual Specification Sections, prepare a written summary indicating types of products required for the Work and their intended location. Include the following information in tabular form:
 - a. Type of product. Include unique identifier for each product.
 - b. Number and name of room or space.
 - c. Location within room or space.
 - d. Number of Copies. Submit five copies of product schedule or list, unless otherwise indicated. City will return two copies.
 - i. Mark up and retain one returned copy as a Project Record Document.
- F. Contractor's Construction Schedule: Comply with requirements specified in Division 01 Section "Construction Progress Documentation" for Construction Manager's action.
- G. Submittals Schedule. Comply with requirements specified in Division 01 Section "Construction Progress Documentation."
- H. Application for Payment. Comply with requirements specified in Division 01 Section "Payment Procedures."
- I. Schedule of Values. Comply with requirements specified in Division 01 Section "Payment Procedures."

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- J. Subcontract List. Prepare a written summary identifying individuals or firms proposed for each portion of the Work, including those who are to furnish products or equipment fabricated to a special design. Include the following information in tabular form:
- a. Name, address, and telephone number of entity performing subcontract or supplying products.
 - b. Number of Copies. Submit four copies of subcontractor list, unless otherwise indicated. City will return two copies.
 - i. Mark up and retain one returned copy as a Project Record Document.

2.2 INFORMATIONAL SUBMITTALS

- A. General. Prepare and submit Informational Submittals required by other Specification Sections.
- a. Number of Copies. Submit two copies of each submittal, unless otherwise indicated. City will not return copies.
 - b. Certificates and Certifications. Provide a notarized statement that includes signature of entity responsible for preparing certification. Certificates and certifications shall be signed by an officer or other individual authorized to sign documents on behalf of that entity.
 - c. Test and Inspection Reports. Comply with requirements specified in Division 01 Section "Quality Requirements."
- B. Coordination Drawings. Comply with requirements specified in Division 01 Section "Project Management and Coordination."
- C. Contractor's Construction Schedule. Comply with requirements specified in Division 01 Section "Construction Progress Documentation."
- D. Installer Certificates. Prepare written statements on manufacturer's letterhead certifying that Installer complies with requirements in the Contract Documents and, where required, is authorized by manufacturer for this specific Project.
- E. Product Certificates. Prepare written statements on manufacturer's letterhead certifying that product complies with requirements in the Contract Documents.
- F. Material Certificates. Prepare written statements on manufacturer's letterhead certifying that material complies with requirements in the Contract Documents.
- G. Material Test Reports. Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements in the Contract Documents.
- H. Field Test Reports. Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of field tests performed either during installation of product or after product is installed in its final location, for

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compliance with requirements in the Contract Documents.

- I. Insurance Certificates and Bonds. Prepare written information indicating current status of insurance or bonding coverage. Include name of entity covered by insurance or bond, limits of coverage, amounts of deductibles, if any, and term of the coverage.
- J. Construction Photographs. Comply with requirements specified in Section 01380.

PART 3 EXECUTION

3.1 CONTRACTOR'S REVIEW

- A. Review each submittal and check for coordination with other Work of the Contract and for compliance with the Contract Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to Engineer.
- B. Approval Stamp. Stamp each submittal with a uniform, approval stamp. Include Project name and location, submittal number, Specification Section title and number, name of reviewer, date of Contractor's approval, and statement certifying that submittal has been reviewed, checked, and approved for compliance with the Contract Documents.

3.2 ENGINEER'S ACTION

- A. General. Engineer will not review submittals that do not bear Contractor's approval stamp and will return them without action.
- B. Action Submittals. Engineer will review each submittal, make marks to indicate corrections or modifications required, and return it. Engineer will stamp each submittal with an action stamp and will mark stamp appropriately to indicate action taken, as follows:
 - a. Approved as submitted
 - b. Approved as noted
 - c. Revise and resubmit
 - d. Rejected.
- C. Informational Submittals. Engineer will review each submittal and will not return it, or will return it if it does not comply with requirements. Engineer will forward each submittal to appropriate party.
- D. Partial submittals are not acceptable, will be considered nonresponsive, and will be returned without review.
- E. Submittals not required by the Contract Documents may not be reviewed and may be discarded.

END OF SECTION

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SECTION 01380 – CONSTRUCTION PHOTOGRAPHS

PART 1 GENERAL

1.1 GENERAL

- A. Employ competent photographer to take construction record photographs periodically, monthly at a minimum, during course of the work.

1.2 RELATED REQUIREMENTS

- A. Section 01010: Summary of Work.
- B. Section 01720: Project Record Documents.

1.3 PHOTOGRAPHY REQUIRED

- A. Provide photographs taken on cutoff date for each scheduled application for Payment.
- B. Provide photographs taken at each major stage of construction.
- C. Provide photographs taken of change order work.
- D. Provide five prints of each view.
- E. Negatives:
 - a. Remain property of photographer.
 - b. Require that photographer maintain negatives for a period of two years from Date of Substantial Completion of entire Project.
 - c. Photographer shall agree to furnish additional prints to OWNER and the ENGINEER at commercial rates applicable at time of purchase.

1.4 COSTS OF PHOTOGRAPHY

- A. CONTRACTOR shall pay costs for specified photography and prints.
 - a. Parties requiring additional photography or prints will pay photographer directly.

1.5 DIGITAL PHOTOGRAPHY

- A. At OWNER and ENGINEER's discretion, digital photography may be used for all construction photographs except aerial progress photographs.

PART 2 PRODUCTS

2.1 PRINTS

- A. Color:

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- a. Paper: Single weight, color print paper.
- b. Finish: Smooth surface, glossy.
- c. Size: 8-inch x 10-inch.
- B. Identify each print on back, listing:
 - a. Name of Project.
 - b. Specific Location.
 - c. Date and time of exposure.
 - d. Name and address of photographer.
 - e. Photographer's numbered identification of exposure.

PART 3 EXECUTION**3.1 TECHNIQUE**

- A. Factual presentation.
- B. Correct exposure and focus.
 - a. High resolution and sharpness.
 - b. Maximum depth-of-field.
 - c. Minimum distortion.

3.2 VIEWS REQUIRED

- A. Photograph from locations to adequately illustrate condition of construction and state of progress.
- B. Photographs shall include aerial photographs showing the entire construction area.

3.3 DELIVERY OF PRINTS

- A. Deliver prints to the ENGINEER to accompany each Application for Payment.
- B. Distribution of prints as soon as processed, is anticipated to be as follows:
 - a. OWNER (one set).
 - b. ENGINEER (two sets).
 - c. Project Record File (one set to be stored by

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CONTRACTOR).

d. CONTRACTOR (one set).

3.4 MEASUREMENT AND PAYMENT

- A. There shall be no special measurement or payment for the work under this section; it shall be included in the price of all other work.

END OF SECTION

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SECTION 01400 – QUALITY CONTROL

PART 1 GENERAL

1.1 DEFINITION

- A. Specific quality control requirements for the WORK are indicated throughout the Contract and Permit Documents. The requirements of this Section are primarily related to performance of the WORK beyond furnishing of manufactured products. The term "Quality Control" includes inspection, sampling and testing, and associated requirements.

1.2 INSPECTION AT PLACE OF MANUFACTURE

- A. Unless otherwise indicated, all products, materials, and equipment shall be subject to inspection by the ENGINEER at the place of manufacture.
- B. The presence of the ENGINEER at the place of manufacturer, however, shall not relieve the CONTRACTOR of the responsibility for furnishing products, materials, and equipment, which comply with all requirements of the Contract Documents. Compliance is a duty of the CONTRACTOR, and said duty shall not be avoided by any act or omission on the part of the ENGINEER.

1.3 SAMPLING AND TESTING

- A. Unless otherwise indicated, all sampling and testing shall be in accordance with the methods prescribed in the current standards of the ASTM, as applicable to the class and nature of the article or materials considered.
- B. Any waiver by the OWNER of any specific testing or other quality assurance measures, whether or not such waiver is accompanied by a guarantee of substantial performance as a relief from the specified testing or other quality assurance requirements as originally specified, and whether or not such guarantee is accompanied by a performance bond to assure execution of any necessary corrective or remedial WORK, shall not be construed as a waiver of any requirements of the Contract Documents.
- C. Notwithstanding the existence of such waiver, the ENGINEER reserves the right to make independent investigations and tests, and failure of any portion of the WORK to meet any of the requirements of the Contract Documents, shall be reasonable cause for the ENGINEER to require the removal or correction and reconstruction of any such work in accordance with the General Conditions.

1.4 INSPECTION AND TESTING LABORATORY SERVICE

- A. Inspection and testing laboratory service shall comply with the following:
 - a. CONTRACTOR shall appoint, employ, and pay for services of an independent firm to perform inspection and testing.
 - b. The independent testing firm will perform inspections, testings and other services specified in individual specification sections and as required by the ENGINEER or OWNER.

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- c. Reports will be submitted to the ENGINEER in duplicate, indicating observations and results of tests and indicating compliance or non-compliance with Contract Documents.
- d. The CONTRACTOR shall cooperate with the OWNER and independent testing firm and furnish samples of materials, design mix, equipment, tools, storage and assistance as requested.
- e. The CONTRACTOR shall notify ENGINEER and any applicable permitting agencies 48 hours prior to the expected time for operations requiring inspection and laboratory testing services, so they can be present at the time of testing
- f. Retesting required because of non-conformance to specified requirements shall be performed by the same independent firm on instructions by the ENGINEER. The CONTRACTOR shall bear all costs from such retesting at no additional cost to the OWNER.
- g. For samples and tests required for CONTRACTOR'S use, the CONTRACTOR shall make arrangements with an independent firm for payment and scheduling of testing. The cost of all sampling and testing shall be included in the Contract Price.
- h. CONTRACTOR shall bear all costs incurred should the materials for testing not be ready for testing at time specified/scheduled by CONTRACTOR for test.

PART 2 PRODUCTS (Not Applicable)**PART 3 EXECUTION****3.1 INSTALLATION**

- A. Inspection. The CONTRACTOR shall inspect materials or equipment upon the arrival on the job site and immediately prior to installation, and reject damaged and defective items.
- B. Measurements. The CONTRACTOR shall verify measurements and dimensions of the WORK, as an integral step of starting each installation.
- C. Manufacturer's Instructions. Where installations include manufactured products, the CONTRACTOR shall comply with manufacturer's applicable instructions and recommendations for installation, to whatever extent these are more explicit or more stringent than applicable requirements indicated in Contract Documents.

END OF SECTION

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SECTION 01410 – TESTING LABORATORY SERVICES

PART 1 GENERAL

1.1 REQUIREMENTS INCLUDED

- A. CONTRACTOR will employ and pay for the services of an Independent Testing laboratory to perform all required testing: (All required testing services under the Contract and Permit Documents shall be provided by the CONTRACTOR through an independent testing firm.
- a. CONTRACTOR shall cooperate with the laboratory to facilitate the execution of its required services.
- b. Employment of the laboratory by the CONTRACTOR for specific testing shall in no way relieve the CONTRACTOR's obligations to perform the work of the Contract as specified.
- c. The tests to be provided by the CONTRACTOR shall include, but not be limited to, the following
- i. Density
 - ii. Proctor
 - iii. Limerock Bearing Ratio (LBR)
 - iv. Carbonate Content
 - v. Gradation
 - vi. Plastic Index and Liquid Limit
 - vii. Organic Content
 - viii. Concrete Compressive Strength and Slump
 - ix. Asphalt Extraction
 - x. Any other tests as required to satisfy an permitting agency requirements.
- B. CONTRACTOR shall pay for all required testing, including bacteriological testing.

1.2 RELATED REQUIREMENTS

- A. All applicable sections of the Specifications.
- B. Conditions of the Contract: Inspections and testing required by laws, ordinances, rules, regulations, orders or approvals of public authorities.

1.3 QUALIFICATION OF LABORATORY

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- A. Meet "Recommended Requirements for Independent Laboratory Qualification", published by American Council of Independent Laboratories.
- B. Meet basic requirements of ASTM E-329.
- C. Authorized to operate in the state in which the project is located.
- D. Submit copy of report of inspection of facilities made by Materials Reference Laboratory of National Bureau of Standards during the most recent tour of inspection, with memorandum of remedies of any deficiencies reported by the inspection.
- E. Testing Equipment
 - a. Calibrated at reasonable intervals by devices of accuracy traceable to either:
 - i. National Bureau of Standards.
 - ii. Accepted values of natural physical constants.

1.4 LABORATORY DUTIES

- A. Cooperate with OWNER's Representative and CONTRACTOR; provide qualified personnel after due notice.
- B. Perform specified inspections, sampling and testing of materials and methods of construction:
 - a. Comply with specified standards.
 - b. Ascertain compliance of materials with requirements of Contract Documents.
- C. Promptly notify OWNER's Representative and CONTRACTOR of observed irregularities of deficiencies of work or products.
- D. Promptly submit written report of each test and inspection; one copy each to OWNER's Representative, OWNER, CONTRACTOR, and one copy to Record Document File. Each report shall include:
 - a. Date issued.
 - b. Project title, OWNER'S project number and Parcel number.
 - c. Testing laboratory name, address and telephone number.
 - d. Name and signature of laboratory inspector.
 - e. Date and time of sampling or inspection.
 - f. Record of temperature and weather conditions.
 - g. Date of test.

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- h. Identification of fill product and specification section.
- i. Location of sample or test in the project area (i.e. station and offset or other relevant dimensioning).
- j. Type of inspection or test.
- k. Results of tests and compliance with Contract Documents.
- l. Interpretation of test results, when requested by OWNER's Representative.

E. Perform additional tests as required by the OWNER's Representative.

1.5 LIMITATION OF AUTHORITY OF TESTING LABORATORY

A. Laboratory is not authorized to:

- a. Release, revoke, alter or enlarge on requirements of Contract documents.
- b. Approve or accept any portion of the work.
- c. Perform any duties of the CONTRACTOR.

1.6 CONTRACTOR'S RESPONSIBILITIES

- A. Cooperate with laboratory personnel and provide access to work.
- B. Secure and deliver to the laboratory adequate quantities of representational samples of materials proposed to be used and which require testing.
- C. Provide to the laboratory the preliminary design mix proposed to be used for concrete, and other material mixes, which require control by the Testing Laboratory.
- D. Furnish copies of Products test reports as required.
- E. Furnish incidental labor and facilities:
 - a. To provide access to work to be tested.
 - b. To obtain and handle samples at the project site or at the source of the product to be tested.
 - c. To facilitate inspections and tests.
 - d. For storage of test samples.
- F. Notify laboratory sufficiently in advance of operations to allow for laboratory assignment of personnel and scheduling of tests.
 - a. When tests or inspections cannot be performed after such notice, reimburse OWNER for laboratory personnel and travel expenses incurred due to CONTRACTOR's negligence.

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PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION

3.1 MEASUREMENT AND PAYMENT

- A. There shall be no special measurement or payment for the work under this section. It shall be included in the price for all other work.

END OF SECTION

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SECTION 01505 – MOBILIZATION

PART 1 GENERAL

1.1 GENERAL

- A. Mobilization shall include the obtaining of all permits; moving onto the site of all equipment; temporary buildings, and other construction facilities; and implementing security requirements; all as required for the proper performance and completion of the WORK. Mobilization shall include the following principal items:
- a. Moving on to the site of all CONTRACTOR's equipment required for first month operations.
 - b. Installing temporary construction power, wiring, and lighting facilities.
 - c. Developing construction water supply.
 - d. Providing field office trailers for the CONTRACTOR, complete with all specified furnishings and utility services including telephones, telephone appurtenances, and copying machine.
 - e. Providing all on-site communication facilities, including telephones and radio pagers.
 - f. Providing on-site sanitary facilities and potable water facilities.
 - g. Arranging for and erection of CONTRACTOR's work, site access, and storage.
 - h. Obtaining all required permits (including Notice of Intent (NOI) and Stormwater Pollution Prevention Plan (SWPPP) permits as needed).
 - i. Having all OSHA required notices and establishment of safety programs.
 - j. Having the CONTRACTOR's superintendent at the job site full time.
 - k. Submitting initial submittals.
 - l. Audio-Visual preconstruction record as described in Section 01010.
 - m. Project identification and signs.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION

3.1 PAYMENT FOR MOBILIZATION

- D. The CONTRACTOR's attention is directed to the condition that no payment for mobilization or any part thereof will be approved for payment under the Contract until all mobilization items listed in Paragraph 1.01.A. above have been completed as

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specified.

END OF SECTION

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SECTION 01510 – TEMPORARY UTILITIES

PART 1 GENERAL

1.1 GENERAL REQUIREMENTS

- A. Types. The types of utility services required for general temporary use at the project site include the following:
- a. Water service (potable for certain uses)
 - b. Storm sewer
 - c. Sanitary sewer
 - d. Electric power service
 - e. Telephone service
- B. It shall be the CONTRACTOR's responsibility to provide equipment that is adequate for the performance of the WORK under this Contract within the time specified. All equipment shall be kept in satisfactory operating condition, shall be capable of safety and efficiently performing the required WORK, and shall be subject to inspection and approval by the OWNER's representative at any time within the duration of the Contract. All work hereunder shall conform to the applicable requirements of the OSHA Standards for Construction.

1.2 JOB CONDITIONS

- A. Scheduled Uses. The CONTRACTOR shall, in conjunction with establishment of job progress schedule, establish a schedule for implementation and termination of service for each temporary utility or facility; at earliest feasible time, and when acceptable to OWNER and ENGINEER change over from use of temporary utility service to permanent service.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION

3.1 INSTALLATION OF POWER DISTRIBUTION SYSTEM

- A. Power. The CONTRACTOR shall provide all necessary power required for its operations under the Contract, and shall provide and maintain all temporary power lines required to perform the WORK in a safe and satisfactory manner.

3.2 INSTALLATION OF LIGHTING

- A. Construction Lighting. All WORK conducted at night or under conditions of deficient daylight shall be suitable lighted to insure proper WORK and to afford adequate facilities for inspection and safe working conditions.

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3.3 WATER SUPPLY

- A. General. The OWNER will furnish reasonable quantities of water required by the CONTRACTOR in performance of the WORK under the Contract; however, the CONTRACTOR shall provide all facilities necessary to convey the water from the OWNER-designated source to the points of use in accordance with the requirements of the Contract Document. The CONTRACTOR shall pay all permit and water charges.
- B. Potable Water. All drinking water on the site during construction shall be furnished by the CONTRACTOR and shall be bottled water or water furnished in acceptable metal dispensers. Notices shall be posted conspicuously throughout the site warning the CONTRACTOR's personnel that piped water may be contaminated.
- C. Water Connections. The CONTRACTOR shall not make connection to, or draw water from, any fire hydrant or pipeline without first obtaining permission of the authority having jurisdiction over the use of said fire hydrant or pipeline and from the agency owning the affected water system. For each such connection made, the CONTRACTOR shall first attach to the fire hydrant or pipeline a valve and a meter, if required by the said authority, of a size and type acceptable to said authority and agency. The CONTRACTOR shall pay all permit and water charges.
- D. Removal of Water Connections. Before final acceptance of the WORK on the project, all temporary connections and piping installed by the CONTRACTOR shall be entirely removed, and all affected improvements shall be restored to their original condition, or better, to the satisfaction of the ENGINEER and to the agency owning the affected utility.

3.4 INSTALLATION OF SANITARY FACILITIES

- A. Toilet Facilities. Fixed or portable chemical toilets shall be provided wherever needed for the use of CONTRACTOR's employees. Toilets at construction job sites shall conform to the requirements of Subpart D, Section 1926.51 of the OSHA Standards for Construction.
- B. Sanitary and Other Organic Wastes. The CONTRACTOR shall establish a regular daily collection of all sanitary and organic wastes. All wastes and refuse from sanitary facilities provided by the CONTRACTOR or organic material wasted from any other source related to the CONTRACTOR's operations shall be disposed of away from the site in a manner satisfactory to the ENGINEER and in accordance with all laws and regulations pertaining thereto.

3.5 INSTALLATION OF FIRE PROTECTION

- A. Fire Protection. The construction of the WORK shall be connected with the CONTRACTOR's water supply system and shall be adequately protected against damage by fire. Hose connections and hose, water casks, chemical equipment, or other sufficient means shall be provided for fighting fires in the temporary structures and other portions of the WORK, and responsible persons shall be designated and instructed in the operation such fire apparatus so as to prevent or minimize the hazard of fire. The CONTRACTOR's fire protection program shall conform to the requirements of Subpart F of the OSHA Standards for Construction.

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3.6 INSTALLATION OF COMMUNICATIONS

- A. Telephone Services. The CONTRACTOR shall provide and maintain at all time during the progress of the WORK not less than one telephone in good working order, at its own field construction office, at or near the site of the WORK included in the Contract. Each such telephone shall be connected to an established exchange for toll service and with all other telephones utilized by the CONTRACTOR.
- B. Telephone Use. The CONTRACTOR shall permit the ENGINEER, the OWNER, or their authorized representatives or employees free and unlimited use of said telephone facilities for all calls that do not involve published toll charges. Calls originated by the ENGINEER, the OWNER, their authorized representatives or employees who involve toll or the CONTRACTOR at the rates charged by the telephone company shall bill message unit charge to the OWNER.

3.7 MEASUREMENT AND PAYMENT

- A. There shall be no special measurement or payment for the work under this section; it shall be included in the lump sum price for Mobilization.

END OF SECTION

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SECTION 01520 – CONSTRUCTION AIDS

PART 1 GENERAL

1.1 REQUIREMENTS INCLUDED

- A. Furnish, install and maintain required construction aids, remove on completion of work.

1.2 RELATED REQUIREMENTS

- A. All applicable sections of the Specifications.
- B. Conditions of the Contract.

PART 2 PRODUCTS

2.1 MATERIALS, GENERAL

- A. Materials may be new or used, suitable for the intended purpose, but must not violate requirements of applicable codes and standards.

2.2 CONSTRUCTION AIDS

- A. Provide construction aids and equipment required by personnel and to facilitate execution of the work; scaffolds, staging, ladders, stairs, ramps, runways, platforms, railings, hoists, cranes, chutes and other such facilities and equipment.
 - a. Refer to respective sections for particular requirements for each trade.
 - b. Provide protective coverings for finished surfaces.
- B. Maintain facilities and equipment in first-class condition.

PART 3 EXECUTION

3.1 PREPARATION

- A. Consult with OWNER's Representative, review site conditions and factors which affect construction procedures and construction aids including adjacent properties and public facilities which may be affected by execution of the work.

3.2 GENERAL

- A. Comply with applicable requirements specified in sections of Division 2 through 4 (as applicable).
- B. Relocate construction aids as required by progress of construction, by storage or work requirements, and to accommodate legitimate requirements of OWNER and other Contractors employer at the site.

3.3 REMOVAL

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- A. Completely remove temporary materials, equipment and services:
 - a. When construction needs can be met by use of permanent construction.
 - b. At completion of project.
- B. Clean, repair damage caused by installation or by use of temporary facilities.
 - a. Remove foundations and underground installations for construction aids.
 - b. Grade areas of site affected by temporary installations to required elevations and slopes, and clean the area.
- C. Restore permanent facilities used for temporary purposes to specified condition.

3.4 MEASUREMENT AND PAYMENT

- A. There shall be no special measurement or payment for the work under this section, it shall be included in the price of all other work.

END OF SECTION

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SECTION 01530 – PROTECTION OF EXISTING FACILITIES

PART 1 GENERAL

1.1 GENERAL

- A. The CONTRACTOR shall protect all existing utilities and improvements not designated for removal and shall restore damaged or temporarily relocated utilities and improvements to a condition equal to or better than they were prior to such damage or temporary relocation, all in accordance with requirements of the Contract Documents.
- B. The CONTRACTOR shall verify the exact locations and depths of all utilities shown and the CONTRACTOR shall make exploratory excavations of all utilities that may interfere with the WORK. All such exploratory excavations shall be performed as soon as practicable after award of the contract and, in any event, a sufficient time in advance of construction to avoid possible delays to the CONTRACTOR's work. When such exploratory excavations show the utility location as shown to be in error, the CONTRACTOR shall so notify the ENGINEER.
- C. The number of exploratory excavations required shall be that number which is sufficient to determine the alignment and grade of the utility.

1.2 RIGHTS-OF-WAY

- A. The CONTRACTOR shall not do any work that would affect any oil, gas, sewer, or water pipeline; any telephone, telegraph, or electric transmission line; any fence; or any other structure, nor shall the CONTRACTOR enter upon the rights-of-way involved until notified by the ENGINEER that the OWNER has secured authority from the proper party. After authority has been obtained, the CONTRACTOR shall give said party due notice of its intention to begin work, if required by said party, and shall remove, shore, support or otherwise protect such pipeline, transmission line, ditch, fence, or structure or replace the same. When two or more contracts are being executed at one time on the same or adjacent land in such manner that work on one contract may interfere with that on another, the OWNER shall determine the sequence and order of the WORK. When the territory of one contract is the necessary or convenient means of access for the execution of another contract, such privilege of access or any other reasonable privilege may be granted by the OWNER to the CONTRACTOR so desiring, to the extent, amount, in the manner, and at the times permitted. No such decision as to the method or time of conducting the WORK or the use of territory shall be made the basis of any claim for delay or damage, except as provided for temporary suspension of the WORK in the General Conditions of the Contract.

1.3 PROTECTION OF STREET OR ROADWAY MARKERS

- A. The CONTRACTOR shall not destroy, remove, or otherwise disturb any existing survey markers or other existing street or roadway markers without proper authorization. No pavement breaking or excavation shall be started until all survey or other permanent marker points that will be disturbed by the construction operations have been properly referenced. All survey markers or points disturbed by the CONTRACTOR shall be accurately restored after all streets or roadway

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resurfacing has been completed.

1.4 RESTORATION OF PAVEMENT

- A. General. All paved areas including asphaltic concrete berms cut or damaged during construction shall be replaced with similar materials and of equal thickness to match the existing adjacent undisturbed areas, except where specific resurfacing requirements have been called for in the Contract Documents or in the requirements of the agency issuing the permit. All temporary and permanent pavement shall conform to the requirements of the affected pavement OWNER. All pavements which are subject to partial removal shall be neatly saw cut in straight lines.
- B. Temporary Resurfacing. Wherever required by the public authorities having jurisdiction, the CONTRACTOR shall place temporary surfacing promptly after backfilling and shall maintain such surfacing for the period of time fixed by said authorities before proceeding with the final restoration of improvements.
- C. Permanent Resurfacing. In order to obtain a satisfactory junction with adjacent surfaces, the CONTRACTOR shall saw cut back and trim the edge so as to provide a clean, sound, vertical joint before permanent replacement of an excavated or damaged portion of pavement. Damaged edges of pavement along excavations and elsewhere shall be trimmed back by saw cutting in straight lines. All pavement restoration and other facilities restoration shall be constructed to finish grades compatible with adjacent undisturbed pavement.
- D. Restoration of Sidewalks or Private Properties. Wherever sidewalks or private properties and driveways have been removed for purposes of construction, the CONTRACTOR shall place suitable temporary sidewalks or driveways promptly after backfilling and shall maintain them in satisfactory condition for the period of time fixed by the authorities having jurisdiction over the affected portions before proceeding with the final restoration or, if no such period of times is so fixed, the CONTRACTOR shall maintain said temporary sidewalks or driveways until the final restoration thereof has been made. The CONTRACTOR shall restore all private properties within thirty (30) days after a complaint is received by the OWNER.

1.5 EXISTING UTILITIES AND IMPROVEMENTS

- A. General. The CONTRACTOR shall protect all Underground Utilities and other improvements which may be impaired during construction operations. It shall be the CONTRACTOR's responsibility to ascertain the actual location of all existing utilities and other improvements that will be encountered in its construction operations, and to see that such utilities or other improvements are adequately protected from damage due to such operations. The CONTRACTOR shall take all possible precautions for the protection of unforeseen utility lines to provide for uninterrupted service and to provide such special protection as may be necessary.
- B. Utilities to be Moved. In the case it shall be necessary to move the property of any public utility or franchise holder, such utility company or franchise holder will, upon request of the CONTRACTOR, be notified by the OWNER to move such property within a specified reasonable time. When utility lines that are to be removed are encountered within the area of operations, the CONTRACTOR shall notify the

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ENGINEER a sufficient time in advance for the necessary measures to be taken to prevent interruption of service.

- C. Where the proper completion of the WORK requires the temporary or permanent removal and/or relocation of an existing utility or other improvement which is indicated, the CONTRACTOR shall remove and, without unnecessary delay, temporarily replace or relocate such utility or improvement in a manner satisfactory to the ENGINEER and the OWNER of the facility. In all cases of such temporary removal or relocation, restoration to former location shall be accomplished by the CONTRACTOR in a manner that will restore or replace the utility or improvement as nearly as possible to its former locations and to as good or better condition than found prior to removal.
- D. OWNER's Right of Access. The right is reserved to the OWNER and to the OWNERS of public utilities and franchises to enter at any time upon any public street, alley, right-of-way, or easement for the purpose of making changes in their property made necessary by the WORK of this Contract.
- E. Underground Utilities Indicated. Existing utility lines that are indicated or the locations of which are made known to the CONTRACTOR prior to excavation and that are to be retained, and all utility lines that are constructed during excavation operations shall be protected from damage during excavation and backfilling and, if damaged, shall be immediately repaired or replaced by the CONTRACTOR.
- F. Underground Utilities Not Indicated. In the event that the CONTRACTOR damages any existing utility lines that are not indicated or the locations of which are not made known to the CONTRACTOR prior to excavation, a written report thereof shall be made immediately to the ENGINEER. If directed by the ENGINEER, repairs shall be made by the CONTRACTOR under the provisions for changes and extra work contained in the General Conditions.
- G. All costs of locating, repairing damage not due to failure of the CONTRACTOR to exercise reasonable care, and removing or relocating such utility facilities not shown in the Contract Documents with reasonable accuracy, and for equipment on the project which was actually working on that portion of the work which was interrupted or idled by removal or relocation of such utility facilities, and which was necessarily idled during such work will be paid for as extra work in accordance with the provisions of the General Conditions.
- H. Approval of Repairs. All repairs to a damaged utility or improvement are subject to inspection and approval by an authorized representative of the utility or improvement OWNER and the ENGINEER before being concealed by backfill or other work.
- I. Maintaining in Service. All oil and gasoline pipelines, power, and telephone or the communication cable ducts, gas and water mains, irrigation lines, sewer lines, storm drain lines, poles, and overhead power and communication wires and cables encountered along the line of the WORK shall remain continuously in service during all the operations under the Contract, unless other arrangements satisfactory to the ENGINEER are made with the owner of said pipelines, duct, main, irrigation line, sewer, storm drain, pole, or wire or cable. The CONTRACTOR shall be responsible for and shall repair all damage due to its operations, and the provisions of this Section

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shall not be abated even in the event such damage occurs after backfilling or is not discovered until after completion of the backfilling.

- J. Existing Water Services. CONTRACTOR shall protect and provide temporary support for existing water services. Any water service damaged by the CONTRACTOR shall be replaced at the CONTRACTOR's expense, with a new water service complete with new water main tap.

1.6 TREES WITHIN STREET RIGHTS-OF-WAY AND PROJECT LIMITS

- A. General. The CONTRACTOR shall exercise all necessary precautions so as not to damage or destroy any trees or shrubs, including those lying within street rights-of-way and project limits, and shall not trim or remove any trees unless such trees have been approved for trimming or removal by the jurisdictional agency or OWNER. All existing trees and shrubs which are damaged during construction shall be trimmed or replaced by the CONTRACTOR or a certified tree company under permit from the jurisdictional agency and/or the OWNER. Tree trimming and replacement shall be accomplished in accordance with the following paragraphs.
- B. Trimming. Symmetry of the tree shall be preserved; no stubs or splits or torn branches left; clean cuts shall be made close to the trunk or large branch. Spikes shall not be used for climbing live trees. All cuts over 1-1/2 inches in diameter shall be coated with an asphaltic emulsion material.
- C. Replacement. The CONTRACTOR shall immediately notify the jurisdictional agency and/or the OWNER if any tree is damaged by the CONTRACTOR's operations. If, in the opinion of said agency or the OWNER, the damage is such that replacement is necessary, the CONTRACTOR shall replace the tree at CONTRACTOR's own expense. The tree shall be of a like size and variety as the tree damaged, or, if of a smaller size, the CONTRACTOR shall pay to the OWNER of said tree a compensatory payment acceptable to the tree OWNER, subject to the approval of the jurisdictional agency or OWNER. The size of the trees shall be not less than 1-inch diameter nor less than 6 feet in height.

1.7 NOTIFICATION BY THE CONTRACTOR

- A. Prior to any excavation in the vicinity of any existing underground facilities, including all water, sewer, storm drain, gas, petroleum products, or other pipelines; all buried electric power, communications, or television cables; all traffic signal and street lighting facilities; and all roadway and state highway rights-of-way the CONTRACTOR shall notify the respective authorities representing the OWNERS or agencies responsible for such facilities not less than 3 days nor more than 7 days prior to excavation so that a representative of said OWNERS or agencies can be present during such work if they so desire. The CONTRACTOR shall also notify the Sunshine State One Call Center 1-800-432-4770 at least 2 days, but no more than 14 days, prior to such excavation.

PART 2 PRODUCTS

2.1 MATERIALS, GENERAL

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- A. Materials may be new or used, suitable for the intended purpose, but must not violate requirements of applicable codes and standards.

2.2 FENCING

- A. Materials to CONTRACTOR's option, minimum fence height = 6 feet.

2.3 BARRIERS

- A. Materials to CONTRACTOR's option, as appropriate to serve required purpose.

PART 3 EXECUTION

3.1 GENERAL

- A. Install facilities of a neat and reasonable uniform appearance, structurally adequate for required purposes.
- B. Maintain barriers during entire construction period.
- C. Relocate barriers as required by progress of construction.

3.2 TREE AND PLANT PROTECTION

- A. Preserve and protect existing trees and plants adjacent to work areas.
- B. Consult with OWNER's Representative and remove agreed-on roots and branches which interfere with work.
 - a. Employ qualified tree surgeon to remove branches, and to treat cuts.
- C. Protect root zones of trees and plants.
 - a. Do not allow vehicular traffic and parking.
 - b. Do not store materials or products.
 - c. Prevent dumping of refuse or chemically injurious materials or liquids.
 - d. Prevent puddling or continuous running water.
- D. Carefully supervise all work to prevent damage.
- E. Replace trees and plants which are damaged or destroyed due to work operations under this contract.

3.3 REMOVAL

- A. Completely remove barricades, including foundations, when construction has progressed to the point that they are no longer needed, and when approved by OWNER's Representative.

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- B. Clean and repair damage caused by installation, fill and grade areas of the site to required elevations and slopes, and clean the area.

3.4 MEASUREMENT AND PAYMENT

- A. There shall be no special measurement or payment for the work under this section, it shall be included in the price of all other work.

END OF SECTION

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SECTION 01550 – SITE ACCESS AND STORAGE

PART 1 GENERAL

1.1 HIGHWAY LIMITATIONS:

- A. The CONTRACTOR shall make its own investigation of the condition of available public and private roads and of clearances, restrictions, bridge load limits, and other limitations affecting transportation and ingress and egress to the site of the WORK. It shall be the CONTRACTOR's responsibility to construct and maintain any haul roads required for its construction operations.

1.2 TEMPORARY CROSSINGS:

- A. General. Continuous, unobstructed, safe, and adequate pedestrian and vehicular access shall be provided to fire hydrants, commercial and industrial establishments, churches, schools, parking lots, service stations, motels, fire and police stations, and hospitals. Safe and adequate public transportation stops and pedestrian crossings at intervals not exceeding 300 feet shall be provided. The CONTRACTOR shall cooperate with parties involved in the delivery of mail and removal of trash and garbage so as to maintain existing schedules for such services. Vehicular access to residential driveways shall be maintained to the property line except when necessary construction precludes such access for reasonable periods of time.
- B. Temporary Bridges. Wherever necessary, the CONTRACTOR shall provide suitable temporary bridges or steel plates over unfilled excavations, except in such cases as the CONTRACTOR shall secure the written consent of the individuals or authorities concerned to omit such temporary bridges or steel plates, which written consent shall be delivered to the ENGINEER prior to excavation. All such bridges or steel plates shall be maintained in service until access is provided across the backfilled excavation. Temporary bridges or steel plates for street and highway crossing shall conform to the requirements of the authority having jurisdiction in each case, and the CONTRACTOR shall adopt designs furnished by said authority for such bridges or steel plates, or shall submit designs to said authority for approval, as may be required.
- C. Street Use. Nothing herein shall be construed to entitle the CONTRACTOR to the exclusive use of any public street, alleyway, or parking area during the performance of the WORK hereunder, and it shall so conduct its operations as not to interfere unnecessarily with the authorized work of utility companies or other agencies in such streets, alleyways, or parking areas. No street shall be closed to the public without first obtaining permission of the ENGINEER and proper governmental authority. Where excavation is being performed in primary streets or highways, one lane in each direction shall be kept open to traffic at all times unless otherwise indicated. Toe boards shall be provided to retain excavated material if required by the ENGINEER or the agency having jurisdiction over the street or highway. Fire hydrants on or adjacent to the WORK shall be kept accessible to fire-fighting equipment at all times. Temporary provisions shall be made by the CONTRACTOR to assure the use of sidewalks and the proper functioning of all gutters, storm drain inlets, and other drainage facilities.
- D. Traffic Control

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- a. For the protection of traffic in public or private streets and ways, the CONTRACTOR shall provide, place, and maintain all necessary barricades, traffic cones, warning signs, lights, and other safety devices in accordance with the requirements of Broward County and the "Manual of Uniform Traffic Control Devices, Part VI - Traffic Controls for Street and Highway Construction and Maintenance Operations," published by U.S. Department of Transportation, Federal Highway Administration (ANSI D6.1).
 - b. The CONTRACTOR shall take all necessary precautions for the protection of the WORK and the safety of the public. All barricades and obstructions shall be illuminated at night, and all lights shall be kept burning from sunset until sunrise. The CONTRACTOR shall station such guards or flaggers and shall conform to such special safety regulations relating to traffic control as may be required by the public authorities within their respective jurisdictions. All signs, signals, and barricades shall conform to the requirements of the Florida Department of Transportation.
 - c. The CONTRACTOR shall submit 3 copies of a traffic control plan to the ENGINEER for approval a minimum of 2 weeks prior to construction. The ENGINEER reserves the right to observe these traffic control plans in use and to make any changes as field conditions warrant. Any changes shall supersede these plans and be done solely at the CONTRACTOR's expense.
 - d. The CONTRACTOR shall remove traffic control devices when no longer needed, repair all damage caused by installation of the devices, and shall remove post settings and backfill the resulting holes to match grade.
- E. Temporary Driveway Closure. The CONTRACTOR shall notify the OWNER or occupant (if not Owner-occupied) of the closure of the driveways to be closed more than one eight-hour work day at least 3 working days prior to the closure. The CONTRACTOR shall minimize the inconvenience and minimize the time period that the driveways will be closed. The CONTRACTOR shall fully explain to the OWNER/occupant how long the work will take and when closure is to start. Total closure time shall not exceed 5 days.

1.3 CONTRACTOR'S WORK AND STORAGE AREA:

- A. The CONTRACTOR shall designate and arrange for the use of a portion of the property, adjacent to the WORK for its exclusive use during the term of the Contract as a storage and shop area for its construction operations relative to this Contract.
- B. The CONTRACTOR shall make its own arrangements for any necessary off-site storage or shop areas necessary for the proper execution of the WORK.
- C. The CONTRACTOR shall construct and use a separate storage area for hazardous materials used in constructing the WORK.
 - a. For the purpose of this paragraph, hazardous materials to be stored in the separate area are all products labeled with any of the following terms: Warning, Caution, Poisonous, Toxic, flammable, Corrosive, Reactive, or Explosive. In addition, whether or not so labeled, the following materials shall be stored in the

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separate area: diesel fuel, gasoline, new and used motor oil, hydraulic fluid, cement, paints and paint thinners, two-part epoxy coatings, sealants, asphaltic products, glues, solvents, wood preservatives, sand blast materials, and spill absorbent.

- b. Hazardous materials shall be stored in groupings according to the Material Safety Data Sheets.
- c. The CONTRACTOR shall develop and submit to the ENGINEER a plan for storing and disposing of the materials above.
- d. The CONTRACTOR shall obtain and submit to the ENGINEER a single EPA number for wastes generated at the site.
- e. The separate storage area shall meet all the requirements of all authorities having jurisdiction over the storage of hazardous materials.
- f. All hazardous materials which are delivered in containers shall be stored in the original containers until use. Hazardous materials which are delivered in bulk shall be stored in containers which meet the requirements of authorities having jurisdiction.

1.4 PARKING:

A. The CONTRACTOR shall:

- a. Provide temporary parking areas for ENGINEER and OWNER's use.
- b. The CONTRACTOR shall direct its employees to park in designated areas secured by the CONTRACTOR.
- c. Traffic and parking areas shall be maintained in a sound condition, free of excavated material, construction equipment, mud, and construction materials. The CONTRACTOR shall repair breaks, potholes, low areas which collect standing water, and other deficiencies.

PART 2 PRODUCTS (Not Applicable)**PART 3 EXECUTION**

3.1 MEASUREMENT AND PAYMENT

- A. There shall be no special measurement or payment for the work under this section, it shall be included in the price of Mobilization and of all other work.

END OF SECTION

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SECTION 01560 – TEMPORARY CONTROLS

PART 1 GENERAL

1.1 REQUIREMENTS INCLUDED

- A. Provide and maintain methods, equipment, and temporary construction, as necessary, to provide controls over environmental conditions at the construction site and related area under CONTRACTOR's control; remove physical evidence of temporary facilities at completion of work.

1.2 RELATED REQUIREMENTS

- A. All applicable sections of the Specifications.
- B. Conditions of the Contract.

1.3 NOISE CONTROL

- A. Provide all necessary requirements for noise control during the construction period.
 - a. Noise procedures shall conform to all applicable OSHA requirements and local ordinances having jurisdiction on the work.
 - b. Noise levels during nighttime hours shall not exceed 55 db measured at the property line of a residence.

1.4 DUST CONTROL

- A. Provide positive methods and apply dust control materials to minimize raising dust from construction operations, and provide positive means to prevent air-borne dust from dispersing into the atmosphere.

1.5 WATER CONTROL

- A. Provide methods to control surface water to prevent damage to the project, the site, or adjoining properties.
 - a. Control fill, grading and ditching to direct surface drainage away from excavations, pits, tunnels and other construction areas; and to direct drainage to proper runoff.
- B. Provide, operate and maintain hydraulic equipment of adequate capacity to control surface and water.
- C. Dispose of drainage water in a manner to prevent flooding, erosion, or other damage to any portion of the site or to adjoining areas.

1.6 PEST CONTROL

- A. Provide pest control as necessary to prevent infestation of construction or storage area.

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- a. Employ methods and use materials which will not adversely affect conditions at the site or on adjoining properties.
- b. Should the use of pesticides be considered necessary, submit an informational copy of the proposed program to OWNER with a copy to ENGINEER. Clearly indicate:
 - i. The area or areas to be treated.
 - ii. The pesticide to be used, with a copy of the manufacturer's printed instructions.
 - iii. The pollution preventative measures to be employed.
- B. The use of any pesticide shall be in full accordance with the manufacturer's printed instructions and recommendations.

1.7 RODENT CONTROL

- A. Provide rodent control as necessary to prevent infestation of construction or storage area.
 - a. Employ methods and use materials, which will not adversely affect conditions at the site or on adjoining properties
 - b. Should the use of rodenticide be considered necessary, submit an informational copy of the proposed program to OWNER with a copy to OWNER's Representative. Clearly indicate:
 - i. the area or areas to be treated.
 - ii. the rodenticide to be used, with a copy of the manufacturer's printed instructions.
 - iii. the pollution preventative measures to be employed.
- B. The use of any rodenticide shall be in full accordance with the manufacturer's printed instructions and recommendations.

1.8 DEBRIS CONTROL

- A. Maintain all areas under CONTRACTOR's control free of extraneous debris.
- B. Initiate and maintain a specific program to prevent accumulation of debris at construction site, storage and parking area, or along access roads and haul routes.
 - a. Provide containers for deposit of debris as specified in Section 01710 - Cleaning.
 - b. Prohibit overloading of trucks to prevent spillage on access and haul routes.

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- c. Provide periodic inspection of traffic areas to enforce requirements.
- C. Schedule periodic collections and disposal of debris as specified in Section 01710 - Cleaning.
 - a. Provide additional collections and disposal of debris whenever the periodic schedule is to prevent accumulation.

1.9 POLLUTION CONTROL

- A. Provide methods, means and facilities required to prevent contamination of soil, water or atmosphere by the discharge of noxious substances from construction operations.
- B. Provide equipment and personnel, perform emergency measures required to contain any spillage, and to remove contaminated soils or liquids.
 - a. Excavate and dispose of any contaminated earth off-site and replace with suitable compacted fill and topsoil.
- C. Take special measures to prevent harmful substances from entering public waters.
 - a. Prevent disposal of wastes, effluents, chemicals, or other such substances adjacent to streams or in sanitary or storm sewers.
- D. Provide systems for control of atmospheric pollutants.
 - a. Prevent toxic concentrations of chemicals.
 - b. Prevent harmful dispersal of pollutants into the atmosphere.

1.10 EROSION CONTROL

- A. Plan and execute construction and earthwork, by methods to control surface drainage from cuts and fills, and from borrow and waste disposal areas to prevent erosion and sedimentation.
 - a. Hold the areas of bare soil exposed at one time to a minimum
 - b. Provide temporary control measures such as berms, dikes and drains.
 - c. Provide silt screens as required preventing surface water contamination.
- B. Construct fills and waste areas by selective placement to eliminate surface silts or clays, which will erode.
- C. Periodically inspect earthwork to detect any evidence of the start of erosion, apply corrective measures as required to control erosion.
- D. All erosion control procedures must comply with the National Pollutant Discharge Elimination System (NPDES).

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PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION

3.1 MEASUREMENT AND PAYMENT

- A. There shall be no special measurement or payment for the work under this section; it shall be included in the price of all other work.

END OF SECTION

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SECTION 01570 – TRAFFIC REGULATIONS

PART 1 GENERAL

1.1 REQUIREMENTS INCLUDED

- A. Provide, operate and maintain equipment, services and personnel, with traffic control and protective devices, as required to expedite vehicular traffic flow to provide safe and expeditious movement of traffic through and on haul routes, at site entrances, in construction zones, on-site access roads, and parking areas including driving and/or walking public.
- B. Remove temporary equipment and facilities when no longer required, restore grounds to original, or specified conditions.
- C. The requirements specified herein are in addition to the plan for Maintenance of Traffic as specified in Section 01500.

1.2 RELATED REQUIREMENTS

- A. All applicable sections of the Specifications.
- B. Conditions of the Contract.

1.3 TRAFFIC SIGNALS AND SIGNS

- A. Provide and operate traffic control and directional signals or signs required to direct and maintain an orderly flow of traffic in all areas under CONTRACTOR's control, or affected by CONTRACTOR's operations.

1.4 FLAGPERSON

- A. Provide qualified and suitably equipped flag-person when construction operations encroach on traffic lanes, as required for regulation of traffic.

1.5 FLARES AND LIGHTS

- A. Provide flares and lights during periods of low visibility:
 - a. To clearly delineate traffic lanes and to guide traffic.
 - b. For use of flag-person in directing traffic.
- B. Provide illumination of critical traffic and parking areas.
 - a. Maintain free vehicular access to and through parking areas.
 - b. Prohibit parking on or adjacent to access roads, or in non-designated areas.

1.6 HAUL ROUTES

- A. Consult with OWNER and governing authorities, establish

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public thoroughfares which will be used as haul routes and site access.

- B. Confine construction traffic to designated haul routes.
- C. Provide traffic control at critical areas of haul routes to expedite traffic flow, to minimize interference with normal public traffic.

1.7 EMERGENCY ACCESS

- A. In order to provide protection to the workers and residents, the Contractor shall maintain emergency access to all adjacent properties at all times during construction. If a road is required to be closed to vehicular traffic and the distance of the closure exceeds 150 feet between stabilized surfaces, or prevents access to properties for a distance that exceeds 150 feet, the Contractor shall provide a 10 foot wide stabilized access way on one side of the trench capable of supporting a Fire Truck. Contractor shall also provide stabilized access ways across the trench or un-stabilized area a minimum of 6 feet in width at a spacing not to exceed 100 feet capable of supporting foot traffic. These access ways shall be protected and delineated with lighted barricades or other such devices as approved by the regulatory agency. Both ends of the emergency access way shall be blocked in accordance with the MOT permit approved by the City of Fort Lauderdale and FDOT with signage indicating that this access way is to be used by emergency vehicles only.

No trenches or holes shall be left open after working hours. In the event a trench must be left open after hours, it shall be done so only with the express written permission from the Engineer, and it shall be the Contractor's responsibility to provide proper protection of the open trench or hole as required by the regulatory agency. In addition the Contractor shall provide a security guard at the site whenever the Contractor's personnel are not present, 24 hours per day/ 7 days per week. It shall be the Security Guard's responsibility to protect the open trench or hole from trespassers and to direct emergency personnel on site. The Security Guard shall not have any other responsibilities such as operation pumps or equipment but shall be dedicated to protecting the trench or open hole. The Security Guard shall be equipped with a wireless telephone capable of calling 911 to report an emergency and shall keep that telephone on their person at all times. In addition to this provision the contractor shall maintain trench safety and comply with current OSHA regulations and the Trench Safety Act. The contractor shall maintain and keep all safety barricades, signage, flashers, and detours, in operation condition. A copy of the approved MOT plans, and details, shall be on site at all times.

- B. Measurement and payment for security guard services shall be included in the utility pipe installation unit price. Measurement for temporary emergency access ways will be paid for under the specified line item at the unit price described in the bid schedule.

PART 2 PRODUCTS (Not Applicable)**PART 3 EXECUTION****3.1 MEASUREMENT AND PAYMENT**

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- A. There shall be no special measurement and payment for work under the section; it shall be included in the lump sum price bid for Maintenance of Traffic.

END OF SECTION

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SECTION 01590 – PROJECT SIGN

PART 1 GENERAL

1.1 REQUIREMENTS INCLUDED

- A. Contractor shall furnish two 4' x 8' sign, **below is a sample, not specific to the project.**
- B. **Sign shall be made to be weather resistant and on display for entire length of contract.**
- C. **Shop drawings must be submitted prior to sign construction.**
- D. **The exact style and design of the sign will be provided during the preconstruction meeting.**



- B. See Page 2, "Construction Sign Request Form", for information on the sign for this Project.

END OF SECTION

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Construction Sign Request Form P11870D

Title (Bold):**Title (Not Bold):****What's Happening?****Benefits:****Number of Neighbors Benefitted:****Cost:****Month and Year of Expected Completion:****Contractor:****Phone: 954-828-8000****We're Working On:****Project Manager Signature****Date**SECTION
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| Senior Project Manager Signature |
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SECTION 01600 – MATERIAL AND EQUIPMENT

PART 1 GENERAL

1.1 REQUIREMENTS INCLUDED

- A. Material and equipment incorporated into the work:
 - a. Conform to applicable specifications and standards.
 - b. Comply with size, make, type and quality specified, or as specifically approved in writing by the OWNER's Representative.
 - c. Manufactured and fabricated products:
 - i. Design, fabricate and assemble in accord with the best engineering and shop practices.
 - ii. Manufacture like parts of duplicate units to standard sizes and gauges to be interchangeable.
 - iii. Two or more items of the same kind shall be identical, by the same manufacturer.
 - iv. Products shall be suitable for service conditions.
 - v. Equipment capacities, sizes and dimensions shown or specified shall be adhered to unless variations are specifically approved in writing.
 - d. Do not use material or equipment for any purpose other than that for which it is designed or is specified.

1.2 RELATED REQUIREMENTS

- A. All applicable sections of the Specifications.
- B. Conditions of the Contract.

1.3 MANUFACTURER'S INSTRUCTIONS

- A. When Contract Documents require that installation of work shall comply with manufacturer's printed instructions, obtain and distribute copies of such instructions to parties involved in the installation, including two copies to OWNER's Representative. Maintain one set of complete instructions at the job site during installation and until completion.
- B. Handle, install, connect, clean, condition and adjust products in strict accordance with such instructions and in conformity with specified requirements.
 - a. Should job conditions or specified requirements conflict with manufacturer's instructions, consult with OWNER's Representative for further instructions.

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- b. Do not proceed with work without clear instructions.
- C. Perform work in accord with manufacturer's instructions. Do not omit any preparatory step or installation procedure unless specifically modified or exempted by Contract Documents.

1.4 TRANSPORTATION AND HANDLING

- A. Arrange deliveries of products in accordance with construction schedules, coordinate to avoid conflict with work and conditions at the site. Products shall be delivered to the job site on an "as needed" basis.
 - a. Deliver products in undamaged condition, in manufacturers' original containers or packaging, with identifying labels intact with legible markings.
 - b. Immediately upon delivery, inspect shipments to assure compliance with requirements of Contract Documents and approved submittals, and that products are properly protected and undamaged.
 - c. Pipe and materials shall not be strung out along installation routes for longer than two (2) weeks prior to installation.
- B. Provide equipment and personnel to handle products by methods to prevent soiling or damage to products or packaging.
- C. Coordinate deliveries to avoid conflict with Work and conditions at site:
 - a. Work of other contractors, or OWNER.
 - b. Limitations of storage space.
 - c. Availability of equipment and personnel for handling products.
 - d. OWNER's use of premises.
- D. Deliver products in undamaged condition in original containers or packaging, with identifying labels intact and legible.
- E. Partial deliveries of component parts of equipment shall be clearly marked to identify the equipment, to permit easy accumulation of parts and to facilitate assembly.
- F. Immediately on delivery, inspect shipment to assure:
 - a. Product complies with requirements of Contract Documents and reviewed submittals.
 - b. Quantities are correct.
 - c. Containers and packages are intact, labels are legible.
 - d. Products are properly protected and undamaged.

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- G. Provide equipment and personnel necessary to handle products, including those provided by OWNER, by methods to prevent soiling or damage to products or packaging.
- H. Provide additional protection during handling as necessary to prevent scraping, marring or otherwise damaging products or surrounding surfaces.
- I. Handle products by methods to prevent bending or overstressing.
- J. Lift heavy components only at designated lifting points.

1.5 STORAGE

- A. Store products in accord with manufacturer's instructions, with seals and labels intact and legible.
 - a. Store products subject to damage by the elements in weather-tight enclosures.
 - b. Maintain temperature and humidity within the ranges required by manufacturer's instructions.
 - c. Store unpacked products on shelves, in bins or in neat piles, accessible for inspection.
- B. Exterior Storage
 - a. Provide substantial platforms, blocking or skids to support fabricating products above ground, prevent soiling or staining.
 - i. Cover products, subject to discoloration or deterioration from exposure to the elements, with impervious sheet coverings. Provide adequate ventilation to avoid condensation.
 - b. Store loose granular materials on solid surface such as paved areas, or provide plywood or sheet materials to prevent mixing with foreign matter.
 - i. Provide surface drainage to prevent flow or ponding of rainwater.
 - ii. Prevent mixing of refuse or chemically injurious materials or liquids.

1.6 MAINTENANCE OF STORAGE

- A. Maintain periodic system of inspection of stored products on scheduled basis to assure that:
 - a. State of storage facilities is adequate to provide required conditions.
 - b. Required environmental conditions are maintained on continuing basis.
 - c. Surfaces of products exposed to elements are not adversely affected.

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- i. Any weathering of products, coatings and finishes is not acceptable under requirements of Contract Documents.
- B. Mechanical and electrical equipment which requires servicing during long term storage shall have complete manufacturer's instructions for servicing accompanying each item, with notice of enclosed instructions shown on exterior of package.

1.7 PROTECTION AFTER INSTALLATION

- A. Provide protection of installed products to prevent damage from subsequent operations. Remove when no longer needed, prior to completion of work.
- B. Control traffic to prevent damage to equipment and surfaces.
- C. Provide coverings to protect finished surfaces from damage.
 - a. Cover projections, wall corners, and jambs, sills and soffits of openings, in areas used for traffic and for passage of products in subsequent work.
 - b. Protect finished floors and stairs from dirt and damage.
 - i. In areas subject to foot traffic, secure heavy paper, sheet goods, or other materials in place.
 - ii. For movement of heavy products, lay planking or similar materials in place.
 - iii. Cover wall and floor surfaces in the vicinity of construction personnel activities and all finished surfaces used by construction personnel.
- D. Waterproofed surfaces
 - a. Prohibit use of surfaces for traffic of any kind, and for storage of any products.
 - b. When some activity must take place in order to carry out the Contract, obtain recommendations of installer for protection of surface.
 - i. Install recommended protection; remove on completion of that activity.
 - ii. Restrict use of adjacent unprotected areas.
- E. Lawns and landscaping
 - a. Prohibit traffic of any kind across planted lawn and landscaped areas.
- F. Arrange storage in a manner to provide easy access for inspection. Make periodic inspections of stored products to assure that products are maintained under specified conditions, and free from damage or deterioration.

1.8 SUBSTITUTIONS AND PRODUCT OPTIONS

- A. Limitations on substitutions.

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- a. During bidding period, Instructions to Bidders govern times for submitting requests for substitutions under requirements specified in this section.
 - b. Substitutions will not be considered when indicated on shop drawings or product data submittals without separate formal request, when requested directly by Subcontractor or supplier, or when acceptance will require substantial revision of Contract Documents.
 - c. Substitute products shall not be ordered or installed without written acceptance.
 - d. Only one (1) request for substitution for each product will be considered. When substitution is not accepted, provide specified product.
- B. Products List
- a. Within 15 days after Contract Date submit to ENGINEER a complete list of major products proposed to be used, with the name of the manufacturer and the installing Subcontractor.
- C. Contractors Options
- a. For products specified only by reference standard, select any product meeting that standard.
 - b. For products specified by naming several products or manufacturers, select any one of the products or manufacturers named or approved equal, which complies with the Specifications.
 - c. For products specified by naming one or more products or manufacturers and "or approved equal," CONTRACTOR must submit a request as for substitutions for any product or manufacturer not specifically named.
- D. Substitutions
- a. For a period of 15 days after Contract Date, ENGINEER will consider written request from CONTRACTOR for substitution of products.
 - b. Identify product by specification Section and Article Numbers. Provide manufacturer's name and address, trade name of product, and model or catalog number. List fabricators and suppliers as appropriate.
 - c. List similar projects using product, dates of installation, and names of ENGINEER and OWNER.
 - d. List availability of maintenance services and replacement materials.
 - e. Submit a separate request for each product, supported with complete data, with drawings and samples as appropriate, including:
 - i. Comparison of the qualities and performance of the proposed substitution with that specified.

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- ii. Changes required in other elements of the work because of the substitution.
 - iii. Effect on the construction schedule.
 - iv. Cost data comparing the proposed substitution with the product specified.
 - v. Any required license fees or royalties.
 - vi. Availability of maintenance services, and source of replacement materials.
- f. The burden of proof as to the type, function, and quality of any such substitute material or equipment shall be upon the CONTRACTOR.
 - g. The ENGINEER will be the sole judge as to the type, function, and quality of any such substitute material or equipment and the ENGINEER's decision shall be final.
 - h. The ENGINEER may require the CONTRACTOR to furnish at the CONTRACTOR's expense additional data about the proposed substitute.
 - i. The OWNER may require the CONTRACTOR to furnish at the CONTRACTOR's expense a special performance guarantee or other surety with respect to any substitute.
 - j. Acceptance by the ENGINEER of a substitute item proposed by the CONTRACTOR shall not relieve the CONTRACTOR of the responsibility for full compliance with the Contract Documents and for adequacy of the substitute item.
 - k. The CONTRACTOR shall be responsible for resultant changes and all additional costs which the accepted substitution requires in the CONTRACTOR work, the work of its Subcontractors and of other Contractors, and shall effect such changes without cost to the OWNER.
- E. Contractors Representation:
- a. A request for a substitution constitutes a representation that CONTRACTOR:
 - i. Has investigated the proposed product and determined that it is equal to or superior in all respects to that specified.
 - ii. Will provide the same guarantees or bonds for the substitution as for the product specified.
 - iii. Will coordinate the installation of an accepted substitution into the work, and make such other changes as may be required to make the work complete in all respects.

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- iv. Waives all claims for additional costs, under CONTRACTOR'S responsibility, which may subsequently become apparent.

F. Submittal Procedures

- a. Submit three (3) copies of request for substitution.
- b. ENGINEER will review requests for substitutions with reasonable promptness, and notify CONTRACTOR, in writing, of the decision to accept or reject the requested substitution.
- c. During the bidding period, ENGINEER will record acceptable substitutions in Addenda.
- d. After award of Contract, ENGINEER will notify CONTRACTOR, in writing, of decision to accept or reject requested substitutions in Addenda.

PART 2 PRODUCTS (Not Applicable)**PART 3 EXECUTION (Not Applicable)****END OF SECTION**

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SECTION 01710 – CLEANING

PART 1 GENERAL

1.1 REQUIREMENTS INCLUDED

- A. Execute cleaning, during progress of the Work, and at completion of the Work, as required by the General Conditions.

1.2 RELATED REQUIREMENTS

- A. All applicable sections of the Specifications.
- B. Conditions of the Contract.

1.3 DISPOSAL REQUIREMENTS

- A. Conduct cleaning and disposal operations to comply with codes, ordinances, regulations, and anti-pollution laws.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Use only those cleaning materials which will not create hazards to health or property and which will not damage surfaces.
- B. Use only those cleaning materials and methods recommended by cleaning material manufacturer.

PART 3 EXECUTION

3.1 DURING CONSTRUCTION

- A. Execute periodic cleaning to keep the work, the site and adjacent properties free from accumulation of waste material, rubbish and windblown debris, resulting from Construction Work.
- B. Provide on-site containers for the collection of waste materials, debris and rubbish.
- C. Remove waste materials, debris and rubbish from the site periodically and dispose of at legal disposal areas away from the site.
- C. The OWNER's Representative reserves the right to direct the CONTRACTOR to remove waste materials
- D. Mechanical Sweeping. CONTRACTOR shall maintain on site a mechanical sweeping device for removing debris from existing, temporary and permanent pavement.

3.2 DUST CONTROL

- A. Perform operations so that dust and other contaminants

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resulting from Construction Work operations will not cause any damages or maintenance problems to adjacent properties.

- B. Schedule operations so that dust and other contaminants resulting from cleaning process will not fall on wet or newly coated surfaces.

3.3 FINAL CLEANING

- A. Employ skilled workmen for final cleaning.
- B. Remove grease, mastic, adhesives, dust, dirt, stains, fingerprints, labels, and other foreign materials from sight-exposed interior and exterior surfaces.
- C. Polish glossy surfaces to a clear shine.
- D. Broom clean exterior paved surfaces; rake clean other surfaces of the grounds.
- E. Prior to final completion, or OWNER occupancy, CONTRACTOR shall conduct an inspection of sight-exposed interior and exterior surfaces, and all work areas, to verify the entire work is clean.
- F. All storage and staging areas shall be cleaned and returned to prior conditions or better as per requirements of this section.

3.4 MEASUREMENT AND PAYMENT

- A. There shall be no special measurement or payment for the work under this section; it shall be included in the price of all other work.

END OF SECTION

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SECTION 01720 – PROJECT RECORD DOCUMENTS

PART 1 GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes administrative and procedural requirements for Project Record Documents, including the following:
 - a. Record Drawings.
 - b. Record Specifications.
 - c. Record Product Data.

1.3 SUBMITTALS

- A. Record Drawings. Comply with the following:
 - a. Number of Copies. Submit one set of marked-up Record Prints.
- B. Record Specifications. Submit one copy of Project's Specifications, including addenda and contract modifications.
- C. Record Product Data. Submit one copy of each Product Data submittal.
 - a. Where Record Product Data is required as part of operation and maintenance manuals, submit marked-up Product Data as an insert in manual instead of submittal as Record Product Data.

PART 2 PRODUCTS

2.1 RECORD DRAWINGS

- A. Record Prints. Maintain one set of black-line white prints of the Contract Drawings and Shop Drawings.
 - a. Preparation. Mark Record Prints to show the actual installation where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is Installer, subcontractor, or similar entity, to prepare the marked-up Record Prints.
 - i. Give particular attention to information on concealed elements that would be difficult to identify or measure and record later.

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- ii. Accurately record information in an understandable drawing technique.
- iii. Record data as soon as possible after obtaining it. Record and check the markup before enclosing concealed installations.
 - a. Document with photographs.
- b. Content. Types of items requiring marking include, but are not limited to, the following:
 - i. Dimensional changes to Drawings.
 - ii. Revisions to details shown on Drawings.
 - iii. Depths of foundations.
 - iv. Locations and depths of underground utilities.
 - v. Revisions to routing of piping and conduits.
 - vi. Revisions to electrical circuitry.
 - vii. Actual equipment locations.
 - viii. Changes made by Change Order or Work Change Directive.
 - ix. Changes made following Engineer's written orders.
 - x. Details not on the original Contract Drawings.
 - xi. Field records for variable and concealed conditions.
 - xii. Record information on the Work that is shown only schematically.
- c. Mark the Contract Drawings or Shop Drawings, whichever is most capable of showing actual physical conditions, completely and accurately. If Shop Drawings are marked, show cross-reference on the Contract Drawings.
- d. Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at same location.
- e. Mark important additional information that was either shown schematically or omitted from original Drawings.
- f. Note Construction Change Directive numbers, alternate numbers, Change Order numbers, and similar identification, where applicable.
- g. Immediately before inspection for Certificate of Substantial Completion, review marked-up Record Prints with Engineer. Make corrections where

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required.

- B. Format. Identify and date each Record Drawing; include the designation "PROJECT RECORD DRAWING" in a prominent location.
- a. Record Prints. Organize Record Prints into manageable sets. Bind each set with durable paper cover sheets. Include identification on cover sheets.
- b. Identification. As follows:
- i. Project number.
 - ii. Project name.
 - iii. Date.
 - iv. Designation "PROJECT RECORD DRAWINGS."
 - v. Name of Contractor.

2.2 RECORD SPECIFICATIONS

- A. Preparation. Mark Specifications to indicate the actual product installation where installation varies from that indicated in Specifications, addenda, and contract modifications.
- a. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
 - b. Mark copy with the proprietary name and model number of products, materials, and equipment furnished, including substitutions and product options selected.
 - c. Record the name of manufacturer, supplier, Installer, and other information necessary to provide a record of selections made.
 - d. For each principal product, indicate whether Record Product Data has been submitted in operation and maintenance manuals instead of submitted as Record Product Data.
 - e. Note related Change Orders, Record Product Data, and Record Drawings where applicable.

2.3 RECORD PRODUCT DATA

- A. Preparation. Mark Product Data to indicate the actual product installation where installation varies substantially from that indicated in Product Data submittal.
- a. Include significant changes in the product delivered to Project site and changes in manufacturer's written instructions for installation.

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- b. Note related Change Orders, Record Specifications, and Record Drawings where applicable.

2.4 MISCELLANEOUS RECORD SUBMITTALS

- A. Assemble miscellaneous records required by other Specification Sections for miscellaneous record keeping and submittal in connection with actual performance of the Work. Bind or file miscellaneous records and identify each, ready for continued use and reference.

PART 3 EXECUTION

3.1 RECORDING AND MAINTENANCE

- A. Recording. Maintain one copy of each submittal during the construction period for Project Record Document purposes. Post changes and modifications to Project Record Documents as they occur; do not wait until the end of Project.
- B. Maintenance of Record Documents and Samples. Store Record Documents and Samples in the field office apart from the Contract Documents used for construction. Do not use Project Record Documents for construction purposes. Maintain Record Documents in good order and in a clean, dry, legible condition, protected from deterioration and loss. Provide access to Project Record Documents for Engineer's reference during normal working hours.
- C. Record Documents of water, sewer and drainage must be provided for the General Contractor by a Professional Land Surveyor and must be satisfactory for approval by the OWNER and shall comply with the latest approved version of the CADD City Standards.
- D. Final pay request will not be processed until Record Documents have been completed and submitted to the City.

END OF SECTION

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SECTION 01780 CONTRACT CLOSEOUT

PART 1 GENERAL

1.1 SUBMITTALS

A. Informational Submittals:

- a. Submit prior to application for final payment.
 - i. Record Documents.
 - ii. As-built drawings (signed and sealed hardcopies and electronic format – PDF and CAD files)
 - iii. Special Bonds, Special Guarantees, and Service Agreements.
 - iv. Consent of Surety to Final Payment.
 - v. Releases or Waivers of Liens and Claims.
 - vi. Releases from Agreements.
 - vii. Final Application for Payment: Submit in accordance with procedures and requirements stated in Section 01025, Measurement and Payment.
 - viii. Spare Parts, Special Tools and Extra Materials: As required by individual Specification sections.

B. Subcontractor Identification Form:

- a. Submit form with final pay request.
- b. Submit a separate form for each subcontractor used.
- c. For Capital Improvement Projects, submit form along with final pay request to the PCM.
- d. Form is attached as a Supplement to this Section.

1.2 RECORD DOCUMENTS

A. Quality Assurance:

- a. Furnish qualified and experienced person, whose duty and responsibility shall be to maintain record documents.
- b. Accuracy of Records:
 - i. 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.

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- ii. 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.
- c. Make entries within 24 hours after receipt of information that a change in the Work has occurred.
- d. Prior to submitting each request for progress payment, request PCM'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 PCM to recommend whole or any part of Contractor's Application for Payment, either partial or final.

1.3 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:
 - a. Inform PCM of the reasons.
 - b. 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.
 - c. 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.
 - d. 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.

1.4 AS-BUILT DRAWINGS

- A. Quality Assurance
 - a. As-built drawings must meet all minimum City of Fort Lauderdale CAD standards and be submitted in the latest version of AutoCAD available at the time the contract is signed.

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- b. As-built drawings will be submitted in both electronic and hard copy forms as follow:
 - i. 3 hard copy sets of as-builts will be submitted on 24x36 paper signed, sealed, and dated by a Florida Professional Licensed Surveyor (PLS).
 - ii. 1 CD or jump drive which will include both DWG files for the package and a PDF document including the surveyors signature and seal.
- c. As-built drawings will include the following:
 - i. PLS name, business name, license numbers, address, and telephone number
 - ii. The following statement must be included:

“I hereby certify that the as-built location information of the potable water, reclaimed water, wastewater and drainage facilities shown on these drawings conforms to the minimum technical standards for land surveying in the State of Florida, Chapter 5J-17.050(10)(i) (Florida Administrative Code), as adopted by the Department of Agriculture and Consumer Services, Board of Professional Surveyors and Mappers, and that said as-builts are true and correct to the best of our knowledge and belief.”
 - iii. As-built drawings will contain the information on the design drawings (plan and profile views) plus document changes between the design and construction including correcting all information that is incorrect due to changes during construction. Incorrect or no longer relevant information will be erased or struck through. All location changes constructed materially different (one-tenth foot horizontal, one tenth vertical) than the design location will have their design location struck through and will be redrafted at the constructed location. Design drawing dimensioning will be corrected as necessary.
 - iv. Drawing will be a complete set including cover sheet, index, and any other sheets included in the approved design set. Standard detail sheets are not necessary.

B. Minimum As-Built Drawing Requirements (Not applicable for this project)

- a. Show the location of easements used by the water and wastewater facilities.
- b. Indicate pipe joint locations where water and wastewater or reclaimed water piping crosses.
- c. Indicated the length of gravity wastewater piping and actual slope between manhole centers.

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- d. Show all abandoned in place facilities including the extent and method of abandonment.
- e. Show elevations to the nearest tenth of a foot for top of pipe for water mains, force mains, and reclaimed water mains at vertical deflection points, all bends, valves and fittings and every 200 feet along straight runs and where they cross all other facilities.
- f. Show elevations to the nearest one hundredth of a foot for manhole rims, gravity main inverts at the manhole, force main connections to manholes, lift station top of slab, bottom of wet well, influent pipe invert and control set points.

PART 2 PRODUCTS (NOT USED)**PART 3 EXECUTION****3.1 MAINTENANCE OF RECORD DOCUMENTS****A. General:**

- a. 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.
- b. Delete Engineer title block and seal from all documents.
- c. Label or stamp each record document with title, "RECORD DOCUMENTS," in neat large printed letters.
- d. 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 maintaining up-to-date "red-lined" markups, on site, of all changes including revised locations of buried features and provides access to the City for review at any time.
- e. All piping inserts, fittings, and valve locations shall be located by a Florida Licensed Surveyor in accordance with City of Fort Lauderdale surveying standards and per NAVD 88. Contractor shall provide adequate notice to the surveyor to ensure that all locations are accessible, prior to backfill.

B. Preservation:

- a. Maintain documents in a clean, dry, legible condition and in good order. Do not use record documents for construction purposes.
- b. Make documents and Samples available at all times for observation by PCM or Engineer.

C. Making Entries on Drawings:

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- a. Using an erasable colored pencil (not ink or indelible pencil), clearly describe change by graphic line and note as required.
 - i. Color Coding:
 - a. Green when showing information deleted from Drawings.
 - b. Red when showing information added to Drawings.
 - c. Blue and circled in blue to show notes.
- b. Date entries.
- c. Call attention to entry by “cloud” drawn around area or areas affected.
- d. Legibly mark to record actual changes made during construction, including, but not limited to:
 - i. Depths of various elements of foundation in relation to finished first floor data if not shown or where depth differs from that shown.
 - ii. 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.
 - iii. Location of internal utilities and appurtenances concealed in the construction referenced to visible and accessible features of the structure.
 - iv. Locate existing facilities, piping, equipment, and items critical to the interface between existing physical conditions or construction and new construction.
 - v. 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.
- e. 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.
 - i. Clearly identify the item by accurate notes such as “cast iron drain,” “galv. water,” and the like.
 - ii. Show, by symbol or note, vertical location of item (“under slab,” “in ceiling plenum,” “exposed,” and the like).
 - iii. Make identification so descriptive that it may be related reliably to Specifications.

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D. Coordination with Florida Licensed surveyor:

- a. Contractor shall not cover any bends, valves, or fittings installed until they have been located by the survey crews for the purpose of preparing as-built and/or Record Drawings.
- b. If the above conditions are not met, for any reason, Contractor shall bear the cost of potholing the constructed installation to allow for the locations.

3.2 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.
 - a. Leave the Work and adjacent areas affected in a cleaned condition satisfactory to Owner and PCM.
 - b. Remove grease, dirt, dust, paint or plaster splatter, stains, labels, fingerprints, and other foreign materials from exposed surfaces.
 - c. Repair, patch, and touch up marred surfaces to specified finish and match adjacent surfaces.
 - d. Clean all windows.
 - e. Clean and wax wood, vinyl, or painted floors.
 - f. Broom clean exterior paved driveways and parking areas.
 - g. Hose clean sidewalks, loading areas, and others contiguous with principal structures.
 - h. Rake clean all other surfaces.
 - i. Replace air-handling filters and clean ducts, blowers, and coils of ventilation units operated during construction.
 - j. 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.

3.3 SUPPLEMENTS

- A. The supplements listed below, following "END OF SECTION," are part of this Specification.
 - a. *Subcontractor Identification Form (See next page).*

END OF SECTION

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SUBCONTRACTOR IDENTIFICATION FORM

This form shall be completed by all City of Fort Lauderdale Prime Contractors who subcontracted out any portion of his/her City contract. The form shall be forwarded to the City of Fort Lauderdale's Public Services Department (Engineering and Architectural Services) with the prime contractor's final pay request. A separate form is to be completed and submitted for each subcontractor. Please telephone (954) 761-5057 or 761-5083, if you have any questions regarding this form.

1) CITY OF FORT LAUDERDALE PROJECT NO. _____

2) PROJECT DESCRIPTION _____

3) 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☐ White8) **PRIME Contractor** _____

NAME & TITLE OF PRIME CONTRACTOR'S REPRESENTATIVE COMPLETING THIS FORM (Please
Print)

(Telephone No.)_____
(Fax No.)_____
(Email Address)

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SIGNATURE _____ DATE _____
Prime Contractor's Representative

SECTION 02200 – SITE PREPARATION

PART 1 GENERAL

1.1 DEFINITIONS

- A. Interfering or Objectionable Material: Trash, rubbish, and junk; vegetation and other organic matter, whether alive, dead, or decaying; topsoil.
- B. Clearing. Removal of interfering or objectionable material lying on or protruding above ground surface.
- C. 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.

1.2 QUALITY ASSURANCE

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

1.3 SCHEDULING AND SEQUENCING

- A. Prepare site only after adequate erosion and sediment controls are in place. Limit areas exposed uncontrolled to erosion during installation of temporary erosion and sediment controls.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.1 GENERAL

- A. Clear, grubs, 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.

3.2 LIMITS

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

3.3 TEMPORARY REMOVAL OF INTERFERING PLANTINGS

- A. Remove and store, as specified in 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.

3.4 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.

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3.5 GRUBBING

- A. Grub areas within limits specified.

3.6 SCALPING

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

3.7 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 stripping, meeting requirements of Section 02911, Soil Preparation, for topsoil, separately from other excavated material.

3.8 TREE REMOVAL OUTSIDE CLEARING LIMITS

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

3.9 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:
 - a. Sixteen feet above roadways and shoulders.
 - b. Nine feet above sidewalks.
 - c. Six feet above roofs.
- B. Prune only after planting and in accordance with standard

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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:**

- a. 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.
- b. 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. Scalping: As specified for clearing and grubbing debris.**C. Stripping:**

- a. Dispose of stripping that are unsuitable for topsoil or that exceed quantity required for topsoil offsite or in waste disposal areas approved by CONSULTANT.
- b. Stockpile topsoil in sufficient quantity to meet Project needs. Dispose of excess stripping as specified for clearing and grubbing.

END OF SECTION

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SECTION 02240 – DEWATERING

PART 1 GENERAL (NOT USED)

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.1 GENERAL

- A. The Contractor shall be responsible for design, installation, and operation of a dewatering system to dewater specified excavations.**
 - a. The dewatering system shall be designed in accordance with the Best Management Practices (BMP's) adopted by FDEP.**
 - b. Inspection and control of dewatering system operations will be in accordance with the FDEP guidelines established in the Florida Erosion and Sediment Control Inspector's Manual (current edition).**
- B. Continuously manage and control excavation water recharge in order to facilitate and not impede construction activities at all times, including weekends, holidays, and during periods of work stoppages, and furnish and install, and operate, a contingency backup dewatering system to maintain control of excavation water levels to facilitate construction (i.e.; no construction delays).**

3.2 SUBMITTALS

- A. Submittals shall be made in accordance with the requirements specified in Contract Documents 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:**
 - a. Holding tanks of adequate size and volume.**
 - b. Wellpointing systems.**
 - c. Sump pumping systems.**
 - d. Chemical precipitation of particulates.**
 - e. Filter systems and siltation controls.**

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f. 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:

- a. A written description of the proposed method for temporary stockpiling, transportation, and disposal of all wastes.
- b. Copy of permits of disposal facilities.
- c. Certification of disposal of all wastes.
- d. Directions to the nearest hospital and phone number.
- e. Emergency contact phone numbers.
- f. 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:

- a. Copy of manifests for all wastes leaving the site.
- b. Copy of the laboratory analyses results from all sampling activities.
- c. Copy of closure reports that may be required.

3.3 SURFACE WATER CONTROL

- A. Remove surface runoff controls when no longer needed.**
- B. Seal off or berm catch basins in the area of construction to prevent discharge of untreated dewatering effluent or runoff from unstabilized construction areas into storm drains.**
- C. All drain inlets or catch basins used for dewatering discharge shall be provided with silt and sediment removal barriers as approved by the CONSULTANT.**
 - a. All barriers shall be cleaned regularly to avoid sediment discharge into the storm drain system.

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- b. 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.
- c. All barriers shall be removed upon issuance of a hurricane warning.

3.4 DEWATERING SYSTEMS

- A. Design, furnish, and install, operate, and maintain a dewatering system of sufficient size and capacity to permit excavation and subsequent construction activities in water-free conditions, and to lower and maintain the excavation area groundwater level a minimum of 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 CONSULTANT.**
- D. Design and Operate Dewatering Systems:**
 - a. To prevent loss of ground as water is removed.
 - b. To avoid inducing settlement or damage to existing facilities, completed Work, or adjacent property.
 - c. 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 CONSULTANT.**
- F. Provide controls to prevent surface water from entering excavation pits, trenches, or stockpiled materials.**

3.5 PIPELINES CONSTRUCTED UNDERWATER

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- 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 CITY PROJECT MANAGER within 5 calendar days of the time that the Contractor anticipates using such alternate method.**
- B. If the CITY PROJECT MANAGER 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 CONSULTANT, 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 CITY PROJECT MANAGER 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 CITY PROJECT MANAGER.**
- D. If the dewatering system is eliminated or the effort reduced, and the pipe is laid underwater, additional pipe zone material will be required as backfill to the water table elevation, or to the level it was reduced to.**

3.6 DISPOSAL OF WATER

- A. All water generated, pumped, or removed from excavations as a result of excavation dewatering activities shall be collected, containerized, and managed prior to discharge and or treatment at an approved discharge point or facility, in accordance with Broward County Code of Regulation, Sections 27. 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.**
 - a. 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.
 - b. Maximum allowable turbidity of discharges to surface waters or storm drains will be 10 NTU's.
 - c. Sump discharges cannot be discharged directly to storm drains or surface waters without treatment.

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- C. **Affected storm sewer outfalls shall be protected with floating silt booms as approved by the Broward County Planning and Environmental Regulation Division (BCPERD) and the CONSULTANT. All accumulated debris resulting from the dewatering discharge collecting in the boom shall be removed on a daily basis.**
- 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 BCPERD. 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.**

3.7 WELL POINT REMOVAL

- A. **Well point holes shall be filled with sand which shall be washed into the hole.**
- B. **Well point holes located within asphalt pavement surfaces or concrete pavements, shall be filled with sand to the subgrade. The remaining hole shall be filled with nonshrink grout.**

3.8 CONTAMINATED GROUNDWATER AND DISPOSAL REQUIREMENT

- A. **If Contractor suspects, witnesses, or identifies, groundwater contamination at any time during the performance of the Work, Contractor shall notify the CITY PROJECT MANAGER immediately. Results will be obtained by the onsite mobile laboratory.**
- B. **If analytical testing 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 the CITY PROJECT MANAGER and construction of the remaining sewer pipelines in that area will be installed in the wet or normal construction activities shall be resumed in another areas determined by the CONSULTANT. There shall be no delay or mobilization claim associated with moving to another project area, unless all other Work has been completed. In addition, the local agency will be immediately notified via telephone and in writing by the Contractor. Dewatering activities in the area will not proceed until review of the matter with the local agency is resolved and written authorization is issued.**
- C. **The Contractor shall submit a dewatering plan to the CITY PROJECT MANAGER for review. The Contractor is advised that the SFWMD, FDOT, BCEPGMD, etc. May require that a dewatering plan, prepared by a state of Florida licensed professional engineer or registered professional geologist, be**

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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 BCEPGMD 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 BCEPGMD, 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.
- E. Treatment of the groundwater will include three options depending on the magnitude of the contamination in the trench or as determined by the CONSULTANT: Granular Activated Carbon (GAC) Treatment Vessels, Mobile Air Stripping Units, or Vacuum Truck Removal and Disposal or other method as approved by the CONSULTANT. 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.
- F. If contaminated groundwater in the dewatering trench is encountered, the remediation operations will begin once local agency approval is obtained. Contaminated water will be disposed first into a high volume holding (FRAC) tank and then treated through a GAC unit/portable air stripper or recovered into vacuum hauling trucks for disposal.
- G. Effluent water from the treatment system will be analyzed by the onsite mobile laboratory to confirm that concentrations are below regulatory limits. Effluent water will then be directed to a pre-approved alternative location as determined by local agency and/or the CONSULTANT.

END OF SECTION

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SECTION 02250 - CONTAMINATED SOIL

PART 1 GENERAL

1.1 WORK INCLUDED

- A. This Section covers the Work necessary to remove, transport, and properly dispose of the following wastes:**
- a. Liquid petroleum product.**
 - b. Affected soil.**
 - c. Free petroleum product.**

1.2 DEFINITIONS

- A. Liquid petroleum product (product) is fluid petroleum product partly or entirely composed of diesel fuel or gasoline.**
- B. Affected soil is defined herein.**
- C. Free petroleum product is defined as a liquid which forms a separate floating phase distinct from the groundwater.**

1.3 SUBMITTALS

- A. Submittals shall be made in accordance with the requirements of the Contract Documents and the requirements of this Section.**
- B. The Contractor Shall Provide the Following Submittals:**
- a. A written description of the proposed method for temporary stockpiling, transportation, and disposal of all wastes.**
 - b. Copy of permits of disposal facilities.**
 - c. Certification of disposal of all wastes.**
 - d. Copy of manifests for all wastes leaving the site.**
 - e. Copy of the laboratory analyses required for transportation and disposal of all wastes in accordance with applicable federal, state, and local requirements.**

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- f. Provide name, address, and phone number of all subcontractors.

PART 2 MATERIALS (NOT USED)

PART 3 EXECUTION

3.1 LIQUID PETROLEUM PRODUCT

- A. Classification of liquid petroleum product shall be made by the Consultant/Geologist responsible for the testing of the product.
- B. The Contractor shall remove all liquid petroleum product if discovered in the trench during dewatering operations.
- C. If the petroleum product is discovered, the product will be disposed as described herein.
- D. If contamination is discovered and it is determined that it must be removed, the Contractor shall commence remediation activities as determined by the Consultant/Geologist. During the remediation activities, the Contractor shall move to another location as determined by the CITY PROJECT MANAGER to resume normal construction activities. There shall be no delay or mobilization claim associated with moving to another project area, unless all other Work has been completed.

3.2 AFFECTED SOIL

- A. Excavation of affected soil shall be accomplished in accordance with the Contract Documents. The soil may be contaminated with petroleum product which may be partly or entirely diesel fuel, gasoline, or chlorinated solvents.
- B. Classification of affected soil for disposal purposes will be determined by the CONSULTANT using an Organic Vapor Monitor (OVM) with photo ionization detector or equivalent provided by the Consultant/Geologist. Soils with vapor readings higher than 10 parts per million (ppm) for diesel as defined in Chapter 62-770 of the Florida Administrative Code, are excessively contaminated and will be identified by the Consultant/Geologists for treatment and disposal. Affected soil must be placed on an impermeable barrier when temporarily stockpiled. All stockpile leachate or runoff must be collected for disposal in accordance with applicable federal, state, and local regulations. Soils designated for removal and disposal shall be prepared for shipment, transported, and disposed of in accordance with the requirements of this Section.
- C. Affected soils shall be processed by incineration at a state licensed facility. These soils shall be transported and disposed of in accordance with federal, state, and local regulations. The Contractor shall be responsible for all soil analyses required for transportation and disposal.

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- D. The Contractor shall be responsible for testing soil which has been incinerated to certify the treated soil meets applicable federal, state, and local regulations for final disposal.**

3.3 FREE PETROLEUM PRODUCT

- A. Some free petroleum products which may be partly or entirely diesel fuel or gasoline may be encountered during excavation activities. The Contractor shall remove free petroleum product, if necessary, when a separate floating phase greater than 0.10-inch thick is present as required by health and safety considerations. The free petroleum product shall be removed by skimming, pumping to an oil/water separator, or other approved methods.**
- B. Free petroleum products shall be transported and disposed by the Contractor in accordance with federal, state, and local regulations. The Contractor is responsible for any laboratory analyses required for disposal of the free petroleum products.**

3.4 TRANSPORT AND DISPOSAL

- A. Transport Regulations: The Contractor shall be responsible for the loading, labeling, placarding, marking, weighing, and transporting of all waste materials in accordance with the Florida Department of Transportation Regulations, and U.S. Department of Transportation Regulations. The Contractor shall use only transporters that are licensed and competent to haul these wastes.**

3.5 WASTE CONTAINERS

- A. Each transport container of waste shall be visually inspected by the Contractor for leaks, drips, or container damage prior to being loaded. Containers which are found to be leaking or damaged shall not be loaded until the damage is repaired. The Contractor shall prepare the transport container to prevent spillage or contamination. The Contractor shall notify the CITY PROJECT MANAGER 2 hours before any loaded transport leaves the site.**
- B. All transport containers leaving the site shall be inspected by the Contractor to ensure that no waste material adheres to the wheels or undercarriage.**
- C. All vehicles on which waste is adhering shall be cleaned by sweeping tires and undercarriage or by other dry methods prior to leaving the site.**

3.6 SHIPPING RECORDS

- A. The Contractor shall prepare accurate shipping records for any wastes leaving the site in accordance with applicable federal and state regulations. The Contractor shall be responsible for providing copies of the records to the CITY PROJECT MANAGER and shall immediately notify the CITY PROJECT MANAGER of any problems in completing shipments and disposal of wastes.**
- B. The Contractor shall:**

a. Be responsible for appropriate

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measurement of unit quantity (weight or volume) of waste material removed from the site.

- b. Coordinate vehicle inspection and recording of quantities leaving the site with the CITY PROJECT MANAGER. These quantities shall be compared to recorded quantities received at the treatment or disposal facilities. The Contractor shall resolve any discrepancies occurring immediately, determining the probable cause for the discrepancy.
 - c. Be solely responsible for any and all actions necessary to remedy situations involving waste spiked in transit.
- C. The Contractor shall ensure that a copy of the manifest is returned to the CITY PROJECT MANAGER by the designated treatment or disposal facility within 14 days of receipt of the material to be disposed.

3.7 COORDINATION

- A. The Contractor shall at any time provide the CITY PROJECT MANAGER with safe access to the Work whenever it is in preparation or progress for the purposes of conducting inspections or collecting samples. The Contractor may conduct concurrent sampling and analyses, if desired. Results of any such sampling and analysis shall be furnished to the CITY PROJECT MANAGER at no cost.

PART 4

PAYMENT

4.1 GENERAL

- A. Payment for work in this Section is included as stated in the Bid Form. The Contractor shall be responsible for appropriate measurement of unit quantity (volume or weight) of waste material removed from the site, and for verification of those quantities with receipt records from the disposal site.

END OF SECTION

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SECTION 02260 - EXCAVATION SUPPORT AND PROTECTION

PART 1 GENERAL (NOT USED)

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.1 GENERAL

- A. The Contractor shall be responsible to design, provide, and maintain shoring, sheeting, and bracing as necessary to support the sides of excavations and to prevent detrimental settlement and lateral movement of existing facilities, adjacent property, and completed Work.**
- B. Consider all available geotechnical information available when designing the excavation support system.**

3.2 REMOVAL OF EXCAVATION SUPPORT

- A. Remove excavation support in a manner that will maintain support as excavation is backfilled.**
- B. Do not begin to remove excavation support until support can be removed without damage to existing facilities, completed Work, or adjacent property.**
- C. Remove excavation support in a manner that does not leave voids in the backfill.**

3.3 TRENCHES

- A. For trench excavation exceeding 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

1.1 DEFINITIONS

- A. Prepared Ground Surface. Ground surface after completion of required demolition, clearing and grubbing, scalping of sod, stripping of topsoil, excavation to grade, and subgrade preparation.
- B. Completed Course. A course or layer that is ready for next layer or next phase of Work.
- C. Lift. Loose (uncompacted) layer of material.
- D. Geosynthetics. Geotextiles, geogrids, or geomembranes.
- E. Well-Graded:
 - a. A mixture of particle sizes with no specific concentration or lack thereof of one or more sizes.
 - b. Does not define numerical value that must be placed on coefficient of uniformity, coefficient of curvature, or other specific grain size distribution parameters.
 - c. 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:
 - a. 1-foot outside outermost edge at base of foundations or slabs.
 - b. 1-foot outside outermost edge at surface of roadways or shoulder.
 - c. 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 CITY PROJECT MANAGER determines to be suitable for specific use.
- I. Imported Material. Materials obtained from sources offsite, suitable for specified use.
- J. Structural Fill. Fill materials as required under structures, pavements, and other facilities.
- K. Embankment Material. Fill materials required to raise existing grade in areas other than under structures.

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PART 2 PRODUCTS

2.1 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.

2.2 GRANULAR FILL

- A. Use graded aggregate base material of uniform quality throughout, substantially free from vegetable matter, shale, lumps and clay balls, and having a Limerock Bearing Ratio value of not less than 100.
- B. Aggregate is composed of limestone, marble, or dolomite.
- C. Use material retained on the No. 10 sieve composed of aggregate meeting the following requirements:
 - a. Soundness Loss, Sodium, Sulfate: AASHTO T 104, 15 percent.
 - b. Percent Wear: AASHTO T 96 (Grading A) 45 percent.

| Sieve Size | Percent by Weight Passing |
|------------|---------------------------|
| 2 inch | 100 |
| 1-1/2 inch | 95 to 100 |
| ¾ inch | 65 to 90 |
| 3/8 inch | 45 to 75 |
| No. 4 | 35 to 60 |
| No. 10 | 25 to 45 |
| No. 50 | 5 to 25 |
| No. 200 | 0 to 10 |

2.3 WATER FOR MOISTURE CONDITIONING

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

2.4 FOUNDATION STABILIZATION ROCK

- A. General:

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- a. 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.
- D. Crushed 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. If the shell meets the above requirements without crushing, crushing will not be required.

PART 3 EXECUTION

3.1 GENERAL

- A. Keep placement surfaces free of water, debris, and foreign material during placement and compaction of fill and backfill materials.
- B. Place and spread fill and backfill materials in horizontal lifts of uniform thickness, in a manner that avoids segregation, and compact each lift to specified densities prior to placing succeeding lifts. Slope lifts only where necessary to conform to final grades or as necessary to keep placement surfaces drained of water.
- C. During filling and backfilling, keep level of fill and backfill around each structure and buried tank even.
- D. If Pipe, Conduit, Duct Bank, or Cable is to be laid within Fill or Backfill:
 - a. Fill or backfill to an elevation 2 feet above top of item to be laid.
 - b. Excavate trench for installation of item.
 - c. Install bedding, if applicable, as specified in Contract Document Section - Trench Backfill.
 - d. Install item.

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- e. Backfill pipe zone and remaining trench, as specified in Contract Document Section, Trench Backfill, before resuming filling or backfilling specified in this Section.

- E. Tolerances

- a. Final Lines and Grades: Within a tolerance of 0.1 foot, unless dimensions or grades are shown or specified otherwise.
- b. Grade to establish and maintain slopes and drainage as shown. Reverse slopes are not permitted.

- F. Settlement. Correct and repair any subsequent damage to structures, pavements, curbs, slabs, piping, and other facilities, caused by settlement of fill or backfill material.

3.2 BACKFILL UNDER AND AROUND STRUCTURES

- A. Under Facilities. Within influence area beneath structures, slabs, pavements, curbs, piping, conduits, duct banks, and other facilities, backfill with granular fill, unless otherwise shown. Place granular fill in lifts of 6-inch maximum thickness and compact each lift to a density of at least 100 percent of the maximum density as determined by AASHTO T99, Method C.

3.3 FILL

- A. Outside Influence Areas Beneath Structures, Pavements, Curbs, Slabs, Piping, and Other Facilities: Unless otherwise shown, place earthfill as follows:
 - a. Allow for proper thickness of topsoil where required.
 - b. Maximum 8-inch thick lifts.
 - c. Place and compact fill across full width of embankment.
 - d. Compact to a density of at least 80 percent of the maximum density as determined by AASHTO T99, Method C.
 - e. 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.
 - f. Dress completed embankment with allowance for topsoil, crest surfacing, and slope protection, where applicable.

3.4 SITE TESTING

- A. Gradation
 - a. One sample from each 1,500 tons of finished product or more often as determined by CONSULTANT, if variation in gradation is occurring, or if material appears to depart from Specifications.

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- b. If test results indicate material does not meet Specification requirements, terminate material placement until corrective measures are taken.
 - c. 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:
 - a. Earthfill: One test per 400 feet of pipe run.
 - b. Granular Fill: One test per 400 feet of pipe run.
 - c. Foundation Stabilization Rock: One test per lift.

3.5 REPLACING OVEREXCAVATED MATERIAL

- A. Replace excavation carried below grade lines shown or established by CITY PROJECT MANAGER as follows:
 - a. Beneath Footings. Granular fill.
 - b. Beneath Fill or Backfill. Same material as specified for overlying fill or backfill.
 - c. Beneath Slabs-On-Grade. Granular fill.
 - d. Trenches:
 - i. Unauthorized Overexcavation: Either foundation stabilization rock or granular pipe base material, as specified in Contract Documents Section, Trench Backfill.
 - ii. Authorized Overexcavation: Foundation stabilization rock.
 - e. Permanent Cut Slopes (Where Overlying Area is Not to Receive Fill or Backfill):
 - i. Flat to Moderate Steep Slopes (3 to 1, Horizontal Run: Vertical Rise or Flatter): Earthfill.
 - ii. Steep Slopes (Steeper than 3 to 1):
 - a. 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.
 - b. Backfilling overexcavated areas are prohibited unless, in CONSULTANT's opinion, backfill will remain stable and overexcavated material is replaced as compacted earthfill.

END OF SECTION

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SECTION 02316 - EXCAVATION

PART 1 GENERAL

1.1 QUALITY ASSURANCE

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

1.2 WEATHER LIMITATIONS

- A. Material excavated during inclement weather shall not be used as fill or backfill until after material drains and dries sufficiently for proper compaction.

1.3 SEQUENCING AND SCHEDULING

- A. Clearing, Grubbing, and Stripping: Complete applicable Work specified in Contract Documents prior to excavating.
- B. Contractor shall call the utility companies 72 hours before excavation per the requirements of the Contract Documents.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.1 GENERAL

- A. Excavate to lines, grades, and dimensions shown and as necessary to accomplish Work. Excavate to within tolerance of plus or minus 0.1 foot except where dimensions or grades are shown or specified as maximum or minimum. Allow for forms, working space, granular base, topsoil, and similar items, wherever applicable. 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 overexcavation. Do not overexcavate without written authorization of CONSULTANT. If the Contractor excavates beyond the limits shown or specified, the Contractor shall replace such excavation at his own expense. Replace overexcavated material as specified in Contract Documents.
- 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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3.2 UNCLASSIFIED EXCAVATION

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

3.3 TRENCH WIDTH

- A. Minimum Width of Trenches:
- a. Single Pipes, Conduits, Direct-Buried Cables, and Duct Banks:
 - i. Less than 4-Inch Outside Diameter or Width: 18 inches.
 - ii. 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.
 - b. 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.
 - c. Increase trench widths by thicknesses of sheeting, if used.
 - d. The maximum trench width shall not exceed the minimum stated width of the trench unless approved by the CONSULTANT. Restoration for excavation beyond the minimum required width shall be at the Contractor's sole expense.
- B. **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.**
- C. **Consider all available geotechnical information available when designing the excavation support system.**
- D. **Remove excavation support in a manner that will maintain support as excavation is backfilled.**
- E. **Do not begin to remove excavation support until support can be removed without damage to existing facilities, completed Work, or adjacent property.**
- F. **Remove excavation support in a manner that does not leave voids in the backfill.**
- G. **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.**

3.4 EMBANKMENT AND CUT SLOPES

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- 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.

3.5 STOCKPILING EXCAVATED MATERIAL

- A. Stockpile excavated material that is suitable for use as fill or backfill until material is needed.
- B. Post signs indicating proposed use of material stockpiled. Post signs that are readable from all directions of approach to each stockpile. Signs should be clearly worded and readable by equipment operators from their normal seated position.
- C. Confine stockpiles to within easements, rights-of-way, and approved work areas. Do not obstruct roads, streets, public thoroughfares, or access to fire hydrants.
- D. Do not stockpile excavated material adjacent to trenches and other excavations unless excavation sideslopes and excavation support systems are designed, constructed, and maintained for stockpile loads.
- E. Do not stockpile excavated materials near or over existing facilities, adjacent property, or completed Work, if weight of stockpiled material could induce excessive settlement.

3.6 DISPOSAL OF SPOIL

- A. Dispose of excavated materials, which are unsuitable or exceed quantity needed for fill or backfill, offsite.
- B. Dispose of debris resulting from removal of organic matter, trash, refuse, and junk as specified in the Contract Documents, for clearing and grubbing debris.

END OF SECTION

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SECTION 02319 - SUBGRADE PREPARATION

PART 1 GENERAL

1.1 DEFINITIONS

- A. Prepared Ground Surface. Ground surface after completion of clearing and grubbing, scalping of sod, stripping of topsoil, excavation to grade, and scarification and compaction of subgrade.
- B. Subgrade. Layer of existing soil after completion of clearing, grubbing, scalping of topsoil prior to placement of fill, roadway structure or base for floor slab.
- C. Proof-Rolling. Testing of subgrade by compactive effort to identify areas that will not support the future loading without excessive settlement.

1.2 QUALITY ASSURANCE

- A. Notify CONSULTANT when subgrade is ready for compaction or proof-rolling or whenever compaction or proof-rolling is resumed after a period of extended inactivity.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.1 GENERAL

- A. Keep subgrade free of water, debris, and foreign matter during compaction or proof-rolling.
- B. Bring subgrade to proper grade and cross-section and uniformly compact surface.
- C. Do not use sections of prepared ground surface as haul roads. Protect prepared subgrade from traffic.
- D. Maintain prepared ground surface in finished condition until next course is placed.

3.2 COMPACTION

- A. Under Earthfill: Compact upper 6 inches to minimum of 80 percent of the maximum density as determined by AASHTO T99, Method C.
- B. Under Pavement, Floor Slabs On Grade, or Granular Fill under Structures: Compact the upper 12 inches or as shown on the Drawings, to minimum of 100 percent of the maximum dry density as determined by AASHTO T99, Method C.

3.3 MOISTURE CONDITIONING

- A. Dry Subgrade: Add water, then mix to make moisture content uniform throughout.

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- B. Wet Subgrade: Aerate material by blading, discing, harrowing, or other methods, to hasten drying process.

3.4 TESTING

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

3.5 CORRECTION

- A. Soft or Loose Subgrade:
 - a. Adjust moisture content and recompact, or
 - b. Over excavate and replace with suitable material from the excavation, as specified in the Contract Documents.
 - c. Unsuitable Material: Over excavate and replace with suitable material from the excavation, as specified in Contract Documents.

END OF SECTION

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SECTION 02320 - TRENCH BACKFILL

PART 1 GENERAL

1.1 DEFINITIONS

- A. **Base Rock.** Granular material upon which manhole bases and other structures are placed.
- B. **Bedding Material.** Granular material upon which pipes, conduits, cables, or duct banks are placed.
- C. **Imported Material.** Material obtained by the Contractor from source(s) offsite.
- D. **Lift.** Loose (uncompacted) layer of material.
- E. **Pipe Zone.** Backfill zone that includes full trench width and extends from prepared trench bottom to an upper limit above top outside surface of pipe, conduit, cable or duct bank.
- F. **Prepared Trench Bottom.** Graded trench bottom after excavation and installation of stabilization material, if required, but before installation of bedding material.
- G. **Selected Backfill Material.** Material available onsite that CITY PROJECT MANAGER determines to be suitable for a specific use.
- H. **Well-Graded.** A mixture of particle sizes that has no specific concentration or lack thereof of one or more sizes producing a material type that, when compacted, produces a strong and relatively incompressible soil mass free from detrimental voids. Well-Graded does not define any numerical value that must be placed on the coefficient of uniformity, coefficient of curvature, or other specific grain size distribution parameters.

PART 2 PRODUCTS

2.1 GEOTECTILE

- A. As specified in the Contract Documents.

2.2 MARKING TAPE

- A. **Plastic:**
 - a. Inert polyethylene, impervious to known alkalis, acids, chemical reagents, and solvents likely to be encountered in soil.
 - b. Thickness: Minimum 4 mils.

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- c. Minimum Width: 2 inches.
- d. Identifying Lettering: Minimum 1-inch high, permanent black lettering imprinted continuously over entire length.

- e. Manufacturers and Products:

- i. **Reef Industries; Terra Tape.**

- ii. **Allen; Markline.**

B. Metallic:

- a. Solid aluminum foil, visible on unprinted side, encased in a protective high visibility, inert polyethylene plastic jacket.
- b. Foil Thickness: Minimum 5.5 mils.
- c. Width: 2 inches.
- d. Identifying Lettering: Minimum 1-inch high, permanent black lettering imprinted continuously over entire length.
- e. Joining Clips: Tin or nickel-coated furnished by tape manufacturer.
- f. Manufacturers and Products:

- i. **Reef Industries; Terra "D".**

- ii. **Allen; Detectatape.**

C. Color:

- a. **In accordance with APWA Uniform Color Code for Temporary Marking of Underground Facilities.**

| Color ^a | Facility |
|---|---|
| Red | Electric power lines, cables, conduit, and lightning cables |
| Orange | Communicating alarm or signal lines, cables, or conduit |
| Yellow | Gas, oil, steam, petroleum, or gaseous materials |
| Green | Sewers and drain lines |
| Blue | Water, irrigation, and slurry lines |
| ^a As specified in ANSI Z53.1, Safety Color Code. | |

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2.3 TRENCH STABILIZATION MATERIAL

- A. Foundation stabilization rock as specified in the Contract Documents.

2.4 BEDDING MATERIAL AND PIPE ZONE MATERIAL

- A. Granular fill as specified in the Contract Documents.

2.5 EARTH BACKFILL

- A. Earth fill as specified in the Contract Documents.

PART 3 EXECUTION

3.1 TRENCH PREPARATION

A. Water Control:

- a. As specified in the Contract Documents
- b. Remove water in a manner that minimizes soil erosion from trench sides and bottom.
- c. Provide continuous water control until trench backfill is complete.

- B. Remove foreign material and backfill contaminated with foreign material that falls into trench.

- C. Where the trench has been dewatered, backfilling must be done before the pumps are shut off so that the pipe will not float. Any pipe which has been displaced because of floatation will be removed and installed correctly at the Contractor's expense.

3.2 TRENCH BOTTOM

- A. Firm Subgrade: Grade with hand tools, remove loose and disturbed material, and trim off high areas and ridges left by excavating bucket teeth. Allow space for bedding material if shown or specified.

- B. Soft Subgrade: If subgrade is encountered that may require removal to prevent pipe settlement, notify CITY PROJECT MANAGER. The CITY PROJECT MANAGER will determine depth of over-excavation, if any, required.

3.3 TRENCH STABILIZATION MATERIAL INSTALLATION

- A. Rebuild trench bottom with trench stabilization material as directed by the CONSULTANT.

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- B. Place material over full width of trench in 6-inch lifts to required grade, providing allowance for bedding thickness.**
- C. Compact each lift so as to provide a firm, unyielding support for the bedding material prior to placing succeeding lifts.**

3.4 BEDDING

- A. Furnish granular fill or imported bedding material as directed by the CONSULTANT.**
- 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:**
 - a. Pipe, 15 Inches and Smaller: 4 inches.
 - b. Pipe, 18 Inches to 36 Inches: 6 inches.
 - c. Pipe, 42 Inches and Larger: 8 inches.
 - d. Conduit: 3 inches.
 - e. Direct-Buried Cable: 3 inches.
 - f. 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.**

3.5 BACKFILL PIPE ZONE

- A. Furnish granular fill or imported bedding material as**

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directed by the CONSULTANT.

- B. Upper Limit of Pipe Zone Shall Not Be Less Than Following:**
- a. Pipes:
 - i. Up to 12-Inch Diameter: 6 inches above top of pipe.
 - ii. Greater than 12-Inch Diameter: 12 inches above top of pipe, unless shown otherwise.
 - b. Conduit: 3 inches, unless shown otherwise.
 - c. Direct-Buried Cable: 3 inches, unless shown otherwise.
 - d. 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.**
- a. Pipes 10 Inches and Smaller Diameter: First lift less than or equal to 1/2 pipe diameter but not less than 3 inches.
 - b. Pipes Over 10-Inch Diameter: Maximum 6-inch lifts.
- E. Thoroughly tamp each lift, including area under haunches, with handheld tamping bars supplemented by “walking in” and slicing material under haunches with a shovel to ensure that voids are completely filled before placing each succeeding lift. Compact material in pipe zone to at least 98 percent maximum density as determined by AASHTO T180.**
- F. After the full depth of the pipe zone material has been placed as specified, compact the material by a minimum of three passes with a vibratory plate compactor only over the area between the sides of the pipe and the trench walls. Contractor shall exercise proper care to ensure that no pipe joints will be broken, damaged, or disturbed through the use of any compacting equipment.**
- G. Do not use power-driven impact compactors to compact pipe zone material.**
- H. Where approved by the Engineer, hydraulic compaction of the pipe zone material and granular trench backfill may be used providing density testing requirements are met. A submittal describing the method of hydraulic compaction will be required.**

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3.6 MARKING TAPE INSTALLATION

- A. Continuously install marking tape along centerline of all buried piping, on top of last lift of pipe zone material. Coordinate with piping installation drawings.**
- a. Metallic Marking Tape: Install with nonmetallic piping and waterlines.
 - b. Plastic Marking Tape: Install with metallic piping.

3.7 BACKFILL ABOVE PIPE ZONE

- A. General:**
- a. Process excavated material to meet specified gradation requirements.
 - b. Adjust moisture content as necessary to obtain specified compaction.
 - c. 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.
 - d. Do not use power driven impact type compactors for compaction until at least 4 feet of backfill is placed over top of pipe.
 - e. Backfill to grade with proper allowances for topsoil, crushed rock surfacing and pavement thicknesses, wherever applicable.
 - f. Backfill around structures with same class backfill as specified for adjacent trench unless otherwise shown or specified.
 - g. Hydraulic compaction may be allowed based upon approval by the CITY PROJECT MANAGER of the Contractor's detailed compaction and testing procedures.
- B. Backfill for Areas in Landscaped Areas:**
- a. Place in lifts not exceeding 12-inch thickness.

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- b. 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.

3.8 ALTERNATE METHOD OF CONSTRUCTION

- A. When high water tables, porous soils or other limitations to dewatering are encountered, the Contractor may request the approval of the CITY PROJECT MANAGER for an alternate method of construction.
- B. Use of alternative methods shall not relieve the Contractor of the work, result in increased costs to the Owner or reductions in the quality of the work as defined by testing and acceptance requirements.
- C. Removal of water requirements will be waived and the pipe and appurtenances will be permitted to be installed underwater.
- D. Excavation shall be performed in accordance with the Contract Documents 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 the Contract Documents.
- 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 the Contract Documents. 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.

3.9 MAINTENANCE OF TRENCH BACKFILL

- A. After each section of trench is backfilled, maintain the surface of the backfilled trench even with the adjacent ground surface until final surface restoration is completed.
- B. **Other Areas:** Add excavated material where applicable and keep the surface of the backfilled trench level with the adjacent ground surface.
- C. Water shall be applied to the unstabilized trench backfill to control dust as directed by the CONSULTANT.

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- 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.**

3.10 SETTLEMENT OF BACKFILL

- A. Settlement of trench backfill, or of fill or facilities constructed over trench backfill within the warranty period for the project will be considered a result of defective compaction of trench backfill.**

END OF SECTION

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SECTION 02340 - EROSION CONTROL AND SOIL STABILIZATION

PART 1 GENERAL

1.1 DEFINITIONS

A. Soil Erosion Stabilization:

- a. 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.
- b. Ground surfaces exposed during the wet season.
- c. Areas which will not be subjected to heavy wear by ongoing construction traffic.
- d. 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:

- a. Permanently stabilize exposed soil surfaces at finished grades.
- b. Permanent stabilization methods include, but are not limited to, sodding (permanent), mulching, and landscaping.
- c. Immediately perform permanent stabilization at each completed excavation and embankment areas except for areas that are scheduled to be redisturbed.
- d. Incorporate all permanent erosion control features into the Project at the earliest practical time.

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1.2 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: As specified in the Contract Documents.**
- C. Mulch: Mark package of mulch to show air-dry weight.**

1.3 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. CITY PROJECT MANAGER'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 CITY PROJECT MANAGER at Least 3 Working Days in Advance of:**
 - a. Materials delivery.**
 - b. 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.**

1.4 MAINTENANCE

- A. Operations:**
 - a. Sodded Areas: Perform during maintenance period to include:**
 - i. Watering: Keep surface moist.**
 - ii. Washouts: Repair by filling with topsoil, and replace sodded areas.**

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- iii. **Mulch: Replace wherever and whenever washed or blown away.**
- iv. **Resod unsatisfactory areas or portions thereof immediately if a satisfactory stand has not been produced.**
- b. Inspect, repair, and replace as necessary all erosion control measures during the time period from start of construction to completion of construction.
- c. 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:

- a. 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.
- b. 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.
- c. 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 CITY PROJECT MANAGER.
- d. 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**2.1 FERTILIZER**SECTION
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- 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:**
 - a. Nitrogen: 16 percent.**
 - b. Phosphoric Acid: 4 percent.**
 - c. 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.**

2.2 SOD

- A. As specified in the Contract Documents.**

2.3 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 CITY PROJECT MANAGER, 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.**

2.4 SOIL TACKIFIER

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

2.5 EROSION CONTROL MATTING

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- A. Excelsior mat or straw blanket; staples as recommended by matting manufacturer.**

2.6 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):**
- a. Tear Strength: 130 pounds.
 - b. Elongation: 620 percent.
 - c. Minimum Thickness: 6 mil.

2.7 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.**
- a. Filaments: Resistant to damage from exposure to ultraviolet rays and heat.
 - b. Material Edges: Finish so that, filaments retain their relative positions under stress.
- 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 |

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| Table No. 1 - Filter Fabric | | |
|--|----------------|-------------|
| Physical Property | Required Value | Test Method |
| Ultraviolet Radiation Resistance, % Strength Retention | 80 | ASTM D4355 |
| Flow Rate, gpm/sf, min. ARV | 30 to 50 | ASTM D4491 |

2.8 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.**

2.9 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 in the Contract Documents.**

2.11 DUST CONTROLLER

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

2.12 FILTER FABRIC

- A. All existing and newly constructed storm drainage structures onsite or adjacent to the site shall be protected with two (2) layers of non-woven filter secured beneath the frame and grate.**
- B. Filter Fabric shall meet the requirements of Type D-3 meeting the FDOT specifications Section 985.**

2.13 FLOATING/STACKED TURBIDITY CURTAINS

- A. Curtains shall be minimum 18 ounce nylon reinforced PVC fabric (300 psi Test).**
- B. Curtains are five (5') standard height and shall reach the bottom for depths up to ten (10') feet of water.**

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- C. Turbidity barriers are required on all outfalls located within the site or adjacent to the site. Location of turbidity barriers will be as approved by CITY PROJECT MANAGER.**

PART 3 EXECUTION

3.1 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 CITY PROJECT MANAGER 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 CITY PROJECT MANAGER. This limitation applies separately to clearing and grubbing operations and excavation and filling operation.**
- D. The CITY PROJECT MANAGER 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.**

3.2 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.**
- C. Place aggregate over the subgrade geotextile to a minimum thickness of 8 inches.**

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- D. Minimum dimensions for stabilized construction entrances are 50 feet in length by 20 feet in width.**

3.3 SOIL PREPARATION

- E. 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.**

3.4 SODDING

- A. As specified in the Contract Documents.**

3.5 MULCHING

- A. Apply uniformly on disturbed areas that will remain undisturbed for 7 days or more, as requested by CITY PROJECT MANAGER, 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.**
 - a. As recommended by manufacturer.**

3.6 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.**

3.7 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 CITY PROJECT MANAGER.**

3.8 SILT FENCE

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

3.9 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.**

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- E. Wedge loose straws in any gaps between bales.**

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:**
 - a. Lengthwise: 1 foot minimum.**
 - b. 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 CITY PROJECT MANAGER, 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 02345 - HORIZONTAL DIRECTIONAL DRILLING AND PIPE INSTALLATION

PART 1 GENERAL

1.1 SUBMITTALS

A. Shop Drawings:

- a. Description of how pilot hole drill will be steered and of how position and inclination of bore head will be monitored. Surface (walkover) locating systems using sondes and wireline (with or without auxiliary surface grid) or magnetic steering tools are acceptable as appropriate to site conditions.
- b. Staging and pipe stringing areas, including maintenance of traffic and site access during pipe jointing.
- c. Pipe catalog information confirming that pipe, fittings, joints, and other materials confirm to the requirements of this section.
- d. Installation plan, including detailed plan and profile of bore plotted at scale no smaller than 1 inch equals 20 feet horizontal and vertical.
- e. Solids control plan and drilling procedures.
- f. Contingency Plan For The Following Potential Situations:
 - i. **Loss of drilling fluid circulation.**
 - ii. **Hydrofracture.**
 - iii. **Obstruction encountered during drilling.**
 - iv. **Broken drill pipe.**
 - v. **Collapsed or buckled product pipe.**
- g. Drawings of specific connection details at the ends of each directional drill.
- h. Record drawing plan and profile showing as constructed position of pipeline.

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1.2 QUALITY ASSURANCE

- A. **Provide key personnel with at least 5 years experience in directional drilling and associated pipe installation, including pipe at least as large as 24 inches in diameter. Key personnel include field supervisor and operators of directional drilling equipment, including position monitoring and steering equipment.**
- B. **Pipe manufacturer's fused jointing and testing instructions and certificates of qualification for persons fusing HDPE or PVC pipe. Persons fusing pipe shall have a minimum of 2 years experience fusing HDPE or PVC pipe and shall have received training on the equipment to be utilized.**
- C. **Existing utilities are shown as based on available record information, field survey, and subsurface verification. The CONTRACTOR shall be responsible for selecting steering and guidance tools suitable to the situation taking into account the potential for signal loss and potential interferences.**

PART 2 MATERIALS

2.1 RESTRAINED JOINT DUCTILE IRON

- A. **As specified in the Contract Documents.**
- B. **Manufacturer restrained joint only.**

2.2 HDPE PIPE AND FITTINGS

- A. **The pipe shall be extruded from a polyethylene compound which conforms to AWWA C-906, ASTM D1248, and which possesses the following properties:**
 - a. The polyethylene shall be obtained by polymerization of no less than 85 percent ethylene and no less than 95 percent of total olefins by weight.
 - b. The polyethylene resin shall be classified as a Type III, Grade P34, Class C, Category 5 with a density of 0.955 g/cm³ and have a minimum ASTM D3350 cell classification of 335434C and a designation of PE 3408 by the Plastic Pipe Institute.
 - c. Environmental Stress: Greater than 192 hours. Crack resistance. ASTM D1693 Condition C.
 - d. Minimum Hydrostatic: 1,600 psi. Design basis at 73.4 degrees F, ASTM D2837.

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- e. The polyethylene compound shall be suitably protected against degradation by ultraviolet light by means of carbon black, well dispersed by precompounding in a concentration of not less than 2 percent.
- f. The maximum allowable hoop stress shall be 800 psi at 73.4 degrees F.
- g. The pipe manufacturer shall be listed with the Plastic Pipe Institute as meeting the recipe and mixing requirements of the resin manufacturer for the resin used to manufacture the pipe for this project.
- h. Pipe sizes shall conform to ASTM F714.
- i. The pipe shall contain no recycled compound except that generated in the manufacturer's own plant from resin of the same specification from the same raw material. The pipe shall be homogeneous throughout and free of visible cracks, holes, foreign inclusions, or other deleterious defects, and shall be identical in color, density, melt index, and other physical properties. The resin used for manufacturer of the pipe shall be manufactured by the pipe manufacturer, thus maintaining complete control of the pipe quality.
- j. The CITY PROJECT MANAGER may request, as part of the quality control records submittal, certification that the pipe produced is represented by the quality assurance testing. Additionally, test results from manufacturer's testing or random sampling by the CITY PROJECT MANAGER that do not meet appropriate ASTM Standards or manufacturer's representations may be cause for rejection of pipe represented by the testing. These tests may include density and flow rate measurements from samples taken at selected locations within the pipe wall and thermal stability determinations according to ASTM D3350, 10.1.9.

- B. Pipe Design: The pipe shall be designed according to the ISO modified formula ASTM D3035. The design pressure rating shall be expressed in terms of the static working pressure in psi for water at 73.4 degrees F according to**

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ASTM D2837. The minimum allowable pressure rating for the pipe shall be 120 psi except as noted on the Drawings.

- C. Polyethylene fittings shall be manufactured by molding or fabrication from polyethylene pipe using thermal butt-fusion. All polyethylene fittings shall have the same or higher pressure rating, inside diameter, and composition, and same manufacturer as the pipe.**
- D. Fabricated pipe fittings shall be joined to the polyethylene pipe by using flanges, butt-fused to the pipe unless otherwise specified. Backup flange rings, bolts, and nuts shall be Type 316 stainless steel. Gaskets shall be reinforced black rubber, asbestos-rubber compound, Buna-N, red rubber, or other material as approved by the CITY PROJECT MANAGER and shall be made to fit the joint.**
- E. Polyethylene pipe and fittings shall meet the following minimum dimensional requirements of Performance Pipe as manufactured by Chevron Phillips Chemical Company, or equal.**

2.3 DETECTION TPE AND LOCATOR WIRE

- A. Detection tape for surficial and open cut pipe runs shall be 2 inches wide with a metallic backing. The tape shall be imprinted with the words, CAUTION PRESSURE WATER BELOW. Tape shall be Safety Green "Terra Tape/D" as manufactured by Griffolyn Company, Inc., Houston, Texas; "Detectatape" by Allen Systems, Inc., Houston, Texas; "Line Guard" by Calpico, South San Francisco, California; or equal.**
- B. Pull a No. 6 single strand, copper wire through the borehole with the HDPE and PVC pipe. The wire shall be continuous through the pipe installation.**

2.4 JOINTS

- A. Thermal butt-fusion, except where connecting to DI pipe.**
- B. Butt-fusion shall be in accordance with ASTM D2274 and the pipe manufacturer's recommendations.**

2.5 FLANGES

- A. ASTM A240, Type 316 stainless steel backing flanges with 125-pound, ANSI B16.1 standard drilling, beveled to sit flush against the HDPE flange. Flanges shall be supplied by the pipe manufacturer, complete. Flanges shall be complete with one-piece, molded polyethylene stub ends. Flanged connections shall have the same pressure rating as the pipe or greater.**

2.6 GASKETS

- A. Flat ring, full-face, 1/8-inch ethylene propylene rubber (EPR).**

2.7 BOLTING

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- A. Type 316 stainless steel, ASTM A193, Grade B8 hex head bolts; and ASTM A194, Grade 8 hex head nuts. Bolts shall be fabricated in accordance with ANSI B18.2 and provided with washers of the same material as bolts.**

2.8 HDPE PIPE TRANSITION ADAPTOR

- A. Provide MJ, anchored HDPE/DI fitting at transition from HDPE to ductile iron or PVC pipe.**
- B. Adaptors shall be fully pressure rated to the DR of the specified pipe.**
- C. DIMJA-KIT as manufactured by Independent Pipe Products or equal.**

PART 3 EXECUTION**3.1 GENERAL**

- A. Comply with provisions of all supplied permits.**
- B. Provide freshwater, free of hazardous or toxic substances, for drilling and grouting purposes.**
- C. The access/egress locations for each proposed installation are located in CITY streets and right-of-ways with free and clear passage for drilling equipment. If additional paved or improved areas are required by the Contractor, they shall be provided at no additional cost to the Owner.**

3.2 PREPARATIONS

- A. Locate positions of entry and exit pits, establish elevation and horizontal datum for bore head control, and lay out pipe assembly area.**
- B. Lay out and assemble pipe in manner that does not obstruct adjacent roads, nearby railroads, and commercial or residential activities adjacent to construction easements. Elevate pipe over streets or railroads as necessary to avoid disruption to traffic.**

3.3 DRILLING PILOT HOLE

- A. Drill pilot hole from entrance point to exit point following vertical and horizontal alignment shown. Contractor is responsible for selection and proper use of the steering tools and guidance system based on the known conditions at the site. Loss of control due to interference from known structures and utilities will be corrected at no additional cost to the Owner.**
- B. The steering tool/guidance system shall have orientation sensors to monitor and record pitch, roll, and left/right deviation.**
 - a. As pilot hole is advanced, plot actual horizontal and vertical alignment of pilot hole at intervals not exceeding 50 feet.**

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- b. Provide CITY PROJECT MANAGER with position or inclination of pilot bore upon request and at the completion of the installation.
- c. The Contractor assumes all liability for loss or damage to all down-hole equipment.

C. Alignment Requirements:

- a. Pilot hole exit point shall be within 10 feet horizontally of exit point location shown.
- b. Throughout its alignment, pilot hole shall be within 10 feet of horizontal alignment shown, and no shallower than vertical alignment shown.
- c. Alignment shall have no intermediate high points that might trap air in pipe after installation.
- d. Curvature of completed pilot hole shall not exceed that which after pipe installation will result in pipe wall stresses greater than 0.50 of yield stress.

D. Acceptance: If pilot hole alignment fails to conform to specified requirements, drill new pilot hole with alignment meeting specified requirements.

- a. If the hole is lost or damaged during the performance of the Work, the loss and damage shall be borne by the Contractor.
- b. If the hole is not carried to the contract length and of sufficient diameter, to install the specified carrier pipe the Contractor shall drill a new crossing as if it were the first crossing. The requirement to drill a substitute crossing shall be recurring until the hole is acceptable and at no additional cost to the Owner.
- c. If before the completion of the crossing, the Contractor encounters any condition or unknown obstruction, which, in the Contractor's professional judgment makes continuation of the drill abnormally difficult or hazardous, or which precludes further drilling using normal procedures, the Contractor may

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elect to discontinue drilling, sidetrack to avoid the obstacle, or drill in a substitute location agreeable to the Owner and the CITY PROJECT MANAGER.

3.4 REAMING PILOT HOLE AND PULLING PIPE

- A. Obtain CITY PROJECT MANAGER's approval to proceed before enlarging pilot hole and pulling pipe into position.**
- B. While pulling pipe, enlarge pilot hole ahead of pipe to diameter sufficient for pulling pipe into position.**
- C. While pulling pipe, handle pipe in manner that does not overstress pipe. Limit radius of curvature along length of pipe during installation to minimum radius shown on the Drawings. If pipe buckles or is otherwise damaged, remove damaged section and replace it with new pipe.**
- D. Protect exterior of the pipe from damage.**
- E. Pull pipe so that minimum of 10 feet of pipe is exposed at both ends of bore, or as necessary to make the connections to as shown on the Drawings.**
- F. Record Information:**
 - a. Upon completion of the installation, the Record Drawing Submittal package shall contain the following components:
 - i. Tool Information: A description of the tools actually used on the installation if they differ from what was contained in the approved submittal.
 - ii. Field Operators Records: Provide the tool operators records including predrilling field calibration, raw data record and the location of any anomalies or punch-outs.
 - iii. Record Drawings: Including interpretation analysis of raw data, plan and profile and any deviations to the original installation plan. The Contractors Surveyor will provide field survey at the ends of each installation and provide the datum for establishing location of the installations.

3.5 CLEANING PIPE ENDS

- A. After pulling pipe, clean exposed ends for installation of fittings.**

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3.6 GROUTING

- A. Fill any remaining voids around pipe with grout. Completely displace drilling mud and completely fill annular space between pipe and walls of borehole as required.

3.7 HANDLING AND DISPOSAL OF DRILLING MUD AND CUTTINGS

- A. Make adequate provisions for handling and containing muddy water, drilling mud, and cuttings during drilling operations. Do not discharge these contaminants into waterways.
- B. Construct mud pits at entry and exit points in manner that completely contains mud and prevents its escape.
- C. When onsite provisions for storing muddy water, drilling mud, or cuttings onsite are exceeded, haul contaminants away to suitable legal disposal site.
- D. Conduct directional drilling operation in such manner that drilling mud is not forced through channel subbottom into river, or into other areas when it might be objectionable.

3.8 JOINING PIPE SECTIONS

- A. Pipes shall be joined to one another, to the polyethylene fittings, and to the flange connections by means of thermal butt-fusion. Polyethylene pipe lengths, fittings, and flanged connections to be joined by thermal butt-fusion shall be of the same type, grade, and class of polyethylene compound and supplied from the same raw material supplier.
- B. Mechanical connections of the polyethylene pipe to auxiliary equipment such as valves, pumps, tanks, and other piping systems shall be through flanged connections which shall consist of the following:
 - a. A polyethylene "stub end" shall be thermally butt-fused to the ends of the pipe.
 - b. Provide ASTM A240, Type 316 stainless steel backing flange, 125-pound, ANSI B16.1 standard drilling provided by the pipe manufacturer.
 - c. Type 316 stainless steel bolts and nuts of sufficient length to show a minimum of three complete threads when the joint is made and tightened to the manufacturer's standard. Antigalling compound, as provided by the manufacturer, shall be applied before initial torquing of bolts. Retorque the nuts after 4 hours.

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d. Gaskets as specified shall be made by the manufacturer of the pipe to fit the joint.

C. **Butt-Fusion Joining:** Butt-fusion of pipes and fittings shall be performed in accordance with the pipe manufacturer's recommendations as to equipment and technique. The manufacturer's representative must be onsite to certify the results are satisfactory. Depending on site conditions, Butt-fusion joining shall be performed in or outside of the excavation at the Contractor's option.

D. **Special Precautions at Flanges:** Polyethylene pipe connected at flange-to-flange connections, to heavy fittings manholes, and rigid structure shall be supported in such a manner that no subsequent relative movement between the polyethylene pipe at the flanged joint and the rigid structure is possible. Inside edge of flange in contact with the HDPE flange to be beveled and not in contact with the weld bead.

E. **Cartridge Assembly**

a. When specified for use, the Contractor shall assure proper positioning of the sealing gasket by visually inspecting the interior of the pipe for man entry sizes 24 inches and larger.

b. For pipe smaller than 24 inches, the contractor shall perform a diagnostic test by periodically (as directed by the CITY PROJECT MANAGER) installation of a temporary inflatable testing device to test the most recently completed joint. Low pressure testing (1-2 psi) and any immediate (1 minimum 1 minute) loss of pressure shall be determined to demonstrate an improperly seated gasket.

i. **If a leak is detected the pipe shall not be advanced into the borehole until the problem is corrected.**

ii. **This low pressure test does not preclude AWWA C-600 testing as required by this specification upon completion of the pipe segment.**

3.9 END FITTINGS

A. **Fabricate and install flanged fittings at ends of pipe for attachment of adjacent sections of pipe. Fitting angles shall correspond to field conditions and shall be as approved by CITY PROJECT MANAGER. Coat and line fittings as specified for pipe.**

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- A. Pressure testing of welded HDPE sections shall be conducted prior to pullback. Pressure test at 150 psi for 24 hours in accordance with the criteria provided in the Contract Documents.**
- B. After pulling pipe into position and grouting, but before attachment of adjacent sections of pipe, pressure test pipe again as specified in the Contract Documents.**

3.11 PIPE ABANDONMENT

- A. In event of failure to install pipe, retain possession of pipe and remove it from site. Completely fill borehole with grout or sand so as to prevent future settlement.**
- B. If pipe cannot be withdrawn, cut pipe off at least 3 feet below ground surface and cap ends of pipe with blind flange. Fill annular space with grout.**

3.12 SURFACE RESTORATION

- A. As specified in the Contract Documents.**
- B. Promptly replace damaged pavement. Restore pavement around entry and exit pits as soon as Work specified in this section is completed, even if this pavement will later be removed by other Work.**

END OF SECTION

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SECTION 02481 - TREE RELOCATION AND PROTECTION

PART 1 GENERAL

1.1 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.

1.2 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.

1.3 APPLICABLE STANDARDS AND SPECIFICATIONS

- A. Comply with the following standards and specifications for all materials, methods, and workmanship unless otherwise noted:
 - a. Codes and Standards of the American Association of Nurserymen.
 - b. Codes and Standards of the National Arborists Association.
 - c. Codes and Standards of the International Society of Arboriculturists.

1.4 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.

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1.5 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.

1.6 GUARANTEES

- A. The Contractor Shall Guarantee His Work in the Following Way:
 - a. 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 Owner.
 - b. The Contractor shall provide a comparable specimen at no additional cost to the CITY.
 - c. The guarantee shall be enforced if it is deemed by the CITY Forester that tree mortality or decline is a product of negligence by the Contractor.

PART 2 PRODUCTS

2.1 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.

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- D. Time Release Fertilizer tablets shall be Agriform, 15 grams, designation 8-8-8; or approved equal.

2.2 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.

2.3 SOIL

- A. Soil to be placed once trees or palms are transplanted shall meet the requirements specified in the Contract Documents.

2.4 WATER

- A. Water shall be clean and potable, from municipal Fort Lauderdale source, or from onsite wells.

2.5 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.

2.6 BRACING AND STAKES

- A. All bracing and stakes shall be pressure treated pine. Compression bands shall be stainless steel.

PART 3 EXECUTION**3.1 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.

3.2 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.

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a. Broadleaf Trees:

- i. 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.**
- ii. Repair any existing injuries to trees including cavities and machinery marks.**

b. Palms:

- i. Remove all fruits and seed pods, and all but the 7 youngest fronds.**
- ii. Tie all remaining fronds with untreated cotton twine or burlap straps.**

B. Fertilization and Watering:

- a. Preparation: Clear the root ball area of all foreign material, trash, etc., to expose undisturbed soil.**
- b. Application/Schedule:**
 - i. 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.**
 - ii. 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.**
 - iii. 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:

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a. Technique:

- i. 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.

- ii. **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.**

iii. Timing:

- a. All oaks to be relocated shall be maintained for a minimum of 10 weeks after root pruning prior to relocation.
- b. Palms shall be maintained a minimum of 4 weeks prior to relocation.

3.3 RELOCATION OF TREES AND PALMS

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

B. Preparation:

- a. 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.
- b. Trees and palms shall be thoroughly soaked to the full depth of the root ball daily for 7 consecutive days prior to relocation.
- c. 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.
- d. Ascertain that all proposed paths for machinery are clear of utilities and other obstructions.

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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:

- a. Notify CITY 2 business days in advance of each relocation to allow for observation of procedures.
- b. 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.
- c. 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.
- d. 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.
- e. 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.
- f. Transport plant material on vehicles of adequate size to prevent overcrowding, broken limbs, foliage damage or root ball damage.
- g. Root balls and foliage shall be kept moist during all phases of relocation.

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- h. 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.
- i. Rotate tree prior to setting to achieve best positioning relative to adjacent trees and viewing angles.

E. Backfilling:

- a. Flood bottom soil layer to settle tree into best position and to remove air pockets.
- b. Continue to flood root ball as planting soil is deposited to ensure removal of all air pockets.
- c. Create a saucer to retain water.

F. Bracing:

- a. Support tree with machinery until bracing is complete.
- b. Buttresses may support separate trunks on multiple trunk trees.
- c. 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 02500 - CONVEYANCE PIPING – GENERAL

PART 1**GENERAL****1.1 DELIVERY, STORAGE, AND HANDLING**

- A. In accordance with manufacturer's recommendations and as specified in the individual Specification(s) following this Section.**
- B. Marking at Plant: Mark each pipe and fitting at plant. Include date of**

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manufacture, manufacturer's identification, specification standard, diameter of pipe, pipe class, and other information required for type of pipe.

- C. Pipe, specials, and fittings received at Project site in damaged condition will not be accepted.**
- D. Gasket Storage: Store rubber gaskets in cool, well ventilated place and do not expose to direct rays of sun. Do not allow contact with oils, fuels, petroleum, or solvents.**
- E. Handling:**
 - a. Heavy canvas or nylon slings of suitable strength shall be used for lifting and supporting materials. Do not use chains or cables.
 - b. Lifting pipe during unloading or lifting into trench shall be done using two slings placed at quarter point of pipe section. Pipe may be lifted using one sling near center of pipe, provided pipe is guided to prevent uncontrolled swinging and no damage will result to pipe or harm to workmen. Slings shall bear uniformly against pipe.
 - c. Pipe and fittings shall not be stored on rocks or gravel, or other hard material that might damage pipe. This includes storage area and along pipe trench.

1.2 SUBMITTALS

- A. The Contractor shall submit complete shop drawings and certificates, test reports, affidavits of compliance, of all piping systems, in accordance with the requirements in Section 01300 – Submittals, and as specified in the individual piping sections.**
- B. Each shop drawing submittal shall be complete in all aspects incorporating all information and data listed herein and all additional information required to evaluate the proposed piping material's compliance with the Contract Documents. Partial or incomplete submissions will be returned to the Contractor without review.**
- C. Data to be submitted shall include, but not be limited to:**
 - a. Catalog Data consisting of specifications, illustrations, and a parts schedule that identifies the materials to be used for the various piping components and accessories. The illustrations shall be in sufficient detail to serve as a guide for assembly and disassembly.

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- b. Complete layout and installation drawings with clearly marked dimensions and elevations. Piece numbers which are coordinated with the tabulated pipe layout schedule shall be clearly marked. Piping layout drawings shall indicate the following additional information; pipe supports, location, support type, hanger rod size, insert type and the load on the hanger in pounds.
 - c. Weight of all component parts; including pipe hanger load calculations signed and sealed by a registered professional engineer.
 - d. Tabulated pipe layout schedule which shall include the following information for all pipe and fittings, service, pipe size, working pressure, wall thickness and piece number.
- D. Certifications: prior to installation, the Contractor shall furnish an Affidavit of Compliance certified by the pipe manufacturer that the pipe, fittings and specials furnished under this Contract comply with all applicable provisions of AWWA and these specifications. No pipe or fittings will be accepted for use in the Work on this project until the affidavits have been submitted and accepted in accordance with Section 01300 – Submittals.**
- E. All expenses incurred in making samples for certification of tests shall be borne by the Contractor.**

PART 2**PRODUCTS****2.1****PIPE**

- A. As specified in the individual Specification(s) following this Section and as shown on the Drawings.**
- B. Color Coding for Water Mains:**
 - a. All pipe used for water main applications shall be color-coded blue in accordance with FAC 62-555.320(21)(b)(3).
 - b. Continuous blue stripes, parallel to the axis of the pipe, shall be applied using tape or paint applied to the dry pipe exterior surface.
 - c. Pipe striped during manufacture shall have stripes applied at

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90-degree intervals around the pipe that remain intact following installation of the pipe.

- d. Pipe striped during installation shall be in a continuous line along the top of the pipe. Pipes 24 inches and greater shall have two additional stripes on each side.
- e. Aboveground water main piping shall be color-coded or marked similar to underground piping.

2.2**JOINTS**

- A. As specified in the individual Specification(s) following this Section.**

2.3**COUPLINGS**

- A. General:**

- a. Coupling linings for use in potable water systems shall be in conformance with NSF 61B. Linings for wastewater piping shall be in accordance with the provisions of the Contract Documents.
- b. Couplings shall be rated for appropriate operating pressure and hydrostatic test pressure.
- c. Exposed, bolted, sleeve-type couplings shall be lined and coated with fusion bonded epoxy in accordance with AWWA C213.
- d. Buried, bolted, sleeve-type couplings shall be lined and coated with fusion bonded epoxy in accordance with AWWA C213.

- B. For Pipe with Plain Ends:**

- a. Bolted, sleeve-type couplings in accordance with AWWA C219.
- b. Fabricated steel, mechanical slip-type expansion joints, in accordance with AWWA C221.

- C. Unless thrust restraint is provided by other means, bolted, sleeve-type couplings shall be harnessed. Harness details shall be in accordance with**

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requirements of appropriate reference standard or as shown on Drawings.

D. For Pipe with Grooved Ends:

- a. Grooved couplings in accordance with AWWA C606. System shall provide for flexible or rigid joints as shown on Drawings.
- b. Exposed couplings shall be lined and coated with fusion bonded epoxy in accordance with AWWA C213.
- c. Buried couplings shall be lined and coated with fusion bonded epoxy in accordance with AWWA C213.

E. For Pipe with Flanged Ends:

- a. Flanged coupling adapters in accordance with AWWA C219.
- b. Dismantling joints for connecting flanged pipe shall be AWWA C219 compliant. Studs and nuts provided to seal gasket shall be separate and independent from tie-bar restraint system.

F. Bolting Materials: As recommended by coupling manufacturer for specified conditions.

2.4

SLEEVES

- A. Sleeves shall be long or short pattern as appropriate to the application conforming to AWWA C110.
- B. Sleeves shall be mechanical joint with restraint if required, provided by external mechanical joint restraints.
- C. Sleeves shall have a minimum pressure rating of 250 psi.
- D. Linings and coatings ductile iron sleeves shall be in accordance with the provisions of the Contract Documents.

2.5

TAPPING SLEEVES – DUCTILE IRON

- A. Ductile iron tapping sleeves are preferred for force main and water main taps.
- B. Tapping sleeves shall meet ASTM A536 Grade 65-45-12.
- C. Side flange seals shall be O-ring type with round, oval, or rectangular cross section.

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- D. Contractor shall inspect and/or verify diameter of the pipe to be tapped and order the correct sleeve.
- E. Sleeves shall be coated in accordance with the provisions of this Specification.
- F. Tapping sleeve and tapping valve shall be of the same or compatible manufacturer to assure proper fit of the aligning ring on the valve and the recess on the sleeve. No post factory modifications to either the sleeve or valve will be permitted.
- G. Tapping sleeve shall be American Flow Control Series 1004 or 2800, Mueller H-615, US Pipe T-9 or Clow F-5205.
- H. Tapping machine and cutter shall provide the full-size of the tapped connection.
- I. The coupon shall be removed from the pipe shall be given to the PCM.

2.6

Tapping Sleeves – Steel

- A. Steel tapping sleeves are acceptable for use where ductile iron sleeves are not practical and as approved by the CONSULTANT.
- B. Tapping sleeve composed of two halves of heavy welded steel, bolting together on the pipe and sealing against a concave Buna-N wedge gasket around the nozzle opening. Both halves of the sleeve are fabricated to accurately conform to the outside diameter of the ductile iron host pipe and to provide reinforcement without the use of shims or pads.
- C. The sleeve half opposite the nozzle shall be solid and shall not consist of straps or U-bolts. Sleeve and nozzle shall be fabricated from ASTM 285, Grade C, carbon steel. Branch leg flange shall conform to AWWA, Class D, Schedule C-207, 150-pound drilling to match tapping valve. The flange face shall be recessed to accommodate the tapping valve in accordance with MSS-SP60. All steel shall meet the requirements of ASTM A36, as a minimum. All weldments shall be braced and stress relieved.
- D. The ferrous metal parts of the fitting shall receive a factory applied fusion-bonded, epoxy coating, 12-mil minimum dry film thickness in accordance with AWWA C213.
- E. Minimum wall thickness of the sleeve shall be 0.375 inch.
- F. Tapping sleeve shall be pressure rated to 150 psi, minimum.
- G. Tapping sleeve shall be, Dresser Style 630, JCM Series 412; or equal.
- H. Tapping machine and cutter shall provide the full-size of the tapped connection.
- I. The coupon removed from the pipe shall be given to the PCM.

2.7

SERVICE SADDLESSECTION
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- A. Service saddles shall be ductile iron with double stainless steel straps conforming to AWWA C-111/A.21.11-00.**

2.8 SLAB, FLOOR, WALL, AND ROOF PENETRATIONS

A. Modular Mechanical Seal:

- a. Type: Interconnected synthetic rubber links shaped and sized to continuously fill annular space between pipe and wall sleeve opening.
- b. Assemble interconnected rubber links with Type 316 stainless steel bolts, nuts, and pressure plates.
- c. Size modular mechanical seals according to manufacturer's instructions for the size of pipes shown to provide a watertight seal between pipe and wall sleeve opening.

B. Wall Sleeves:

- a. Diameter, ends, and length shall be as shown on Drawings.
- b. Shall include integral seep ring to minimize seepage between metal sleeve and concrete.

C. Wall Couplings:

- a. Diameter, ends, and length shall be as shown on Drawings.
- b. Wall couplings shall provide flexible mechanical joint.
- c. Body and end rings shall be coated with fusion bonded epoxy.
- d. Body shall include integral seep ring.
- e. Shall comply with AWWA C219.

- D. If core drilling is required for penetrations of existing concrete walls or slabs, locations of drilling shall be determined by radiograph to avoid damage to reinforcing steel and conduits.**

2.9 FLANGES, FLANGE GASKETS, AND BOLTING MATERIALS

- A. As specified in individual Specifications following this**

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- B. Flanges, bolting materials, and flange gaskets for steel flanges shall conform to AWWA C207.**
- C. Flanges, bolting materials, and flange gaskets for ductile iron flanges shall conform to AWWA C110 and C115.**

2.10 INSULATING FLANGES and COUPLINGS

- A. Dielectric Flange Manufacturers or equal:**
 - a. Pipeline Seal and Insulator, Inc.; Houston, Texas.
 - b. Central Plastics Co.; Shawnee, Oklahoma.
 - c. Calpico, Inc.; South San Francisco, California.
- B. Insulating Flanges:**
 - a. Bolt holes sized as required.
 - b. Manufacturers and Products or equal:
 - i. Dresser Industries; Style 39.**
 - ii. Baker Coupling Company, Inc.; Series 216.**

2.11 PIPE LOCATING TAPE

- A. As specified in the Contract Documents.**

2.12 PIPE BEDDING AND PIPE ZONE MATERIAL

- A. Granular material as specified in the Contract Documents.**

2.13 TRENCH STABILIZATION MATERIAL

- A. As specified in the Contract Documents.**

PART 3 EXECUTION**3.1 GENERAL**

- A. Notify CITY PROJECT MANAGER at least 2 weeks prior to field fabrication of pipe or fittings.**
- B. Furnish feeler gauges of proper size, type, and shape for use during installation for each type of pipe furnished.**

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- C. **Distributing Materials:** Place materials along trench only as will be used each day, unless otherwise approved by CONSULTANT. Placement of materials shall not be hazardous to traffic or to general public, obstruct access to adjacent property, or obstruct others working in area.

3.2

EXAMINATION

- A. **Verify size, material, joint types, elevation, and horizontal location of existing pipeline to be connected to new pipeline or new equipment.**
- B. **Inspect size and location of structure penetrations to verify adequacy of wall pipes, sleeves, and other openings.**
- C. **Damaged Coatings and Linings:** Repair using coating and lining materials in accordance with manufacturer's instructions.

3.3

PREPARATION

- A. **Prepare trench as specified in the Contract Documents.**
- B. **Unless otherwise permitted by CONSULTANT, maximum length of open trench shall not exceed 400 feet.**
- C. **Trench Grade:**
- a. Grade bottom of trench by hand to specified line and grade, with proper allowance for pipe thickness and pipe base, when specified. Trench bottom shall form a continuous and uniform bearing and support for pipe between bell holes.
- b. Before laying each section of pipe, check grade and correct irregularities found. Grade may be disturbed for removal of lifting tackle.
- D. **Pipe Bedding: Place and compact pipe bedding material as follows:**
- a. Install to full width of trench, from the following depths below bottom to springline of pipe:
- i. **For Pipe 12-Inch Diameter: 4 to 6 inches.**
- ii. **For Pipe Larger than 12-Inch Diameter: 6 to 8 inches.**
- b. **Compact to at least 98** percent of its maximum density as determined by AASHTO T180.
- c. Ensure that no unfilled or uncompacted areas occur beneath

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pipe.

- E. Bell (Joint) Holes: At each joint, dig bell holes of ample dimensions in bottom of trench, and at sides where necessary, to permit joint to be made properly and to permit easy visual inspection of entire joint.**

3.4 INSTALLATION

A. General:

- a. Provide and use proper implements, tools, and facilities for safe and proper prosecution of Work.
- b. Lower pipe, fittings, and appurtenances into trench, piece by piece, by means of a crane, slings, or other suitable tools and equipment, in such a manner as to prevent damage to pipe materials, protective coatings and linings.
- c. Do not drop or dump pipe materials into trench.
- d. Join pipe and fittings in accordance with manufacturer's instructions, unless otherwise shown or specified.
- e. Install individual pipe lengths in according to approved lay diagram. Misplaced pipe shall be removed and replaced.
- f. Inspect pipe and fittings before installation, clean ends thoroughly, remove foreign matter and dirt from inside.
- g. Flanged Joints:
 - i. **Install perpendicular to pipe centerline.**
 - ii. **Bolt Holes: Straddle vertical centerline, aligned with connecting equipment flanges or as shown on Drawings.**
 - iii. **Use torque-limiting wrenches to provide uniform bearing and proper bolt tightness.**
 - iv. **Flange Type: Use flat-faced flange when joining with flat-faced ductile or cast iron flange.**
- h. Couplings:

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- i. **Install in accordance with manufacturer's written instructions.**
- ii. **Before coupling, clean pipe holdback area of oil, scale, rust, and dirt.**
- iii. **Do not remove pipe coating. If damaged, repair before joint is made.**
- iv. **Clean and lubricate gaskets before installation.**
- v. **Tighten coupling bolts progressively, drawing up bolts on opposite sides gradually until bolts have uniform tightness.**

B. Cleaning Pipe and Fittings:

- a. Remove lumps, blisters, and excess coating from bell and spigot ends of each pipe. Wire brush outside of spigot and inside of bell and wipe clean, dry, and free from oil and grease before pipe is laid.
- b. Wipe ends of mechanical joint pipe and fittings and of rubber gasket joint pipe and fittings clean of dirt, grease, and foreign matter.

C. Laying Pipe:

- a. Direction of Laying: Lay pipe with bell end facing in direction of laying. For lines on an appreciable slope, face bells upgrade at discretion of CONSULTANT.
- b. Mechanical Joint, Push-On Joint, and Restrained Joint Pipe: After first length of pipe is installed in trench, secure pipe in-place with approved backfill material tamped under and along sides to prevent movement. Keep ends clear of backfill. After each section is jointed, place backfill as specified to prevent movement.
- c. Take precautions necessary to prevent floating of pipe prior to completion of backfill operation.

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- d. When using movable trench shield, take necessary precautions to prevent pipe joints from pulling apart when moving shield ahead.
- e. Do not allow foreign material to enter pipe while it is being placed in trench.
- f. Close and block open end of last laid section of pipe to prevent entry of foreign material or creep of gasketed joints when laying operations are not in progress, at close of day's work, or whenever workers are absent from job.
- g. Pipe shall be installed in a straight alignment and deflections made as required after the joint has been completed.

D. Joining Push-On Joint Pipe and Mechanical Joint Fittings:

- a. Join pipe with push-on joints and mechanical joint fittings in strict accordance with manufacturer's recommendations.
- b. Provide special tools and devices, such as, special jacks, chokers, and similar items required for installation.
- c. Lubricate all pipe gaskets and pipe ends using lubricant furnished by pipe manufacturer. No substitutes will be permitted.
- d. Clean ends of fittings of dirt, mud, and foreign matter by washing with water and scrubbing with a wire brush, after which, slip gland and gasket on plain end of pipe. Lubricate end of pipe to facilitate sliding gasket in place, then guide fitting onto spigot of pipe previously laid.

E. Cutting Pipe:

- a. General: Cut pipe for inserting valves, fittings, or closure pieces in a neat and workmanlike manner without damaging pipe or lining and so as to leave a smooth end, at right angles to axis of pipe.
- b. Pipe: Cut pipe with milling type cutter or saw. Do not flame cut.

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- c. Dressing Cut Ends: Dress cut end of mechanical joint pipe to remove sharp edges or projections, which may damage rubber gasket. Dress cut ends of push-on joint pipe by beveling, as recommended by manufacturer.
- F. **Buried Pressure Pipe:**
 - a. Concrete Encased or Embedded Pipe: Do not encase joints in concrete unless specifically shown on Drawings.
 - b. Placement:
 - i. **Keep trench dry until pipe laying and joining is completed. If the excavation cannot be effectively dewatered the Contractor shall propose alternate pipe installation methodology for approval by the CITY PROJECT MANAGER prior to proceeding. All requirements of trench backfill per the Contract Documents will remain in effect.**
 - ii. **Exercise care when lowering pipe into trench to prevent twisting or damage to pipe.**
 - iii. **Measure for grade at pipe invert, not at top of pipe.**
 - iv. **Excavate trench bottom and sides of ample dimensions to permit proper joining, welding, visual inspection, and testing of entire joint.**
 - v. **Prevent foreign material from entering pipe during placement.**
 - vi. **Close and block open end of last laid pipe section when placement operations are not in progress and at close of day's work.**
 - vii. **In general, lay pipe upgrade with bell ends pointing in direction of laying.**

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- viii. Deflect pipe at joints for pipelines laid on a curve using unsymmetrical closure of spigot into bell. If joint deflection of standard pipe lengths will not accommodate horizontal or vertical curves in alignment, provide:**
 - a. Shorter pipe lengths.**
 - b. Special mitered joints.**
 - c. Standard or special fabricated bends.**
 - ix. Check gasket position with feeler gauge to assure proper seating.**
 - x. After joint has been made, check pipe alignment and grade.**
 - xi. Place sufficient pipe zone material to secure pipe from movement before next joint is installed.**
 - xii. Prevent uplift and floating of pipe prior to backfilling.**
- c. Tolerances:**
- i. Deflection From Horizontal Line: Maximum 2 inches.**
 - ii. Deflection From Vertical Line: Maximum 1 inch.**
 - iii. Joint Deflection: Maximum of 75 percent of manufacturer's recommendation.**
 - iv. Horizontal position of pipe centerline on alignment around curves maximum variation of 1 foot from position shown.**
- d. Cover Over Top of Pipe: Minimum 3 feet, unless otherwise shown.**
- e. Disposal of Excess Excavated Material: As specified in Section 02316, Excavation.**

G. Line and Grade:

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- a. No high points will be allowed between air valves on pressure piping.
- b. Maintain pipe grade between invert elevations to provide minimum clearance at air valve locations from existing ground surface to top of pipe.
- c. Install air valves as shown on the Drawings and as verified in the field and field verify intervening low points. When field conditions warrant, exceptions may be made upon approval of CONSULTANT.
- d. Deviations exceeding 1/2 inch from specified line or 1/4 inch from specified grade will not be allowed without express approval of CONSULTANT.
- e. Pipeline sections that are not installed to elevations shown or installed as approved by CITY PROJECT MANAGER shall be reinstalled to proper elevation.

3.5 THRUST RESTRAINT

- A. **Location: At pipeline tees, plugs, valves, caps, bends, and locations where unbalanced forces exist, and as shown on the Drawings.**
- B. **All pressure pipe will be restrained at all valves and fittings. Provide additional restraint as shown on the Drawings.**
- C. **Use of thrust blocks is not permitted.**

3.6 CORROSION PROTECTION

- A. **Buried Pipe: As specified in the individual Specifications following this Section.**
- B. **Notify CITY PROJECT MANAGER at least 3 days prior to start of surface preparation, coating application, and corrosion protection work.**

3.7 PLACEMENT OF PIPE LOCATING TAPE

- A. **Place pipe locating tape in accordance with the Contract Documents.**

3.8 PIPE BEDDING AND PIPE ZONE MATERIAL

- A. **Place pipe bedding and pipe zone material in accordance with the Contract Documents.**

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3.9 FIELD QUALITY CONTROL – INSPECTION AND TESTING**A. General:**

- a. Notify CITY PROJECT MANAGER in writing at least 15 days in advance of testing. Perform testing in presence of CONSULTANT.
- b. Using water as test medium, all newly installed pipelines shall successfully pass hydrostatic leakage test prior to acceptance.
- c. Conduct field hydrostatic test on buried piping after trench has been completely backfilled. Testing may, as approved by CONSULTANT, be done prior to placement of asphaltic concrete or roadway structural section.
- d. Contractor may, if field conditions permit and as approved by CONSULTANT, partially backfill trench and leave joints open for inspection and conduct initial service leak test. Final field hydrostatic test shall not, however, be conducted until backfilling has been completed as specified above.
- e. Supply of Temporary Water: In accordance with the Contract Documents.
- f. Install restraint as necessary to prevent movement of pipe and protect adjacent piping or equipment. Make necessary taps in piping prior to testing.
- g. Prior to test, remove or suitably isolate appurtenant instruments or devices that could be damaged by pressure testing.
- h. New Piping Connected to Existing Piping: Isolate new piping with grooved-end pipe caps, blind flanges, or other means as acceptable to CONSULTANT.
- i. Service connections for water mains are to be installed to the angle stop prior to disinfection and testing of the installed main.
- j. Fire hydrant leads are to be installed to the shut-off valve prior

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to disinfection and testing of the installed main.

B. TAPPING SLEEVE AND VALVE:

- a. Install mechanically restrained test plug with relief port.
- b. Test tapping sleeve and valve prior to performing tap.
 - i. Test at 150 psi for 15 minutes.
 - ii. Successful test will be no visible leakage.
- c. Test sleeve and valve together with valve open.

C. Hydrostatic Testing Procedure:

- a. Furnish testing equipment, as approved by CONSULTANT, which provides observable and accurate measurements of leakage under specified conditions.
- b. Maximum Filling Velocity: 0.25 foot per second calculated based on full area of pipe.
- c. Expel air from piping system during filling.
- d. Test Pressure: 150 psi as measured at low point of pipeline.
- e. Apply and maintain specified test pressure with hydraulic force pump. Valve off piping system when test pressure is reached.
- f. Maintain hydrostatic test pressure continuously for 2 hours minimum, adding makeup water only as necessary to restore test pressure.
- g. Determine actual leakage by measuring quantity of water necessary to maintain specified test pressure for duration of test.

D. Maximum Allowable Leakage:

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| | |
|----------------------------|----------------------------------|
| 20-ft nominal length pipes | $L = \frac{SD\sqrt{P}}{148,000}$ |
| 18-ft nominal length pipes | $L = \frac{SD\sqrt{P}}{133,200}$ |

where:

- L = Allowable leakage, in gallons per hour.
- S = Length of pipe in feet.
- D = Nominal diameter of pipe, in inches.
- P = Average test pressure during leakage test, in pounds per square inch.

3.10 CLEANING AND DISINFECTION

- A. Pipelines shall be kept clean during installation. Following assembly and testing, and prior to disinfection and final acceptance, flush pipelines with water at 2.5 fps minimum flushing velocity until foreign matter is removed.
- B. Water shall be obtained from a potable, CITY source and shall be metered. The CITY shall be notified at least 2 working days prior to the intended use such that the meter can be installed. The Contractor shall pay the CITY for all water used. Water cost shall be incidental to the related pipeline installation work items.
- C. Flushing shall be accomplished by partially opening and closing valves several times under expected line pressures with velocities adequate to remove foreign materials from the pipe, valves, and hydrants.
- D. If impractical to flush large diameter pipe at 2.5 fps, clean pipe by use of pipe pig as approved by CONSULTANT. Multiple passes of pipe pig may be required to adequately clean line.
- E. Remove accumulated debris through blowoffs 2 inches and larger or by removing spools and valves from piping. If hydrants are used, they must be adequately flushed and cleaned prior to being put into service.
- F. Disinfection of Water Mains: As specified in the Contract Documents.

3.11 ABANDONMENT OF WATER MAINS

- A. Water mains, 8 inches and less, being replaced shall be abandoned in-place.
- B. When new mains have been tested, approved, and services relocated, cut, cap, and restrain any connections to remaining pressurized mains.

3.12

REPAIR OF DAMAGED PIPING

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- A. All existing piping damaged by the Contractor as a result of construction activities shall be repaired by the Contractor.**
- a. The Utilities Department shall be notified of all water main and force main damage and for all control valve operation.
 - b. Damage to unmarked mains shall be considered additional work or will be repaired by the Owner.
 - c. Damage to marked mains shall be repaired at no additional cost to the Owner.
- B. Cleaning and disinfection of water main repairs shall be in accordance with the provisions of the Contract Documents.**
- C. If the Owner is required to make repairs for damaged mains that are the responsibility of the Contractor, the cost of the work will be charged to the Contractor.**

END OF SECTION

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SECTION 02502 - DUCTILE IRON PIPE AND FITTINGS

PART 1

GENERAL

1.1 SUBMITTALS

A. Quality Control Submittals:

- a. Manufacturer's Certificate of Compliance, in accordance with the Contract Documents, stating that inspections and specified tests have been made and that results thereby comply with requirements of Article Source Quality Control.
- b. Field Hydrostatic Testing Plan: Submit at least 15 days prior to testing and at minimum, include the following:
 - i. **Testing dates.**
 - ii. **Piping systems and section(s) to be tested.**
 - iii. **Method of isolation.**
 - iv. **Method of conveying water from source to system being tested.**
 - v. **Calculation of maximum allowable leakage for piping section(s) to be tested.**
- c. Certifications of Calibration: Approved testing laboratory certificate if pressure gauge for hydrostatic test has been previously used. If pressure gauge is new, no certificate is required.
- d. Test documentation form and results.

B. Shop Drawings

PART 2

PRODUCTS

2.1

MATERIALS

A. Pipe:

- a. General:

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- i. **Centrifugally cast, grade 60-42-10 iron, minimum 350 psi working pressure for pipes 12 inches and less, minimum 250 psi working pressure for pipes 14 inches and greater.**
- ii. **Meet requirements of AWWA C151, C110, C153, and C111.**
- iii. **Lined and coated as specified.**
- b. Pressure rating of pipe to be specified according to the particular requirements of the Project.
- c. Pipe wall thickness of threaded pipe for a flanged pipe end shall be minimum special thickness Class 53 from 4-inch to 54-inch and/or minimum pressure Class 350 for 60-inch to 64-inch diameter pipe in accordance with AWWA C115.
- d. Grooved end pipe, for all pipe diameters, shall be minimum Special Class 53.
- e. Pipe shall be new and recently manufactured. Refurbished pipe shall not be provided.

B. Joints:

- a. Push-On Joint: Rated at minimum working pressure equal to pipe material design.
- b. Restrained Joint:
 - i. **Manufactured proprietary joint that mechanically restrains pipe to adjoining pipe.**
 - ii. **Manufacturers and Products or equal:**
 - a. U.S. Pipe; TR Flex, Restrained Tyton, and Field-Lok.
 - b. American Cast Iron Pipe; Flex-Ring, Lok-Ring, and Fast-Grip.
 - c. One bolt fittings as manufactured by One Bolt, Inc., for restrained fittings 12 inches in diameter and less.

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iii. Use of restraining gaskets for planned joint restraint is restricted to pipes 12 inches in diameter or less.

- c. Mechanical Wedge Action Type Joint: Use only in areas where adjoining to fixed points where laying length is determined in field. Prior to purchase and installation, type and application of this joint shall be approved by CONSULTANT. Use of mechanical joint restraint or field-restraining type gaskets in excess of 12 inches shall not be allowed, unless an unexpected field condition requires cutting the pipe and installation of a field applied restraint. Use of set screws to provide restraint of any kind is not permitted.

i. Manufacturers and Products or equal:

- a. Meg-a-lug, as manufactured by EBBA Iron.
- b. Stargrip, as manufactured by Star Pipe Products.
- c. Grip-ring, as manufactured by Romac.
- d. Flanged Joint: Threaded 250 psi working pressure ductile iron flanges conforming to AWWA C115 for Class 125 flanges.
- e. Grooved Joint:
- i. Rigid and/or Flexible type radius cut grooved, conforming to AWWA C606, depending on the particular application.
- ii. As manufactured by Victaulic Company of America.

C. Fittings:

- a. Ductile Iron, Push-On, Flanged or Restrained Joint: In accordance with AWWA C110 or C153; 250 psi minimum working pressure for 4- to 24-inch fittings and 250 psi minimum working pressure for 24- to 64-inch fittings and AWWA C111.
- b. Mechanical Joint Fittings: In accordance with AWWA C111.
- c. Grooved End Fittings:

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machine and transverse direction (ASTM D882).

- d. Tensile Strength: 3,600 psi, minimum.
- e. Dielectric Strength: 800V/mil-thickness, minimum.
- f. Propagation Tear Resistance: 2,550 gf, minimum in machine and transverse direction (ASTM 1922).
- g. Tube form, conforming to AWWA C105.
- h. Film shall have minimum in thickness of 0.008 in (8 mil).

H. Bolting:

- a. Bolts for flanged connections shall be carbon steel, ASTM A307, Grade A hex bolts and ASTM A563, Grade A hex head nuts.
- b. Bolts for grooved end connections shall be manufacturer's standard.

I. Gaskets:

- a. Gaskets for flat faced 150 and 250 psi working pressure flanges shall be 1/8-inch thick, red rubber (SBR), hardness 80 (Shore A), rated to 200 degrees F, conforming to ANSI B16.21, AWWA C207, and ASTM D1330, Grades 1 and 2.
- b. Gaskets for grooved end joints shall be Halogenated butyl, conforming to ASTM D2000 and AWWA C606.
- c. Tor-seal or equal gaskets shall be used for exposed, flanged joints.

J. Pressure Test Gauges:

- a. Heavy duty industrial quality gauges.
- b. Oil-filled.

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2.2 SOURCE QUALITY CONTROL

- A. Factory Tests:** In accordance with AWWA C104, C105, C110, C111, C115, C150, C151, C153, or C606, as required by the particular Project application.

PART 3 EXECUTION**3.1 EXAMINATION**

- A. Inspect pipe and fittings to ensure no cracked, broken, or otherwise defective materials are being used.**

3.2 INSTALLATION

- A. In accordance with AWWA C605, ASTM D2321, and AWWA Manual 23 and the Contract Documents.**

B. Field Welding:

- a. Use of field welded outlets will not be allowed. Welding for outlets shall be performed only in pipe manufacturer's shop.
- b. Field installed outlets may be installed with saddle approved by CONSULTANT. Opening in pipe shall be machined cut and not with cutting torch.
- c. Field welding of bars for restrained joint systems will not be allowed. All welding shall be performed in pipe manufacturer's shop.

C. Polyethylene Encasement:

- a. Encase pipe, fittings, and valves where specified in accordance with AWWA C105, Method A.
- b. Cut polyethylene tube approximately 2 feet longer than pipe length.
- c. Slip tube around pipe, centering to provide 1-foot overlap on each adjacent section.
- d. Pull encasement to take out slack and wrap snug around pipe.
- e. Secure overlap in place and fold at quarter

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points of pipe length.

- f. Wrap and tape encasement snug around fittings and valves.

3.3

TESTING AND INSPECTION

- A. In accordance with the provisions of the Contract.

END OF SECTION

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SECTION 02510 - HIGH DENSITY POLYETHYLENE (HDPE) PRESSURE PIPE AND FITTINGS

PART 1

GENERAL

1.1

SUBMITTALS

A. Quality Control Submittals:

- a. Manufacturer's Certificate of Compliance, in accordance with the Contract Documents.
- b. Certification from pipe manufacturer that Contractor is qualified to join, lay, and handle pipe.
- c. Certificates of qualification for persons to be fusing HDPE pipe. Experience and training record of persons to be fusing HDPE pipe.
- d. Testing Plan: Submit at least 15 days prior to testing and at minimum, include the following:
 - i. **Testing dates.**
 - ii. **Piping systems and section(s) to be tested.**
 - iii. **Method of isolation.**
 - iv. **Method of conveying water from source to system being tested.**
 - v. **Calculation of maximum allowable leakage for piping section(s) to be tested.**
- e. Certifications of Calibration: Approved testing laboratory certificate if pressure gauge for hydrostatic test has been previously used. If pressure gauge is new, no certificate is required.
- f. Test report documentation.

B. Shop Drawings

1.2

QUALIFICATIONS

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- A. Pipe Manufacturer: Listed with Plastic Pipe Institute as meeting recipe and mixing requirements of resin manufacturer for resin used to manufacture pipe for this Project.**
- B. Persons fusing HDPE pipe shall be certified under 49 CFR § 192.285 have minimum of 1 year of experience with fusing HDPE pipe and shall have received training for fusing HDPE pipe in accordance with recommendations of pipe supplier or fusing equipment supplier.**

1.3 DELIVERY, STORAGE, AND HANDLING

- A. Shipping: Do not cut, kink, or otherwise damage pipe during transportation.**
- B. Storage:**
 - a. Limit stacking of pipe to a height that will not cause excessive deformation of bottom layers of pipes under anticipated temperature conditions.
 - b. Where necessary due to ground conditions, store pipe on wooden sleepers, spaced suitably and of such widths as not to allow deformation of pipe at point of contact with sleeper or between supports.

1.4 ENVIRONMENTAL CONDITIONS

- A. Fusing Conditions: To be specified according to each particular application.**

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Pipe and Fittings Specified in this Section shall be Products of:**
 - a. Phillips 66; Driscopipe, Series 4000 and Series 4100.
 - b. Chevron; Plexco, Blue Stripe.
 - c. Products of equivalent or better standard by other manufacturers.

2.2 SERVICE CONDITIONS

- A. Service conditions to be specified per individual project requirements.**

2.3 MATERIALS

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A. Pipe and Fittings:

- a. Conform to requirements of AWWA C906.
- b. Polyethylene resin shall meet or exceed requirements of ASTM D3350 for PE 3408 material with cell classification of 335434C, or better.
- c. Maximum Allowable Hoop Stress: 800 psi at 73.4 degrees F.
- d. Pipe sizes shall conform to ASTM F714.
- e. Pipe and fittings shall have a pressure rating of 160 psi (nominal SDR 11).

B. Pipe lengths, fittings, and flanged connections to be joined by thermal butt-fusion shall be of same type, grade, and class of polyethylene compound and supplied from same raw material supplier.**C. Fittings shall be molded for sizes 6 inches and smaller and shall be fabricated from polyethylene pipe; for sizes 8 inch and larger, by means of thermal butt-fusion. Ends of fabricated fittings shall not be trimmed to match pipe section to which they are going to be joined. Polyethylene fittings shall have same or higher pressure rating as pipe when installed.****D. Special Markings: Name of manufacturer, pipe diameter, date of manufacture, pipe class or pressure rating, pipe material and service application (water or sewer).****E. Flanges: ASTM A240, Type 316 stainless steel, ANSI B16.1 Standard drilling. Flanges shall be complete with one-piece, molded polyethylene stub ends. Flanged connections shall have same or greater pressure rating as pipe.****F. Ductile Iron Adapters:**

- a. MJ adapter fully pressure rated to the DR of the HDPE pipe.
- b. HDPE anchor fitting to be butt-welded to pipeline end.
- c. Provide with stainless steel stiffener and rubber gasket.
- d. C-110 full body gland ring.
- e. Independent Pipe Products DIMJA; or equal.

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- G. Gaskets:** Gasket material, size, and thickness shall be as recommended by pipe or flange manufacturer.
- H. Joints:** Thermal butt-fusion, except where connecting to unions, valves, and equipment with threaded connections that may require future disassembly.
- I. Bolts, Nuts, Washers:** Type 316 stainless steel, ASTM A193, Grade B8 hex head bolts; and ASTM A194, Grade 8 hex head nuts. Bolts shall be fabricated in accordance with ANSI B18.2.2 and provided with washers of same material as bolts.
- J. Wall Anchor:**
 - a. Material: Same as HDPE pipe.
 - b. Internal Diameter: Equal to adjacent pipe.
 - c. Outside Diameter: 5 inches greater than adjacent pipe.
 - d. Shear Strength: Equal to or greater than tensile strength of adjacent pipe.
 - e. Fabrication: Butt fusion. Extrusion bead welding is not allowed.

PART 3**EXECUTION****3.1****INSTALLATION**

- A. General:**
 - a. Fabricate and install polyethylene pipe in strict conformance with ASTM D2774, and pipe manufacturer's recommendations.
 - b. Joining: Butt-fuse pipes and fittings in accordance with pipe manufacturer's recommendations. Depending on site conditions, perform butt-fusion joining in or outside of excavation.
 - c. Mechanical Connections: Connect HDPE pipe to auxiliary equipment such as valves, pumps, tanks, and other piping systems with flanged connections as follows:

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- i. **Polyethylene “stub end,” thermally butt-fused to ends of pipe.**
 - ii. **Backing flange, as specified.**
 - iii. **Bolt and nut of sufficient length to show a minimum of three complete threads when joint is made and tightened to manufacturer's standard. Retorque nuts after 4 hours.**
 - iv. **Gaskets as specified.**
- d. Special Precautions at Flanges: Support polyethylene pipe connected to heavy fittings, manholes, and rigid structures in such a manner that no subsequent relative movement between polyethylene pipe at flanged joint and rigid structures is possible.
- B. Placement in Trench:**
- a. Handle joined pipeline in such a manner that pipe is not damaged by dragging it over sharp and cutting objects.
 - b. Position slings for handling pipeline away from butt-fused joints.
 - c. Remove sections of damaged pipe and replace it with undamaged pipe. Damaged pipe is defined as pipe with kinks or gouges exceeding 10 percent of pipe wall thickness.
 - d. Exercise care when lowering pipe into trench to prevent damage or twisting of pipe.
 - e. Snake pipe from one side of trench to other to allow for thermal and settling movements.
 - f. At flanges, valves, and connections, excavate trench bottom out sufficiently to ensure clearance between undisturbed trench bottom and flange, valve, or connection.

3.2**TESTING AND INSPECTION**SECTION
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A. Joint and Mandrel Testing:

a. Joint:

- i. Test Procedure: ASTM D638.**
- ii. Specimens: Cut pipe 12 inches on each side of field made joint. Rejoin ends and proceed with Work.**
- iii. Test Frequency:**
 - a. First: 600 Linear Feet: 3 joints selected at random by CONSULTANT.**
 - b. Each Additional 3,000 Linear Feet: 2 joints selected at random by CONSULTANT.**
 - c. Each Test Failure: 2 additional joints selected at random by CONSULTANT.**

b. Mandrel:

- i. After leak testing, mandrel test pipeline.**
- ii. Mandrel Configuration: Rigid, with circular cross-section of diameter not less than 95 percent of average inside diameter of pipeline and with length of circular portion equal to nominal diameter of pipeline.**
- iii. Pulling Method: Manually, by hand.**

B. Pipeline Hydrostatic Test:

a. General:

- i. Notify CITY PROJECT MANAGER in writing 15 days in advance of testing. Perform testing in presence of CONSULTANT.**
- ii. Test newly installed pipelines. Using water as test medium, pipes shall successfully pass a leakage test prior to acceptance.**

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- iii. **Furnish testing equipment and perform tests in manner satisfactory to CONSULTANT. Testing equipment shall provide observable and accurate measurements of leakage under specified conditions.**
 - iv. **Isolate new pipelines that are connected to existing pipelines.**
 - v. **Conduct field hydrostatic test on buried piping after trench has been completely backfilled. Testing may, as approved by CONSULTANT, be done prior to placement of asphaltic concrete or roadway structural section.**
 - vi. **Contractor may, if field conditions permit and as determined by CONSULTANT, partially backfill trench and leave joints open for inspection and conduct an initial service leak test. Final field hydrostatic test shall not, however, be conducted until backfilling has been completed as specified above.**
 - vii. **Supply of temporary water shall be as stated in Section 01500, Construction Facilities and Temporary Controls.**
- b. **Preparation:**
- i. **Install temporary thrust blocking or other restraint as necessary to prevent movement of pipe and protect adjacent piping or equipment. Make necessary taps in piping prior to testing.**
 - ii. **Wait 5 days minimum after concrete thrust blocking is installed to perform pressure tests.**
 - iii. **Prior to test, remove or suitably isolate appurtenant instruments or devices that could be damaged by pressure testing.**

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- iv. New Piping Connected to Existing Piping: Isolate new piping with grooved-end pipe caps, blind flanges, or other means as acceptable to CONSULTANT.**
- c. Procedure:**
 - i. Test pressure shall be 150 psi as measured at lowest point in pipeline.**
 - ii. Maximum filling velocity shall not exceed 0.25 feet per second, calculated based on full area of the pipe.**
 - iii. Expel air from pipe system during filling.**
 - iv. Test Procedure Consists of Two Steps: initial expansion phase and test phase. During initial expansion phase, apply and maintain specified test pressure with hydraulic force pump. Valve off piping system when test pressure is reached. Add make-up water at hourly intervals for 3 hours to maintain test pressure. Continue initial expansion phase for 4 hours and then begin test phase. Test phase shall continue for 3 hours.**
 - v. At conclusion of test phase, determine actual leakage by measuring quantity of water necessary to return system to test pressure.**
 - vi. If test is not completed due to leakage, equipment failure, or other reasons, depressurize test section and allow it to relax for at least 8 hours before retesting.**
 - vii. If measured leakage exceeds allowable leakage or if leaks are visible, repair defective pipe section and repeat hydrostatic test.**
- d. Allowable Leakage:**

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- i. **Maximum allowable makeup water at conclusion of test phase shall not exceed recommended amounts stated in the following table.**
- ii. **Table is based on test pressure equal to 1.5 times pressure class of pipe. If lower pressure is used for test, allowances shall be reduced by ratio of test pressure to pressure class of pipe. When testing at pressure below 75 degrees F, less pipe expansion takes place.**
- iii. **For a water temperature of 68 degrees F, multiply values in table by 0.75. For water temperature of 50 degrees F, multiply values in table by 0.50.**

| Makeup Water Allowance for Test Phase (U.S. Gallons per 100 feet of Pipe) | | | |
|--|-----------------------|-----------------------|-----------------------|
| Nominal Pipe Size (inches) | 1-hour Test (Gallons) | 2-hour Test (Gallons) | 3-hour Test (Gallons) |
| 3 | 0.10 | 0.15 | 0.25 |
| 4 | 0.13 | 0.25 | 0.40 |
| 6 | 0.30 | 0.60 | 0.90 |
| 8 | 0.50 | 1.0 | 1.5 |
| 10 | 0.75 | 1.3 | 2.1 |
| 12 | 1.1 | 2.3 | 3.4 |
| 14 | 1.4 | 2.8 | 4.2 |
| 16 | 1.7 | 3.3 | 5.0 |
| 18 | 2.2 | 4.3 | 6.5 |
| 20 | 2.8 | 5.5 | 8.0 |
| 24 | 4.5 | 8.9 | 13.3 |
| 28 | 5.5 | 11.1 | 16.8 |
| 32 | 7.0 | 14.3 | 21.5 |
| 36 | 9.0 | 18.0 | 27.0 |
| 40 | 11.0 | 22.0 | 33.0 |
| 42 | 12.0 | 22.5 | 35.0 |
| 48 | 15.0 | 27.0 | 43.0 |
| 54 | 18.0 | 30.0 | 50.0 |

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| Makeup Water Allowance for Test Phase (U.S. Gallons per 100 feet of Pipe) | | | |
|--|--------------------------|--------------------------|--------------------------|
| Nominal Pipe Size (inches) | 1-hour Test (Gallons) | 2-hour Test (Gallons) | 3-hour Test (Gallons) |
| 63 | 27.0 | 54.0 | 81.0 |

END OF SECTIONSECTION
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SECTION 02519 - DISINFECTION OF WATER SYSTEMS

PART 1 GENERAL

1.1 GENERAL

- A. All work under this Section to be done in the presence of the Owner's Representatives.
- B. Existing valves and connections to the water system are to be operated by the Owner's staff only.

PART 2 PRODUCTS

2.1 WATER FOR DISINFECTION AND TESTING

- A. Clean, uncontaminated, and potable.
- B. Owner will supply potable quality water. Contractor shall convey in disinfected pipelines or containers.

2.2 CONTRACTOR'S EQUIPMENT

- A. Furnish chemicals and equipment, such as pumps and hoses, to accomplish disinfection.
- B. Provide protection as required by AWWA Standards C651, C652, C653, and/or C654 against cross-connections.

PART 3 EXECUTION

3.1 GENERAL

- A. Disinfection procedures shall conform to AWWA Standards C651, C652, C653, and/or C654 and this Specification.
- B. Disinfect the following items installed or modified under this Project, intended to hold, transport, or otherwise contact potable water:
 - a. Pumps.
 - b. Tanks.
 - c. Wells.
 - d. Filters.
 - e. Pipelines: Disinfect new pipelines that connect to existing pipelines up to point of connection.

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- f. Disinfect surfaces of materials that will contact finished water, both during and following construction, using one of the methods described in AWWA C652 and C653. Disinfect prior to contact with finished water. Take care to avoid recontamination following disinfection.
- C. Prior to application of disinfectants, clean pump, tank, filters, wellhead works and pipelines of loose and suspended material. Flush pipelines until clear of suspended solids and color. Use water suitable for flushing and disinfecting.
- D. Conform to AWWA C651 for pipes and pipelines, C652 for tanks and reservoirs, C653 for water treatment plants and filters, and C654 for wells, except as modified in these Specifications. AWWA Specification requirements will be made available to the Contractor upon request.
- E. Allow freshwater and disinfectant solution to flow into pipe or vessel at a measured rate so that chlorine-water solution is at specified strength. Do not place concentrated commercial disinfectant in pipeline or other facilities to be disinfected before it is filled with water.

3.2

SEQUENCING AND SCHEDULING

- A. Commence Initial Disinfection After Completion of Following:
 - a. Installation of water services, valves, and hydrant leads.
 - b. Completion and acceptance of internal painting of system(s).
 - c. Hydrostatic and pneumatic testing, pressure testing, functional and performance testing and acceptance of pipelines, pumping systems, structures, and equipment.
 - d. Disinfection of:
 - i. Pumps and associated system piping.
 - ii. Treatment plant basins and processes used to supply water to system.
- B. Provide 48 hour's notice to Owner's Representative for scheduling of valve operation, sampling, or laboratory testing.

3.3

PIPING AND PIPELINES

- A. Flushing:

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- a. Before disinfecting, flush and/or pig as required all foreign matter from pipe in accordance with AWWA C651. Provide hoses, temporary pipes, ditches, and other conduits as needed to dispose of flushing water without damage to adjacent properties.
 - b. Flush service connections and hydrants. Flush distribution lines prior to flushing hydrants and service connections.
 - c. Flush pipe through flushing branches and remove branches after flushing is completed.
 - d. Operate new valves during flushing process at least twice during each flush.
- B. Disinfecting Procedure:** In accordance with AWWA C651. The piping and appurtenances shall be sterilized by introducing the sterilizing agent into the water which is being pumped into the system in such a manner that the entire system involved will be filled with water containing a minimum chlorine concentration of 50 ppm at any point. The water shall be allowed to remain in the system for a minimum contact period of 24 hours before the system is flushed out.
- C. Pipelines larger than 36 inches in diameter may be disinfected by spraying in accordance with the method described in AWWA C652.**
- D. Sampling Points:** Provide sampling points on all water mains at the end of each water main and at a maximum spacing of 1,500 feet.
- E. Water mains can be put into service when the chlorine concentration is less than 0.1 ppm free chlorine and 3.0 ppm total chlorine.**

3.4**DAMAGED WATER MAINS**

- A. All pipe and fittings used to repair a damaged water main or service shall be swabbed or sprayed with hypochlorite as specified above.**
- a. Hypochlorite concentration shall range from 4 to 12 percent.
 - b. Hypochlorite solution must remain in contact with all pipe and fittings for a minimum of 10 minutes.

3.5**PUMPS**

- A. Disinfecting Solutions: Minimum free chlorine concentration of 100 ppm.**

B. Application:

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- a. Inject disinfecting solution into pump and associated piping and circulate for a minimum 3 hour period of time. At end of 3 hour period, solution shall have a strength of at least 50 ppm free chlorine.
- b. Operate valves and pump appurtenances during disinfection to ensure that disinfecting solution is dispersed into all parts of pump and lines.
- c. If disinfecting solution contained in pump has a residual free chlorine concentration less than 50 ppm after the 3 hour retention period, reclean pump, reapply disinfecting solution, and retest until a satisfactory test result is obtained.
- d. After chlorination, flush water from pump until water through the unit is chemically and bacteriologically equal to permanent source of supply.

3.6**TANKS AND RESERVOIRS****A. Cleaning:**

- a. Clean interior surfaces using water under pressure before sterilizing. Isolate tank and/or reservoir from system to prevent contaminating materials from entering the distribution system. Cleaning shall:
 - i. **Remove all deposits of foreign nature.**
 - ii. **Remove all biological growths.**
 - iii. **Clean the slopes, walls, top, and bottom.**
 - iv. **Avoid damage to the structure.**
 - v. **Avoid pollution or oil deposits by workers and equipment.**
- b. Dispose of water used in cleaning in accordance with applicable regulations before adding disinfecting solution to tank and/or reservoir.

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- B. Disinfecting Procedure: In accordance with AWWA C652, unless herein modified. Parts of structures, such as ceilings or overflows that cannot be immersed, shall be spray or brush disinfected.**

3.7**FILTERS**

- A. Prior to disinfection, remove foreign material from filtration structures. Clean using fire hoses and tools suitable for adequate scrubbing and cleaning. Pump or drain scrub water from structures.**
- B. Disinfection Procedure: In accordance with AWWA C653, unless herein modified.**
- C. Disinfect the Following Components:**
- a. Influent pipes and channels.
 - b. Filter structure.
 - c. Filter media and underdrains.
 - d. Filter effluent pumping.
 - e. Backwash supply piping.
 - f. Finished water piping.
 - g. Potable water piping.
- D. Clean other new facilities designed to hold or transport process water prior to disinfection of filter system including:**
- a. Raw water piping.
 - b. Flocculation and sedimentation basins.

3.8**WELLS**

- A. Disinfection Procedures: In accordance with AWWA C654, unless herein modified.**
- a. After well has been completed and tested, it shall be cleaned of all foreign substances. Swab the inner lining using alkalis, if necessary, to remove oil, grease, or other extraneous matter.

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- b. Use chlorine solution of a volume and strength so that a concentration of at least 50 ppm of free chlorine is contained in well.
- c. Chlorine solution shall be poured into well and well surged for at least 5 minutes. After 4 hours, well shall be pumped or bailed until chlorine concentration is less than 5 ppm.
- d. Tack weld capping plate to casing after well has been disinfected and pumped out.
- e. Take care to prevent the entrance into well of dirt or other contamination while installing pump.
- f. Before being placed into the well thoroughly wash pump bowl, column, and air line, first with clear water and then with chlorinated solution in accordance with AWWA C654.
- g. Chlorinate well in accordance with AWWA C654 and applicable State standards. In case of a discrepancy between AWWA and State standard, the strictest requirement shall apply.

3.9 DISPOSAL OF HEAVILY CHLORINATED WATER

- A. Do not allow flow into a waterway without neutralizing disinfectant residual.
- B. See the appendix of AWWA C651, C652, C653, and/or C654 for acceptable neutralization methods.

3.10 TESTING

- A. After tanks, reservoirs, filters, pumps, channels, and pipelines have been cleaned, disinfected, and refilled with potable water, Owner will take water samples and have them analyzed for conformance to bacterial limitations for public drinking water supplies.
- B. Sampling and testing shall be in accordance with AWWA C-651 and FAC 62-555.340. Any main installed, tested and put into service shall pass all required testing as a single unit. If any single sampling point on the main fails, all testing shall be repeated (at no additional cost) until all sampling points pass.
- C. Bacteriological samples must be collected on two consecutive days. The Contractor will coordinate and provide a means of sampling for CITY personnel to collect the samples. Samples will be analyzed by the CITY's laboratory. Failure

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to provide adequate notice and any subsequent delay in sampling will not be considered grounds for project delay.

- D. If minimum samples required above are bacterially positive, disinfecting procedures and bacteriological testing shall be repeated until bacterial limits are met at no additional cost.**

END OF SECTION

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SECTION 02535 - STRUCTURES

PART 1 GENERAL

1.1 RELATED DOCUMENTS

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

1.2 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.

1.3 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

2.1 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."

2.2 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

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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.

2.3 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.

2.4 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

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shall be smooth, true to pattern and free from projections, san holes, warp and other defects. The horizontal surface of the frame cover seats and the under surface of the 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****3.1 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.

3.2 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.

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3.3 MANHOLE AND STRUCTURES

- 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.

3.4 CLEANING AND MAINTENANCE

- A. All structures shall be cleaned and maintained in workable condition until accepted by the CITY PROJECT MANAGER.

END OF SECTION

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SECTION 02575 - SURFACE RESTORATION

PART 1

GENERAL

1.1 STANDARD SPECIFICATIONS

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

1.2 INTENT

- A. Specific surface restoration requirements are detailed in this and other sections.
- B. For pipeline projects, the intent of these Specifications and the criteria of the Measurement and Payment Section 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.
- a. 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.
- i. Argentine Bahia sod will be used for areas without irrigation systems, except where St. Augustine turf existed previously.
- ii. St. Augustine "Floritam" sod will be used for areas with irrigation systems and in locations with similar, existing turf.
- iii. Seashore Paspalum sod will be used in areas prone to salt water flooding, Driveways and sidewalks will be placed in kind, using similar materials of construction.
- b. 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 the Contract Documents.
- C. For work areas disturbed by the Contractor for convenience, the area affected shall be restored in kind.
- a. The costs of this restoration shall be incidental to the cost of the Work.

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- b. Payment for restoration outside the limits of work shall be repaired at the Contractor's expense.

1.3**WORK INCLUDED**

- A. This Section covers the Work necessary to replace all pavement, curbs, sidewalks, rock surfacing, and other street features damaged either directly or indirectly by the operations incidental to the construction described in other sections of the Contract Documents.
- B. Where the materials, construction procedures, degree of compaction of materials, and the method of control and testing, as required in the Contract Documents 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 the Contract Documents.

1.4**OPTIMUM MOISTURE CONTENT**

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

1.5**TEMPORARY TRENCH REPAIR OR STABILIZATION**

- A. Following pipe installation and prior to permanent trench repair or asphalt replacement, temporary trench repair will be defined as one of the following:
 - a. Installation of flowable fill as described in this Section and the Contract Documents.
 - b. Installation of the compacted base course and an asphalt prime coat as described in this Section and the Contract Documents.
- B. Temporary trench repair shall be maintained in accordance with the requirements of this Section and the Contract Documents until the final trench repair or asphalt surface is installed to provide a dust-free, drivable, and safe roadway surface.

PART 2**PRODUCTS****2.1****GENERAL**SECTION
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- 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 of the Contract Documents 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 of the Contract Documents.

2.2

LIME ROCK BASE COURSE

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

2.3

BITUMINOUS PRIME AND TACK COAT

- A. Prime Coat: Material shall be cutback asphalt, Grade RC-70 or RC-250 meeting the requirements of the Standard Specifications, or approved equal.
- B. Tack Coat: Material shall be emulsified asphalt, Grade RS-2, SS-1, or SS-1H meeting the requirements of the Standard Specifications.
- C. Tack coats used for temporary trench stabilization shall be sanded to prevent damage to vehicles.

2.4

ASPHALT CONCRETE

- A. The asphalt concrete for trench leveling, restoration and overlay shall be Type SP-9.5, meeting the requirements of the Standard Specifications and the Contract Documents.
- B. Aggregate: The aggregate shall meet the requirements of the Standard Specifications.
- C. Submit test results from commercial testing laboratories to the CITY PROJECT MANAGER to show that the materials meet the quality and gradation requirements.

2.5

CONCRETE PAVERS

- A. Pavers shall be placed on approved restored base and subgrade with a 1" layer of bedding sand meeting the requirements of the Standard Specifications.

2.6

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 CONSULTANT, at no additional cost.

2.7

CONCRETE

- A. Concrete shall be 3,000 psi minimum concrete meeting

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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.

2.8

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 markings meeting the requirements of the Broward County Traffic Engineering Division and 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 Broward County Traffic Engineering Division and the Standard Specifications.
- C. The Contractor shall place and maintain temporary striping markings throughout the course of the work until the permanent striping marking is placed on the final roadway surface.
- D. The Contractor shall provide 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.

2.9

SWALE STABILIZATION

- A. Materials used for stabilization of swale areas as indicated on the Drawings shall consist of suitable excess existing base material removed from trenching operations, if approved by the CONSULTANT, crushed limerock, rock screenings, or other suitable material as approved by the CONSULTANT.
 - a. Materials having a plasticity index of more than 10, or a liquid limit greater than 40 shall not be used.
 - b. Maximum dimension shall not exceed 1.5 inches.

PART 3

EXECUTION

3.1

CONSTRUCTION PROCEDURE

- A. The CITY PROJECT MANAGER reserves the right to vary the type of resurfacing as best serves the interest of the Owner. Trench backfill shall be as specified in the Contract Documents.
- B. Replace all bituminous and concrete roadway pavement damaged or removed under this Contract with asphalt concrete regardless of original type.

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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 CITY PROJECT MANAGER until the trench repair has been stabilized. If control of dust is inadequate by these means, the CITY PROJECT MANAGER 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 CITY PROJECT MANAGER 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.**

3.2 REMOVAL OF PAVEMENT, SIDEWALK, CURBS, AND GUTTERS

- A. Removal of all pavement, sidewalks, curbs, and gutters shall conform to the Contract Documents, and payment for removal shall be included in that Section of the Contract Documents. Payment for removal is incidental to the cost of pipe installation except where required for water and sewer service installation.**

3.3 CUTTING EXISTING PAVEMENT

- A. Where new pavement abuts existing pavement, the old pavement shall be trimmed by saw cutting to a straight line. Any pavement which has been damaged or which is broken and unsound shall be removed to provide a smooth, sound edge for joining new pavement.**

3.4 STREET MAINTENANCE

- A. Maintain all trenches as specified in this section and the Contract Documents.**

3.5 CONSTRUCTION OF BASE COURSE

- A. Base course shall be constructed in accordance with the City of Fort Lauderdale Standards and 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 CONSULTANT. 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 CONSULTANT, the Contractor shall**

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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.

3.6 MILLING OR GRINDING OF EXISTING ASPHALT PAVEMENT

- A. Milling of existing asphalt pavement shall meet the requirements 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.

3.7 BITUMINOUS PRIME AND TACK COAT

- A. The bituminous prime coat shall be applied to the lime rock base immediately following the placement of the compacted base course. The prime coat shall be maintained with additional coats as determined by the CITY PROJECT MANAGER 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.

3.8 ASPHALT CONCRETE PAVEMENT REPLACEMENT

- A. Preparation for Paving:
 - a. 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.

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

3.9 CONSTRUCTION OF ASPHALT CONCRETE PAVEMENT OVERLAY – IF REQUIRED

- A. The Contractor shall place a layer of tack coat at a rate of 0.05 to 0.12 gallon per square yard over all areas to receive asphalt concrete.
- B. Lay asphalt concrete over all areas designated to be resurfaced. The asphalt concrete pavement overlay shall be placed in minimum 1-inch lift and maximum lift as shown in the Contract Documents. 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 CITY PROJECT MANAGER 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

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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.
- 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 CONSULTANT. 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.
- B. 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.

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- 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 CONSULTANT.**
- 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 CONSULTANT, the Contractor shall without additional charge, provide the CITY PROJECT MANAGER 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 CONSULTANT. He shall also provide the CITY PROJECT MANAGER with test results of samples of the uncompressed asphalt concrete mixtures and all materials incorporated in the Work.**

3.15**WEATHER CONDITIONS**

- A. Asphalt shall not be applied to wet material. Asphalt shall not be applied during rainfall or any imminent storms that might adversely affect the construction. The CITY PROJECT MANAGER 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 the Contract Documents.**

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3.17 EXCESS MATERIALS

- A. Dispose of all excess materials. Make arrangements for the disposal and bear all costs or retain any profit incidental to such disposal.**

3.18 Contractor'S RESPONSIBILITY

- A. Settlement of replaced pavement over trenches within the warranty period shall be considered the result of improper or inadequate compaction of the subbase or base materials. The Contractor shall promptly repair all pavement deficiencies noted during the warranty period at the Contractor's sole expense.**

3.19 SIDEWALKS AND CURBS

- A. Replace concrete sidewalks and curbs to the same section width, depth, line, and grade as that removed or damaged or as shown on the Drawings. The minimum thickness of sidewalks shall be 6 inches. 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. All curbs and all gutters shall have a minimum of 4" LBR 100 limerock "curb pad".**

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 the Contract Documents.**

3.21 TRAFFIC STRIPES

- A. All areas having traffic stripes prior to paving shall be restriped. Temporary traffic striping shall be applied immediately after asphalt pavement has been placed. Permanent traffic striping may be applied only after the proper curing time for the asphalt. Traffic stripes (temporary and permanent) shall meet the requirements of Broward County Traffic Engineering Division Standards and 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.**

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Pavement markers and adhesive (temporary and permanent) shall meet the requirements of Broward County Traffic Engineering Division and 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 and the Broward County Traffic Engineering Division Standards.

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 CITY PROJECT MANAGER and at no additional cost to the Owner. The repair shall include preparation of the subgrade, placing and compaction of the lime rock base and placement of the final asphalt surface as described in this Section.
- B. The width of all repairs shall extend at least 12 inches beyond the limit of the damage with the edge of pavement left saw cut to a true edge with no irregularities. For county roads and CITY streets recently constructed or overlaid, the repair may be required to be full-lane width as 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 CONSULTANT, 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

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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 CONSULTANT, 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 CITY PROJECT MANAGER when required to measure small or isolated sections (except where such testing may be considered unnecessary by the CONSULTANT). Each set of three shall be averaged as indicated above for determination of meeting the minimum requirements.

3.26

SPECIAL SWALE REPAIR

- A. Certain swale areas (designated on Drawings) have longitudinal trench filled with ballast rock for drainage. If appropriate, a separate pay item applies for removal and reconstruction of ballast rock drainage damaged during installation of pipelines. All other aspects of restoration work in the swale will be paid for separately under the restoration item. Swale stabilization will not be required in those areas with ballast rock drainage.

3.27

BRICK OR PAVER RESTORATION

- A. Remove and salvage bricks or paver materials to be disturbed by the work. Payment will be made in accordance with the unit price for these items.
- B. Restore pavers and apron area shall be constructed as shown in the Drawings. Payment will be made in accordance with the unit price for these items.
- C. Paver and apron areas shall be constructed as shown in the Drawings.
- D. 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

1.1 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.

1.2 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".

1.3 REFERENCE STANDARDS

- A. American Society For Testing and Materials (ASTM)
 - a. A185 – Steel Welded Wire Fabric, Plain, for Concrete Reinforcement
 - b. A615 – Deformed and Plain Billet-Steel Bars for Concrete Reinforcement
 - c. A760 – Corrugated Steel Pipe, Metallic-Coated for Sewers and Drains
 - d. A798 – Installation of Corrugated-Steel Pipe for Sewers and Other Applications
 - e. A929 – Metallic-Coated by the Hot-Dip Process for Corrugated Steel Pipe
 - f. C76 – Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe
 - g. C478 – Precast Reinforced Concrete Manhole Sections
 - h. C1479 – Installation of Reinforced Concrete Pipe
 - i. C990-01A – Joints for Concrete Pipe, Manholes, and Precast Box Sections Using Preformed Flexible Joint Sealants
 - j. D2321 – Installation of Thermoplastic Pipe for Sewer/Gravity-Flow Applications
 - k. D3034 – Type PSM Poly(Vinyl Chloride) (PVC) Sewer Pipe and Fittings
 - l. D3212 – Joints for Drain and Sewer Plastic Pipes Using Elastomeric Seals

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- m. F477 – Elastomeric Seals (Gaskets) for Joining Plastic Pipe
 - n. F794 – Poly(Vinyl Chloride) (PVC) Profile Gravity Sewer Pipe and Fittings Based on Controlled Inside Diameter
 - o. F949 – Poly(Vinyl Chloride) (PVC) Corrugated Sewer Pipe With a Smooth Interior and Fittings
- B. American Association of State Highway and Transportation Officials (AASHTO)
 - a. M198 – Joints for Circular Concrete Sewer and Culvert Pipe Using Flexible Watertight Gaskets
 - b. M252 – Corrugated Polyethylene Drainage Tubing
 - c. M274 – Aluminum-Coated (Type 2), for Corrugated Steel Pipe
 - d. M294 – Corrugated Polyethylene Pipe. 12 to 14 inch Diameter
 - e. M36 – Metallic Coated Corrugated Steel Culverts and Underdrains
 - f. M190 – Bituminous Coated Corrugated Metal Culvert Pipe and Pipe Arches
 - g. M199 – Standard Specification for Precast Reinforced Concrete Manhole Sections
- C. American Water Works Association (AWWA)
 - a. 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)
 - b. C111 – Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings
 - c. C151 – Ductile-Iron Pipe, Centrifugally Cast, for Water
- D. American Concrete Institute (ACI)
 - a. 301 – Structural Concrete for Buildings, Specifications for
 - b. 318 – Building Code Requirements for Structural Plain Concrete

1.4 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.

1.5 EXISTING UTILITIES

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- 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 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.

1.6 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.

1.7 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****2.1 PIPE**

- A. Reinforced concrete culvert pipe:
 - a. 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.
 - b. 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.

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- c. Concrete pipe may be either bell and spigot, tongue and groove or modified tongue and groove.
- d. 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 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.
- e. 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:

- a. High Performance polypropylene storm pipe shall be produced by a reputable manufacturer engaged in the full time business of manufacturing of piping.
- b. 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.
- c. 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:

- a. 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 0.0121.

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b. Basic Material:

- i. 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.
- ii. Rotational Molded Pipe and Fittings: Pipe and fittings shall be made of virgin PE compounds which conform with the requirements of Type III, Category 3, Grade P33, Class C; or Grade P34, Class C, as defined and described in ASTM D1248.

c. Corrugated Polyethylene Pipe shall meet the requirements as describe in ASTM D 2412 for pipe stiffness.

d. Corrugated Polyethylene Pipe shall be in accordance for brittleness with ASTM D 2444.

D. PVC corrugated pipe:

- a. 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.
- b. 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.
- c. 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****3.1 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.

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- 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
 - a. 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,
 - b. 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.

3.2 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.
 - a. 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.
 - b. 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.
 - c. 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.
 - d. Any unstable soil encountered shall be removed and replaced with gravel, crushed rock or rock and sand suitably compacted.

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3.3 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 uniformly support the bottom quadrant of the pipe barrel.

3.4 BEDDING

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

3.5 PIPE INSTALLATION

- A. Laying Pipe
 - a. 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.
 - b. 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.
 - c. 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.
 - d. Pipe sections shall be firmly joined together with appropriate gaskets or bands.
 - e. 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.
 - f. 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

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approved by the CITY PROJECT MANAGER.

- g. 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.
- h. 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.

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

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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.

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 lamped 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 02631 - EXFILTRATION TRENCH DRAINS

PART 1 GENERAL

1.1 RELATED DOCUMENTS

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

1.2 WORK INCLUDED

- A. Provide all labor, materials, necessary equipment and services to complete the Exfiltration Trench System work, as indicated on the Drawings, as specified herein or both, except as for items specifically indicated as "NIC ITEMS".

1.3 EXISTING UTILITIES

- A. Locate and stake all existing underground utilities that may be in the area of the drainage system.

1.4 SUBMITTALS

- A. Submit Plan Drawings showing the locations of all piping and underground utilities that may be in conflict with the Drainage System.
- B. Submit samples of the 3/4" washed rock (ASTM No. 5) for approval.
- C. Submit samples and product data of filter fabric.

PART 2 PRODUCTS

2.1 DRAINAGE PIPE AND BALLAST ROCK

- A. Drainage pipe shall be in conformance with material as specified in Contract Documents and have the maximum number of perforations allowable per the manufacturer's recommendations.
- B. Ballast rock shall be from fresh water and washed free of deleterious matter.
- C. Trench liner shall be non-woven filter fabric.

2.2 FILTER FABRIC

- A. Filter fabric shall be a non-woven fabric consisting of polypropylene fibers treated to resist biological degradation.
- B. Minimum Characteristics:

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| Mechanical Properties | Test Method | Unit | Minimum Average Roll Value | |
|------------------------------|-------------|---|----------------------------|-----------|
| | | | MD | CD |
| Grab Tensile Strength | ASTM D4632 | lbs (N) | 100 (445) | 100 (445) |
| Grab Tensile Elongation | ASTM D4632 | % | 50 | 50 |
| Trapezoid Tear Strength | ASTM D4533 | lbs (N) | 45 (200) | 45 (200) |
| CBR Puncture Strength | ASTM D6241 | lbs (N) | 250 (1113) | |
| | | | Maximum Opening Size | |
| Apparent Opening Size (AOS) | ASTM D4751 | U.S. Sieve (mm) | 70 (0.212) | |
| | | | Minimum Roll Value | |
| Permittivity | ASTM D4491 | sec ⁻¹ | 2.0 | |
| Flow Rate | ASTM D4491 | gal/min/ft ² (l/min/m ²) | 140 (5704) | |
| | | | Minimum Test Value | |
| UV Resistance (at 500 hours) | ASTM D4355 | % strength retained | 70 | |

| Physical Properties | Unit | Roll Sizes | |
|----------------------------------|-----------------------------------|------------------------|-----------------------|
| Roll Dimensions (width x length) | ft (m) | 12.5 x 360 (3.8 x 110) | 15 x 360 (4.57 x 110) |
| Roll Area | yd ² (m ²) | 500 (418) | 600 (502) |

PART 3**EXECUTION****3.1****INSTALLATION**

- A. Lay out Exfiltration Trench System as shown on the Plans.
- B. The bottom of the trench shall provide a minimum of 12" if ballast rock below the drain pipe.
- C. Drain pipe shall terminate a minimum of two feet beyond the end of the trench or connect to a catch basin as required.
- D. Cover temporary pipe ends with No. 10 galvanized or aluminum screen with openings no larger than 1/2" x 1/2".
- E. Bottom, sides and top of trench to be lined with trench lining material with a minimum of 2 feet of overlap at the top of the trench.
- F. A minimum of 4 feet of solid drain pipe shall be installed between drainage structures and the beginning of the trench.
- G. Concrete pipe shall be placed with the slots on the sides of the pipe equal distance from the plumb line.

3.2**CLEANUP**

- A. Remove all excess rock, liner and pipe from the site.

END OF SECTION

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SECTION 02710 - LIMEROCK BASE

PART 1 GENERAL

1.1 DEFINITIONS

- A. **Completed Course:** Compacted, unyielding, free from irregularities, with smooth, tight, even surface, true to grade, line, and cross section.
- B. **Completed Lift:** Compacted with uniform surface reasonably true to cross-section.

PART 2 PRODUCTS

2.1 LIMEROCK BASE ROCK

- A. The material used in limerock base shall be material classified as Miami Oolite Formation.
- B. The minimum of carbonates of calcium and magnesium in the limerock shall be 70 percent. The maximum percentage of water-sensitive clay material shall be 3.
- C. Limerock material shall be uniform in color and not contain cherty or other extremely hard pieces, or lumps, balls, or pockets of sand or clay size material in sufficient quantities as to be detrimental to the proper bonding, finishing, or strength of the limerock base.
- D. The limerock base shall be uniformly graded from coarse to fine with 97 percent passing a 3-1/2-inch sieve, 80 percent passing a 2-inch sieve. The fine material shall consist entirely of dust of fracture. All crushing or breaking up, which might be necessary in order to meet such size requirements, shall be done before the material is placed on the road.
- E. **Physical Qualities:**
 - a. Liquid Limit, AASHTO T89: Maximum 35 percent.
 - b. Nonplastic.
 - c. Limerock material shall have an average limerock bearing ratio (LBR) value of not less than 100.

2.2 SOURCE QUALITY CONTROL

- A. **Contractor:** Perform tests necessary to locate acceptable source of materials meeting specified requirements.
- B. **Final approval of aggregate material** will be based on materials' test results on installed materials.
- C. **Should separation of coarse from fine materials occur during processing or stockpiling,** immediately change methods of handling materials to correct uniformity in

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grading.

PART 3

EXECUTION

3.1

SUBGRADE PREPARATION

- A. As specified in the Contract Documents.
- B. Obtain CONSULTANT's acceptance of subgrade before placement of limerock base rock.
- C. Do not place base materials on soft, muddy subgrade.

3.2

EQUIPMENT

- A. Use mechanical rock spreaders, equipped with a device that strikes off the rock uniformly to laying thickness, capable of producing even distribution. For areas where the use of a mechanical spreader is not practicable, the Contractor may spread the rock using bulldozers or blade graders.

3.3

HAULING AND SPREADING

- A. **Hauling Materials:**
 - a. The limerock shall be transported to the point where it is to be used and dumped on the end of the preceding spread.
 - b. Do not haul over surfacing in process of construction.
 - c. Loads: Of uniform capacity.
 - d. Maintain consistent gradation of material delivered; loads of widely varying gradations will be cause for rejection.
- B. **Spreading Materials:**
 - a. Distribute material to provide required density, depth, grade and dimensions with allowance for subsequent lifts.
 - b. Produce even distribution of material upon roadway without segregation.
 - c. Should segregation of coarse from fine materials occur during placing, immediately change methods of handling materials to

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correct uniformity in grading.

3.4

CONSTRUCTION OF COURSES

- A. **General: Complete each lift in advance of laying succeeding lift to provide required results and adequate inspection.**
- B. **Limerock Base:**
 - a. Maximum Completed Lift Thickness: 6 inches or equal thickness.
 - b. Completed Course Total Thickness: As shown.
 - c. Spread lift on preceding course to required cross-section.
 - d. Lightly blade and roll surface until thoroughly compacted.
 - e. Blade or broom surface to maintain true line, grade, and cross-section.
- C. **Gravel Surfacing:**
 - a. Maximum Completed Lift Thickness: 6 inches or equal thickness.
 - b. Completed Course Total Thickness: As shown.
 - c. Spread on preceding course in accordance with cross-section shown.
 - d. Blade lightly and roll surface until material is thoroughly compacted.

3.5

ROLLING AND COMPACTION

- A. **Commence compaction of each layer of base after spreading operations and continue until density of 98 percent of maximum density has been achieved as determined by AASHTO T 180.**
- B. **Density tests will be conducted every 500 square yards or as directed by the CITY PROJECT MANAGER.**
- C. **Roll each course of surfacing until material shall not creep under roller before succeeding course of surfacing material is applied.**

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- D. Commence rolling at outer edges of surfacing and continue toward center; do not roll center of road first.
- E. 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.
- F. Place and compact each lift to required density before succeeding lift is placed.
- G. Bind up preceding course before placing leveling course. Remove floating or loose stone from surface.
- H. Blade or otherwise work surfacing as necessary to maintain grade and cross-section at all times, and to keep surface smooth and thoroughly compacted.
- I. Surface Defects: Remedy surface defects by loosening and rerolling. Reroll entire area, including surrounding surface, until thoroughly compacted.
- J. Finished Surface: True to grade and crown before proceeding with surfacing.

3.6 SURFACE TOLERANCES

- A. Finished Surface of Base Course and Leveling Course: Within plus or minus 0.04-foot of grade shown at any individual point.
- B. Compacted Surface of Leveling Course: Within 0.04-foot from lower edge of 10-foot straightedge placed on finished surface, parallel to centerline.
- C. Overall Average: Within plus or minus 0.01-foot from crown and grade specified.

3.7 DRIVEWAY RESURFACING

- A. Replace gravel surfacing on driveways which were gravel surfaced prior to construction.
- B. Provide compacted gravel surfacing to depth equal to original, but not less than 4 inches.
- C. Leave each driveway in as good or better condition as it was before start of construction.

3.8 FIELD QUALITY CONTROL

- A. In-Place Density Tests:
 - a. Construct base course so areas shall be ready for testing.
 - b. Allow reasonable length of time for CITY PROJECT MANAGER to

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perform tests and obtain results during normal working hours.

3.9

CLEANING

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

END OF SECTION

SECTION 02761 - PAVEMENT MARKING

PART 1

GENERAL

1.1

STANDARD SPECIFICATIONS

- A. When referenced in this section, Standard Specifications shall mean Florida Department of Transportation, Standard Specifications for Road and Bridge Construction, current edition. All Pavement Markings and Signage shall conform to the Broward County Traffic Engineering Division Standards, latest revision.

1.2

SUBMITTALS

- A. The CONTRACTOR shall submit its proposed formula for the asphaltic concrete paving for review in accordance with the Section entitled "Submittals".

1.3

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

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thinner under any circumstances.

PART 2

PRODUCTS

2.1

PAINT

- A. Color: White, yellow, or blue traffic striping meeting the requirements of Broward County Traffic Engineering Division and the Standard Specifications.
- B. Homogeneous, easily stirred to smooth consistency, with no hard settlement or other objectionable characteristics during a storage period of 6 months.

2.2

THERMOPLASTIC STRIPING

- A. White or yellow thermoplastic striping material meeting the requirements of Broward County Traffic Engineering Division and the Standard Specifications.

2.3

RAISED REFLECTIVE MARKERS

- A. Metallic or nonmetallic, or prismatic reflector type, of permanent colors retaining color and brightness under action of traffic.
- B. Rounded surfaces presenting a smooth contour to traffic. The minimum area of each reflective face shall be 2-1/2 inches squared.
- C. Marker and adhesive epoxy in accordance with ASTM D4280
- D. Markers shall meet the requirements of Broward County Traffic Engineering Division and the Standard Specifications.

2.4

GLASS SPHERES

- A. Glass spheres shall be of a composition designed to be highly resistant to traffic wear and to the effects of weathering.
- B. In accordance with AASHTO M247, Type I with moisture resistant coating or a formulation specified by the traffic striping material manufacturer and the Broward County Traffic Engineering Division and the Standard Specifications.

PART 3

EXECUTION

3.1 SURFACE PREPARATION

- A. Cleaning:
 - a. Thoroughly clean surfaces to be marked before application of pavement marking material.

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- b. Remove dust, dirt, and other granular surface deposits by sweeping, blowing with compressed air, rinsing with water or a combination of these methods.
- c. 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.
- d. 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.
- e. 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.
- f. Oil-Soaked Areas: After cleaning, seal with cut shellac to prevent bleeding through the new paint.
- g. Reclean surfaces when Work has been stopped due to rain.
- h. Existing Pavement Markings:
 - i. **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.**
 - ii. **Do not apply thermoplastic markings over existing preformed or thermoplastic markings.**
 - iii. **Perform grinding, scraping, sandblasting or other operations so finished pavement surface is not damaged.**
- B. **Pretreatment for Early Striping: Where early striping is required on rigid pavements, pretreat with an aqueous solution containing 3 percent phosphoric acid and 2 percent zinc chloride.**
- C. **New Concrete Pavement:**
 - a. Allow a minimum cure time of 30 days before cleaning and marking.

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- b. Clean by either sandblasting or water blasting to the following results:
 - i. **No visible evidence of curing compound on peaks of textured concrete surface.**
 - ii. **No heavy puddled deposits of curing compound in valleys of textured concrete surface.**
 - iii. **Remaining curing compound is intact, with loose and flaking material completely removed.**
 - iv. **Peaks of textured pavement surface are rounded in profile and free of sharp edges and irregularities.**
- D. Allow a minimum drying time of 24 hours after water blasting before applying thermoplastic markings.

3.2**ALIGNMENT FOR MARKINGS**

- A. The Contractor shall be responsible for all measurements, reference points and marks, string lining, and any other steps required in establishing pavement marking locations and alignment. On tangents and on curves up to 1 degree, the alignment of the marking shall not deviate from the string line by more than 1 inch. On curves exceeding 1 degree, the maximum permissible deviation shall be 2 inches. All alignment width and location shall conform to the details shown on the Drawings.

3.3**PAINT APPLICATION**

- A. **General:**
 - a. Thoroughly mix pigment and vehicle together prior to application, and keep thoroughly agitated during application.
 - b. Do not add thinner.
 - c. 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.

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- d. Apply only when surface is dry.
- e. Do not apply when conditions are windy to the point of causing overspray or fuzzy line edges.
- f. New Asphalt Pavement: Allow a minimum pavement cure time as recommended by the manufacturer before applying paint.
- g. Provide guide lines and templates to control paint application.
- h. Take special precautions in marking numbers, letters, and symbols.
- i. Sharply outline edges of markings and apply without running or spattering.

B. Rate of Application:

- a. Reflective Markings:
 - i. **Paint: Apply evenly, 105 plus or minus 5 square feet per gallon.**
 - ii. **Glass Beads: Apply uniformly, 6 plus or minus 0.5 pounds of glass spheres per gallon of paint.**
- b. Nonreflective Markings: Apply paint evenly to pavement surface at a rate of 105 plus or minus 5 square feet per gallon.
- c. 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:

- a. Provide maximum drying time to prevent undue softening of bitumen and pickup, displacement, or discoloration by traffic.
- b. If drying is abnormally slow, discontinue painting operations until cause is determined and corrected.

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- 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:**
 - a. Pavement Surface: Minimum 40 degrees F and rising.
 - b. Thermoplastic: Minimum 375 degrees F, maximum 425 degrees F.
- D. Primer:**
 - a. On portland cement concrete and existing asphalt pavements, apply epoxy resin primer/sealer according to the thermoplastic manufacturer's recommendations.
 - b. All primer/sealer to dry prior to applying thermoplastic.
- E. Thermoplastic Marking:**
 - a. 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 Design Standards.
 - b. Apply centerline, skipline, edgeline, and other longitudinal type markings with a mobile applicator.
 - c. Apply special markings, crosswalks, stop bars, legends, arrows, and similar patterns with a portable, extrusion-type applicator.
- F. Glass Bead Application:**
 - a. Immediately after marker application, mechanically apply such that the beads are held by and imbedded in the surface of the molten material.
 - b. Application Rate: One pound per 20 square feet of compound.

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- G. Cool completed marking to ambient temperature prior to allowing vehicular traffic.

3.5 INSTALLATION OF RAISED REFLECTIVE MARKERS

- A. Apply markers to the bonding surface using bituminous adhesives only.
- B. Apply the adhesive to the binding surface (not the marker) so that 100 percent of the bonding area of the marker will be covered.
- C. Align markers carefully, projecting no more than 3/4-inch above level of pavement. Reflective face of the marker shall be perpendicular to a line parallel to the roadway centerline. Do not install markers over longitudinal or transverse joints of the bonding surface.
- D. Spacing: As shown on the Drawings.
- E. Immediately remove excess adhesive from the bonding surface and exposed surface of the marker.
- F. Use only a mineral spirits meeting Federal Specifications TT-T-291 to remove adhesive from exposed faces of markers.

3.6 GLASS BEAD APPLICATION

- A. Apply immediately following application of paint.
- B. Use evenly distributed, drop-on application method.
- C. Rate: 10 pounds per gallon of paint.

3.7 PROTECTION

- A. The CONTRACTOR shall erect adequate warning signs and/or provide sufficient number of flagmen, and take all necessary precautions for the protection of the materials and safety of the public.
- B. Protect surfaces from disfiguration by paint spatters, splashes, spills, or drips.

3.8 CLEANUP

- A. Remove paint spatters, splashes, spills, or drips from Work and staging areas and areas outside of the immediate Work area where spills occur.

END OF SECTION

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SECTION 02765 - CURED-IN-PLACE PIPE LINING

PART 1 GENERAL

1.1 SCOPE

- A. It is the intent of this specification to provide for the reconstruction of pipelines and conduits by the installation of a resin-impregnated flexible tube which is formed to the original conduit and cured to produce a continuous and tight fitting Cured-In-Place Pipe (CIPP).
- B. The work specified in this Section includes all labor, materials, accessories, equipment and tools necessary to install and test cured-in-place pipe lining in main lines and in service laterals.

1.2 GENERAL

- A. This specification references ASTM F1216 (Rehabilitation of pipelines by the inversion and curing of a resin-impregnated tube), ASTM F1743 (Rehabilitation of pipelines by pulled-in-place installation of a cured-in-place thermosetting resin pipe), and ASTM D790 (Test methods for flexural properties of unreinforced plastics) which are made a part hereof by such reference and shall be the latest edition and revision thereof. In case of conflicting requirements between this specification and these referenced documents, this specification will govern.

1.3 SUBMITTALS

- A. The CONTRACTOR shall submit shop drawings and other information to the CITY for review in accordance with the Contract Documents.
- B. With the bid, the following submittals are required.
 - a. Documentation as outlined herein under the section titled, PRODUCT AND INSTALLER ACCEPTABILITY, including installation references of projects that are similar in size and scope to this project. The submittal shall include, at a minimum, the client contact name, phone number, and the diameter and footage of pipe rehabilitated. Documentation for product and installation experience must be satisfactory to the CITY.
- C. After contract award, the following submittals are required.
 - a. Detailed design calculations as specified herein under the section titled, MATERIALS FOR MAIN LINES AND LATERALS.
 - b. Various test results as specified herein under the section titled, TESTING REQUIREMENTS.
 - c. Documentation as specified herein under the sections titled WET-OUT AND CURE REPORT and TELEVISION SURVEY.

1.4 PRODUCT AND INSTALLER ACCEPTABILITY

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- A. Since sewer products are intended to have a 50 year design life, and in order to minimize the CITY'S risk, only proven products and installers with substantial successful long term track records will be approved.
- B. Products and installers seeking approval must document an ability to meet all of the following criteria to be deemed commercially acceptable:
 - a. For a product to be considered commercially proven, a minimum of 1,000,000 linear feet or 4,000 manhole-to-manhole line sections of successful wastewater collection system installations in the U.S. must be documented to the satisfaction of the CITY to assure commercial viability. In addition, at least 250,000 linear feet of the product shall have been in successful service within the State of Florida for a minimum of five years.
 - b. For an Installer to be considered as commercially proven, the installer must satisfy all insurance, financial, and bonding requirements of the CITY, and must have had at least 5 (five) years active experience in the commercial installation of the product. For sewer mains, the installer must have successfully installed at least 250,000 feet of the product in wastewater collection systems **in the United States with at least 150,000 feet of the product in wastewater collection systems in Florida**. For sewer laterals, the installer must have successfully installed a minimum of 500 lateral liners in Florida. Acceptable documentation of these minimum installations must be submitted to the CITY. For purposes of this requirement, "Installer" shall mean the corporation or business entity submitting the bid.
 - c. Sewer rehabilitation products submitted for approval must provide third party test results supporting the long term performance and structural strength of the product and such data shall be satisfactory to the CITY. Test samples shall be prepared so as to simulate installation methods and trauma of the product. No product will be approved without independent third party testing verification.

PART 2 PRODUCTS**2.1 MATERIALS FOR MAIN LINES AND LATERALS**

- A. The sewn tube shall consist of one or more layers of absorbent non-woven felt fabric and meet the requirements of ASTM F1216 or ASTM F1743, Section 5. The tube shall be constructed to withstand installation pressures, have sufficient strength to bridge breaks and missing sections of the existing pipe, and stretch to fit irregular pipe sections. The new jointless pipe-within-a-pipe must fit tightly against the old pipe wall and consolidate all disconnected sections into a single continuous conduit, substantially reducing or eliminating infiltration or exfiltration.
- B. The wetout tube shall have a uniform thickness that when compressed at installation pressures will meet or exceed the Design thickness.
- C. The tube shall be sewn to a size that when installed will tightly fit the internal circumference and length of the original pipe with minimal shrinkage, in such a way as to minimize water migration (tracking) between the liner and the host pipe. Allowance should be made for circumferential stretching during inversion, and longitudinal

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stretching during pull in. Overlapped layers of felt in longitudinal seams that cause lumps in the final product shall not be utilized.

- D. The minimum tube length shall be that deemed necessary by the Contractor to effectively span the distance between the access points and to facilitate a good, "non-tracking" seal. The Contractor shall verify the lengths in the field before cutting liner to length and otherwise preparing it for installation.
- E. The outside layer of the tube (before wetout) shall be coated with an impermeable, flexible membrane that will contain the resin and facilitate monitoring of resin saturation during the resin impregnation (wetout) procedure.
- F. The tube shall be homogeneous across the entire wall thickness containing no intermediate or encapsulated elastomeric layers. No material shall be included in the tube that may cause delamination in the cured CIPP. No dry or unsaturated layers shall be evident.
- G. The wall color of the interior pipe surface of CIPP after installation shall be a light reflective color so that a clear detailed examination with closed circuit television inspection equipment may be made.
- H. Seams in the tube shall be stronger than the unseamed felt.
- I. The outside of the tube shall be marked for distance at regular intervals along its entire length, not to exceed 5 ft. Such markings shall include the Manufacturers name or identifying symbol. The tubes must be manufactured in the USA.
- J. The resin system shall be a corrosion resistant polyester, vinyl ester, or epoxy and catalyst system that when properly cured within the tube composite meets the requirements of ASTM F1216 and ASTM F1743, the physical properties herein, and those which are to be utilized in the Design of the CIPP for this project. The resin shall produce CIPP which will comply with the structural and chemical resistance requirements of this specification.
- K. The finished pipe in place shall be fabricated from materials which when cured will be chemically resistant to withstand internal exposure to domestic sewage. All constituent materials will be suitable for service in the environment intended. The final product will not deteriorate, corrode or lose structural strength that will reduce the projected product life. In industrial areas a liner system using epoxy vinyl ester resin shall be utilized and a polyester resin shall be used in non-industrial areas. The CITY shall determine the type of appropriate resin to be utilized for each line segment.
- L. The CIPP shall be designed as per ASTM F1216, Appendix X1. The CIPP design shall assume no bonding to the original pipe wall. The structural performance of the finished pipe must be adequate to accommodate all anticipated loads throughout its design life.
- M. The CIPP must have a minimum design life of fifty (50) years. The minimum design life may be documented by submitting life estimates by national and/or international authorities or specifying agencies. Otherwise, long-term testing and long-term in-service results (minimum ten (10) years) may be used, with the results extrapolated to fifty (50) years.

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- N. The CONTRACTOR must have performed long-term testing for flexural creep of the CIPP pipe material installed by his company. Such testing results are to be used to determine the long-term, time dependent flexural modulus to be utilized in the product design. This is a performance test of the materials (tube and resin) and general workmanship of the installation and curing. A percentage of the instantaneous flexural modulus value (as measured by ASTM D-790 testing) will be used in design calculations for external buckling. The percentage, or the long-term creep retention value utilized, will be verified by this testing. Values in excess of 50% will not be applied unless substantiated by qualified third party test data. The materials utilized for the contracted project shall be of a quality equal to or better than the materials used in the long-term test with respect to the initial flexural modulus used in design.
- O. The minimum required structural CIPP wall thickness shall be based on the physical and structural properties described herein and in accordance with the design equations in the appendix of ASTM F 1216, and the following design parameters:

| | |
|---|-----------------------|
| Design Safety Factor | 2.0 |
| Retention Factor for Long-Term Flexural Modulus to be used in Design (as determined by Long-Term tests described in paragraph 2.02.B) | 50 % |
| Ovality* | 2 % |
| Water Table = Grade Elevation | ft. |
| Soil Depth (above crown)* | ft. |
| Soil Modulus | 700 psi |
| Soil Density | 120 pcf |
| Live Load | One H20 passing truck |
| Design Condition | Fully deteriorated |
| *Denotes information which can be provided here or in inspection video tapes or project construction plans. Multiple line segments may require a table of values. | |

- P. The lining manufacturer shall submit to the CITY for review complete design calculations for the liner, signed and sealed by a Professional Engineer registered in the State of Florida and certified by the manufacturer as to the compliance of his materials to the values used in the calculations. The buckling analysis shall account for the combination of dead load, live load, hydrostatic pressure and grout pressure (if any). The liner side support shall be considered as if provided by soil pressure against the liner. The existing pipe shall not be considered as providing any structural support. Modulus of soil reaction shall be 700, corresponding to a moderate degree of compaction of bedding and a fine-grained soil as shown in AWWA Manual M45, Fiberglass Pipe Design.
- Q. As part of the design calculation submittal, the liner manufacturer shall submit a tabulation of time versus temperature. This tabulation shall show the lengths of time that exposed portions of the liner will endure without self-initiated cure or other deterioration beginning. This tabulation shall be at five degree Fahrenheit increments ranging from 70 degrees F

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to 100 degrees F. The manufacturer shall also submit his analysis of the progressive effects of such "pre-cure" on the insertion and cured properties of the liner. This information shall be submitted in a timely fashion prior to the preconstruction conference so that the CITY may set procedures for dealing with such an instance caused by construction delays.

- R. The layers of the cured CIPP shall be uniformly bonded. It shall not be possible to separate any two layers with a probe or point of a knife blade so that the layers separate cleanly or the probe or knife blade moves freely between the layers. If separation of the layers occurs during testing of field samples, new samples will be cut from the work. Any reoccurrence may cause rejection of the work.
- S. Any layers of the tube that are not saturated with resin prior to insertion into the existing pipe shall not be included in the structural CIPP wall thickness computation.
- T. Liner shall be neither accepted nor installed until design calculations are acceptable to the CITY. Liner shall be as manufactured by Insituform Technologies, Inc., 702 Spirit 40 Avenue, Chesterfield, MO 63005, Phone No. 800-325-1159, or approved equal.

2.2 STRUCTURAL REQUIREMENTS FOR MAIN LINES

- A. Since the pipe strength is related to the uniformity and density of the pipe wall, only resin vacuum impregnation will be allowed. Resin impregnation without vacuum entraps air and creates voids which weaken the pipe wall. If reinforcing materials (fiberglass, etc.) are used, the reinforcing material must be fully encapsulated within the resin to assure that the reinforcement is not exposed, either to the inside of the pipe or at the interface of the CIPP and the existing pipe.
- B. The design for the CIPP wall thickness will be based on the following strengths, unless otherwise submitted to and approved by the CITY.

| Property | Test Method | Cured Composite per ASTM F1216 |
|--------------------------------|-------------|--------------------------------|
| Flexural Modulus of Elasticity | ASTM D-790 | 250,000 psi |
| Flexural Stress | ASTM D-790 | 4,500 psi |

2.3 STRUCTURAL REQUIREMENTS FOR SERVICE LATERALS

- A. The design for the CIPP wall thickness will be based on the following strengths, unless otherwise submitted to and approved by the CITY:

| Property | Test Method | Cured Composite per ASTM F1216 |
|----------|-------------|--------------------------------|
|----------|-------------|--------------------------------|

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| | | |
|--------------------------------|------------|-------------|
| Flexural Modulus of Elasticity | ASTM D-790 | 250,000 psi |
| Flexural Stress | ASTM D-790 | 4,500 psi |

2.4 REQUIREMENTS FOR MAINLINE/LATERAL CONNECTIONS

A. Mainline/Lateral Connection Interface Seal

- a. The interface seal shall provide a water tight connection between the lateral (service connection) and the mainline pipe. The lateral and mainline pipe may or may not have liners installed. If the interface seal requires insertion, the interface seal shall be completely installed via remote device without any excavation. The interface seal between the lateral and the mainline sewer pipe shall be compatible with the lateral pipe (either lined or unlined) and the sewer pipe (either lined or unlined). The interface seal shall have structural properties in accordance with ASTM F1216. The interface seal shall meet the 50 year design life of the CIPP lateral liner.
- b. The interface seal shall be a polyester impregnated, corrosion resistant fiberglass insert with an epoxy component. The seal shall be of one-piece construction and shall be designed such that when expanded shall tightly fit both Tee and Wye connections at the interface between the main line and the lateral sewer. The seal shall extend into the mainline so as to provide a 3-inch "brim" and shall provide a minimum of eight-inch overlap inside the lateral pipe. An epoxy sealant rated for piping applications shall be applied to the interface seal to ensure that there is a watertight connection between the mainline pipe whether lined or unlined and the lateral pipe whether lined or unlined.
- c. Where the CITY has indicated the installation of 4-inch and 6-inch CIP lateral liner with mainline/lateral connection interface seal up to 16 feet in depth, the connection, with a minimum 3-inch "brim" to create a watertight seal inside the main (lined or unlined), shall be either integrally manufactured to the lateral liner or achieved with the installation of an interface seal.
- d. The integrally manufactured lateral liner and mainline connection shall be as manufactured by Insituform Technologies, Inc., 702 Spirit 40 Park Drive, Chesterfield, MO 63005, (800)234-2992, or approved equal. The interface seal connection shall be as manufactured by Cosmic Soudermashthinenbau, Kasten, Austria, and distributed by AMerik Supplies, Inc., 2600 Ainsley Ct., Marietta, GA 30066, (770)924-2899, or approved equal.

2.5 TESTING REQUIREMENTS

- A. Chemical Resistance - The CIPP shall meet the chemical resistance requirements of ASTM F1216, Appendix X2. CIPP samples for testing shall be of tube and resin system similar to that proposed for actual construction. It is required that CIPP samples with and without plastic coating meet these chemical testing requirements.
- B. Hydraulic Capacity - Overall, the hydraulic profile shall be maintained as large as possible. The CIPP shall provide at least 100 percent of the flow capacity of the original

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pipe before rehabilitation. In lieu of actual measurements, calculated capacities may be derived using commonly accepted equations and values of the Manning flow coefficients (designated "n" coefficients). The original pipe material and condition at the time of reconstruction will determine the Manning coefficient used in the host pipe. A Manning coefficient of 0.009 for a jointless, relatively smooth-wall cured-in-place pipe will be used for the lateral CIPP flow calculation.

- C. CIPP Field Samples - When requested by the CITY, the CONTRACTOR shall submit test results from field installations in the USA of the same resin system and tube materials as proposed for the actual installation. These test results must verify that the CIPP physical properties specified herein have been achieved in previous field applications.
- D. Prior to any liner installation, the CONTRACTOR shall submit technical data sheets showing the physical and chemical properties and infrared spectrum analysis per ASTM E1252 (chemical fingerprint) of the proposed resin system as modified for the cured-in-place process. Additionally, copies of the certificates of analysis for resin used on the project must be made available to the CITY. The CONTRACTOR shall test each lot of resin used by conducting infrared spectrum analyses on field samples. These analyses shall be conducted at the CONTRACTOR's expense.
- E. The CONTRACTOR shall provide resin samples as directed by the CITY during the duration of the project and infrared spectrography chemical fingerprints shall be run and compared to the submitted fingerprint to verify the resin used is the resin submitted for use on this project. These analyses shall be conducted at the CITY's expense.
- F. In the case of liner installation performed under this contract, CIPP samples shall be prepared and physical properties tested in accordance with ASTM F1216 or ASTM F1743, Section 8, using either method proposed.
 - a. The CONTRACTOR shall submit a method to the CITY, for approval, to obtain representative samples from the installed liners. These samples will be tested by the CITY, at the CITY's expense, to verify compliance with the installed material specifications. The CONTRACTOR shall produce these test samples when so directed by the CITY. The CITY reserves the right to request samples from as many as 10 percent of the liners installed, unless a pattern of failure occurs. In this case, the CONTRACTOR will be requested to provide a greater quantity of samples, up to 25 percent, at no additional cost, and the CONTRACTOR shall bear all costs of this additional testing. Liners which do not pass these material tests will be accepted at reduced payment or rejected pursuant to the Contract Documents.
 - b. The cost for sample collection shall be included in the bid price for rehabilitation.
 - c. Test specimens shall be marked in indelible ink with the appropriate lateral or main section, work order number, date of installation, and orientation to the top of the pipe (direction of up) so the results can be correlated to the field work performed. All test results shall use this designated labeling as a reference.

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- d. The extraction and labeling of test specimens shall be done in the presence of the CITY. The CITY and CONTRACTOR shall, upon completion of sample extraction and labeling, both sign a chain-of-custody form that shall subsequently accompany the sample at all times and shall ultimately be received and signed at the testing laboratory. Test reports shall include a copy of the chain-of-custody form with all signatures to ensure that reported test results are for the correct sample.
- e. The flexural properties must meet or exceed the values specified herein.
- f. Wall thickness of samples shall be determined as described in paragraph 8.1.6 of ASTM F1743.
- g. Visual inspection of the CIPP shall be by closed-circuit television.

PART 3 EXECUTION**3.1 CLEANING/SURFACE PREPARATION**

- A. It shall be the responsibility of the CONTRACTOR to clean the pipeline with a high-pressure water jet and to remove all internal debris out of the pipeline in accordance with Contract Documents.

3.2 SEWER REPAIRS

- A. Any protruding pieces of concrete, dropped joints or broken pipe shall be subjected to point repairs so that the pipe is left in a clean smooth condition in all respects ready for lining, unless otherwise jointly determined by the Contractor and the CITY that the defect will not compromise the integrity of the liner.
- B. If conditions such as broken pipe and major blockages are found that will prevent proper cleaning, or where additional damage would result if cleaning is attempted or continued, the CONTRACTOR, with the advance concurrence of the CITY, shall notify the city, and then complete the cleaning.

3.3 JOINT, CRACK, ANNULAR SPACE, AND LINER END CHEMICAL SEALING

- A. Prior to cured-in-place liner installation, all active leaks of a magnitude to compromise the integrity of the liner shall be stopped using chemical grout, at no additional cost to the CITY.
- B. Materials used on this Project shall have the following properties: react quickly to form a permanent watertight seal; resultant seal shall be flexible and immune to the effects of wet/dry cycles; non-biodegradable and immune to the effects of acids, alkalis, and organics in sewage; component packaging and mixing compatible with field conditions and worker safety; extraneous sealant left inside pipe shall be readily removable; and shall be compatible with the CIPP liner resin system utilized. The chemical sealing materials shall be acrylic resin type and shall be furnished with activators, initiators, inhibitors and any other materials recommended by the manufacturer for a complete grout system. Sealing grout shall be furnished in liquid form in standard manufacturer's containers. Sealing grout shall be AV-100 manufactured by Avanti International,

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Houston, Texas (1-800-877-2570), or approved equal.

- C. The Contractor shall modify his equipment as necessary to seal the leaks, however both his equipment and sealing method must meet the approval of the CITY prior to use. Extreme caution shall be utilized during leak sealing (pressure) operations in order to avoid damaging the already weakened sewer pipe. If any damage occurs, it shall be repaired at the CONTRACTOR's cost and to the satisfaction of the CITY. Excessive pumping of grout which might plug a service lateral shall be avoided. Any service laterals blocked by the grouting operation shall be cleared immediately by the Contractor.

3.4 FLOW CONTROL

- A. Flow control shall be exercised as required to ensure that no flowing sewage comes into contact with sections of the sewer under repair.

3.5 LINER INSTALLATION FOR MAIN LINES AND LATERALS

- A. The pre-lining video of the prepared pipe shall be reviewed and be acceptable to the CITY for cleanliness and smoothness before the CONTRACTOR begins to line the pipe.
- B. The CONTRACTOR shall present to the CITY, for review, a description of his methods for avoiding liner stoppage due to conflict and friction with such points as the manhole entrance and the bend into the pipe entrance. He shall also present plans for dealing with a liner stopped by snagging within the pipe. This information shall be rendered to the CITY in a timely fashion prior to the preconstruction conference.
- C. The CONTRACTOR shall immediately notify the CITY of any construction delays taking place during the insertion operation. Such delays shall possibly require sampling and testing by an independent laboratory of portions of the cured liner at the CITY's discretion. The cost of such test shall be born by the CONTRACTOR and no extra compensation will be allowed. Any failure of sample tests or a lack of immediate notification of delay shall be automatic cause for rejection of that part of the work at the CITY's discretion.
- D. The CONTRACTOR shall designate a location where the tube will be impregnated with resin prior to installation. The CONTRACTOR shall allow the CITY and/or CITY to inspect the materials and the "wet-out" procedure.
- E. The CONTRACTOR shall submit construction schedules for advance approval by the CITY. At no time will any service lateral remain inoperative for more than an eight (8)-hour period. Any service that will be out of service for more than eight (8) hours will be temporarily by-passed into a mainline sanitary sewer, at the CONTRACTOR's expense.
- F. The materials and processes must be reasonably available for pre-installation, installation and post-installation inspections. Areas which require inspection include, but are not limited to, the following:
 - a. Product materials should exhibit sufficient transparency to visually verify the

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quality of resin impregnation.

- b. Temperature sensing devices, such as thermocouples, shall be located between the existing pipe and the CIPP to ensure the quality of the cure of the wall laminate.

3.6 LINER INSTALLATION FOR MAIN LINES

- A. After the inversion is complete, the CONTRACTOR shall supply a suitable heat source and water recirculation equipment to circulate heated water throughout the pipeline. The equipment shall be capable of delivering hot water throughout the pipeline to uniformly raise the water temperature to a level required to effectively cure the resin. The heat source shall be fitted with suitable monitors to gauge the temperature of the incoming and outgoing water supply. Another such gage shall be placed between the tube and the host pipe at the termination end at or near the bottom to determine the temperatures during cure. Water temperature in the pipe during the cure period shall be as recommended by the resin manufacturer.
- B. Initial cure shall be deemed complete when the exposed portions of the tube appear to be hard and sound and the temperature sensor indicates that the temperature is of a magnitude to realize an exotherm. The cure period shall be of a duration recommended by the resin manufacturer and may require continuous recirculation of the water to maintain the temperature. The CONTRACTOR shall have on hand at all times, for use by his personnel and the CITY, a digital thermometer or other means of accurately and quickly checking the temperature of exposed portions of the liner.
- C. CIPP installation shall be in accordance with ASTM F1216, Section 7, or ASTM F1743, Section 6, with modifications as listed herein.
- D. Resin Impregnation: The quantity of resin used for tube impregnation shall be sufficient to fill the volume of air voids in the tube with additional allowances for polymerization shrinkage and the loss of resin through cracks and irregularities in the original pipe wall. A vacuum impregnation process shall be used. To insure thorough resin saturation throughout the length of the felt tube, the point of vacuum shall be no further than 25 feet from the point of initial resin introduction. After vacuum in the tube is established, a vacuum point shall be no further than 75 feet from the leading edge of the resin. The leading edge of the resin slug shall be as near to perpendicular as possible. A roller system shall be used to uniformly distribute the resin throughout the tube. If the Installer uses an alternate method of resin impregnation, the method must produce the same results. Any alternate resin impregnation method must be proven.
- E. Tube Insertion: The wetout tube shall be positioned in the pipeline using either inversion or a pull-in method. If pulled into place, a power winch should be utilized and care should be exercised not to damage the tube as a result of pull-in friction. The tube should be pulled-in or inverted through an existing manhole or approved access point and fully extend to the next designated manhole or termination point.
- F. Temperature gauges shall be placed inside the tube at the invert level of each end to monitor the temperatures during the cure cycle.
- G. Curing shall be accomplished by utilizing hot water under hydrostatic pressure in

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accordance with the manufacturer's recommended cure schedule.

- H. Cooldown: The CONTRACTOR shall cool the hardened pipe to a temperature below 100 F before relieving the hydrostatic head. Cooldown may be accomplished by the introduction of cool water into the inversion standpipe to replace water being pumped out of the manhole. Care should be taken in release of static head so that vacuum will not be developed that could damage the newly installed liner.
- I. Finish: The new pipe shall be cut off in the manhole at a suitable location. The finished product shall be continuous over the length of pipe reconstructed and be free from dry spots, delamination and lifts. Should the liner not make a tight seal at the inside manhole wall, a watertight seal shall be made by use of extra polyester fiber felt and epoxy resin. Pipe entries and exists shall be smooth, free of irregularities, and watertight. No visible leaks shall be present and the CONTRACTOR shall be responsible for grouting to remove leaks or fill voids between the host pipe and the liner. During the warranty period, any defects which will affect the integrity or strength of the product shall be repaired at the CONTRACTOR's expense, in a manner mutually agreed upon by the CITY and the CONTRACTOR.

3.7 REINSTATEMENT OF SERVICE LATERALS, BRANCH CONNECTIONS, AND DROP MANHOLE CONNECTIONS

- A. After the pipe has been cured in place, the CONTRACTOR shall reconnect the existing service connections. This shall be done from the interior of the pipeline without excavation using a robotic cutter. Where holes are cut through the liner, they shall be neat and smooth in order to prevent blockage at the service connections. Cut-in service connections shall be opened to a minimum of 95 percent of the flow capacity of the building sewer. Cuts shall be wire-brushed to remove jagged edges. All coupons shall be recovered at the downstream manhole and removed. The CONTRACTOR shall stop all visible leaks, including at service connections as required. All reinstated service lateral connections (between the liner and the existing pipe) shall be grouted. The reinstatement of the service connections shall be a separate pay item.
- B. It is the intent of these specifications that service laterals be reopened without excavation, utilizing a remote controlled cutting device, monitored by a video TV camera. The Contractor shall certify he has a minimum of 2 complete working cutters plus spare key components on the site before each liner installation. No additional payment will be made for excavations for the purpose of reopening connections and the Contractor will be responsible for all costs and liability associated with such excavation and restoration work.
- C. Unless otherwise directed by the CITY, all laterals will be reinstated. The CITY will provide specific direction concerning any laterals that will be abandoned and will therefore not require reinstatement. The CONTRACTOR shall abandon a lateral by not reinstating the lateral only with the written consent of the CITY.
- D. The language in this section applies equally to branch connections and drop manhole connections.

3.8 LINER INSTALLATION FOR SERVICE LATERALS

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- A. The lateral CIPP usually requires an access point to be established at the reconstruction termination point remote from the mainline pipe. The authorization for the access point and required location and excavation shall be obtained and performed by the CITY of the system. The CITY may install a clean-out, if required. The clean-out will be constructed of a polyvinyl chloride fitting or its equivalent with a riser pipe of equal diameter to the service pipe. The riser will be extended to the existing grade elevation and capped.
- B. The lateral CIPP shall be installed to affect a bond with the mainline invert-and-cure pipe to substantially reduce or eliminate the infiltration into the mainline pipe. The mainline pipe opening shall be prepared to accept the lateral CIPP. The lateral CIPP will protrude into the mainline pipe and form a seal with the inside surface of the mainline invert-and-cure pipe surface. The bonding area of the lateral CIPP and the mainline invert-and-cure pipe shall be maximized to obtain the best possible bond. The protrusion shall not inhibit the closed circuit television post video inspection of the mainline or service lateral pipes, inhibit flow, or encourage solids deposition.

3.9 ACCEPTANCE

- A. The finished liner shall be continuous over the entire length of the installation. The liner shall be free from visual defects, damage, deflection, holes, delamination, uncured resin, and the like. No pinholes, cracks, thin spots, dry spots, or other defects in the liner will be permitted. There shall be no visible infiltration through the liner or from behind the liner at manholes and service connections. Cut-ins and attachments at service connections shall be neat and smooth.
- B. Ridges or wrinkles in the installed liner shall be accepted or rejected at the sole discretion of the CITY. If, in the opinion of the CITY, such defects could cause structural weakening of the liner, impede the progress of a camera during internal television inspection, or encourage solids deposition and potential interruptions to flow, such defects shall be corrected at the CONTRACTOR's expense in a manner acceptable to the CITY.

3.10 WET-OUT AND CURE REPORT

- A. The CONTRACTOR shall submit "wet out" and "cure" reports documenting the specific details of the liner's vacuum impregnation and saturation with resin and the CIPP installation of the liner. A copy of all "wet out" and "cure" records shall be made available to the CITY upon request, and shall be turned over to the CITY on a weekly basis and prior to request for payment. If the "wet out" and "cure" reports are not presented prior to a payment request for a repair work order, payment for the work will not be made and the request will be rejected. At a minimum, this report shall include, in addition to CONTRACTOR and Contract identification:
 - a. Line identification and location
 - b. Wet-out date
 - c. Sample identification(s) and technician
 - d. Installation (in sewer) date

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- e. Host sewer pipe inside diameter
- f. Liner thickness
- g. Liner length
- h. Liner and resin batch numbers
- i. Resin type
- j. Wet out length
- k. Quantity of resin and catalyst utilized
- l. Wet out technicians
- m. Time wet out started and completed
- n. Applicable remarks
- o. Boiler and liner heating fluid pressure and temperature versus time log during cure period
- p. Cool down report

3.11 CLEANUP

- A. After the liner installation has been completed and accepted, the CONTRACTOR shall cleanup the entire project area and return the ground cover to the original or better condition. All excess material and debris not incorporated into the permanent installation shall be disposed of by the CONTRACTOR.

3.12 TELEVISION SURVEY

- A. Television survey, including Preconstruction Survey, Post Construction Survey, and Warranty Survey, as described in the Contract Documents, is required for all cured-in-place lining, including main lines and service laterals, and shall be completed within 2 weeks of liner installation.

3.13 PUBLIC NOTIFICATION

- A. The Contractor shall make every effort to maintain service usage throughout the duration of the project. In the event that a service will be out of service, the maximum amount of time of no service shall be 8 hours for any property served by the sewer. A public notification program shall be implemented, and shall as a minimum, require the Contractor to be responsible for contacting each home or business connected to the sanitary sewer and informing them of the work to be conducted, and when the sewer will be off-line. The Contractor shall also provide the following:

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- a. Whether or not an interruption in service is expected, written notice to be delivered to each home or business the day prior to the beginning of work being conducted on the section, and a local telephone number of the Contractor the home or business can call to discuss the project or any problems which could arise.
- b. Personal contact with any home or business which cannot be reconnected within the time stated in the written notice.

3.14 WARRANTY

- A. The liner shall be certified by the manufacturer for specified material properties for a particular job. The manufacturer warrants the liner to be free from defects in raw materials for one year from the date of acceptance. During the warranty period, any defects which affect the integrity or strength of the pipe shall be repaired at the CONTRACTOR's expense in a manner mutually agreed by the CITY and the CONTRACTOR.

END OF SECTION

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SECTION 02770 - CURED-IN-PLACE T-LINER

PART 1 GENERAL

1.1 SCOPE

- A. The work specified in this section consists of providing for the reconstruction of a particular mainline section and the adjacent lateral sewer pipe without excavation while providing a one piece leak free connection at the interface of the mainline and lateral pipelines.

1.2 GENERAL

- A. The reconstruction will be accomplished using a non-woven fabric tube of particular length and a thermoset resin with physical and chemical properties appropriate for the application. The lateral tube within a translucent inversion bladder is vacuum impregnated with the resin then placed inside a protective carrying device. The mainline liner that is physically attached to the lateral tube is affixed around a rigid "T" launching device. The "T" launching device and protective carrying device are winched into the existing sewer. When the "T" launching device is properly positioned at the lateral connection, the mainline liner is inflated and the resin saturated tube is inverted up through the lateral pipe, using air or water pressure, by the action of the inversion bladder. Once the tube/resin composite is cured, the inversion bladder and launching/carrying devices are removed. The cured-in-place mainline/lateral connection repair system shall be "T-Liner" as manufactured by LMK Enterprises, Inc., or approved equal.

1.3 SUBMITTALS

- A. The CONTRACTOR shall submit shop drawings, samples of materials, and other information to the CITY for review in accordance with the Contract Documents, "Submittals". Included shall be design calculations for the work.

1.4 QUALIFICATIONS

- A. The Qualifications of the CONTRACTOR shall be submitted prior to contract award. These Qualifications shall include detailed descriptions of the following:
- a. Name, business address and telephone number of the CONTRACTOR.
 - b. Name(s) of all supervisory personnel to be directly involved with this project.
 - c. The CONTRACTOR shall sign and date the information provided and certify that to the extent of his knowledge, the information is true and accurate, and that the supervisory personnel will be directly involved with and used on this project. Substitutions of personnel and/or methods will not be allowed without written authorization of the CITY.
 - d. Specialty technicians shall be certified by the equipment manufacturer and/or its authorized representative. Certifications shall be submitted to the CITY.
 - e. The CONTRACTOR shall provide his references of previous project lists going

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back two years including his customers' names, addresses, and telephone numbers.

- f. To be acceptable, a minimum of 400 T-Liner installations must be documented.
- g. To be acceptable, the installer must have had a minimum of two (2) years active experience in the commercial installation of the product. For purposes of this requirement, "Installer" shall mean the corporation or business entity submitting the bid.

PART 2 PRODUCTS**2.1 GENERAL**

- A. The finished liner shall be fabricated from material as specified in this section which when cured will be resistant to the corrosive effects of the raw sewage and hydrogen sulfide.

2.2 LINER SIZING

- A. The liner shall be fabricated to a size that when installed will neatly fit the internal circumference of the conduit to be repaired as specified by the CITY.

2.3 LINER MATERIAL

- A. The liner shall be one piece and will consist of a lateral portion and the mainline portion with one or more layers of flexible needled felt or an equivalent non-woven material. The liner will be continuous in length and the wall thickness shall be uniform. No overlapping sections shall be allowed in the circumference or the length of the lateral liner. The tube will be capable of conforming to offset joints, bells, and disfigured pipe sections. The mainline liner will be flat with one end overlapping the second end and sized accordingly to create a circular lining equal to the diameter of the mainline pipe. The resin will be polyester or vinyl ester with proper catalysts as designed for the specific application. The cured-in-place pipe shall provide a smooth bore interior. Each installation shall have a design report documenting the design criteria for a fully deteriorated pipe section, relative to the hydrostatic pressures, depth of soil cover, and type of soil. The mainline sectional liner shall be a full-circle 16-inch long CIPP liner integrally manufactured to the lateral liner providing a seamless connection between the mainline pipe liner and the lateral liner. Installation will be accomplished remotely using air or water for inversion and curing. The cured pipe repair system shall be watertight and shall conform to the existing pipe and eliminate any leakage or connection to the outside of the host pipe/service.
- B. The composite of the materials above will, upon installation inside the host pipe, exceed the minimum test standards specified by the American Society for Testing Methods.

| Item | Test Value | Reference Standard |
|-------------------|------------|--------------------|
| Flexural Strength | 4,500 psi | ASTM D 790 |

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| Item | Test Value | Reference Standard |
|------------------|-------------|--------------------|
| Flexural Modulus | 250,000 psi | ASTM D 790 |

2.4 LINER DESIGN

- A. The minimum required structural CIPP wall thickness shall be based on the physical properties described above and in accordance with the design equations in the appendix of ASTM F 1216, and the following design parameters:

| | |
|---|-----------------------|
| Design Safety Factor | 2.0 |
| Retention Factor for Long-Term Flexural Modulus to be used in Design | 50 % |
| Ovality* | 2 % |
| Groundwater Depth = Pipe Depth (above invert)* | ft. |
| Soil Depth (above crown)* | ft. |
| Soil Modulus | 700 psi |
| Soil Density | 120 pcf |
| Live Load | One H20 passing truck |
| Design Condition | Fully deteriorated |
| *Denotes information which can be provided here or in inspection video tapes or project construction plans. Multiple line segments may require a table of values. | |

- B. The lining manufacturer shall submit to the CITY for review complete design calculations for the liner, signed and sealed by a Professional Engineer registered in the State of Florida and certified by the manufacturer as to the compliance of his materials to the values used in the calculations. A safety factor of 2 shall be applied in the design calculation. The host pipe shall be considered fully deteriorated. The liner shall be designed to withstand a live load equivalent to one H-20 passing truck plus all pertinent dead loads, hydrostatic pressure and grout pressure (if any). For design purposes, the water table shall be considered at grade elevation. The liner shall be designed in accordance with ASTM F 1216. The buckling analysis shall account for the combination of dead load, live load, hydrostatic pressure and grout pressure (if any). The liner side support shall be considered as if provided by soil pressure against the liner. The existing pipe shall not be considered as providing any structural support. Modulus of soil reaction shall be 700, corresponding to a moderate degree of compaction of bedding and a fine-grained soil as shown in AWWA Manual M45, Fiberglass Pipe Design.
- C. Liner shall be neither accepted nor installed until design calculations are acceptable to the CITY.

PART 3 EXECUTION

3.1 CLEANING SEWER LINES

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- A. Prior to any lining of a pipe so designated, it shall be the responsibility of the CONTRACTOR to remove internal deposits from the pipeline in accordance with the Contract Documents. Both mainline and lateral line shall be cleaned.

3.2 TELEVISION SURVEY

- A. Television survey shall be performed in accordance with the Contract Documents, including Preconstruction and Post Construction Surveys. Both main line and lateral line shall be televised.
- B. The interior of the pipeline shall be carefully surveyed to determine the locations and extent of any structural failures. The location of any conditions which may prevent proper installation of lining materials into the pipelines shall be noted so that these conditions can be corrected. A video tape and suitable log shall be kept and turned over to the CITY.

3.3 FLOW BYPASSING

- A. The CONTRACTOR, when required, shall provide for the transfer of flow, through or around section or sections of pipe that are to be repaired. The proposed bypassing system shall be acceptable in advance by the CITY. The acceptance of the bypassing system in advance by the CITY shall in no way relieve the CONTRACTOR of his responsibility and/or public liability. The flow bypassing shall be done in accordance with the Contract Documents.

Note: If the repair can be made in a few hours, bypass pumping may not be required. The placement carriage shall be equipped with a bypass section to allow flow once liner is pressed into place.

3.4 LINE OBSTRUCTIONS

- A. It shall be the responsibility of the CONTRACTOR to clear the line of obstruction. If survey reveals an obstruction that cannot be removed by conventional cleaning equipment, the CONTRACTOR shall notify the CITY immediately.

3.5 LINER INSTALLATION

- A. The tube is inspected for tears and frayed sections. The tube, in good condition, will be vacuum impregnated with the thermostat resin. The resin will be introduced into the tube creating a slug of resin at the beginning of the tube. A calibration roller will assist the resin slug to move throughout the tube. All air in the tube shall be removed by vacuum allowing the resin to thoroughly impregnate the tube. All resin shall be contained to ensure no public property or persons are exposed to the liquid resin. The mainline liner will be saturated upon a wet-out platform. The resin impregnated sample (wick), shall be retained by the installer to provide verification of the curing process taking place in the host pipe.
- B. The saturated tube along with the inversion bladder will be inserted into the carrying device. The mainline liner is affixed on the "T" launching device. Both the launching and carrying device is pulled into the pipe using a cable winch. The pull is complete when the open port of the "T" launching device is aligned with the interface of the

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service connection and mainline pipe. The resin saturated lateral tube is completely protected during the pull. No resin shall be lost by contact with manhole walls or the pipe during the pull. The resin saturated mainline liner is supported upon the rigid "T" launcher that is elevated above the pipe invert by means of rotating skid system. The mainline liner should not be contaminated or diluted by exposure to dirt, debris, or water during the pull.

- C. The installer shall document the placement of the "T" Liner by internal video inspection with the camera being inserted from the lateral pipe down to the mainline pipe.
- D. The mainline liner is expanded against the mainline pipe and lateral tube is inverted out of the "T" launcher/carrying device by controlled air or water pressure. The installer shall be capable of viewing the lateral liner contacting the lateral pipe from the beginning to the end of the repair. The mainline liner and the lateral tube are held tightly in place against the wall of the host pipe by controlled pressure until the cure is complete.
- E. When the curing process is complete, the pressure will be released. The inversion bladder and launching device shall be removed from the host pipe with the winch. No barriers, coatings, or any material other than the cured tube/resin composite, specifically designed for desirable physical and chemical resistance properties, should ever be left in the host pipe. Any materials used in the installation other than the cured tube/resin composite are to be removed from the pipe by the installer.

3.6 ACCEPTANCE AND TESTING

- A. The finished liner shall be continuous over the entire length of the installation. The liner shall be free from visual defects, damage, deflection, holes, delamination, uncured resin, and the like. There shall be no visible infiltration through the liner or from behind the liner.
- B. Verification of a non-leaking lateral liner and service connection shall require an air test in accordance with the following specifications. Testing shall be performed at the CITY'S discretion but at a frequency not to exceed one test for every ten T-liners installed. The cost for the test shall be included in the T-liner installation cost, and no separate payment shall be made.
 - a. A camera shall be inserted into the lateral pipe via a clean-out upstream of the upper most portion of the cured in-place lateral liner. The camera is then moved through the lateral pipe until it becomes positioned at the lateral/main connection. The camera is utilized to assist in positioning and placing a pair of plugs in the mainline on either side of the lateral opening. A pair of test plugs with a minimum of a ten-inch clear separation shall be centered on the lateral opening and spanning the brim of the lined connection.
 - b. Next, an air test plug shall be introduced into the lateral pipe by use of the clean-out opening. The test plug will be placed not more than five inches inside of the cured in-place lateral liner at its upper most portion. The test plug shall be inflated and sealed against the upper most portion of the cured in-place lateral liner.

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- c. The pair of plugs within the mainline are then inflated and sealed across the service connection.
- d. Air-pressure not less than 4 PSI shall be introduced through the test plug. The void area between the three plugs shall be pressurized at 4 PSI, held for 3 minutes and during this time the pressure shall not drop below 3.5 PSI.
- e. If an installed cured in-place lateral liner fails the specified air test, the following corrective measures shall be taken.
 - i. The cured in-place lateral liner shall be re-inspected by use of a closed circuit television camera in attempt to identify the defect.
 - ii. Any repairs made shall consist of materials that are structural and meet or exceed the same criteria as the cured in-place lateral liner is required to meet in a domestic sewer collection system. Such materials shall have a minimum life expectancy of 50 years in accordance with ASTM F-1216-93 Appendix X1 Design Considerations and Appendix X2 Chemical-Resistance Test.
 - iii. Once the defect has been corrected, the renewed lateral pipe shall be re-tested in accordance with the air test procedure as described above.
 - iv. Any corrective measures shall be performed at the CONTRACTOR's expense.
- f. If any of the air tests fail, the CITY at its option may require the CONTRACTOR to test an additional lateral at no additional charge to the CITY. If a second air test shall fail, the CITY at its option may require the CONTRACTOR to test additional or all of the installed cured in-place lateral linings at no additional charge to the CITY.

3.7 CLEANUP

- A. After the liner installation has been completed and accepted, the CONTRACTOR shall clean up the entire project area and return the ground cover to grade. All excess material and debris not incorporated into the permanent installation shall be disposed of by the CONTRACTOR.

3.8 WARRANTY

- A. The liner shall be certified by the manufacturer for specified material properties for a particular job. The manufacturer warrants the liner to be free from defects in raw materials for one year from the date of acceptance. During the warranty period, any defects which affect the integrity or strength of the pipe shall be repaired at the CONTRACTOR's expense in a manner mutually agreed by the CITY and the CONTRACTOR.

END OF SECTION

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SECTION 02771 - CONCRETE CURBS AND SIDEWALKS

PART 1 GENERAL (NOT USED)

PART 2 PRODUCTS

2.1 EXPANSION JOINT FILLER

- A. 1/2-inch thick, preformed asphalt-impregnated, expansion joint material meeting AASHTO M153 Type I, II, or III, or AASHTO M213, or cellulose fiber types meeting the requirements of AASHTO M213, except the asphalt content is acceptable provided they contain minimum of 0.2 percent copper pentachlorophenate as a preservative and 1 percent water proofing wax.

2.2 CONCRETE

- A. Ready-mixed meeting ASTM C94, Option A, with compressive strength of 3,000 psi at 28 days.
- B. Maximum Aggregate Size: 1-1/2 inch.
- C. Slump: 2 to 4 inches.

2.3 CURING COMPOUND

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

PART 3 EXECUTION

3.1 FORMWORK

- A. Lumber Materials:
 - a. 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.
 - b. 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:
 - a. Construct forms to shape, lines, grades, and dimensions.

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b. Stake securely in place.

D. Bracing:

a. Brace forms to prevent change of shape or movement resulting from placement.

b. Construct short-radius curved forms to exact radius.

E. Tolerances:

a. Do not vary tops of forms from gradeline more than 1/8 inch when checked with 10-foot straightedge.

b. Do not vary alignment of straight sections more than 1/8 inch in 10 feet.

3.2

PLACING CONCRETE

A. Excavate to the required depth, place and compact limerock base rock as specified in the Contract Documents. Compact directly under the area and 1 foot beyond each side of the sidewalk and curb.

B. Prior to placing concrete, remove water from excavation and debris and foreign material from forms.

C. Place concrete as soon as possible, and within 1-1/2 hours after adding cement to mix without segregation or loss of ingredients, and without splashing.

D. Place, process, finish, and cure concrete in accordance with applicable requirements of ACI 304, and this section. Wherever requirements differ, the more stringent shall govern.

E. To compact, vibrate until concrete becomes uniformly plastic.

F. All edges shall be smooth and rounded.

3.3

CURB CONSTRUCTION

A. Construct ramps at pedestrian crossings in compliance with FDOT and PROWAG minimum standards. Standards apply to work in the City's Rights of Way.

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.

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- C. Gutter minimum slope shall be 0.33% unless otherwise approved by the CITY PROJECT MANAGER.**
- D. Curb Facing: Do not allow horizontal joints within 7 inches from top of curb.**
- E. All gutters and curb and gutters shall have a minimum 4" thick limerock "curb pad" LBR 100.**
- F. Contraction Joints:**
 - a. Maximum 10-foot intervals in curb.
 - b. Provide open joint type by inserting thin, oiled steel sheet vertically in fresh concrete to force coarse aggregate away from joint.
 - c. Insert steel sheet to full depth of curb.
 - d. Remove steel sheet with sawing motion after initial set has occurred in concrete and prior to removing front curb form.
 - e. Finish top of curb with steel trowel and finish edges with steel edging tool.
- G. Front Face:**
 - a. Remove front form and finish exposed surfaces when concrete has set sufficiently to support its own weight.
 - b. Finish formed face by rubbing with burlap sack or similar device to produce uniformly textured surface, free of form marks, honeycomb, and other defects.
 - c. Remove and replace defective concrete.
 - d. Apply curing compound to exposed surfaces of curb upon completion of finishing.
 - e. Continue curing for minimum of 5 days.
- H. Backfill curb with earth upon completion of curing period, but not before 7 days has elapsed since placing concrete.**

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- a. Backfill shall be free from rocks 2 inches and larger and other foreign material.
- b. Compact backfill firmly.

3.4

SIDEWALK CONSTRUCTION

A. Thickness:

- a. 6 inches.

B. Connection to Existing Sidewalk:

- a. Remove old concrete back to an existing contraction joint.
- b. Clean the surface.
- c. 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:**

- a. Provide transversely to walks at locations opposite contraction joints in curb.
- b. Dimensions: 3/16-inch by 1-inch weakened plane joints.
- c. Construct straight and at right angles to surface of walk.

E. Finish:

- a. Broom surface with fine-hair broom at right angles to length of walk and tool at edges, joints, and markings.
- b. Ensure that the surface variations are not more than ¼ inch under a 10-foot straightedge, or more than 1/8 inch on a 5-foot transverse section.

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- c. Mark walks transversely at 5-foot intervals, or in pattern shown on Drawings, with jointing tool; finish edges with rounded steel edging tool.
- d. Apply curing compound to exposed surfaces upon completion of finishing.
- e. Protect sidewalk from damage and allow to cure for at least 7 days.

F. Curb Ramps:

- a. All curb ramps and detectable warnings shall comply with the current FDOT Index 304 and the Accessibility Guidelines for Pedestrian Facilities in the Public Right-of-Way by the United States Access Board.

END OF SECTION

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SECTION 02772 - ASPHALT CONCRETE PAVEMENT

PART 1

GENERAL

1.1 Standard Specifications

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

1.2 QUALITY ASSURANCE

- A. Qualifications:
- a. Independent Testing Laboratory: In accordance with ASTM E329.
 - b. Asphalt concrete mix formula shall be prepared by an approved certified independent laboratory under the supervision of a certified asphalt technician.

1.3 SUBMITTALS

- A. The CONTRACTOR shall submit its proposed formula for the asphaltic concrete paving for review in accordance with the Section entitled "Submittals".

1.4 ENVIRONMENTAL REQUIREMENTS

- A. Temperature: Do not apply asphalt materials or place asphalt mixes when ground temperature is lower than 10 degrees C (50 degrees F), or air temperature is lower than 4 degrees C (40 degrees F). Measure ground and air temperature in shaded areas away from heat sources or wet surfaces.
- B. Moisture: Do not apply asphalt materials or place asphalt mixes when application surface is wet.

PART 2

PRODUCTS

2.1 MATERIALS

- A. Prime Coat: Cut-back 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 CITY PROJECT MANAGER.
- C. Sand (Blotter Material): Clean, dry, with 100 percent passing a 4.75 mm (No. 4) sieve, and a maximum of 10 percent passing a 75 mm (No. 200) sieve.

2.2 ASPHALT CONCRETE MIX

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A. General:

- a. Mix formula shall not be modified except with the written approval of CITY PROJECT MANAGER.
- b. Source Changes:
 - i. **Should material source(s) change, establish a new asphalt concrete mix formula before the new material(s) is used.**
 - ii. **Perform check tests of properties of the plant-mix bituminous materials on the first day of production and as requested by CITY PROJECT MANAGER to confirm that properties are in compliance with design criteria.**
 - iii. **Make adjustments in gradation or asphalt content as necessary to meet design criteria.**

B. Asphalt Concrete: Type SP meeting the requirements of the Standard Specifications.**C. Composition: Hot-plant mix of aggregate, mineral filler, and paving grade asphalt cement. The several aggregate fractions shall be sized, uniformly graded, and combined in such proportions that the resulting mixture meets the grading requirements of the mix formula.****D. Aggregate:**

- a. The aggregate shall meet the requirements of the Standard Specifications.
- b. Mineral Filler shall meet the requirements of the Standard Specifications

E. Asphalt Cement: Paving Grade AC-30 meeting the requirements of the Standard Specifications.**PART 3****EXECUTION****3.1****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**

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good or better condition than before start of construction.

3.2

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.

3.3

PREPARATION

- A. Prepare subgrade as specified in the Contract Documents.
- B. Existing Roadway:
 - a. 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.
 - b. Resurface entire roadway following adjustment of base and asphalt grades.
 - c. 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.

3.4

PAVEMENT APPLICATION

- A. General: Place asphalt concrete mixture on an approved, prepared base in conformance with this Section.
- B. Cold Milling
 - a. Milling of existing asphalt pavement shall be at the depth and location as indicated on the Construction DRAWINGS or as directed by the OWNER.
 - b. The milled surface shall be reasonably smooth and free of excessive scarification marks, gouges, ridges, continuous grooves, or other damage. The milled pavement surface shall be thoroughly cleaned of all loose aggregate particles, dust, and other objectionable material by the use of power brooms, power blowers, power vacuums or other means.

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- c. The CONTRACTOR shall coordinate the adjustment of maintenance access structures, meter boxes, drainage inlets, and valve boxes with the milling operation.
- d. All milled material shall become the property of the CONTRACTOR and shall be disposed of off-site or used in conformance with the Contract Documents, or for utilization as Reclaimed Asphalt Pavement, in conformance with the specification provided above, as approved by the OWNER.

C. Prime Coat:

- a. Heat cut-back asphalt between 100 degrees F and 150 degrees F prior to application.
- b. Apply uniformly to clean, dry surfaces. Avoiding overlapping of applications.
- c. Do not apply when moisture content of upper 3 inches of base exceeds optimum moisture content of base, or if free moisture is present.
- d. Application Rate: Minimum 0.1 gallons per square yard of surface area.
- e. Remove or redistribute excess material.
- f. Allow a minimum of 5 full days for curing of primed surface before placing asphalt concrete.

D. Tack Coat:

- a. Apply uniformly to clean, dry surfaces. Avoiding overlapping of applications.
- b. Do not apply more tack coat than necessary for the day's paving operation.

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- c. Touch up missed or lightly coated surfaces and remove excess material.
- d. Application Rate:
 - i. **Minimum 0.05 gallons to maximum 0.12 gallons of asphalt (residual if diluted emulsified asphalt) per square yard of surface area.**
 - ii. **Apply at rate, within range specified, sufficient to assure good bonding, but not so heavy that surplus asphalt flushes into asphalt concrete being placed.**
- E. Pavement Mix:
 - a. Prior to Paving:
 - i. **Sweep primed surface free of dirt, dust, or other foreign matter.**
 - ii. **Patch holes in primed surface with asphalt concrete pavement mix.**
 - iii. **Blot excess prime material with sand.**
 - b. Place asphalt concrete pavement mix in lifts as shown.
 - c. Compacted Lift Thickness:
 - i. **Minimum: Twice the maximum aggregate size, but in no case less than 1 inch. Minimum thickness for Type SP-9.5 is 1.0 inches.**
 - ii. **Maximum: 4 inches.**
 - d. Total Compacted Thickness: Per Contract Documents.
 - e. Apply such that meet lines are straight and edges are vertical.

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- f. Collect and dispose of segregated aggregate from raking process. Do not scatter material over finished surface.
 - g. Joints:
 - i. **Offset edge of each layer a minimum of 6 inches so joints are not directly over those in underlying layer.**
 - ii. **Offset longitudinal joints in roadway pavements, so longitudinal joints in wearing layer coincide with pavement centerlines and lane divider lines.**
 - iii. **Form transverse joints by cutting back on previous day's run to expose full vertical depth of layer.**
 - h. Succeeding Lifts: Apply tack coat to pavement surface between each lift.
 - i. 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.
- F. Compaction:**
- a. Roll until roller marks are eliminated and compacted to 100 percent of the laboratory compacted mixture.
 - b. Joint Compaction:
 - i. **Place top or wearing layer as continuously as possible.**
 - ii. **Pass roller over unprotected end of freshly laid mixture only when placing of mix is discontinued long enough to permit mixture to become chilled.**
 - iii. **Cut back previously compacted mixture when Work is resumed to produce a slightly beveled edge for full thickness of layer.**

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iv. Cut away waste material and lay new mix against fresh cut.**G. Tolerances:**

- a. 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.
- b. Completed Surface or Wearing Layer Smoothness:
 - i. **Uniform texture, smooth, and uniform to crown and grade.**
 - ii. **Maximum Deviation: 1/8 inch from lower edge of a 12-foot straightedge, measured continuously parallel and at right angle to centerline.**
 - iii. **If surface of completed pavement deviates by more than twice the specified tolerances, remove and replace wearing surface.**
- c. Transverse Slope Maximum Deviation: ¼ inch in 12 feet from the rate of slope shown.
- d. Finished Grade:
 - i. **Perform a field differential level survey on a maximum 50-foot grid and along all grade breaks.**
 - ii. **Maximum Deviation: 0.02 foot from the grade shown.**

H. Seal Coat:

- a. 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 CITY PROJECT MANAGER.
- b. Preparation:

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- i. **Maintain surfaces that are to be sealed free of holes, dry, and clean of dust and loose material.**
 - ii. **Seal in dry weather and when the temperature is above 35 degrees F.**
- c. Application:
 - i. **Fill cracks over 1/16 inch in width with an asphalt-sand slurry or approved crack sealer prior to sealing.**
 - ii. **When sealing patched surfaces and joints with existing pavements, extend minimum 6 inches beyond edges of patches.**

3.5

PAVEMENT OVERLAY

A. Preparation:

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

B. Application:

- a. Tack Coat: As specified in this Section.
- b. Place and compact asphalt concrete as specified in Article Pavement Application.

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- c. Place first layer to include widening of pavement and leveling of irregularities in the surface of the existing pavement.
- d. When leveling irregular surfaces and raising low areas, the actual compacted thickness of any one lift shall not exceed 2 inches.
- e. The actual compacted thickness of intermittent areas of 120 square yards or less may exceed 2 inches, but not 4 inches.
- f. Final wearing layer shall be of uniform thickness, and meet grade and cross-section as shown.

3.6

PATCHING HOT MIX ASPHALT

A. Preparation:

- a. Remove damaged, broken, or unsound asphalt concrete adjacent to patches. Trim to straight lines exposing smooth, sound, vertical edges.
- b. Prepare patch subgrade as specified in the Contract Documents.

B. Application:

- a. Patch Thickness: 3 inches or thickness of adjacent asphalt concrete, whichever is greater.
- b. Place asphalt concrete mix across full width of patch in layers of equal thickness.
- c. Spread and grade asphalt concrete with hand tools or mechanical spreader, depending on size of area to be patched.

C. Compaction:

- a. Roll patches with power rollers capable of providing compression of 200 to 300 pounds per linear inch. Use hand tampers where rolling is impractical.
- b. Begin rolling top course at edges of patches, lapping adjacent asphalt surface at least 1/2 the roller width. Progress toward

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center of patch overlapping each preceding track by at least 1/2 the width of roller.

- c. Make sufficient passes over entire area to remove roller marks and to produce desired finished surface.

D. Tolerances:

- a. Finished surface shall be flush with and match grade, slope, and crown of adjacent surface.
- b. 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.

3.7

FIELD QUALITY CONTROL

- A. General: Provide services of an approved certified independent testing laboratory to conduct tests.**

B. Field Density Tests:

- a. Perform tests from cores or sawed samples.
- b. Measure with properly operating and calibrated nuclear density gauge.
- c. 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:

- a. Quality Control Tests:
 - i. **Asphalt Content, Aggregate Gradation: Once per every 500 tons of mix or once every 4 hours, whichever is greater.**
 - ii. **Mix Design Properties, Measured Maximum (Rice's) Specific Gravity: Once every 1,000 tons or once every 8 hours, whichever is greater.**

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- b. Density Tests: Once every 500 tons of mix or once every 4 hours, whichever is greater.

END OF SECTION

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SECTION 02810 - UNDERGROUND IRRIGATION

PART 1

GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes the following:
- a. Pipe and fittings, valves, sprinkler heads and accessories; and,
 - b. Irrigation control system.

1.3 WORK INCLUDED

- A. The work is to include the furnishing of all labor, supplies, equipment and materials necessary to complete the installation of the pipe and fittings, valves, and sprinkler heads, controller, etc as shown on the Drawings as well as all other related responsibilities described in these Specifications and accompanying Plans.
- B. The system is a fully automatic system comprised of zones operated by the controller. This system has been designed to provide 100% coverage. It is the responsibility of the Contractor to ensure the entire system is installed according to applicable laws, rules, regulations and conventions.

1.4 REFERENCE STANDARDS

- A. American Society of Testing and Materials
- a. ANSI/ASTM D2282 - Acrylonitrile-Butadiene-Styrene (ABS) Plastic pipe (SDR-PR);
 - b. ANSI/ASTM D2564 - Solvent Cement for Poly (Vinyl Chloride) (PVC) Plastic Pipe and Fittings;
 - c. ASTM B32 - Solder Metal;
 - d. ASTM B42 - Seamless Copper Pipe, Standard Sizes;
 - e. ASTM B88 - Seamless Copper Water Tube;
 - f. ASTM D1784 - Rigid and Chlorinated Polyvinyl Compounds
 - g. ATSM D2235 - Solvent Cement for Acrylonitrile - Butadiene - Styrene (ABS) Plastic Pipe and Fittings;

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- h. ASTM D2466 - Polyvinyl Plastic Pipe Fittings, Schedule 40; and,
- i. ASTM D2467 - Polyvinyl Plastic Pipe Fittings, Schedule 80.
- B. FS O-F-506 - Flux, Soldering; Paste and Liquid.
- C. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum).

1.5 QUALITY ASSURANCE

- A. Responsibility for Assuring Quality Work:
 - a. The CONTRACTOR's Superintendent shall be well versed in standard plumbing procedures, PVC assembly procedures, blueprint reading and coordination with other contracts or services in the project area.
 - b. 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 material on the job throughout the duration of his responsibility.
- B. Requirements of Regulatory Agencies:
 - a. All work and materials shall be in full accordance with the latest rules and regulations of safety order of Division of Industrial Safety; the Florida Building Code, the Uniform Building Code and other applicable laws and regulations, including any regulatory authorities having jurisdiction, and Plumbing Codes; and,
 - b. Should the contract documents be at variance with the aforementioned rules and regulations, notify the CITY for instructions before proceeding with work affected.
- C. Testing:
 - a. Preliminary inspection of completed installation will be made prior to backfilling of trenches and during hydrostatic testing; and,
 - b. Final inspection shall be made in conjunction with the final inspection of lawn, shrub and tree planting.
- D. Permits and Inspections:
 - a. Any permits for the installation or construction of any work included under this contract, which are required by any of the legally constituted authorities having jurisdiction, shall be obtained and paid for by the CONTRACTOR, each at the proper time; and,
 - b. The CONTRACTOR shall also arrange for and pay all costs in connection with any inspection and examination required by these authorities.

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1.6

SUBMITTALS

- A. Shop drawing or irrigation system design, including but not limited to piping, sprinkler heads, valves, wiring, and controls, if not provided in drawings.
- B. CONTRACTOR shall furnish 2 manufacturer's service manuals to the CITY. Manuals may be loose-leaf and shall contain complete drawings of all equipment installed showing components and catalog numbers together with the manufacturer's name and address.
- C. Loose equipment to furnish: Loose irrigation equipment, operating keys and spare parts if shown on the drawings.
 - a. 3 quick coupler keys and matching swivel hose cells;
 - b. 2 valve keys for gate valves;
 - c. 2 keys for each controller;
 - d. 2 sets of special tools required for removing, disassembling and adjusting each type of sprinkler and valve supplied on this project; and,
 - e. 2 cover lifting tools for valve boxes.
- D. Record Drawings:
 - a. The CONTRACTOR shall maintain one record set of blue-line prints of the irrigation system in good condition at the site and mark on them the exact 'record'. The CONTRACTOR shall make a daily record of all work installed during each day. Drawings shall indicate the exact location of check valves, gate valves, wire locations, head layout, automatic valves, quick couplers, irrigation, drainage piping, etc. Locations should be shown by the triangular system of measurements from easily identified permanent features, such as buildings, curbs, fences, walks, and by GPS, etc. Drawings shall show approved substitutions if any, of material including manufacturer's name and catalogue number. Drawings shall be to scale and all information shall be recorded in a neat, orderly way.
 - i. At the time of the irrigation mainline test, the CONTRACTOR shall provide a preliminary set of 'Record' drawings to the CITY; and,
 - ii. On or before the date of substantial inspection, the CONTRACTOR shall deliver 2 sets of As-Built drawings to the CITY. The delivery of the prints shall not relieve the CONTRACTOR of the responsibility of furnishing required information that may have been omitted.
 - iii. Immediately upon installation of any work which deviates from what is shown on the prints, the CONTRACTOR shall clearly indicate such changes in red pencil on the prints. Such changes shall include, but not be limited to, changes

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in (1) material, (2) sizes of material, (3) location, and (4) quantities. Dimensions shall be used where required such as, but not limited to underground utilities.

G. Substitutions:

- a. The CONTRACTOR shall use materials as specified herein. Material other than that specified will be permitted only after written application by CONTRACTOR and written approval by the CITY;
- b. Substitutions will only be allowed when in the best interest of the CITY; and,
- c. The installation of any approved substitution is the CONTRACTOR's responsibility. Any changes required for installation of any approved substitution must be made to the satisfaction of the CITY and without additional cost to the CITY.

1.7 LOCATION

- A. Bidders shall personally examine the sites and fully acquaint themselves with all of the existing conditions in order that no misunderstanding may afterwards arise as to the character or as to the extent of the work to be done; and, likewise, in order to advise and acquaint themselves with all precautions to be taken in order to avoid injury to persons or property of another. No additional compensation will be granted because of any unusual difficulties which may be encountered in the execution or maintenance of any portion of the work.

PART 2**PRODUCTS****2.1****PIPE**

- A. Pipe locations shown on the plan are schematic and shall be adjusted in field.
- B. All PVC pipe shall be new and free from defects and shall be continuously marked indicating size, schedule, type and Department of Commerce Standard Reference. Pipe shall be furnished in standard length of 20 feet.
- C. Main: Main line shall be solvent weld schedule 40 PVC pipe sized as noted on plans.
- D. Laterals: All lateral pipes shall be Polyvinyl Chloride (PVC) 1120-1120, Class 200. Threaded connections shall be schedule 80 unless noted otherwise on the Plans or Specifications.
- E. Galvanized Steel Pipe: All pressure mains which are exposed to possible damage, such as above ground, shall be threaded end, standard weight, Schedule 40 galvanized or coated steel.
- F. Sleeves: All sleeves to be Polyvinyl Chloride (PVC) Schedule 40 and sized as twice the size of the pipe it is carrying.

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- G. Chaseways: All chaseways shall be PVC Schedule 40 and sized as needed for present and future use.

2.2 PIPE FITTINGS AND JOINTS

- A. All PVC lateral pipe shall have PVC solvent weld Schedule 40 fittings and joints. The primer and solvent glue shall be compatible with the pipe and fittings. No male threaded PVC fittings are to be used, with the exception of street ells and riser adapters.
- B. Galvanized steel pipe shall have threaded standard, 150 pound galvanized malleable fittings. All sprinkler heads shall be connected to the supply line with flexible pipe and ells, (Rainbird flex pipe and barbed ells O.A.F.) or Schedule 80 swing joints as shown on the details.
- C. Main line pipe joints shall be "belled" solvent-weld type.

2.3 SPRINKLER HEADS

- A. Shrub heads and bubblers shall be installed on 1/2" schedule 40 PVC risers. Paint all risers with black paint. Shrub heads shall be installed to a standard height of 6" above plants, and shall be installed within planted masses to be less visible. Bubblers shall be installed at the base of trees for low level watering.
- B. All pop-up heads shall be mounted on flexible type swing joints.
- C. All pop up and shrub heads shall be pressure compensating.
- D. Use screens in all heads.

2.4 IRRIGATION CONTROL WIRE

- A. If necessary, all irrigation control wire from the controller to the electric valve shall be UL approved PE irrigation control wire, single conductor insulated utilizing low density high molecular weight polyethylene insulation suitable for operating at 600 volts and conductor temperatures up to 60° C. The conductor shall be soft drawn bare copper meeting the requirements of ASTM Specification B-3 or B-8. Temperature rating shall be from -55° to +60° C. Thickness of insulation for conductor size 14 AWG through 12 AWG solid shall be 3/64 inches. Wire size, number and color as follows: #12 White for Common; #14 Red for Hotwires; #14 Yellow for Spares.

2.5 WIRE CONNECTORS

- A. All splices in irrigation control wire shall be accomplished by using 3M Dry Direct Bury Splice Kit or approved equal.

2.6 SLEEVING AND CONDUIT

- A. Sleeving and conduit shall be PVC, Schedule 40 for pipe sizes through 3 inches, and Class 160 for sizes 4 inches diameter or greater. Size as required by code or as

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shown on the Plan, whichever is larger in size. Electric conduit shall be gray PVC with Underwriters' Laboratories label.

2.7 RISERS

- A. Risers to be Schedule 40 NPT riser threshold, height to be determined by use.

2.8 AUTOMATIC CONTROL VALVES

- A. Utilize the automatic valves that are noted on the plans or if not noted use Rainbird ESP series or approved equal.

2.9 GATE VALVES & ISOLATION VALVES

- A. Gate valves 3 inches and smaller shall be NIBCO T-113 (screwed end) with all bronze body, wedge disc and non-rising stem, or approved equal.
- B. Isolation valves shall be iron body resilient seat gate valves with modified wedge disc NRS type, with slip on joint ends installed with thrust blocks.

2.10 VALVE BOXES

- A. Valve boxes shall be made of molded plastic as manufactured by Carson Industries or approved equal. Boxes shall be 9 in. x 9 in. x 6 in. and green with a green cover marked "Irrigation" on top.

2.11 PAINT FOR RISERS

- A. All risers to be painted black.

2.12 CONTROLLER

- A. Controller shall be Solatrol Inc.- LEIT 8000 or approved equal with stainless steel enclosure as specified on Contract Documents.

2.13 VACUUM BREAKER

- A. Vacuum breaker shall be FEBCO 765Y or approved equal.

PART 3**EXECUTION****3.1 GENERAL**

- A. The Irrigation Contractor shall carefully schedule his work with the Landscape Contractor and all other site developments.
- B. Sleeves are required wherever piping or electrical wires are placed under paved surfaces. Install sleeves prior to commencement of paving.
- C. No consideration will be given to any design changes. Should any

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changes be deemed necessary after award of contract, for proper installation and operation of the system, the CITY shall negotiate such changes.

- D. Lay out work as accurately as possible to the submitted shop drawings.
- E. Full and complete coverage is required. CONTRACTOR shall make any necessary minor adjustments to layout as required to achieve full coverage of irrigated areas at no additional cost to the CITY.
- F. Where piping is shown on drawings to be under paved areas but running parallel and adjacent to planted areas, the intent is to install piping in planted areas. Do not install directly over another line in same trench.
- G. It shall be the CONTRACTOR's responsibility to establish the location of all sprinkler heads in order to assure proper coverage of all areas. In no case shall spacing of sprinkler head exceed distances shown on the drawings and/or those specified. Pipe sizes shall conform to those shown on the drawings. No substitutions of smaller pipe sizes will be permitted, but substitutions of larger sizes may be approved. All pipe damaged or rejected because of defects shall be removed from the site at the time of said rejection, at not additional cost to the CITY.
- H. Install irrigation system after completion of site grading. The irrigation system shall be installed and completely operational three days prior to the installation of any planting operations.

3.2

PREPARATION

- A. Layout of Main and Laterals: The sprinkler main lines and all laterals shall be laid out by the CONTRACTOR and approved by the CITY or CITY PROJECT MANAGER, prior to excavation. The sprinkler lines, as shown on the Plans, are drawn for clarity and are schematic in nature. No sprinkler lines shall be under paved areas unless in sleeves or specifically noted on the Plans. Any adjustment or site modification shall be done prior to the excavation operation.
- B. Layout of Sprinkler Heads: All sprinkler heads locations shall be staked by the CONTRACTOR and approved by the CITY or CITY PROJECT MANAGER, prior to installation to ensure uniformity and correctness to both pattern and coverage.
- C. Valve Locations: The location of all valves shall be in landscape areas. The location of all valves shall be staked by the CONTRACTOR and approved by the CITY or CITY PROJECT MANAGER, prior to installation to ensure ease of access for maintenance and to ensure that they do not conflict with other elements on the project. Each valve shall be installed in a separate valve box. The valve locations shown on the plan are drawn for clarity and are schematic in nature. Sequence all valves so that the farthest valve from the P.O.C. operates first and the closest to the P.O.C. operates last.
- D. Valve boxes must be placed a minimum of 12 inches and a maximum of 15 inches from the edge of pavement and the top of the box shall be 2 inches above finish grade. Valve boxes to be installed in shrub beds only. Using 3 inches high number stencils, paint the valve number in white on the lid of each valve box.

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- E. Irrigation Plans: The irrigation system indicated on the drawings is drawn for clarity and is essentially diagrammatic. Spacing of the heads shown on the Plans shall not be modified unless approved in writing by the CITY and CITY PROJECT MANAGER.

3.3

TRENCHING

- A. Perform all excavations as required for installation of work included under this Section, including shoring of earth banks, if necessary. Restore all surfaces, existing underground installation, etc., damaged or cut as a result of the excavations, to their original condition.
- B. Should utilities not shown on the drawings be found during excavations, CONTRACTOR shall promptly notify the CITY for instructions as to further action. Failure to do so will make the CONTRACTOR liable for any and all damage thereto arising from his operations subsequent to discovery of such utilities. Indicate such utility crossings on the record drawings promptly.
- C. Trenches shall be open, vertical sided construction wide enough to provide free working space around work installed and to provide ample space for backfilling and compacting.
- D. When 2 pipes are to be placed in the same trench, a 6 inch space is to be maintained between pipes. The CONTRACTOR shall not install 2 pipes with one directly above the other.
- E. Backfill and compaction shall be in accordance with Section 02305, Excavation and Backfilling for Utilities. Depth of trenches shall be sufficient or provide a minimum cover above the top of the pipe as follows or as showing drawing if greater:
- a. 12 inches over non-pressure lateral lines
 - b. 18 inches over non-pressure lateral lines under paving
 - c. 18 inches over control wires
 - d. 18 inches over sprinkler main line
 - e. 24 inches over sprinkler main line under paving
- F. The CONTRACTOR shall cut trenches for pipe to required grade lines and compact trench bottom to prove accurate grade and uniform bearing for the full length of the line.
- G. All laterals and mainline shall be sufficiently sloped to provide positive drainage through drain valves.
- H. The CONTRACTOR shall be held responsible for any damages caused by these operations and shall immediately repair or replace damaged parts.

3.4

INSTALLATION

- A. Ground Level Areas: The CONTRACTOR shall do all necessary excavating and backfilling required for the proper installation of the work. Minimum depth of

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cover over lateral lines shall be 12 inches, over main line shall be 18 inches, over sleeves it shall be 24 inches. Backfill material shall be clean fill. If existing material has rock, then clean sand must be used. In rocky areas, the trenching depth shall be two inches below normal trench depth to allow for a 2 inch bed of sand below the pipe. There shall be no rock in contact with PVC pipe. The CONTRACTOR shall use backfilling equipment that will tamp backfill to its original density. He shall barricade or light the excavation to prevent hazards to the public. Objectionable materials such as coral rock, asphalt, limerock and bricks that are encountered during working operations shall be removed from the project by the CONTRACTOR.

- B. Modifications Due to Field Conditions: Conditions that occur on the site that causes the system to be modified, shall be presented as shop drawings by the CONTRACTOR and approved by the CITY PROJECT MANAGER, prior to construction.
- C. The existence and location of utilities (overhead, above ground 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 working so as not to damage utilities or endanger the safety and lives of people. Should overhead, above ground or underground obstructions be encountered which interfere with the work, the CITY PROJECT MANAGER shall be consulted in order for a decision to be made on the relocation of the work to clear such obstruction. The CONTRACTOR shall be responsible for the immediate repair of any damage to utilities caused by his work.
- D. PVC Sleeves and Electrical Conduit
 - a. All PVC sleeves shall be a minimum of twice (2x) the diameter of the pipe to be sleeved; and,
 - b. All PVC control wire conduit shall be of sufficient size to hold the required quantity of control and common wires. Electrical wires are not to be placed in the same sleeve with water pipes.

3.5 PVC PIPE ASSEMBLY

- A. All PVC pipe shall be cut to the proper length prior to assembly. The cut shall be neat and square, 90 degrees to the axis of the pipe. Prior to assembly, the cut end shall be de-burred. The fitting and pipe end shall both be cleaned with a PVC High Etch Primer. This primer shall have a purple tint to aid in visual inspection.
- B. A thin even flow coat of slow drying, heavy duty PVC solvent/glue shall be applied to both the inside of the fitting and the pipe mating surface.
- C. The pipe shall be inserted into the fitting until it bottoms, then given a quarter turn to ensure proper sealing. The pipe and fittings shall be out of service during the curing time as recommended by the manufacturer or 24 hours, whichever is longer. The finished joint shall be water-tight and shall have a strength equal to or greater than that of the pipe being joined. The direct tapping of PVC pipe or fittings shall not be permitted.
- D. Threaded Joints for PVC Pipes

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- a. Use Teflon tape on all threaded PVC fittings;
- b. Use strap-type friction wrench only. Do not use metal-jawed wrench; and,
- c. At threaded joints between PVC and metal pipes, the metal shall contain the socket end and the PVC end shall contain the spigot. A metal spigot shall not, under any circumstances, be screwed into a PVC socket.

3.6 IRRIGATION CONTROL VALVES

- A. Valves shall be carefully inspected during installation; they shall be opened wide and then tightly closed and tested for tightness. Special care shall be taken to prevent any foreign matter from becoming lodged in the valve seat. Valves shall be set plump at the locations indicated and in accordance with the details shown on the drawings.
- B. Install control valves in valve boxes grouping together where practical. Place no closer than 12 inches to walk edges, buildings and walls.
- C. Pressure regulating remote control valves shall be adjusted so that the most remote sprinkler heads operate at the pressure specified.
- D. Valves shall be installed as shown in details and in accordance with manufacturer's instructions and the specifications.

3.7 QUICK COUPLING VALVES

- A. Shall be set a minimum of 12 inches from walks, curbs or paved areas where applicable or as otherwise noted. Quick coupling valves shall be housed in valve boxes.
- B. Valves shall be installed on 3 elbow PVC Schedule 80 swing joint assembly.

3.8 VALVE BOXES

- A. Valve boxes shall be set flush with finish grade in lawn areas and ½ inch above finish grade in ground cover and shrub bed areas.

3.9 SPRINKLER HEADS

- A. Sprinkler Heads: All sprinkler heads shall be installed as shown on the Drawings. Backfill around the sprinkler shall be free of rocks, roots, or debris. If finished grade has not been established, the line shall be temporarily capped at the head and a stake marker placed. After grading has been completed, the sprinkler head shall be set. The CONTRACTOR shall coordinate his operations with the various phases of the work. Adjust heads for proper coverage avoiding excess water on walks, walls and paving.
- B. All sprinkler heads within a zone shall have matched precipitation rates.
- C. All heads operating on one valve (zone) shall do so at the same pressure.

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- D. All heads shall be pop-up type heads. Permanent shrub risers are not permitted.
- E. Do not mix different types of heads within zone.
- F. Shrub beds and lawn areas are to be on separate valves (zones).
- G. Place part-circle pop-up sprinkler heads 6 inches from edge of adjacent walks, curbs and mowing bands, or paved areas at time of installation.
- H. All sprinkler nozzles shall be adjusted for the proper radius and direction of spray pattern. Make adjustments where possible to prevent over-spraying into walks, pavement or buildings.
- I. Sprinkler heads and quick coupling valves shall be set perpendicular to finished grade unless otherwise designated on the drawings.

3.10 DRAIN VALVES

- A. All laterals shall be provided with manual drain valves.
- B. The mainline shall be drained with manual drain valves.
- C. Drain valves are to be provided at sufficient intervals to provide complete drainage of all piping.

3.11 AUTOMATIC CONTROLLER

- A. The automatic controller shall be installed at the approximate location shown on the irrigation drawings. Controller shall be wall mounted in a locking box. Suitable power supply will be supplied by the Electrical Subcontractor.
- B. All regulatory authorities having jurisdiction and other applicable codes shall take precedence in connecting the 110-volt electrical service to the controller.
- C. Install per regulatory authority having jurisdiction code, manufacturer's latest printed instructions, and as detailed.
- D. Connect remote control valves to controller in sequence to correspond with station setting beginning with 1, 2, 3, etc.
- E. Affix controller name (i.e., 'Controller A') on inside of controller cabinet door with letters minimum of 1 inch high. Affix a non-fading copy of irrigation diagram to cabinet door below controller name. Irrigation diagram is to be sealed between two sheets of 20 mil (minimum) plastic. Irrigation diagram shall be a reduced copy of the as-built drawing and shall show clearly all valves operated by the Controller, showing station number, valve size and type of planting irrigated.

3.12 CONTROL WIRING

- A. Control Lines: All electric control lines shall be installed in the same trench with the pipe lines in a neat and orderly fashion. They shall be installed in the main

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and lateral trenching or in their own trenches, and where necessary, bundled together and taped every 5 feet.

- B. Connections: any connections to existing pipe systems shall be made after consultation and approval of regulatory agencies.
- C. All electrical equipment and wiring shall comply with regulatory authorities having jurisdiction and be installed by those skilled and licensed in the trade.
- D. Wiring shall occupy the same trench and shall be installed along the same route as pressure supply or lateral lines wherever possible, and shall have a minimum of an 18 inch cover.
- E. Control wires shall be installed to the side of the main line whenever possible. Placement over pipes is not permitted.
- F. Where more than 1 wire is placed in a trench, the wiring shall be taped together at intervals of 10 feet.
- G. An expansion curl shall be provided within 3 feet of each wire connection and at least every 100 feet of wire length on runs of more than 100 feet in length. Expansion curls shall be formed by wrapping at least 5 turns of wire around a 1 inch diameter pipe, then withdrawing pipe.
- H. Control wire splices at remote control valves to be crimped and scaled with specified splicing materials. Line splices will be allowed only on runs of more than 500 feet and they must be located in 10 inch round splice boxes, which are green in color. The connector shall be 3MD BY splice kit by 3M Corporation, or 'Snip-Snap' connector by Imperial, or equal. Use one splice per connector sealing packs.
- I. Wire: Tape and bundle control wires every 10 feet and run alongside mainline. At all turns in direction make a 2 foot coil or wire. At all valve boxes coil wire around a ¾ inch piece of PVC to make a coil using 30 inches of wire. Provide 1 spare for every 10 hot wires – a minimum of 2 extra. Number all wires, using an electrical book of numbers, according to the plans. Number wires in all valve boxes, junction boxes and at the controller.

3.13 SHUT-OFF VALVES

- A. Shall be located in the following locations:
 - a. After backflow preventer and prior to main supply loop;
 - b. Between mainline and each remote control valves; and,
 - c. To be located within planting and lawn areas.
- B. All shut-off valves shall be located in valve boxes.

3.14 CLOSING OF PIPE AND FLUSHING OF LINES

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- A. All testing shall be done under the supervision of the CITY or CITY PROJECT MANAGER. Submit written requests for inspections to the CITY at least 3 days prior to the anticipated inspection date.
- a. Flushing: All lines shall be flushed prior to any installation of automatic sprinkler valves or sprinkler heads to remove all sand and other foreign matter with velocity of the flushing water not less than 4 feet per second. Flushing shall be terminated at the direction of the CITY PROJECT MANAGER. The CONTRACTOR shall dispose of the flushing water without causing a nuisance or property damage.
 - b. Thoroughly flush out all water lines under a full head of water before installing heads, valves, quick couplers assemblies, etc. Maintain flushing for a minimum of three minutes at the valve located furthest from water supply;
 - c. After flushing, cap or plug all openings to prevent entrance of materials that would obstruct the pipe or clog heads. Leave in place until removal is necessary for completion of installation;
 - d. Test as specified below;
 - e. Upon completion of testing, complete assembly and adjust sprinkler heads for proper distribution; and,
 - f. All sprinkler heads and quick coupling valves shall be set perpendicular to finished grades unless otherwise designated on the drawings, or otherwise specified. Sprinkler heads adjacent to existing walls, curbs and other paved areas, shall be set to grade. Sprinkler heads, which are to be installed in lawn areas where the turf has not yet been established, shall be set 1 inch above the proposed finish grade. Heads installed in this manner will be lowered to grade when the turf is sufficiently established to allow walking on it without appreciable destruction. Such lowering of heads shall be done by this CONTRACTOR as part of the original contract with no additional cost to the CITY.

3.15

TESTING

- A. Pressure and Leakage Testing:
- a. General: All pumps, gauges, and measuring devices shall be furnished, installed and operated by the CONTRACTOR and all such equipment and devices and their installation shall be approved by the CITY PROJECT MANAGER.
 - b. Pressure Tests for Lines: Pressure piping installed under this contract shall be subjected to a pressure test after the pipe has been installed and partially backfilled for underground installations. Each pressure test shall be maintained for at least one hour at 150 psi during which time all joints shall be examined for leaks.
 - c. Before application of test pressure, all air shall be expelled from the pipe. If

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permanent air vents are not located at all high points, the CONTRACTOR shall install corporation cocks or fittings and valves at such points so the air can be expelled as the pipe system is slowly filled with water. After expulsion of air, the corporation cocks, or other blow-off devices shall be closed and the test pressure applied.

- d. All exposed pipe, fittings, valves, and joints shall be carefully examined for leaks. All cracked, broken, or defective pipe, fittings, or valves discovered as a consequence of this pressure test shall be removed and replaced with sound material. All leaking, or defective joints shall be repaired, replaced, or corrected. After all necessary replacements and corrections, the test shall be repeated until satisfactory to the CITY PROJECT MANAGER.
- e. Leakage Testing for Pressure Piping: After completion of satisfactory pressure tests of piping, the lines shall be subjected to leakage tests. The duration of each leakage test shall be at least two hours and the pressures maintained during each leakage test shall be as specified above for the pressure tests.
- f. Leakage is defined as the quantity of water that must be supplied into the newly laid pipe or any valved section thereof to maintain the specified test pressure after the air in the pipeline has been expelled and the pipe has been filled with water. The allowable limits for leakage of underground piping shall be determined by the following formula.
- g. Allowable Limits for Leakage of Pressure Piping: The hydrostatic pressure tests shall be performed as hereinabove specified and no installation, or section thereof, will be acceptable until the leakage is less than the number of gallons per hour as determined by the formula:

$$L = SD(P)^{1/2}/133,200$$

in which,

- L = Allowable leakage, in gallons per hour
- S = Length of pipe being tested in feet
- D = Nominal pipe diameter; in inches
- P = Average test pressure during the test, in psi gauge

- h. Water shall be supplied to the line during the test period as required to maintain the test pressure as specified. The quantity used, which shall be compared to the above allowable quantity, shall be measured by pumping from the calibrated container.
- i. Where leakage exceeds the allowable limit, the defective pipe or joints shall be located and repaired. If the defective portions cannot be located, the CONTRACTOR shall remove and reconstruct as much of the work as is necessary in order to conform to the specified limits. No additional payment will be made for the correction of defective work, or to damage to other parts of the work resulting from such corrective work.

B. Balancing and Adjustment: The CONTRACTOR shall balance and adjust the various

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components of the sprinkler system so the overall operation of the system is most efficient. This includes a synchronization of the controllers, part circle sprinkler heads, and individual station adjustments on the controllers.

3.16

INSPECTION

- A. The CONTRACTOR shall maintain proper facilities and provide safe access for inspection to all parts of the work.
- B. Irrigation inspection shall consist of a minimum of:
 - a. Mainline pressure test;
 - b. Coverage test; and,
 - c. Final irrigation inspection.
- C. If the laws, ordinances or any public authority require any work to be specifically tested or approved, the CONTRACTOR shall give the CITY 3 days notice of its readiness for inspection.
- D. The CONTRACTOR shall be solely responsible for notifying the CITY where and when such work is in readiness for testing.
- E. If any work should be covered up without approval of the CITY it must be uncovered, if required, for examination at CONTRACTOR's expense.
- F. No inspection will commence without 'Record' drawings and without completing previously noted corrections, or without preparing the system for inspection.

3.17

BACKFILL AND COMPACTING

- A. After system is operating and required tests and inspections have been made, backfill excavations and trenches.
- B. Backfill for all trenches, regardless of the type of pipe covered, shall be compacted to the requirements of Section 02305, Excavation and Backfilling for Utilities.
- C. All backfill shall be clean and free of any stones or debris larger than 1-1/2" in size.
- D. Within all planting and lawn areas the existing 4 inch layer of topsoil shall be restored to its original condition and finish grade. After backfilling, the CONTRACTOR shall dispose of surplus earth offsite.

3.18

RESPONSIBILITY PRIOR TO FINAL ACCEPTANCE

- A. The CONTRACTOR shall be responsible for maintenance until the inspection for completion and final acceptance. The responsibilities include the following:
- B. Repair of all damage to installed material and equipment as needed.

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- C. Adjustment of all sprinkler heads with regard to proper height after landscape installation, arc coverage, radius and operation at least once a week.
- D. The system shall be operational at least one month prior to Substantial Completion. Once a week after Substantial Completion, the CONTRACTOR shall clean, repair and adjust all valves and other controls. Also, check to ensure that they are opening and closing properly.
- E. Once a week the controllers shall be checked to ensure that the clocks have the right time, the program is properly set and that it is properly operating all of the valves correctly. Following inspections, the pump enclosure is to be locked.

END OF SECTION

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SECTION 02920 - SODDING

PART 1

GENERAL

1.1

DEFINITIONS

- A. Maintenance Period:** Begin maintenance immediately after each area is planted (sod) and continue for a period of 8 weeks after all planting under this Section is completed.
- B. Satisfactory Stand:**
 - a. Grass or Section of Grass that has:**
 - i. No bare spots larger than 3 square feet.**
 - ii. Not more than 10 percent of total area with bare spots larger than 1 square foot.**
 - iii. Not more than 15 percent of total area with bare spots larger than 6 square inches.**

1.2

DELIVERY, STORAGE, AND PROTECTION

- A. Sod:**
 - A. Do not harvest if sod is excessively dry or wet to the extent survival may be adversely affected.**
 - B. Harvest and deliver sod only after laying bed is prepared for sodding.**
 - C. Roll or stack to prevent yellowing.**
 - D. Deliver and lay within 24 hours of harvesting.**
 - E. Keep moist and covered to protect from drying from time of harvesting until laid.**

1.3

WEATHER RESTRICTIONS

- A. Perform Work under favorable weather and soil moisture conditions as determined by accepted local practice.**

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1.4 SEQUENCING AND SCHEDULING

- A. Prepare topsoil as specified in the Contract Documents, before starting Work of this Section.**
- B. Complete Work under this Section within 10 days following completion of soil preparation.**
- C. Notify CITY PROJECT MANAGER at Least 3 Days in Advance of:**
 - a. Each material delivery.
 - b. Start of planting activity.
- D. Planting Season: Those times of year that are normal for such Work as determined by accepted local practice.**

1.5 MAINTENANCE SERVICE

- A. Contractor: Perform maintenance operations during maintenance period to include:**
 - a. Watering: Keep surface moist.
 - b. Washouts: Repair by filling with topsoil, and replace sodded areas.
 - c. Mowing: Mow to 2 inches after grass height reaches 3 inches, and mow to maintain grass height from exceeding 3 1/2 inches.
 - d. Re-sod unsatisfactory areas or portions thereof immediately at the end of the maintenance period if a satisfactory stand has not been produced, at which time maintenance period shall recommence.
 - e. Re-sod during next planting season if scheduled end of maintenance period falls after September 15.

PART 2 MATERIALS

2.1 FERTILIZER

- A. Commercial, uniform in composition, free-flowing, suitable for application with equipment designed for that purpose. Minimum percentage of plant food by weight.**
- B. Mix:**
 - a. Nitrogen: Sixteen.

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b. Phosphoric Acid: Four.

c. Potash: Eight.

2.2**SOD**

A. Unless a particular type of sod is called for, sod may be of either St. Augustine Floritam, Bahia grass or Seashore Paspalum, at the Contractor's option.

a. Use Bahia grass where no irrigation system exists.

b. Use St. Augustine Floritam here an irrigation system is in use.

c. Seashore Paspalum sod will be used in areas prone to salt water flooding.

B. Strongly rooted pads, capable of supporting own weight and retaining size and shape when suspended vertically from a firm grasp on upper 10 percent of pad.

a. Grass Height: Normal.

b. Strip Size: Supplier's standard, commercial size rectangles.

c. Soil Thickness: Uniform; 1-inch plus or minus 1/4-inch at time of cutting.

d. Age: Not less than 10 months or more than 30 months.

e. Condition: Healthy, green, moist; free of diseases, nematodes and insects, and of undesirable grassy and broadleaf weeds. Yellow sod, or broken pads, or torn or uneven ends will not be accepted

f. Any netting contained within the sod shall be certified by the manufacturer to be bio-degradable within a period of 3 months from installation.

PART 3**EXECUTION****3.1****PREPARATION**

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A. Grade Areas to Smooth, Even Surface with Loose, Uniformly Fine Texture:

- a. Roll and rake, remove ridges, fill depressions to meet finish grades.
- b. Limit such Work to areas to be planted within immediate future.
- c. Remove debris, foreign material and stones larger than 1 1/2 inches diameter, and other objects that may interfere with planting and maintenance operations.

B. Moisten prepared areas before planting if soil is dry. Water thoroughly and allow surface to dry off before seeding. Do not create muddy soil.**C. Restore prepared areas to specified condition if eroded or otherwise disturbed after preparation and before planting.****D. Limit preparation to those areas that can be sodded within 72 hours after preparation.**

3.2

FERTILIZER**A. Apply evenly over area in accordance with manufacturer's instructions. Mix into top 2 inches of top soil.****B. Application Rate: 20 pounds per 1,000 square feet (1,000 pounds per acre).**

3.3

SODDING**A. Do not plant dormant sod, or when soil conditions are unsuitable for proper results.****B. Pre-wet the area prior to placing sod. Lay sod to form solid mass with tightly fitted joints; butt ends and sides, do not overlap:**

- a. Stagger strips to offset joints in adjacent courses.
- b. Work from boards to avoid damage to subgrade or sod.
- c. Tamp or roll lightly to ensure contact with subgrade; work sifted soil into minor cracks between pieces of sod, remove excess to avoid smothering adjacent grass.
- d. Complete sod surface true to finished grade, even, and firm.

C. Fasten sod on slopes to prevent slippage with wooden pins 6 inches long driven through sod into subgrade, until flush with top of sod. Install at sufficiently close intervals to securely hold sod.SECTION
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- D. Water sod with fine spray immediately after planting. During first month, water daily or as required to maintain moist soil to depth of 4 inches.

3.4

FIELD QUALITY CONTROL

- A. Eight weeks after sodding is complete and on written notice from Contractor, CITY PROJECT MANAGER will, within 15 days of receipt, determine if the sod has been satisfactorily established.
- B. If the sod is not satisfactorily established, Contractor shall replace the sod and repeat the requirements of this Section.

END OF SECTION

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SECTION 02930 - LANDSCAPE WORK

PART 1

GENERAL

1.1

DEFINITIONS

A. Measurement:

- a. In size grading Balled and Burlapped (B & B), caliper takes precedence over height.
- b. Take trunk caliper 6 inches above the ground level (up to and including 4-inch caliper size) and 12 inches above the ground level for larger trees.
- c. Measure size of container-grown stock by height and width of plant.
- d. Measure herbaceous perennials pot size, not top growth.

1.2

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 CONSULTANT.

- a. Cover plants during shipment with a tarpaulin or other suitable covering to minimize drying.
- b. **Balled and Burlapped Plants: Wrap each ball firmly with burlap and securely bind with twine, cord, or wire for shipment and handling. Drum-lace balls with a diameter of 30 inches or more. Wire wrap burlap if root ball is not sufficiently compacted. Palms will not require burlap wrapping if the following requirements are met:**
 - i. Dug from marl or heavy soil that adheres to roots and retains shape without shattering.
 - ii. Moistened material used to cover ball and roots not exposed to wind and sun.
 - iii. 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

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protected at all times. Such protection shall encompass the entire period which the plants are in transit, being handled, or are in temporary storage.

- c. All plant material shall not remain on the work site longer than two (2) days prior to being installed.
- d. As specified herein for transplanting.

1.3

MAINTENANCE

- A. Commence to maintain plant life immediately after planting and maintain for a minimum of one growing season, and until plants are well established and exhibit a vigorous growing condition.
- B. In Accordance with Accepted Submittal on Care and Maintenance of Plants and as Follows:
 - a. Maintain by watering, pruning, cultivating, and weeding as required for healthy growth. Restore planting saucers.
 - b. Tighten and repair stake and guy supports and reset trees and shrubs to proper grades or vertical position as required.
 - c. Restore or replace damaged wrappings. Spray as required to keep trees and shrubs free of insects and disease.
 - d. Remove guys, stakes, and other supports at end of maintenance service.
 - e. Maintenance includes temporary protection fences, barriers, and signs as required for protection.
 - f. Coordinate watering to provide deep root watering to newly installed trees.

1.4

SCHEDULING AND SEQUENCING

- A. Plant Deliveries: Notify CONSULTANT at least 3 days in advance of each delivery.
- B. Planting Season: Conduct planting during times of year that are normal for such work as determined by accepted local practice.
- C. Plant trees and shrubs after final grades are established and before planting of lawns or grasses.

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PART 2**MATERIALS****2.1****PLANT MATERIALS**

- A. Provide quantity, size, genus, species, and variety of trees and shrubs indicated; comply with applicable requirements of ANSI Z60.1.**
- B. Nomenclature (Names of Plants): In accordance with "Hortus Third".**
- C. Quality and Size:**
 - a. Nursery-grown, habit of growth normal for species.
 - b. Sound, healthy, vigorous, and free from insects, diseases, and injuries - Florida #1 quality or better.
 - c. Equal to or exceeding measurements specified in plant list. Measure plants before pruning with branches in normal position.
 - d. Root System of Container-Grown Plants: Well developed and well distributed throughout the container, such that the roots visibly extend to the inside face of the growing container.
 - e. Perform necessary pruning at time of planting.
 - f. Sizes: Dimensional relationship requirements of ANSI Z60.1 for kind and type of plants required.
 - g. Balled and Burlapped Plants: Firm, intact ball of earth encompassing enough of the fibrous and feeding root system to enable full plant recovery.
 - h. Ball Size: ANSI Z60.1.**
 - i. Container-Grown Plants: Self-established root systems, sufficient to hold earth together after removal from container, without being rootbound.

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- j. **Stock: Grown in delivery containers for at least 6 months, but not over 2 years.**
- k. Label each tree and shrub of each variety with securely attached waterproof tag, bearing legible designation of botanical and common name.
- l. All trees must have a fully developed fibrous root system, be heavily branched, or in palms, heavily leafed, free from all insects, fungus, and other diseases.
- m. Palms: Wrap the roots of all plants of the palm species before transporting, except if they are container grown plants and ensure that they have an adequate root ball structure, and mass for healthy transplantation as defined in "Florida Grades and Standards for Nursery Plants."
- n. The CONSULTANT will not require burlapping, if the palm is carefully dug from marl or heavy soil that adheres to the roots and retains its shape without crumbling. During transporting and after arrival, carefully protect root balls of palms from wind and exposure to the sun. Muck grown palms are not allowed. After delivery to the job site, if not planting the palm within 24 hours, cover the root ball with a moist material. Plant all palms within 48 hours of delivery to the site.
- o. Move sabal and coconut palms in accordance with the "Florida Grades and Standards for Nursery Plants."
- D. **Replacement Shrubs and Trees: Same species, size, and quality as specified for plant being replaced, except existing trees larger than 4-inch caliper, may be replaced with 4-inch caliper trees to satisfy the caliper inches lost.**

2.2 ANTIDESICCANT

- A. **Provide transpiration retarding material to be used where any plant material is moved during the growing season.**

2.3 GUYING, STAKING, AND WRAPPING MATERIALS

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- A. **Wood Stake: 2 inches by 2 inches by 8 feet.**
- B. **Guy Wires: Galvanized, 12-gauge, ductile steel.**
- C. **Flags:**
 - a. **Wood: 1/2-inch by 3 inches by 12 inches, with 3/8-inch hole centered 1-1/2 inches from each end, painted white.**
 - b. **Sheet Metal: 1-1/2-inch with clipped corners and both ends punched, painted white.**
- D. **Hose: Two-ply, reinforced rubber garden hose, not less than 1/2-inch diameter, new or used.**
- E. **Burlap: Of first quality, minimum 8 ounces in weight, not less than 6 inches nor more than 10 inches in width.**

2.4

MULCH

- A. **Mulch shall be free from noxious weed seed and foreign material harmful to plant growth and shall be an approved non-native tree bark mulch. It must be uniformly shredded and be free from large pieces of bark, foreign matter, weed seeds and any other organic or inorganic material.**
- B. **Barkdust: Medium grind, pine; maximum 3/4-inch particle size.**

2.5

PLANTING SOIL MIX

- A. **Proportion by Weight: 75% approved good quality top soil mixed with 25% approved organic matter as approved by CONSULTANT. The soil must be taken from ground that has never been stripped, with a slight acid reaction (5.5 to 6.5 ph) and without an excess of calcium or carbonate. Soil shall have a loose friable condition.**
- B. **Special Type: Planting soil for palms shall be a good grade of salt free sand, which is free of all weeds.**

2.6

TOPSOIL

- A. **General: Uniform mixture of 75 percent good grade of clean, salt free, weed free sand and 25 percent organic material in a loose friable condition, free from objects larger than 1-1/2 inches maximum dimension, and free of subsoil, roots, grass, other foreign matter, hazardous or toxic substances, and deleterious material that may be harmful to plant growth or may hinder grading, planting, or maintenance.**
- B. **Textural Amendments: Amend as necessary to conform to required composition.**

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- C. Source: Import topsoil if onsite material fails to meet specified requirements or is insufficient in quantity.
- D. 95% of topsoil shall pass a ¼ inch sieve.
- E. Organic matter content shall be 4% to 12% of total dry weight.

2.7 SOURCE QUALITY CONTROL

- A. Topsoil Analysis/Testing: Performed by county or state soil testing service or approved certified independent testing laboratory.
- B. Should soil tests prove the topsoil to alkaline or above the accepted minimum for salt content, the topsoil shall be removed and replaced by acceptable material at Contractor's expense.

PART 3 EXECUTION**3.1 TRANSPLANTING**

- A. Remove existing plantings identified for transplant prior to beginning Work in area in accordance with standard nursery practices and as specified herein.
- B. Nondormant Plants: Prior to digging, spray foliage with antidesiccant, as recommended by manufacturer.
- C. Cover balls and containers of plants that cannot be planted immediately, with moist soil or mulch.
- D. Water plants as often as necessary to prevent drying until planted.
- E. Do not remove container-grown stock from containers before time of planting.
- F. Bare-Root Plants:
- G. Dig up with least possible injury to fibrous root system.
- H. Immediately upon removal from ground, cover roots with thick coating of mud or wrap in wet straw, moss, or other suitable packing material for protection from drying until planted.
- I. Plant or heel-in immediately upon relocation to temporary storage. Open and separate bundles of bare-root plants, and eliminate air pockets among roots as they are covered.
- J. Replant each temporarily removed tree, shrub, or other plant only

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after construction activities are completed and applicable grading and topsoil replacement is completed in its vicinity. Replant trees, shrubs, and other plants in their original positions unless otherwise shown or approved. Plant as specified for new plants.

- K. Maintain transplanted materials in same manner as new trees and shrubs.

3.2 LOCATION OF PLANTS

- A. Locate new planting or stake positions as shown unless obstructions are encountered, in which case notify CONSULTANT.
- B. Locate no planting, except ground cover, closer than 18 inches to pavements, pedestrian pathways, and structures.
- C. Request CONSULTANT observe locations, and adjust as necessary before planting begins.

3.3 PREPARATION

- A. Subsoil Drainage: Furnish for plant pits and beds.
- B. Planting Soil: Delay mixing of amendments and fertilizer if planting will not follow preparation of planting soil within 2 days. For pit and trench type backfill, mix planting soil prior to backfilling and stockpile at site.
- C. Plants: Place on undisturbed existing soil or well-compacted backfill.
- D. Trees and Shrubs:
- a. Pits, Beds, and Trenches: Excavate with vertical and scarified sides.
 - b. B & B Trees and Shrubs: Make excavations at least twice as wide as root ball.
 - c. Container-Grown Stock: Excavate as specified for B & B stock, adjust for size of container width and depth.
 - d. Bare-Root Trees: Excavate pits to a width to just accommodate roots fully extended and depth to allow uppermost roots to be below original grade.
 - e. Fill excavations with water and allow to percolate out prior to planting.

- E. Ground Cover Beds:

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- a. Mix amendments and fertilizer with top soil prior to placing or apply on surface of top soil and mix thoroughly before planting.
- b. Scarify top soil to a depth of 4 to 6 inches.
- c. Establish finish grading of soil. Rake areas to smooth and create uniform texture and fill depressions.
- d. Moisten.

3.4

PLANTING

- A. Plant trees before planting surrounding smaller shrubs and ground covers. Adjust plants with most desirable side facing toward the prominent view (sidewalk, building, street).
- B. B & B Plants: Place in pit by lifting and carrying by its ball (do not lift by branches or trunk). Lower into pit. Set straight and in pit center with tip of rootball 1 to 2 inches above adjacent finish grade.
- C. Bare-Root Plants: Spread roots and set stock on cushion of planting soil mixture. Set straight in the pit center so that roots, when fully extended, will not touch walls of the planting pit and the uppermost root is just below finish grade. Cover roots of bare-root plants to the crown.
- D. Container-Grown Plants: Remove containers, slash edges of rootballs from top to bottom at least 1-inch deep. Plant as for B & B plants.
- E. Ground Covers: Dig planting holes through mulch with one of the following: hand trowel, shovel, bulb planter, or hoe. Split biodegradable pots or remove nonbiodegradable pots. Root systems of all potted plants shall be split or crumbled. Plant so roots are surrounded by soil below the mulch. Set potted plants so pot top is even with existing grade.

3.5

BACKFILLING

- A. Backfill with planting soil, except where existing soil is suitable according to top soil analysis.
- B. B & B Plants:
 - a. Partially backfill pit to support plant. Remove burlap and binding from sides and tops of B & B plants, do not pull burlap from under balls.
 - b. When excavation is approximately 2/3 full, water thoroughly before placing remainder of backfill to eliminate air pockets even if it is

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raining. Finish backfilling pit sides.

- c. Never cover top of rootball with soil. Form a saucer above existing grade, completely around the outer rim of the plant pit.

C. Bare-Root Plants:

- a. Plumb before backfilling and maintain plumb while working backfill around roots and placing layers above roots.
- b. Set original soil line of plant 1-inch to 2 inches above adjacent finish landscape grades. Spread out roots without tangling or turning up to surface. Cut injured roots cleanly; do not break.
- c. Carefully work backfill around roots by hand; puddle with water until backfill layers are completely saturated.

3.5 GUYING and STAKING

- A. Support trees immediately after planting to maintain plumb position.
- B. Guying: Support all trees over 4 inches in caliper with 3 guys equally.
- C. Special Requirements for Palm Trees: Brace palms which are to be staked with three 2-inch by 4-inch wood braces, toe-nailed to cleats which are securely banded at two points to the palm, at a point one third the height of the trunk. Pad the trunk with five layers of burlap under the cleats. Place braces approximately 120 degrees apart and secure them underground by 2- by 4- by 12-inch stake pads.

3.7 SUBGRADE PREPARATION

- A. The subgrade shall be 4 inches lower than finished grade with 2 inches of topsoil added to sod areas.
- B. Scarify subgrade to minimum depth of 6 inches where topsoil is to be placed.
- C. Remove stones over 2-1/2 inches in any dimension, sticks, roots, rubbish, and other extraneous material.
- D. Limit preparation to areas which will receive topsoil within 2 days after preparation.

3.8 TOPSOIL PLACEMENT

- A. Topsoil Thickness:

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- a. Sodded Areas: 2 inches.
 - b. Planting Beds: 6 inches.
 - c. Planting Beds in Roadways and Parking Lots: All planting areas shall be excavated to a minimum depth of 24" or greater as needed to remove all road base/rock down to native soil prior to backfilling with approved planting soil.
- B. Do not place topsoil when subsoil or topsoil is excessively wet or otherwise detrimental to the Work.**
- C. Mix soil amendments with topsoil before placement or spread on topsoil surface and mix thoroughly into entire depth of topsoil before planting or seeding.**
- D. Uniformly distribute to within 1/2-inch of final grades. Fine grade topsoil eliminating rough or low areas and maintaining levels, profiles, and contours of subgrade.**
- E. Remove stones exceeding 1-1/2 inches, roots, sticks, debris, and foreign matter during and after topsoil placement.**
- F. Remove surplus subsoil and topsoil from site. Grade stockpile area as necessary and place in condition acceptable for planting or seeding.**

3.9

MULCHING

- A. Cover planting beds and area of saucer around each plant with 3-inch thick layer of mulch within 2 days after planting. Saturate planting area with water.**

3.10

PRUNING AND REPAIR

- A. Prune only after planting and in accordance with standard horticultural practice to preserve natural character of the plant. Perform in presence of CONSULTANT or OWNER's representative. Remove all dead wood, suckers, and broken or badly bruised branches. Use only clean, sharp tools. Do not cut lead shoot.**
- B. For Existing Trees Impacted by Construction Activities:**
- a. Maintain a minimum 6-foot clearance from the trunk of all trees except palm trees. Existing trees to remain shall be protected during all construction phases. Protective barriers shall be provided at the drip line of existing trees adjacent to construction operations. Replacement of any trees that are damaged or destroyed due to the CONTRACTOR'S operations shall be the CONTRACTOR'S

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responsibility and shall be replaced at the CONTRACTOR'S expense

- b. Where roots of trees are encountered in the excavation area, use a 24-inch deep saw cut prior to excavation. Roots shall not be torn by excavating equipment. Hand dig around roots. Cut roots do not require coating.
- c. Overhead branches not trimmed prior to construction and interfering with construction activities will be pruned and cut as approved by the CITY Forester and not torn or broken off with excavating equipment.

3.11 WEED CONTROL

- A. Maintain a weed-free condition within planting areas. Apply pre-emergent selective herbicide to mulched beds at manufacturer's recommended rate of application.

3.12 PROTECTION OF INSTALLED WORK

- A. Protect planting areas and plants against damage for duration of maintenance period.

3.13 ROOT BARRIERS

- A. Root barriers shall be installed parallel to all trees (except palms) when there is a sidewalks, roadway or utility adjacent to the planting area. Root barriers will be installed as directed by CITY PROJECT MANAGER.

END OF SECTION

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SECTION 03300 - CAST-IN-PLACE CONCRETE

PART 1

GENERAL

1.1 REFERENCES

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

- a. American Concrete Institute (ACI):**
 - i. 117, Standard Specification for Tolerances for Concrete Construction and Materials.**
 - ii. 211.1, Standard Practice for Selecting Proportions for Normal, Heavyweight, and Mass Concrete.**
 - iii. 301, Standard Specification for Structural Concrete.**
 - iv. 302.1R, Guide For Concrete Floor and Slab Construction.**
 - v. 304R, Guide for Measuring, Mixing, Transporting, and Placing Concrete.**
 - vi. 304.2R, Placing Concrete by Pumping Methods.**
 - vii. 305R, Hot Weather Concreting.**
 - viii. 306.1, Standard Specification for Cold Weather Concreting.**
 - ix. 309R, Guide for Consolidation of Concrete.**
 - x. 318/318R, Building Code Requirements for Structural Concrete.**
 - xi. SP-15, Standard Specification for Structural Concrete.**
- b. ASTM International (ASTM):**
 - i. C31, Standard Practice for Making and Curing Concrete Test Specimens in the Field.**
 - ii. C33, Standard Specification for Concrete Aggregates.**

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- iii. **C39, Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens.**
- iv. **C88, Standard Test Method for Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate.**
- v. **C94, Standard Specification for Ready-Mixed Concrete.**
- vi. **C143, Standard Test Method for Slump of Hydraulic-Cement Concrete.**
- vii. **C150, Standard Specification for Portland Cement.**
- viii. **C157, Standard Test Method for Length Change of Hardened Hydraulic-Cement Mortar and Concrete.**
- ix. **C192, Standard Practice for Making and Curing Concrete Test Specimens in the Laboratory.**
- x. **C231, Standard Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method.**
- xi. **C260, Standard Specification for Air-Entraining Admixtures for Concrete.**
- xii. **C311, Standard Test Methods for Sampling and Testing Fly Ash or Natural Pozzolans for Use as a Mineral Admixture in Portland-Cement Concrete.**
- xiii. **C452, Standard Test Method for Potential Expansion of Portland-Cement Mortars Exposed to Sulfate.**
- xiv. **C494, Standard Specification for Chemical Admixtures for Concrete.**
- xv. **C595, Standard Specification for Blended Hydraulic Cements.**
- xvi. **C618, Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use as a Mineral Admixture in Concrete.**

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- xvii. **C1012, Standard Test Method for Length Change of Hydraulic-Cement Mortars Exposed to a Sulfate Solution.**
 - xviii. **C1018, Standard Test Method for Flexural Toughness and First-Crack Strength of Fiber-Reinforced Concrete (Using Beam with Third-Point Loading).**
 - xix. **C1116, Standard Specification for Fiber-Reinforced Concrete and Shotcrete**
 - xx. **C1218 Standard Test Method for Water-Soluble Chloride in Mortar and Concrete**
 - xxi. **C1240, Standard Specification for Silica Fume for Use as a Mineral Admixture in Hydraulic-Cement Concrete, Mortar, and Grout.**
 - xxii. **D2000, Standard Classification System for Rubber Products in Automotive Applications.**
 - xxiii. **D4580, Standard Practice for Measuring Delaminations in Concrete Bridge Decks by Sounding.**
 - xxiv. **E329, Standard Specification for Agencies Engaged in the Testing and/or Inspection of Materials Used in Construction.**
- c. National Bureau of Standards: Handbook No. 44, Specifications, Tolerances, and Other Technical Requirements for Commercial Weighing and Measuring Devices.

1.2 DEFINITIONS

- A. **Defective Areas.** Surface defects that include honeycomb, rock pockets, indentations greater than 3/16 inch, cracks 0.005 inch wide and larger as well as any crack that leaks for liquid containment basins and belowgrade habitable spaces; cracks 0.010 inch wide and larger in nonfluid holding structures spalls, chips, air bubbles greater than 3/4 inch in diameter, pinholes, bug holes, embedded debris, lift lines, sand lines, bleed lines, leakage from form joints, fins and other projections, form popouts, texture irregularities, and stains and other color variations that cannot be removed by cleaning.
- B. **Exposed Concrete.** Concrete surfaces that can be seen inside or outside of structures regardless whether concrete is above water, dry at all times, or can be seen when

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structure is drained.

- C. **Hydraulic Structures.** Liquid containment basins.
- D. **New Concrete.** Less than 60 days old.
- E. **Slurry Concrete.** Mixture of sand, 3/8-inch minus aggregate, cement, and water for wall construction joints.

1.3 SUBMITTALS

A. **Action Submittals:**

a. **Shop Drawings:**

- i. **Product Data.** Admixtures, bonding agent, bond breaker, and patching materials.
- ii. **Design Data.** Concrete mix designs signed by qualified mix designer.
- iii. **Placement Drawings:**
 - a. Concrete, identifying location of each type of construction joint.
 - b. Tremie concrete.
- iv. **Gradation for coarse and fine aggregates, and combined together. List gradings, percent passing through each sieve size.**
- v. **Detailed plan for hot weather placements including curing and protection for concrete placed in ambient temperatures over 80 degrees F.**
- vi. **Concrete repair methods and materials.**

B. **Informational Submittals:**

a. **Statements of Qualification:**

- i. **Contractor's resident superintendent for concrete installation.**

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- ii. **Mix designer.**
 - iii. **Batch plant.**
- b. **Test Reports:**
 - i. **Admixtures, test reports showing chemical ingredients and percentage of chloride in each admixture and fly ash.**
 - ii. **Source test analysis report for fly ash, including percentage of chloride content.**
 - iii. **Statement identifying aggregates reactivity. Determine water soluble chloride in each component of aggregates in accordance with ASTM C1218.**
 - iv. **For each trial concrete mix design and signed by a qualified mix designer.**
 - v. **Cylinder compressive test results for laboratory concrete mixes.**
- c. **Concrete Delivery Tickets:**
 - i. **For each batch of concrete before unloading at Site.**
 - ii. **Record of drum revolution counter, type, brand, test certification, Amount of fly ash if used in accordance with ASTM C94, Section 16.**

1.4 QUALITY ASSURANCE

A. **Qualifications:**

- a. Mix Designer. Licensed professional engineer registered in the State of Florida.
- b. Batch Plant. Currently certified by the National Ready Mixed Concrete Association.

B. **Preinstallation Conference:**

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- a. Required Meeting Attendees:
 - i. **Contractor, including pumping, placing and finishing, and curing subcontractors.**
 - ii. **Ready-mix producer.**
 - iii. **Admixture representative.**
 - iv. **Testing and sampling personnel.**
 - v. **Engineer.**
- b. Schedule and conduct prior to incorporation of respective products into Project. Notify Engineer of location and time.
- c. Agenda shall include:
 - i. **Admixture types, dosage, performance, and redosing at Site.**
 - ii. **Mix designs, test of mixes, and Submittals.**
 - iii. **Placement methods, techniques, equipment, consolidation, and form pressures.**
 - iv. **Slump and placement time to maintain slump.**
 - v. **Finish, curing, and water retention.**
 - vi. **Protection procedures for weather conditions.**
 - vii. **Other specified requirements requiring coordination.**
- d. Conference minutes as specified in Section 01200, Project Meetings.

PART 2 PRODUCTS**2.1 MATERIALS****A. Cement. Furnish from one source.**

- a. Portland Cement Type I or Type II:

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- i. **Meet ASTM C150.**
- ii. **Alkalies: Maximum 0.60 percent.**
- iii. **Tricalcium Aluminate Content of Type I Cement: Maximum 12 percent.**
- iv. **Nonhydraulic Abovegrade Structures: Type I or Type II cement.**
- v. **Hydraulic and Belowgrade Structures and Sewers: Type II cement or combination of Type I mixed with fly ash.**
- vi. **Combine fly ash with cement at batch plant or during production of cement in accordance with ASTM C595, Type IP cement.**

B. Aggregates. Furnish from one source.

- a. Natural Aggregates:
 - i. **Free from deleterious coatings and substances in accordance with ASTM C33, except as modified herein.**
 - ii. **Free of materials and aggregate types causing popouts, discoloration, staining, or other defects on surface of concrete.**
- b. Nonpotentially Reactive. In accordance with ASTM C33, Appendix XI, Paragraph X1.1.
- c. Aggregate Soundness. Test for fine and coarse aggregates in accordance with ASTM C33 and ASTM C88 using sodium sulfate solution.
- d. Fine Aggregates:
 - i. **Clean, sharp, natural sand.**
 - ii. **ASTM C33.**

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- iii. **Materials Passing 200 Sieve: 4 percent maximum.**
- iv. **Limit deleterious substances in accordance with ASTM C33, Table 1 with material finer than 200 sieve limited to 3 percent, coal and lignite limited to 0.5 percent.**
- e. **Coarse Aggregate:**
 - i. **Natural gravels, combination of gravels and crushed gravels, crushed stone, or combination of these materials containing no more than 15 percent flat or elongated particles (long dimension more than five times the short dimension).**
 - ii. **Materials Passing 200 Sieve: 0.5 percent maximum.**
 - iii. **Limit deleterious substances in accordance with ASTM C33, Table 3 for exposed concrete.**

C. **Admixtures.** Furnish from one manufacturer.

- a. **Characteristics.** Compatible with each other and free of chlorides or other corrosive chemicals.
- b. **Air-Entraining Admixture:**
 - i. **ASTM C260, nontoxic after 30 days and contains no chlorides.**
 - ii. **Concrete with air-entrainment admixture added shall maintain air percentage as batched, within plus or minus 2 percent for time required for placement into structure.**
- c. **Water-Reducing Admixture,** ASTM C494, Type A or Type D.
 - i. **Manufacturers and Products:**
 - a. **Master Builders, Inc., Cleveland, OH; Pozzolith or Polyheed.**
 - b. **W. R. Grace & Co., Cambridge, MA; WRDA with HYCOL.**
 - c. **Euclid Chemical Co., Cleveland, OH;**

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Eucon WR-91.

- d. High Range Water Reducing Admixture (Superplasticizer):
 - i. **ASTM C494.**
 - ii. **Hold slump of 5 inches or greater for time required for placement.**
 - iii. **Furnish type as recommended by manufacturer for allowed temperature ranges.**
 - iv. **Type F or G.**
 - v. **Manufacturers and Products:**
 - a. Master Builders, Inc., Cleveland, OH; Rheobuild or Polyheed at dosage greater than 10 ounces per 100 pounds of cement.
 - b. W. R. Grace & Co., Cambridge, MA; Daracem 100.
 - c. Euclid Chemical Co., Cleveland, OH; Eucon 537.
- e. Pozzolan (Fly Ash). Class C or Class F fly ash in accordance with ASTM C618, Table 1 and 2, except as modified herein:
 - i. **Shall not be produced from process that has utilized hazardous or potentially hazardous materials.**
 - ii. **Loss on Ignition: Maximum 3 percent.**
 - iii. **Water Requirement: Maximum 100 percent of control.**
 - iv. $\frac{CaO(\%) - 5}{FE_2O_3(\%)} : \text{Maximum } 1.5$
 - v. **ASTM C618, Table 3, Reactivity with Cement Alkalies, apply when aggregate or portions of aggregate is reactive as specified under Paragraph Nonpotentially Reactive.**
 - vi. **ASTM C618, Table 3, Uniformity Requirements, apply when loss on ignition of fly ash furnished exceeds 3 percent.**
- f. Fly Ash. Maximum 25 percent, minimum

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15 percent of total weight of fly ash plus cement.

- g. For fly ash not meeting requirements of chemical ratio listed above, furnish the following:
 - i. **Test fly ash in accordance with ASTM C1012.**
 - ii. **Furnish test data confirming fly ash in combination with cement used meets strength requirements, is compatible with air-entraining agents and other additives, and provides increased sulfate resistance equivalent to or better than Type II cement.**
 - iii. **Conduct tests using proposed fly ash and cement samples together with control samples using Type II cement without fly ash.**

D. **Water.** Clean and potable containing less than 500 ppm of chlorides.

2.2 CONCRETE MIX DESIGN

- A. **Design.** Select and proportion ingredients using trial batches; sample, cure and test concrete mix through approved independent testing laboratory in accordance with ACI 211.1.
 - a. Concrete Compressive Strength, F'_c :
 - i. **4,000 psi at 28 days, unless otherwise shown, except 3,000 psi at 28 days for secondary concrete elements such as curbs, sidewalks, and pipe/conduit encasements.**
 - ii. **Design lab-cured trial mix cylinders.**
 - iii. **Use additional cement or cement plus fly ash above minimum specified if required to meet average compressive strength, F'_{cr} .**
 - iv. **Use F'_{cr} as basis for selection of concrete proportions as set forth in ACI 301.**
 - v. **F'_{cr} : Equal to F'_c plus 1,200 when data are not available to establish standard deviation.**

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b. Concrete Fill:

- i. **Design for 2,500 psi at 28 days using 3/4-inch aggregate, 4-inch maximum slump and 0.46 maximum water-cement ratio.**
- ii. **Use water-reducing admixture.**

B. Proportions:

- a. Design mix to meet aesthetic and structural concrete requirements.
- b. In accordance with ACI 211.1, unless specified otherwise.
- c. Unless specifically stated otherwise, water-cement ratio (or water-cement plus fly ash ratio) shall control amount of total water added to concrete as follows:

| Water-Cement Ratio | | | |
|-----------------------|---------------------------------------|--|--|
| Coarse Aggregate Size | Maximum W/C Ratio w/ Superplasticizer | Maximum W/C Ratio w/o Superplasticizer | |
| 1-1/2" | 0.40 | 0.44 | |
| 1" | 0.40 | 0.44 | |
| 3/4" | 0.40 | 0.44 | |

- d. Minimum Cement Content (or Combined Cement Plus Fly Ash Content When Fly Ash is Used):
 - i. **517 pounds per cubic yard for concrete with 1-1/2-inch maximum size aggregate.**
 - ii. **540 pounds per cubic yard for 1-inch maximum size aggregate.**
 - iii. **564 pounds per cubic yard for 3/4-inch maximum size aggregate.**
 - iv. **Increase cement content or combined cement plus fly ash content, as required to meet strength requirements and water-cement ratio.**

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- a. Air Content. 4 to 6 percent when tested in accordance with ASTM C231; 3 percent maximum for interior slabs where heavy-duty concrete floor finish is required.
- b. Fly Ash. Maximum 25 percent, minimum 15 percent of total weight of fly ash plus cement.
- c. Water Reducers. Use in all concrete.
- d. High Range Water Reducers (Superplastizicers). Use at Contractor's option. Control slump and workability to at least 4-1/2-inch slump at discharge into forms by adjusting high range water reducer at batch plant.

D. Slump Range at Site:

- a. 4-1/2 inches minimum, 8 inches maximum for concrete with a high range water reducing admixture.
- b. 3 inches minimum and 5 inches maximum for concrete without high range water reducing admixture.

E. Combined Aggregate Gradation:

- a. Structures. Select one of the gradations shown in the following table.
- b. Combined Gradation Limits. Limits shown are for coarse aggregates and fine aggregates mixed together (combined).

| Sieve Sizes | Combined Gradation | | |
|-------------|--------------------|----------|-----------|
| | Percentage Passing | | |
| | 1-1/2" Max. | 1" Max. | 3/4" Max. |
| 2" | - 100 | - | - |
| 1-1/2" | 95 - 100 | - 100 | - |
| 1" | 65 - 85 | 90 - 100 | - 100 |

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| Sieve Sizes | Combined Gradation | | |
|----------------|--------------------|------------|--------------|
| | Percentage Passing | | |
| | 1-1/2" Max. | 1" Max. | 3/4" Max. |
| 3/4" | 55 - 75 | 70 - 90 | 92 - 100 |
| 1/2" | - | | 68 - 86 |
| 3/8" | 40 - 55 | 45 - 65 | 57 - 74 |
| No. 4 | 30 - 45 | 31 - 47 | 38 - 57 |
| No. 8 | 23 - 38 | 23 - 40 | 28 - 46 |
| No. 16 | 16 - 30 | 17 - 35 | 20 - 36 |
| No. 30 | 10 - 20 | 10 - 23 | 14 - 25 |
| No. 50 | 4 - 10 | 2 - 10 | 5 - 14 |
| No. 100 | 0 - 3 | 0 - 3 | 0 - 5 |
| No. 200 | 0 - 2 | 0 - 2 | 0 - 2 |

F. Tremie Concrete:

- a. Minimum cement content of 658 pounds per cubic yard.
- b. Use high range water reducing admixture (superplasticizers) admixture in accordance with ASTM C494, Type F or Type G.
- c. Fine Aggregate Range: 40 to 50 percent of total aggregates by weight.
- d. Use natural round gravel if available in Project area.
- e. Proportion mix for design strength and slump range of 6 to 9 inches with maximum water-cement ratio.
- f. Use anti-washout admixture in accordance with manufacturer's recommendations.

2.3 CONCRETE MIXING**A. General. In accordance with ACI 304R.****B. Concrete Mix Temperatures. As shown below for various stages of mixing and placing:**

| CONCRETE TEMPERATURES | |
|-----------------------|---|
| | Concrete Member Size, Minimum Dimension |

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| Ambient Air Temp. | <12" | 12"-36" | 36"-72" | >72" |
|---|-----------|-----------|-----------|-----------|
| Minimum concrete temperature as mixed for indicated air temperature: | | | | |
| Above 30 deg. F | 60 deg. F | 55 deg. F | 50 deg. F | 45 deg. F |
| 0 to 30 deg. F | 65 deg. F | 60 deg. F | 55 deg. F | 50 deg. F |
| Below 0 deg. F | 70 deg. F | 65 deg. F | 60 deg. F | 55 deg. F |
| Maximum allowable gradual temperature drop in first 24 hours after curing period and after end of protection: | | | | |
| — | 50 deg. F | 40 deg. F | 30 deg. F | 20 deg. F |

C. Truck Mixers:

- a. Equip with electrically actuated counters to readily verify number of revolutions of drum or blades.
- b. Counter:
 - i. **Resettable, recording type, mounted in driver's cab.**
 - ii. **Actuated at time of starting mixers at mixing speeds.**
- c. Truck mixer operation shall furnish concrete batch as discharged that is homogeneous with respect to consistency, mix, and grading.
- d. If slump tests taken at approximately 1/4 and 3/4 points of load during discharge give slumps differing by more than 2 inches when specified, slump is more than 4 inches, discontinue use of truck mixer unless causing condition is corrected and satisfactory performance is verified by additional slump tests.
- e. Before attempting to reuse unit, check mechanical details of mixer, such as water measuring, and discharge apparatus, condition of blades, speed of rotation, general mechanical condition of unit, admixture dispensing equipment, and clearance of drum.
- f. Do not use nonagitating or combination truck and trailer equipment for transporting ready-mixed concrete.
- g. Concrete Volume in Truck:
 - i. **Limit to 63 percent of total volume capacity in accordance**

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with ASTM C94 when truck mixed.

ii. Limit to 80 percent of total volume capacity when central mixed.

- h. Mix each batch of concrete in truck mixer for minimum 70 revolutions of drum or blades at rate of rotation designated by equipment manufacturer.
- i. Perform additional mixing, if required, at speed designated by equipment manufacturer as agitating speed.
- j. Place materials, including mixing water, in mixer drum before actuating revolution counter for determining number of mixing revolutions.

D. Aggregates. Thoroughly and uniformly wash before use.

E. Admixtures:

- a. Air-Entraining Admixture. Add at plant through manufacturer-approved dispensing equipment.
- b. Water Reducers. Add prior to addition of high range water reducing admixture (superplasticizers).
- c. High range water reducing admixture (superplasticizers) and Air-Entraining Admixtures:
 - i. **Add at concrete plant only through equipment furnished or approved by admixture manufacturer.**
 - ii. **Accomplish variations in slump, working time, and air content for flowable mixes by increasing or reducing high range water reducing admixture (superplasticizers) dose or air-entraining admixture dose at ready-mix plant only.**
 - iii. **Equipment shall provide for easy and quick visual verification of admixture amount used for each dose.**

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- iv. **Add discharge amount to each load of concrete into separate dispensing container, verify amount is correct, and add to concrete.**
- v. **Additional dosage of high range water reducing admixture (superplasticizers) may be added in field using manufacturer-approved dispensing when unexpected delays cause too great of slump loss.**

2.4 SOURCE QUALITY CONTROL

- A. **Cement. Test for total chloride content.**
- B. **Fly Ash. Test in accordance with ASTM C311.**
- C. **Batch Plant Inspection. Engineer shall have access to and have right to inspect batch plants, cement mills, and supply facilities of suppliers, manufacturers, and Subcontractors, providing products included in these Specifications.**
 - a. **Weighing Scales. Tested and certified within tolerances set forth in the National Bureau of Standards Handbook No. 44.**
 - b. **Batch Plant Equipment. Either semiautomatic or fully automatic in accordance with ASTM C94.**

PART 3 EXECUTION

3.1 PLACING CONCRETE

- A. **Preparation. Meet requirements and recommendations of ACI 304R and ACI 301, except as modified herein.**
- B. **Inspection. Notify Engineer at least 1 full working day in advance before starting to place concrete.**
- C. **Discharge Time:**
 - a. As determined by set time, do not exceed 1-1/2 hours after adding cement to water unless special approved time delay admixtures are used. Coordinate time delay admixture information with manufacturer and Engineer prior to placing concrete.

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- b. Adjust slump or air content at Site by adding admixtures for particular load when approved by Engineer. Then, adjust plant dosage for remainder of placement. Additional dosage at Site shall be through approved dispenser supplied by admixture manufacturer.
- c. Maintain required slump throughout time of concrete placement and consolidation. Discontinue use of high range water reducing admixture (superplasticizers) and provide new mix design if it fails to maintain slump between 4 to 8 inches and produce good consolidation for the length of time required. Redesign mix adjusting set control admixtures to maintain setting time in range required.

D. Placement into Formwork:

- a. Before depositing concrete, remove debris from space to be occupied by concrete.
- b. Prior to placement of concrete, dampen fill under slabs on ground, dampen sand where vapor retarder is specified, and dampen wood forms.
- c. Reinforcement, Secure in position before placing concrete.
- 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 1.5 feet deep, except for slabs which shall be placed full depth. Place and consolidate successive layers prior to initial set of first layer to prevent cold joints.
- e. Use placement devices, for example, chutes, pouring spouts, and pumps.
- f. Vertical Free Fall Drop to Final Placement: 5 feet in forms 8 inches or less wide and 8 feet in forms wider than 8 inches, except as specified.

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- i. **For placements where drops are greater than specified, use placement device such that free fall below placement device conforms to required value.**
 - ii. **Limit free fall to prevent segregation caused by aggregates hitting reinforcing steel.**
- g. Do not use aluminum conveying devices.
- h. Provide sufficient illumination in the interior of forms so concrete deposition is visible, permitting confirmation of consolidation quality.
- i. Joints in Footings and Slabs:
 - i. **Ensure space beneath plastic water stop completely fills with concrete.**
 - ii. **During concrete placement, make visual inspection of entire water stop area.**
 - iii. **Limit concrete placement to elevation of water stop in first pass, vibrate concrete under water stop, lift water stop to confirm full consolidation without voids, place remaining concrete to full height of slab.**
 - iv. **Apply procedure to full length of water stops.**
- j. If reinforcement is in direct sunlight or is more than 20 degrees F higher in temperature than concrete temperature before placement, wet reinforcement with water fog spray before placing concrete to cool reinforcement.
- k. Trowel and round off top exposed edges of walls with 1/4-inch radius steel edging tool.

- a. Design and arrange ends of chutes, hopper gates, and other points of concrete discharge throughout conveying, hoisting, and placing

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system for concrete to pass without becoming segregated.

- b. Do not use chutes longer than 50 feet.
- c. Minimum Slopes of Chutes, Angled to allow concrete to readily flow without segregation.
- d. Conveyor Belts:
 - i. **Approved by Engineer.**
 - ii. **Wipe clean with device that does not allow mortar to adhere to belt.**
 - iii. **Cover conveyor belts and chutes.**

F. Retempering. Not permitted for concrete where cement has partially hydrated.

G. **Pumping of Concrete:**

- a. Provide standby pump, conveyor system, crane and concrete bucket, or other system onsite during pumping, for adequate redundancy to assure completion of concrete placement without cold joints in case of primary placing equipment breakdown.
- b. Minimum Pump Hose (Conduit) Diameter. 4 inches.
- c. Replace pumping equipment and hoses (conduits) that are not functioning properly.

H. **Maximum Size of Concrete Placements:**

- a. Limit size of each placement to allow for strength gain and volume change due to shrinkage.
- b. Locate expansion, control, contraction, and construction joints where shown. When expansion or control joints are not shown, provide construction joints at maximum spacing of 40 feet. When expansion or control joint spacing exceeds 60 feet, provide intermediate construction joints at maximum spacing of 40 feet.

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Uniformly space construction joints. Vertical construction joint shall not be greater than 20 feet from wall corners or intersections.

- c. Consider beams, girders, brackets, column capitals, and haunches as part of floor or roof system and place monolithically with floor or roof system.
- d. Should placement sequence result in cold joint located below finished water surface, install water stop in joint.

I. Minimum Time Between Adjacent Placements:

- a. Construction Joints. 14 days (7 days wet cure and 7 days dry cure).
- b. Control Joints. 6 days.
- c. Expansion Joints/Contraction Joints. 1 day.
- d. At least 2 hours shall elapse after depositing concrete in long columns and walls thicker than 8 inches before depositing concrete in beams, girders, or slabs supported thereon.
- e. For columns and walls 10 feet in height or less, wait at least 45 minutes prior to depositing concrete in beams, girders, brackets, column capitals, or slabs supported thereon.

J. Removal of Water. Unless tremie method for placing concrete is specified, remove water from space to be occupied by concrete.

K. Consolidation and Visual Observation:

- a. Consolidate concrete with internal vibrators with minimum frequency of 8,000 cycles per minute and amplitude as required to consolidate concrete in section being placed.
- b. Provide at least one standby vibrator in operable condition at placement Site prior to placing concrete.
- c. Consolidation Equipment and Methods: ACI 309R.

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- d. Provide sufficient windows in forms or limit form height to allow for concrete placement through windows and for visual observation of concrete.
- e. Vibration consolidation shall not exceed distance of 3 feet from point of placement.
- f. Vibrate concrete in vicinity of joints to obtain impervious concrete.

L. Hot Weather:

- a. Prepare ingredients, mix, place, cure, and protect in accordance with ACI 305R.
- b. Placement frequency shall be such that lift lines will not be visible in exposed concrete finishes.
- c. Maintain concrete temperature below 90 degrees F at time of placement, or furnish test data or provide other proof that admixtures and mix ingredients do not produce flash set plastic shrinkage, or cracking due to heat of hydration. Cool ingredients before mixing to maintain fresh concrete temperatures as specified or less.
- d. Provide for windbreaks, shading, fog spraying, sprinkling, ice, wet cover, or other means as necessary to maintain concrete at or below specified temperature.
- e. Prevent differential temperature between reinforcing steel and concrete.
- f. Evaporation Retardant: As specified in Section 03370, Concrete Curing.

3.2 PLACING TREMIE CONCRETE SEALS

- A. Place concrete when water level inside area to be filled with concrete is equal to groundwater elevation outside.**

- B. Maintain relation of water levels until concrete design strength is**

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obtained.

3.3 CONCRETE BONDING

A. Horizontal Construction Joints in Reinforced Concrete Walls:

- a. Thoroughly clean and saturate surface of joint with water.
- b. Limit slurry concrete placement to 2-inch maximum thickness, 1-inch minimum thickness.
- c. Use positive measuring device such as bucket or other device that will contain only enough slurry concrete for depositing in visually measurable area of wall to ensure that portion of form receives appropriate amount of slurry concrete to satisfy placement thickness requirements.
- d. Do not deposit slurry concrete from pump hoses or large concrete buckets, unless specified placement thickness can be maintained and verified through inspection windows close to joint.
- e. Limit concrete placed immediately on top of slurry concrete to 12 inches thick. Thoroughly vibrate to mix concrete and slurry concrete together.

B. To Existing Concrete:

- a. Thoroughly clean and mechanically roughen existing concrete surfaces to roughness profile of 1/4 inch.
- b. Saturate surface with water for 24 hours prior to placing new concrete.

3.4 CONSTRUCTION JOINTS

A. As specified in Section 03251, Concrete Joints.

3.5 REPAIRING CONCRETE

A. General:

- a. Inject cracks that leak with crack repair epoxy.

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- b. Obtain quantities of repair material and manufacturer's detailed instructions for use to provide repair with finish to match adjacent surface or apply sufficient repair material adjacent to repair to blend finish appearance.
- c. Repair of concrete shall provide structurally sound surface finish, uniform in appearance or upgrade finish by other means until acceptable to Engineer.

B. Tie Holes:

- a. Fill with nonshrink grout as specified in Section 03600, Grout.
- b. Match color of adjacent concrete and demonstrate on mockup panels first.
- c. Compact grout using steel hammer and steel tool to drive grout to high density. Cure grout with water.

C. Alternate Form Ties; Through-Bolts:

- a. Mechanically roughen entire interior surface of through hole. Epoxy coat roughened surface and drive elastic vinyl plug to half depth. Dry pack entire hole from both sides of plug with nonshrink grout, as specified in Section 03600, Grout. Use only enough water to dry pack grout. Dry pack while epoxy is still tacky. If epoxy has dried, remove epoxy by mechanical means and reapply new epoxy.
- b. Compact grout using steel hammer and steel tool to drive grout to high density. Cure grout with water.

D. Exposed Metal Objects:

- a. Metal objects not intended to be exposed in as-built condition of structure including wire, nails, and bolts, shall be removed by chipping back concrete to depth of 1 inch and then cutting or removing metal object.
- b. Repair area of chipped-out concrete per requirements of

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Section 03720, Vertical And Overhead Concrete Repair Systems.

E. Blockouts at Pipes or Other Penetrations:

- a. Install per details shown on Drawings or submit proposed blockouts for review.
- b. Use nonshrink, nonmetallic grout.

3.6 CONCRETE WALL FINISHED

A. Type W-1 (Ordinary Wall Finish):

- a. Patch tie holes.
- b. Knock off projections.
- c. Patch defective areas.

B. Type W-2 (Smooth Wall Finish):

- a. Patch tie holes.
- b. Grind off projections, fins, and rough spots.
- c. Patch defective areas and repair rough spots resulting from form release agent failure or other reasons to provide smooth uniform appearance.

C. Type W-4 (Finish for Cementitious Coatings):

- a. Patch tie holes.
- b. Grind off projections, fins, and rough spots.
- c. Patch and repair defective areas as specified for Type W-2.

D. Type W-5 (Finish for Painting):

- a. Patch tie holes.

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- b. Grind off projections, fins, and rough spots.
 - c. Patch and repair defective areas as specified for Type W-2.
 - d. Leave surface ready for painting as specified in Section 09900, Painting and Protective Coatings.
- E. Type W-7 (Smooth Rubbed Wall Finish):**
- a. Only water curing will be permitted on walls being rubbed.
 - b. Perform rubbing while green concrete can be physically worked and smoothed without adding other materials, if structurally possible, the day following placement. Finish no later than 3 days after placement has been completed.
 - c. Remove forms at such a rate that all finishing, form tie filling, fin removal, and patching can be completed on same day forms are removed while curing wall.
 - d. After pointings have set sufficiently to permit working on surface, thoroughly saturate entire surface with water for period of 3 hours and rub until uniform surface is obtained.
 - e. Rub either by hand with carborundum stone of medium-coarse grade or abrasive of equal quality, or mechanically operated carborundum stone.
 - f. Mechanically operated carborundum stones shall be approved by Engineer before concrete finishing.
 - g. No cement grout, other than cement paste drawn from the concrete itself by the rubbing process shall be used.
 - h. Finish paste formed by rubbing by either brushing or floating as follows:

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i. Brushing:

- a. Carefully strike with clean brush.
- b. Brush in long direction of surface being finished.

i. Floating:

- a. Spread uniformly over surface and allow to reset.
- b. Finish by floating with canvas, carpet face, or cork float, or rub down with dry burlap.

- j. Continue water curing of wall during finishing operation in areas not being rubbed.
- k. Move water curing onto rubbed areas as soon as water will not erode rubbed surface.

F. Type W-8 (Rubbed Wall Finish):

- a. Meet requirements for Type W-7, except allow paste obtained from rubbing to set at least 24 hours.
- b. After thoroughly saturating with water, coat surface with mixture of 85 percent cement and 15 percent lime with sufficient water to give creamy consistency. Demonstrate on sample panel prior to production finishing.
- c. Rub this mixture into surface with coarse carborundum stone and brush with damp brush.
- d. Brush in long direction of surface being finished.
- e. Latex bonding admixture may be used. Consult with Euclid Chemical Co., Cleveland, OH or Master Builders Co., Cleveland, OH.

G. Type W-9 (Grout Cleaned Finish):

- a. Meet requirements for Type W-7, except that finish must be accomplished within 7 days of placement.

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- b. Grout. Mixed with 1 part Portland cement and 1-1/2 parts fine sand and bonding agent to produce grout with consistency of thick paint. White Portland cement shall be substituted for part of gray Portland cement in order to produce color matching color of surrounding concrete, as determined by trial patch.
- c. Wet surface of concrete sufficiently to prevent absorption of water from grout and apply grout uniformly with brushes or spray gun.
- d. Immediately after applying grout, scrub surface vigorously with cork float or stone to coat surface and fill air bubbles and holes.
- e. While grout is still plastic, remove excess grout by working surface with rubber float, burlap, or other means. After surface whitens from drying (about 30 minutes at 70 degrees F), rub vigorously with clean burlap. Continue to water cure wall until curing period of 7 days is complete.
- f. Latex bonding admixture may be used.

H. W-10 (Fractured Fin Finish):

- a. Form exterior surface of walls with approved form liner.
- b. Use stainless steel form ties and place at valleys.
- c. Patch form tie holes.
- d. Achieve final texture by light sandblast and then breaking off tips of ridge with light bushhammering, or other approved process.
- e. Same person starting bushhammering shall complete process for any given structure and match approved mockup panel.

I. Type W-11 (Abrasive Blast - Sandblast Finish):

- a. Intent of this procedure is to remove surface skin to depth no more than 1/16 inch, and expose only fine aggregate and air holes near

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surface, thus producing uniform texture.

- b. Perform sandblasting on building or on concrete surfaces in same area of view at same time and obtain uniformity of appearance.
- c. Same person shall accomplish sandblasting on one structure and on concrete in same area.
- d. Perform sandblasting to match approved mockup panel.
- e. Abrasive. Use clean silica sand, free of foreign materials, and supplied in sealed sacks.
- f. Blast surface with 100 psi air pressure at rate of 2 to 3 square feet per minute with nozzle held approximately 2 feet from surface and perpendicular thereto.

3.7 CONCRETE SLAB FINISHED

A. General:

- a. Finish slab concrete per the requirements of ACI 302.1R.
- b. Use manual screeds, vibrating screeds, or roller compacting screeds to place concrete level and smooth.
- c. Do not use "jitterbugs" or other special tools designed for purpose of forcing coarse aggregate away from surface and allowing layer of mortar, which will be weak and cause surface cracks or delamination, to accumulate.
- d. Do not dust surfaces with dry materials.
- e. Use evaporation retardant.
- f. Round off edges of slabs with steel edging tool, except where cove finish is shown. Steel edging tool radius shall be 1/4 inch for slabs subject to wheeled traffic.

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B. Type S-1 (Steel Troweled Finish):

- a. Finish by screeding and floating with straightedges to bring surfaces to required finish elevation. Use evaporation retardant.
- b. While concrete is still green, but sufficiently hardened to bear a person's weight without deep imprint, wood float to true, even plane with no coarse aggregate visible.
- c. Use sufficient pressure on wood floats to bring moisture to surface.
- d. After surface moisture has disappeared, hand trowel concrete to produce smooth, impervious surface, free from trowel marks.
- e. Burnish surface with an additional troweling. Final troweling shall produce ringing sound from trowel.
- f. Do not use dry cement or additional water during troweling, nor will excessive troweling be permitted.
- g. Power Finishing:
 - i. **Approved power machine may be used in lieu of hand finishing in accordance with directions of machine manufacturer.**
 - ii. **Do not use power machine when concrete has not attained necessary set to allow finishing without introducing high and low spots in slab.**
 - iii. **Do first steel troweling for slab S-1 finish by hand.**

C. Type S-2 (Wood Float Finish):

- a. Finish slab to receive fill and mortar setting bed by screeding with straightedges to bring surface to required finish plane.
- b. Wood float finish to compact and seal surface.

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c. Remove laitance and leave surface clean.

d. Coordinate with other finish procedures.

D. Type S-4 (Exposed Aggregate Finish):

a. Embed single layer of selected aggregates at surface of concrete slab immediately after it has been placed, screeded, and smoothed.

b. Embed aggregates by tamping with wood float, darby, or rolling device.

c. Accomplish exposure of selected aggregates by removing surface matrix by washing with water and brushing with stiff plastic bristled brush as soon as concrete has set sufficiently to support weight of a person.

d. Exposure. No greater than 1/3 the average diameter of aggregate, nor less than 1/4.

e. Next day acid wash until there is no noticeable cement film on aggregate exposed.

f. Apply clear sealer per manufacturer's recommendations.

E. Type S-5 (Broomed Finish):

a. Finish as specified for Type S-1 floor finish, except omit final troweling and finish surface by drawing fine-hair broom lightly across surface.

b. Broom in same direction and parallel to expansion joints, or, in the case of inclined slabs, perpendicular to slope, except for round roof slab, broom surface in radial direction.

F. Type S-6 (Sidewalk Finish):

a. Slope walks down 1/4 inch per foot away from structures, unless otherwise shown.

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- b. Strike off surface by means of strike board and float with wood or cork float to true plane, then flat steel trowel before brooming.
- c. Broom surface at right angles to direction of traffic or as shown.
- d. Lay out sidewalk surfaces in blocks, as shown or as directed by Engineer, with grooving tool.

G. Concrete Curbs:

- a. Float top surface of curb smooth, and finish all discontinuous edges with steel edger.
- b. After concrete has taken its initial set, remove front form and give exposed vertical surface an ordinary wall finish, Type W-1.

3.8 CONCRETE SLAB TOLERANCES**A. Slab Tolerances:**

- a. Exposed Slab Surfaces. Comprise of flat planes as required within tolerances specified.
- b. Slab Finish Tolerances and Slope Tolerances. Crowns on floor surface not too high as to prevent 10-foot straightedge from resting on neither end blocks, nor low spots that allow block of twice the tolerance in thickness to pass under supported 10-foot straightedge.
- c. Slab Type S-A. Steel gauge block 5/16 inch thick.
- d. Slab Type S-B. Steel gauge block 1/8 inch thick.
- e. Slab Type S-A and S-B: Finish Slab Elevation. Slope slabs to floor drain and gutter, and shall adequately drain regardless of tolerances.
- f. Thickness. Maximum 1/4 inch minus or 1/2 inch plus from thickness shown. Where thickness tolerance will not affect slope, drainage,

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or slab elevation, thickness tolerance may exceed 1/2 inch plus.

- B. **Thickness.** Maximum 1/4 inch minus or 1/2 inch plus from thickness shown. Where thickness tolerance will not affect slope, drainage, or slab elevation, thickness tolerance may exceed 1/2 inch plus.

3.9 BEAM AND COLUMN FINISHED

- A. **General.** Inject cracks with crack repair epoxy. Patch and repair defective areas.

- B. **Match Wall Type:**

- a. Repair rock pockets.
- b. Fill air voids.

3.10 BACKFILL AGAINST WALLS

- A. **Do not backfill** against walls until concrete has obtained specified 28-day compressive strength.
- B. **Place backfill simultaneously** on both sides of wall, where required, to prevent differential pressures.

3.11 FIELD QUALITY CONTROL

- A. **General:**
- a. Provide adequate facilities for safe storage and proper curing of concrete test cylinders onsite for first 24 hours, and for additional time as may be required before transporting to test lab.
 - b. Provide concrete for testing of slump, air content, and for making cylinders from the point of discharge into forms. When concrete is pumped, Samples used shall be taken from discharge end of pump hose.
 - c. Evaluation will be in accordance with ACI 301 and Specifications.
 - d. Specimens shall be made, cured, and tested in accordance with ASTM C31 and ASTM C39.

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- e. Frequency of testing may be changed at discretion of Engineer.
- f. Pumped Concrete. Take concrete samples for slump (ASTM C143) and test cylinders (ASTM C31 and C39) and shrinkage specimens (ASTM C157) at placement (discharge) end of line.
- g. Reject concrete represented by cylinders failing to meet strength and air content specified.

B. Tolerances:

- a. Walls. Measure and inspect walls for compliance with tolerances specified in Section 03100, Concrete Formwork.
- b. Slab Finish Tolerances and Slope Tolerances:
 - i. **Floor flatness measurements shall be made day after floor is finished and before shoring is removed to eliminate effects of shrinkage, curing, and deflection.**
 - ii. **Support 10-foot long straightedge at each end with steel gauge blocks of thicknesses equal to specified tolerance.**
 - iii. **Compliance with designated limits in four of five consecutive measurements is satisfactory, unless defective conditions are observed.**

C. Water Leakage Tests:

- a. Purpose. Determine integrity and watertightness of finished exterior and interior water holding concrete surfaces.
- b. Potable Water Supply Reservoirs. Clean and sterilize prior to conducting test as specified in Section 02519, Disinfection of Water Systems.
- c. Water-Holding Structures:
 - i. **Perform leakage tests after concrete structure is complete and capable of resisting hydrostatic pressure of water test.**

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Concrete shall have achieved its full design strength.

- ii. Perform leakage test before backfill, brick facing, grout topping slab, coatings, or other work that will cover concrete surfaces has begun.**
 - iii. Install temporary bulkheads, cofferdams, and pipe blind flanges, and close valves. Inspect each to see that it provides complete seal.**
 - iv. Fill with water to test level shown, or maximum liquid level if no test level is given. Maintain this level for 72 hours prior to start of test to allow water absorption, structural deflection, and temperature to stabilize.**
 - v. Measure evaporation and precipitation by floating a partially filled, transparent, calibrated, open top container.**
 - vi. Measure water surface at two points 180 degrees apart when possible where attachments, such as ladders exist, at 24-hour intervals. Using sharp pointed hook gauge and fixed metal measure capable of reading to 1/100 of an inch. Continue test for period of time sufficient to produce at least 1/2-inch drop in water surface based on assumption that leakage would occur at maximum allowable rate specified or for 72 hours, whichever is lesser time.**
- d. Acceptance Criteria:**
 - i. Volume loss shall not exceed 0.075 percent of contained liquid volume in 24-hour period, correcting for evaporation, precipitation, and settlement.**
 - ii. No damp spots or seepage visible on exposed surfaces. Damp spot is defined as sufficient moisture to be transferred to dry hand upon touching.**
- e. Repairs When Test Fails: Dewater structure; fill leaking cracks with crack repair epoxy as specified in Section 03740, Concrete Repair Crack Injection. Patch areas of damp spots previously recorded, and**

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repeat water leakage test in its entirety until the structure successfully passes the test.

3.12 MANUFACTURER'S SERVICES

A. Provide the following representative at Site in accordance with Section 01640, Manufacturers' Services, for installation assistance, inspection, and certification of proper installation for concrete ingredients, mix design, mixing, and placement.

a. Batch Plant Representative:

- i. Observe how concrete mixes are performing.**
- ii. Be present during first placement of each type of concrete mix.**
- iii. Assist with concrete mix design, performance, placement, weather problems, and problems as may occur with concrete mix throughout Project.**
- iv. Establish control limits on concrete mix designs.**

b. Admixture Manufacturer's Representative:

- i. Demonstrate special features, product performance, product mixing, testing, and placement or installation for each type of admixture.**
- ii. Observe how concrete mixes are performing.**
- iii. Be present during first placement of each type of concrete mix.**
- iv. Assist with concrete mix design, performance, placement, weather problems, and problems as may occur with concrete mix throughout Project, including instructions for redosing.**
- v. Provide equipment for control of concrete redosing for air entrainment or high range water reducing admixture (superplasticizers) at Site to maintain proper slump and air**

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content if so needed.

- c. Bonding Agent Manufacturer's Representative: Demonstrate product performance, product mixing, and placement.

3.13 PROTECTION OF INSTALLED WORK

- A. After curing as specified in Section 03370, Concrete Curing, and after applying final floor finish, cover slabs with plywood or particle board or plastic sheeting or other material to keep floor clean and protect it from material and damage due to other construction work.
- B. Repair defective areas and areas damaged by construction.

END OF SECTION

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SECTION 03370 - CONCRETE CURING

PART 1 GENERAL

1.1 THE REQUIREMENT

- A. Protect all freshly deposited concrete from premature drying and excessively hot or cold temperatures, and maintain with minimal moisture loss at a relatively constant temperature for the period of time necessary for the hydration of the cement and proper hardening of the concrete in accordance with requirements specified herein.

1.2 RELATED WORK SPECIFIED ELSEWHERE

- A. Concrete Framework
- B. Joints in Concrete
- C. Cast-in-Place Concrete
- D. Grout
- E. Concrete Finishes

1.3 SUBMITTALS

- A. In accordance with the procedures and requirements set forth in the Section entitled "Submittals", the contractor shall submit the following:
 - a. Request for acceptance along with procedures for protection of concrete under wet weather placement conditions.
 - b. Request for placement along with proposed procedures for hot weather placement.
 - c. Request for acceptance and proposed materials and procedures for moisture preservation.

1.4 REFERENCE SPECIFICATIONS, CODES AND STANDARDS

- A. Without limiting the generality of other requirements of these specifications all work hereunder shall conform to the applicable requirements of the referenced portions of the following documents, to the extent that the requirements therein are not in conflict with the provisions of this Section.
 - a. Specifications for Structural Concrete for buildings, ACI 301.
 - b. Guide for Measuring, Mixing, Transporting, and Placing Concrete, ACI 304.
 - c. Hot Weather Concreting, ACI 305.

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- d. Specifications for Sheet Materials for Curing Concrete, ASTM C171.
- e. Specification for Liquid Membrane - Forming Compounds for Curing Concrete, ASTM C309.
- f. Federal Specification TT-C-800.

1.5 QUALITY ASSURANCE

- A. Curing compound shall not be used on any surface where concrete or other material will be bonded unless the manufacturer certifies that the curing compound will not prevent bond or indicates measures to be taken to completely remove the curing compound from areas to receive bonded applications.
- B. Care shall be taken to ensure that curing compounds are compatible with all finish concrete castings.

PART 2 PRODUCTS**2.1 CURING COMPOUNDS**

- A. All materials shall meet the ASTM specifications C309, Type 1-D or Federal Specification TT-C-800 and shall have a minimum solids content of 30 percent.

PART 3 EXECUTION**3.1 PROTECTION AND CURING**

- A. All concrete work shall be protected from the elements, flowing water and from defacement of any nature during construction operations.
- B. Immediately after placement, protect concrete from premature drying, excessively hot or cold temperatures, and mechanical injury. Protect concrete during the curing period such that the concrete temperature does not fall below the requirements of Section 3.02 -Concrete Temperature. Cure concrete in accordance with paragraph E or paragraph F.
- C. When concrete is placed in cold weather as defined in ACI 306, the concrete shall be protected in accordance with requirements of ACI 306, Cold Weather Concreting.
- D. When concrete is placed in hot weather as defined in ACI 305, the concrete shall be protected in accordance with the requirements of ACI 305, Hot Weather Concreting.
- E. After placing and finishing, use one or more of the following methods to preserve moisture in concrete:
 - a. Ponding or continuous fogging or sprinkling.
 - b. Application of mats or fabric kept continuously wet.

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- c. Continuous application of steam (under 150 degrees Fahrenheit).
 - d. Application of sheet materials conforming to ASTM C171.
 - e. Application of a curing compound conforming to ASTM C309 or Federal Specification TT-C-800. Apply the compound in accordance with the manufacturer's recommendation on after water sheen has disappeared from the concrete surface and after finishing operations. The rate of application shall not exceed 200 square feet per gallon. For rough surfaces, apply in two directions at right angles to each other.
- F. Keep absorbent forms wet until they are removed. After form removal, cure concrete by one of the methods in paragraph E. Frames may be "cracked" within twenty-four hours and kept moist until they are required to be kept in place per Section 03100.

3.2 CONCRETE TEMPERATURE

- A. When the average of the highest and lowest temperature during the period from midnight to midnight is expected to drop below 40 F for more than three successive days, concrete shall be delivered to meet the following minimum temperature immediately after placement:
- a. 55 degrees Fahrenheit for sections less than 12 in. in the least dimension
 - b. 50 degrees Fahrenheit for sections 12 in. to 36 in. in the least dimension
 - c. 45 degrees Fahrenheit for sections 36 in. to 72 in. in the least dimension
 - d. 40 degrees Fahrenheit for sections greater than 72 in. in the least dimension
- B. The temperature of concrete as placed shall not exceed these values by more than 20 degrees Fahrenheit.
- C. These minimum requirements may be terminated when temperatures above 50 degrees Fahrenheit occur during more than half of any 24 hour duration.
- D. Unless otherwise specified or permitted, the temperature of concrete as delivered shall not exceed 90 degrees Fahrenheit.
- E. During and following curing, do not allow the surface of the concrete to change temperature more than the following:
- a. 50 degrees Fahrenheit in any 24-hr period for sections less than 12 in. in the least dimension.
 - b. 40 degrees Fahrenheit for sections from 12 to 36 in. in the least dimension.
 - c. 30 degrees Fahrenheit for sections 36 to 72 in. in the least dimension.
 - d. 20 degrees Fahrenheit for sections greater than 72 in. in the least dimension.

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3.3 FINAL CURING

- A. Cure for at least the first seven days after placement for all concrete except high early strength concrete, for which the period shall be at least the first three days after placement.
- a. Alternatively, moisture retention measures may be terminated when:
- i. Tests are made on at least two additional cylinders kept adjacent to the structure and cured by the same methods as the structure and tests indicate 70 percent of the specified compressive strength, f'c, as determined in accordance with ASTM C39.
 - ii. The temperature of the concrete is maintained at 50 degrees fahrenheit or higher for the time required to achieve 85 percent of f'c in laboratory-cured cylinders representative of the concrete in place.
 - iii. The strength of concrete reaches f'c as determined by accepted nondestructive methods or laboratory-cured cylinder test results.
- B. When one of the curing procedures in Paragraph 3.01-E is used initially, the curing procedure may be replaced by one of the other procedures when concrete is one day old, provided concrete is not permitted to become surface dry at any time.

END OF SECTION

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SECTION 03600 - GROUT

PART 1 GENERAL

1.1 SCOPE OF WORK

- A. Furnish all labor, materials, equipment and incidentals required and install grout complete as shown on the Drawings and as specified herein.

1.2 SUBMITTALS

- A. Submit to the Engineer, in accordance with Section 01300, shop drawings and product data showing materials of construction and details of installation for:
- a. Commercially manufactured nonshrink cementitious grout. The submittal shall include catalog cuts, technical data, storage requirements, product life, working time after mixing, temperature considerations, conformity to required ASTM standards and Material Safety Data Sheet.
 - b. Commercially manufactured nonshrink epoxy grout. The submittal shall include catalog cuts, technical data, storage requirements, product life, working time after mixing, temperature considerations, conformity to required ASTM standards and Material Safety Data Sheet.
 - c. Cement grout. The submittal shall include the type and brand of the cement, the gradation of the fine aggregate, product data on any proposed admixtures and the proposed mix of the grout.
 - d. Concrete grout. The submittal shall include data as required for concrete and fiber reinforcement as delineated in Section. This includes the mix design, constituent quantities per cubic yard and the water/cement ratio.
- B. Samples
- a. Samples of commercially manufactured grout products when requested by the Engineer.
 - b. Aggregates for use in concrete grout when requested by the Engineer.
- C. Laboratory Test Reports
- a. Submit laboratory test data as required under Section 03300 for concrete to be used as concrete grout.
- D. Qualifications
- a. Grout manufacturers shall submit documentation that they have at least 10 years' experience in the production and use of the proposed grouts which they will supply.

1.3 REFERENCE STANDARDS

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- A. American Society for Testing and Materials (ASTM)
 - a. ASTM C531 - Standard Test Method for Linear Shrinkage and Coefficient of Thermal Expansion of Chemical Resistant Mortars, Grouts and Monolithic Surfacing and Polymer Concretes.
 - b. ASTM C579 - Standard Test Method for Compressive Strength of Chemical Resistant Mortars, Grouts and Monolithic Surfacing and Polymer Concretes.
 - c. ASTM C827 - Standard Test Method for Change in Height at Early Ages of Cylindrical Specimens from Cementitious Mixtures.
 - d. ASTM C1107 - Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Nonshrink).
 - e. ASTM D695 - Standard Test Method for Compressive Properties of Rigid Plastics.
- B. U.S. Army Corps of Engineers Standard (CRD)
 - a. CRD C-621 - Corps of Engineers Specification for Nonshrink Grout.
- C. Where reference is made to one of the above standards, the revision in effect at the time of bid opening shall apply.

1.4 QUALITY ASSURANCE

- A. Qualifications
 - a. Grout manufacturer shall have a minimum of 10 years experience in the production and use of the type of grout proposed for the work.
- B. Services of Manufacturer's Representative
 - a. A qualified field technician of the nonshrink grout manufacturer, specifically trained in the installation of the products, shall attend the pre-installation conference and shall be present for the initial installation of each type of nonshrink grout. Additional services shall also be provided, as required, to correct installation problems.
- C. Field Testing
 - a. All field testing and inspection services required shall be provided by the Owner. The Contractor shall assist in the sampling of materials and shall provide any ladders, platforms, etc, for access to the work. The methods of testing shall comply in detail with the applicable ASTM Standards.

1.5 DELIVERY, STORAGE AND HANDLING

- A. Deliver materials to the jobsite in original, unopened packages, clearly labeled with the

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manufacturer's name, product identification, batch numbers and printed instructions.

- B. Store materials in full compliance with the manufacturer's recommendations. Total storage time from date of manufacture to date of installation shall be limited to 6 months or the manufacturer's recommended storage time, whichever is less.
- C. Material which becomes damp or otherwise unacceptable shall be immediately removed from the site and replaced with acceptable material at no additional expense to the Owner.
- D. Nonshrink cement-based grouts shall be delivered as preblended, prepackaged mixes requiring only the addition of water.
- E. Nonshrink epoxy grouts shall be delivered as premeasured, prepackaged, three component systems requiring only blending as directed by the manufacturer.

1.6 DEFINITIONS

- A. Nonshrink Grout: A commercially manufactured product that does not shrink in either the plastic or hardened state, is dimensionally stable in the hardened state and bonds to a clean base plate.

PART 2 PRODUCTS

2.1 GENERAL

- A. The use of a manufacturer's name and product or catalog number is for the purpose of establishing the standard of quality desired.
- B. Like materials shall be the products of one manufacturer or supplier in order to provide standardization of appearance.

2.2 MATERIALS

- A. Nonshrink Cementitious Grout
 - a. Nonshrink cementitious grouts shall meet or exceed the requirements of ASTM C1107, Grades B or C and CRD C-621. Grouts shall be portland cement based, contain a pre-proportioned blend of selected aggregates and shrinkage compensating agents and shall require only the addition of water. Nonshrink cementitious grouts shall not contain expansive cement or metallic particles. The grouts shall exhibit no shrinkage when tested in conformity with ASTM C827.
 - i. General purpose nonshrink cementitious grout shall conform to the standards stated above and shall be SikaGrout 212 by Sika Corp.; Set Grout by Master Builders, Inc.; Gilco Construction Grout by Gifford Hill & Co.; Euco NS by The Euclid Chemical Co.; NBEC Grout by U. S. Grout Corp. or equal.
 - ii. Flowable (Precision) nonshrink cementitious grout shall conform to the standards stated above and shall be Masterflow 928 by Master Builders, Inc.; Hi-Flow Grout by the Euclid Chemical Co.; SikaGrout 212 by Sika

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Corp.; Supreme Grout by Gifford Hill & Co.; Five Star Grout by U. S. Grout Corp. or equal.

B. Nonshrink Epoxy Grout

- a. Nonshrink epoxy-based grout shall be a pre-proportioned, three component, 100 percent solids system consisting of epoxy resin, hardener, and blended aggregate. It shall have a compressive strength of 14,000 psi in 7 days when tested in conformity with ASTM D695 and have a maximum thermal expansion of 30×10^{-6} when tested in conformity with ASTM C531. The grout shall be Ceilcote 648 CP by Master Builders Inc.; Five Star Epoxy Grout by U.S. Grout Corp.; Sikadur 42 Grout-Pak by Sika Corp.; High Strength Epoxy Grout by the Euclid Chemical Co. or equal.

C. Cement Grout

- a. Cement grouts shall be a mixture of one part portland cement conforming to ASTM C150, Types I, II, or III and 1 to 2 parts sand conforming to ASTM C33 with sufficient water to place the grout. The water content shall be sufficient to impart workability to the grout but not to the degree that it will allow the grout to flow.

D. Concrete Grout

- a. Concrete grout shall conform to the requirements of Section 03300 except as specified herein. It shall be proportioned with cement, pozzolan, coarse and fine aggregates, water, water reducer and air entraining agent to produce a mix having an average strength of 2900 psi at 28 days, or 2500 psi nominal strength. Coarse aggregate size shall be $\frac{1}{2}$ in maximum. Slump should not exceed 5-in and should be as low as practical yet still retain sufficient workability.

E. Water

- a. Potable water, free from injurious amounts of oil, acid, alkali, organic matter, or other deleterious substances.

PART 3 EXECUTION

3.1 PREPARATION

- A. Grout shall be placed over cured concrete which has attained its full design strength unless otherwise approved by the Engineer.
- B. Concrete surfaces to receive grout shall be clean and sound; free of ice, frost, dirt, grease, oil, curing compounds, laitance and paints and free of all loose material or foreign matter which may effect the bond or performance of the grout.
- C. Roughen concrete surfaces by chipping, sandblasting, or other mechanical means to ensure bond of the grout to the concrete. Remove loose or broken concrete. Irregular voids or projecting coarse aggregate need not be removed if they are sound, free of

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laitance and firmly embedded into the parent concrete.

- a. Air compressors used to clean surfaces in contact with grout shall be the oilless type or equipped with an oil trap in the air line to prevent oil from being blown onto the surface.
- D. Remove all loose rust, oil or other deleterious substances from metal embedments or bottom of baseplates prior to the installation of the grout.
- E. Concrete surfaces shall be washed clean and then kept moist for at least 24 hours prior to the placement of cementitious or cement grout. Saturation may be achieved by covering the concrete with saturated burlap bags, use of a soaker hose, flooding the surface, or other method acceptable to the Engineer. Upon completion of the 24 hour period, visible water shall be removed from the surface prior to grouting. The use of an adhesive bonding agent in lieu of surface saturation shall only be used when approved by the Engineer for each specific location of grout installation.
- F. Epoxy-based grouts do not require the saturation of the concrete substrate. Surfaces in contact with epoxy grout shall be completely dry before grouting.
- G. Construct grout forms or other leakproof containment as required. Forms shall be lined or coated with release agents recommended by the grout manufacturer. Forms shall be of adequate strength, securely anchored in place and shored to resist the forces imposed by the grout and its placement.
 - a. Forms for epoxy grout shall be designed to allow the formation of a hydraulic head and shall have chamfer strips built into forms.
- H. Level and align the structural or equipment bearing plates in accordance with the structural requirements and the recommendations of the equipment manufacturer.
- I. Equipment shall be supported during alignment and installation of grout by shims, wedges, blocks or other approved means. The shims, wedges and blocking devices shall be prevented from bonding to the grout by appropriate bond breaking coatings and removed after grouting unless otherwise approved by the Engineer.

3.2 INSTALLATION - GENERAL

- A. Mix, apply and cure products in strict compliance with the manufacturer's recommendations and this Section.
- B. Have sufficient manpower and equipment available for rapid and continuous mixing and placing. Keep all necessary tools and materials ready and close at hand.
- C. Maintain temperatures of the foundation plate, supporting concrete, and grout between 40 and 90 degrees F during grouting and for at least 24 hours thereafter or as recommended by the grout manufacturer, whichever is longer. Take precautions to minimize differential heating or cooling of baseplates and grout during the curing period.
- D. Take special precautions for hot weather or cold weather grouting as recommended by

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the manufacturer when ambient temperatures and/or the temperature of the materials in contact with the grout are outside of the 60 and 90 degrees F range.

- E. Install grout in a manner which will preserve the isolation between the elements on either side of the joint where grout is placed in the vicinity of an expansion or control joint.
- F. Reflect all existing underlying expansion, control and construction joints through the grout.

3.3 INSTALLATION - CEMENT GROUTS AND NONSHRINK CEMENTITIOUS GROUTS

- A. Mix in accordance with manufacturer's recommendations. Do not add cement, sand, pea gravel or admixtures without prior approval by the Engineer.
- B. Avoid mixing by hand. Mixing in a mortar mixer (with moving blades) is recommended. Pre-wet the mixer and empty excess water. Add premeasured amount of water for mixing, followed by the grout. Begin with the minimum amount of water recommended by the manufacturer and then add the minimum additional water required to obtain workability. Do not exceed the manufacturer's maximum recommended water content.
- C. Placements greater than 3-in in depth shall include the addition of clean, washed pea gravel to the grout mix when approved by the manufacturer. Comply with the manufacturer's recommendations for the size and amount of aggregate to be added.
- D. Place grout into the designated areas in a manner which will avoid segregation or entrapment of air. Do not vibrate grout to release air or to consolidate the material. Placement should proceed in a manner which will ensure the filling of all spaces and provide full contact between the grout and adjoining surfaces. Provide grout holes as necessary.
- E. Place grout rapidly and continuously to avoid cold joints. Do not place cement grouts in layers. Do not add additional water to the mix (retemper) after initial stiffening.
- F. Just before the grout reaches its final set, cut back the grout to the substrate at a 45 degree angle from the lower edge of bearing plate unless otherwise approved by the Engineer. Finish this surface with a wood float (brush) finish.
- G. Begin curing immediately after form removal, cutback, and finishing. Keep grout moist and within its recommended placement temperature range for at least 24 hours after placement or longer if recommended by the manufacturer. Saturate the grout surface by use of wet burlap, soaker hoses, ponding or other approved means. Provide sunshades as necessary. If drying winds inhibit the ability of a given curing method to keep grout moist, erect wind breaks until wind is no longer a problem or curing is finished.

3.4 INSTALLATION - NONSHRINK EPOXY GROUTS

- A. Mix in accordance with the procedures recommended by the manufacturer. Do not vary the ratio of components or add solvent to change the consistency of the grout mix. Do not overmix. Mix full batches only to maintain proper proportions of resin, hardener and

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aggregate.

- B. Monitor ambient weather conditions and contact the grout manufacturer for special placement procedures to be used for temperatures below 60 or above 90 degrees F.
- C. Place grout into the designated areas in a manner which will avoid trapping air. Placement methods shall ensure the filling of all spaces and provide full contact between the grout and adjoining surfaces. Provide grout holes as necessary.
- D. Minimize "shoulder" length (extension of grout horizontally beyond base plate). In no case shall the shoulder length of the grout be greater than the grout thickness.
- E. Finish grout by puddling to cover all aggregate and provide a smooth finish. Break bubbles and smooth the top surface of the grout in conformity with the manufacturer's recommendations.
- F. Epoxy grouts are self curing and do not require the application of water. Maintain the formed grout within its recommended placement temperature range for at least 24 hours after placing, or longer if recommended by the manufacturer.

3.5 INSTALLATION - CONCRETE GROUT

- A. Screed underlying concrete to the grade shown on the Drawings. Provide the surface with a broomed finish, aligned to drain. Protect and keep the surface clean until placement of concrete grout.
- B. Remove the debris and clean the surface by sweeping and vacuuming of all dirt and other foreign materials. Wash the tank slab using a strong jet of water. Flushing of debris into tank drain lines will not be permitted.
- C. Saturate the concrete surface for at least 24 hours prior to placement of the concrete grout. Saturation may be maintained by ponding, by the use of soaker hoses, or by other methods acceptable to the Engineer. Remove excess water just prior to placement of the concrete grout. Place a cement slurry immediately ahead of the concrete grout so that the slurry is moist when the grout is placed. Work the slurry over the surface with a broom until it is coated with approximately 1/16 to 1/8-in thick cement paste. (A bonding grout composed of 1 part portland cement, 1.5 parts fine sand, an approved bonding admixture and water, mixed to achieve the consistency of thick paint, may be substituted for the cement slurry.)
- D. Place concrete grout to final grade using the scraper mechanism as a guide for surface elevation and to ensure high and low spots are eliminated. Unless specifically approved by the equipment manufacturer, mechanical scraper mechanisms shall not be used as a finishing machine or screed.
- E. Provide grout control joints as indicated on the Drawings.
- F. Finish and cure the concrete grout as specified for cast-in-place concrete.

3.6 SCHEDULE

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- A. The following list indicates where the particular types of grout are to be used:
- a. General purpose nonshrink cementitious grout. Use at all locations where non shrink grout is called for on the plans except for base plates greater in area than 3-ft wide by 3-ft long and except for the setting of anchor rods, anchor bolts or reinforcing steel in concrete.
 - b. Flowable nonshrink cementitious grout. Use under all base plates greater in area than 3-ft by 3-ft. Use at all locations indicated to receive flowable nonshrink grout by the Drawings. The Contractor, at his/her option and convenience, may also substitute flowable nonshrink grout for general purpose nonshrink cementitious grout.
 - c. Nonshrink epoxy grout. Use for the setting of anchor rods, anchor bolts and reinforcing steel in concrete and for all locations specifically indicated to receive epoxy grout.
 - d. Cement grout. Cement grout may be used for grouting of incidental base plates for structural and miscellaneous steel such as post base plates for platforms, base plates for beams, etc. It shall not be used when nonshrink grout is specifically called for on the Drawings or for grouting of primary structural steel members such as columns and girders.
 - e. Concrete grout. Use for overlaying the base concrete to allow more control in placing the surface grade and elsewhere as shown on the Drawings.

END OF SECTION

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SECTION 03740 - MODIFICATIONS AND REPAIR TO EXISTING CONCRETE

PART 1 GENERAL

1.1 SCOPE OF WORK

- A. Furnish all labor, materials, equipment and incidentals required and cut, chip, repair, demolish, excavate, or otherwise modify parts of existing structures or appurtenances as shown on the sketches and as specified herein.
- B. Work under this Section shall include repairs to existing deteriorated concrete. Repairs are separated into three basic categories as follows:
 - a. Surface deterioration, greater than 1/2" and less than 2" depth, no exposed rebar.
 - b. Surface deterioration, greater than 2" and less than 3", with exposed rebar, no rebar deterioration.
 - c. Surface deterioration, greater than 3" to maximum 16" with exposed, deteriorated and/or missing rebar.

1.2 RELATED WORK

- A. Cast-In-Place Concrete is included in Section 03301.
- B. Grout is included in Section 03600.

1.3 GENERAL

- A. No existing structure or concrete shall be shifted, cut, removed, or otherwise altered until written authorization is given by the Engineer.
- B. When removing materials or portions of existing structures and when making openings in existing structures, take all precautions and use all necessary barriers and other protective devices so as not to damage the structures beyond the limits necessary for the new work, nor to damage the structures or contents by falling or flying debris. Unless otherwise permitted, line drilling will be required in cutting existing concrete.
- C. Manufacturer qualifications: The manufacturer of the specified products shall have a minimum of 10 years' experience in the manufacture of such products and shall have an ongoing program of training, certifying and technically supporting the Contractor's personnel.
- D. Contractor qualifications: Contractors shall complete a program of instruction in the application of the approved manufacturer's material and provide certification from the manufacturer attesting to their training and status as an approved applicator.
- E. Furnish a notarized certificate stating that the materials specified meet the project requirements and submit the manufacturer's current printed literature on the specified product.

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1.4 REFERENCE STANDARDS

- A. American Society for Testing and Materials (ASTM)
- a. ASTM D570 - Standard Test Method for Water Absorption of Plastics.
 - b. ASTM D1653, Method B - Standard Test Method for Water Vapor Permeability of Organic Coating Films.
 - c. ASTM D 790 - Standard Test Method for flexural properties of unreinforced and reinforced plastics and electrical insulating materials.
 - d. ASTM D638 - Standard Test Method for Tensile Properties of Plastics.
 - e. ASTM D732 - Standard Test Method for Shear Strength of Plastics by Punch Tool
 - f. ASTM D695 - Standard Test Method for Compressive Properties Rigid Plastics.
 - g. ASTM C882 - Standard Test Method for Bond Strength of Epoxy-Resin Systems Used With Concrete By Slant Shear
 - h. ASTM D1525 - Standard Test Method for Vicat Softening Temperature of Plastics.
- B. Where reference is made to one of the above standards, the revision in effect at the time of bid opening shall apply.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Epoxy Bonding Compound:
- a. The epoxy bonding compound shall be furnished in two components for combining immediately prior to use in accordance with the manufacturer's written instructions and as specified herein.
 - b. The components of the epoxy resin system shall conform to the following requirements:
 - i. Component A - Component A shall be a modified epoxy resin of the epichlorohydrin bisphenol A condensation type, containing suitable viscosity control agents and having an epoxide equivalent of 180 to 200.
 - ii. Component B - Component B shall be primarily a reaction product of an alkyl glycidyl ether and a polyfunctional aliphatic amine containing suitable viscosity agents modified with 2, 4, 6 tri (dimethylamino-methyl) phenol.

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- iii. The component ratio of B:A shall be 1:1 by volume.
- iv. The resultant compound shall be polysulfide free.
- c. Properties of Mixed Components:
 - i. Solids Content: 100 percent by weight
 - ii. Pot Life: 20 to 30 minutes at 73 Degrees F
 - iii. Tack-Free Time (thin film): 3 to 5 hrs at 73 Degrees F
 - iv. Final Cure ASTM D695: 3 days at 73 Degrees F (ASTM D695 percent ultimate strength)
 - v. Initial Viscosity (A+B): 2400 to 3200 cps minimum at 73 Degrees F
 - vi. Color mixed: Straw
- d. Properties of Cured Material:
 - i. Neat Material
 - a. Tensile Strength: 5300 psi minimum at (ASTM D638) 14 days 73 Degrees F cure
 - b. Tensile Elongation: 4.8 percent at 14 days (ASTM D638 modified) 73 Degrees F cure
 - c. Compressive Strength: 7000 psi minimum at 28 days 73 Degrees F cure (ASTM D695)
 - d. Compressive Modulus: 250,000 psi minimum at (ASTM D695) 1.0 percent maximum (ASTM D570)
 - e. Bond Strength: 1500 psi minimum at (Plastic to Hardened) 14 days, 73 Degrees F cure
 - f. Deflection Temperature: 180 Degrees F minimum (ASTM D1525)
 - e. Epoxy bonding compound shall be Sikadur Hi-Mod as manufactured by Sika Chemical Corp., Lyndhurst, N.J.; W.R. Grace Co., Cambridge, MA; Adhesive Engineering Co., Lawrence, MA or equal.
- B. Epoxy Paste
 - a. General
 - i. Epoxy Paste shall be a two-component, solvent-free, asbestos free, moisture insensitive epoxy resin material used to bond dissimilar materials to concrete such as setting railing posts, dowels, anchor bolts

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and all-threads into hardened concrete and shall comply with the requirements of ASTM C881, Type I, Grade 3 and the additional requirements specified herein. It may also be used to patch existing surfaces where the glue line is 1/8-in or less.

b. Material

i. Properties of the cured material:

- a. Compressive Properties (ASTM D695): 10,000 psi minimum at 28 days.
- b. Tensile Strength (ASTM D638): 3,000 psi minimum at 14 days.
- c. Elongation at Break: 0.3 percent minimum.
- d. Flexural Strength (ASTM D790 - Modulus of Rupture): 3,700 psi minimum at 4 days.
- e. Shear Strength (ASTM D732): 2,800 psi minimum at 14 days.
- f. Water Absorption (ASTM D570): 1.0 percent maximum at 7 days.
- g. Bond Strength (ASTM C882): 2,000 psi at 14 days moist cure.
- h. Color: Concrete grey.

c. Approved manufacturer's include:

- i. Overhead applications: Sika Corporation, Lyndhurst, NJ - Sikadur Hi-mod LV 31; Master Builders, Inc., Cleveland, OH - Concreive 1438 or equal.
- ii. Sika Corporation, Lyndhurst, N.J. - Sikadur Hi-mod LV 32; Master Builders, Inc., Cleveland, OH - Concreive 1438 or equal.

C. Non-Shrink Precision Cement Grout, Non-Shrink Cement Grout, Non-Shrink Epoxy Grout and Polymer Modified mortar are included in Section 03600 GROUT.

D. Adhesive Capsule type anchor system shall be equal to Molly parabond two part stud and capsule system by Emhart, Temple, PA or the HVA adhesive Anchoring System by Hilti Fastening Systems, Tulsa, OK. The capsule shall consist of a sealed glass capsule containing premeasured amounts of a polyester or vinylester resin, quartz sand aggregate and a hardener contained in a separate vial within the capsule.

E. Crack Repair Epoxy Adhesive

a. General

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- i. Crack Repair Epoxy Adhesive shall be a two-component, solvent-free, moisture insensitive epoxy resin material suitable for crack grouting by injection or gravity feed. It shall be formulated for the specific size of opening or crack being injected.
- b. Material
 - i. Properties of the cured material
 - a. Compressive Properties (ASTM D695): 10,000 psi minimum at 28 days.
 - b. Tensile Strength (ASTM D638): 5,300 psi minimum at 14 days. Elongation at Break - 2 to 5 percent.
 - c. Flexural Strength (ASTM D790 - Modulus of Rupture): 12,000 psi minimum at 14 days (gravity); 4,600 psi minimum at 14 days (injection)
 - d. Shear Strength (ASTM D732): 3,700 psi minimum at 14 days.
 - e. Water Absorption (ASTM D570 - 2 hour boil): 1.5 percent maximum at 7 days.
 - f. Bond Strength (ASTM C882): 2,400 psi at 2 days dry; 2,000 psi at 14 days dry plus 12 days moist.

PART 3 EXECUTION**3.1 GENERAL**

- A. Cut, chip, repair, reuse, demolish, excavate or otherwise modify parts of the existing structures or appurtenances, as indicated on the sketches, specified herein, or necessary to permit completion of the Work. All work shall comply with other requirements of this of Section and as shown on the sketches.
- B. All commercial products specified in this Section shall be stored, mixed and applied in strict compliance with the manufacturer's recommendations.
- C. In all cases where concrete is repaired in the vicinity of an expansion joint or control joint the repairs shall be made to preserve the isolation between components on either side of the joint.
- D. When drilling holes for dowels/bolts at new or existing concrete, drilling shall stop if rebar is encountered. As approved by the Engineer, the hole location shall be relocated to avoid rebar. Rebar shall not be cut without prior approval by the Engineer. Where possible, rebar locations shall be identified prior to drilling using "rebar locators" so that drilled hole locations may be adjusted to avoid rebar interference.

3.2 REPAIRING EXISTING CONCRETE

PROJECT #12376

/ 3rd AVENUE ON-STREET PARKING IMPROVEMENTS/ 3rd AVENUE & BROWARD BOULEVARD, CITY OF FORT LAUDERDALE

- A. Remove all deteriorated materials, dirt, oil, grease, and all other bond inhibiting materials from the surface by mechanical means, i.e. - waterblasting, sandblasting, grinding, etc, as approved by the Engineer. Be sure the areas are not less than 1/2-in in depth. Irregular voids or surface stones need not be removed if they are sound, free of laitance, and firmly embedded into parent concrete, subject to the Engineer's final inspection.
- B. If reinforcing steel is exposed, it must be mechanically cleaned to remove all contaminants, rust, etc, as approved by the Engineer. If half of the diameter of the reinforcing steel is exposed, chip out behind the steel. The distance chipped behind the steel shall be a minimum of 1/2-in. Reinforcing to be saved shall not be damaged during the demolition operation.
- C. After cleaning the exposed reinforcement it is determined that more than ¼ of the effective cross sectional area has been lost, chip the concrete back along the bar a minimum of 18 bar diameters in each direction from the damaged section and replace the bar with new reinforcement of similar size. Lap the new bar 18 diameters to the exposed non-corroded section. Alternatively, contractor may drill and epoxy grout new rebar in to sound concrete adjacent to deteriorated bar. Embed new bar per grout manufacturer's requirements.
- D. Thoroughly wash the roughened concrete surfaces and keep the surfaces saturated for at least 6 hours before placing new concrete. All free water shall be removed prior to placing the concrete. An epoxy bonding compound as specified may be used in lieu of saturating surface for 6 hours in accordance with repair material manufacturer's requirements.
- E. Repair mortar, shall be placed/pumped to a thickness to match the existing surface.
 - a. Repair mortar shall be Nonshrink cementitious grout as specified in Section 03600.
- F. When the finish surface is not specified to be lined the color of new concrete in the exposed surfaces shall match the color of the existing adjoining concrete as closely as possible.

3.3 CRACK REPAIR

- A. Cracks on horizontal surfaces shall be repaired by gravity feeding crack sealant into cracks per manufacturer's recommendations. If cracks are less than 1/16-in in thickness they shall be pressure injected.
- B. Cracks on vertical surfaces shall be repaired by pressure injecting crack sealant through valves sealed to surface with crack repair epoxy adhesive per manufacturer's recommendations.

END OF SECTION

QUESTIONNAIRE SHEET

PLEASE PRINT OR TYPE:

Firm Name: President

Business Address:

| | |
|----------------------|---|
| <input type="text"/> | 5 |
| <input type="text"/> | 6 |

Telephone:

Fax:

E-Mail Address:

What was the last project of this nature which you completed? Include the year, description, and contract value.

| | |
|----------------------|---|
| <input type="text"/> | 5 |
| <input type="text"/> | 6 |

The following are named as three corporations and representatives of those corporations for which you have performed work similar to that required by this contract, and which the City may contact as your references (include addresses, telephone numbers and e-mail addresses). Include the project name, year, description, and contract value.

| |
|----------------------|
| <input type="text"/> |
| <input type="text"/> |
| <input type="text"/> |

How many years has your organization been in business?

Have you ever failed to complete work awarded to you; if so, where and why?

The name of the qualifying agent for the firm and his position is: Certificate of Competency Number of Qualifying Agent: Effective Date: Expiration Date: Licensed in: Engineering Contractor's License #

(County/State)

Expiration Date:

NOTE: To be considered for award of this contract, the bidder must submit a financial statement upon request.

NOTE: Contractor must have proper licensing and shall provide copy of same with his proposal.

QUESTIONNAIRE SHEET

1. Have you personally inspected the proposed work and have you a complete plan for its performance?

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2. Will you sublet any part of this work? If so, list the portions or specialties of the work that you will.

a)

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g)

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3. What equipment do you own that is available for the work?

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4. What equipment will you purchase for the proposed work?

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| | 5 |
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5. What equipment will you rent for the proposed work?

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| | 5 |
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**CONTRACTOR'S CERTIFICATE OF COMPLIANCE WITH
NON-DISCRIMINATION PROVISIONS OF THE CONTRACT**

The completed and signed form should be returned with the Contractor's submittal. If not provided with submittal, the Contractor must submit within three business days of City's request. Contractor may be deemed non-responsive for failure to fully comply within stated timeframes.

Pursuant to City Ordinance Sec. 2-17(a)(i)(ii), bidders must certify compliance with the Non-Discrimination provision of the ordinance.

- (a) Contractors doing business with the City shall not discriminate against their employees based on the employee's race, color, religion, gender (including identity or expression), marital status, sexual orientation, national origin, age, disability or any other protected classification as defined by applicable law.

Contracts. Every Contract exceeding \$100,000, or otherwise exempt from this section shall contain language that obligates the Contractor to comply with the applicable provisions of this section.

The Contract shall include provisions for the following:

- (i) The Contractor certifies and represents that it will comply with this section during the entire term of the contract.
- (ii) The failure of the Contractor to comply with this section shall be deemed to be a material breach of the contract, entitling the City to pursue any remedy stated below or any remedy provided under applicable law.

Authorized Signature

Print Name and Title

Date

The Contractor shall have previous construction experience in renovation and restoration of marine and seawall structures 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). **Bidder's are expected to provide information on each project by including these forms in their bid submittals.** If these forms are not utilized, the Bidder's must provide identical information to the City for evaluation purposes.

Note: Do not include proposed team members or parent/subsidiary companies as references in your submittals.

A. PRIME BIDDER'S NAME:

CLIENT NO.1 - Name of firm to be contacted:

Address:

Contact Person:

Phone No:

Contact E-Mail Address:

Project Performance Period: to

Dates should be in mm/yy format

Project Name :

Location of Project:

Overall Construction Cost:

Description of the overall scope:

| | |
|--|---|
| | 5 |
| | 6 |

Description of work that was self-performed by Bidder:

| | |
|--|---|
| | 5 |
| | 6 |

CLIENT NO.2 - - Name of firm to be contacted:

Address:

Contact Person:

Phone No:

Contact E-Mail Address:

Project Performance Period: to

Dates should be in mm/yy format

Project Name :

Location of Project:

Overall Construction Cost:

Description of the overall scope:

| | |
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| | 5 |
| | 6 |

Description of work that was self-performed by Bidder:

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| | 5 |
| | 6 |

CLIENT NO.3 - - Name of firm to be contacted:

Address:

Contact Person:

Phone No:

Contact E-Mail Address:

Project Performance Period: to

Dates should be in mm/yy format

Project Name :

Location of Project:

Overall Construction Cost:

Description of the overall scope:

| | |
|--|---|
| | 5 |
| | 6 |

Description of work that was self-performed by Bidder:

| | |
|--|---|
| | 5 |
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CITY OF FORT LAUDERDALE
PUBLIC WORKS DEPARTMENT

MINORITY BUSINESS ENTERPRISE (MBE) - WOMEN BUSINESS ENTERPRISE (WBE)

PRIME CONTRACTOR IDENTIFICATION FORM

In order to assist us in identifying the status of those companies doing business with the City of Fort Lauderdale, this form must be completed and returned with your bid package.

| | |
|---------------------------------|----------------------|
| Name of Firm: | <input type="text"/> |
| Address of Firm: | <input type="text"/> |
| Telephone Number: | <input type="text"/> |
| Name of Person Completing Form: | <input type="text"/> |
| Title: | <input type="text"/> |
| Signature: | <input type="text"/> |
| Date: | <input type="text"/> |
| City Project Number: | <input type="text"/> |
| City Project Description: | <input type="text"/> |

Please check the item(s) which properly identify the status of your firm:

- ☐ Our firm is not a MBE or WBE.
- ☐ Our firm is a MBE, as at least 51 percent is owned and operated by one or more socially and economically disadvantaged individuals.
- ☐ American Indian ☐ Asian ☐ Black ☐ Hispanic
- ☐ Our firm is a WBE, as at least 51 percent is owned and operated by one or more women.
- ☐ American Indian ☐ Asian ☐ Black ☐ Hispanic

MBE/WBE CONTRACTOR INFORMATION

The City, in a continuing effort, is encouraging the increased participation of minority and women-owned businesses in Public Works Department related contracts. Along those lines, we are requiring that each firm provide documentation detailing their own programs for utilizing minority and women-owned businesses.

Submit this information as a part of this bid package and refer to the checklist, to ensure that all areas of concern are covered. The low responsive bidder may be contacted to schedule a meeting to discuss these objectives. It is our intention to proceed as quickly as possible with this project, so your cooperation in this matter is appreciated.

CONTRACTOR CHECKLIST

- ☐ List Previous City of Fort Lauderdale Contracts

| | |
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| | 5 |
| | 6 |

- ☐ Number of Employees in your firm

--Percent () Women

--Percent () Minorities

--Job Classifications of Women and Minorities

| | |
|--|---|
| | 5 |
| | 6 |

- ☐ Use of minority and/or women subcontractors on past projects.

| | |
|--|---|
| | 5 |
| | 6 |

- ☐ Nature of the work subcontracted to minority and/or women-owned firms.

| | |
|--|---|
| | 5 |
| | 6 |

- ☐ How are subcontractors notified of available opportunities with your firm?

| | |
|--|---|
| | 5 |
| | 6 |

☐ Anticipated amount to be subcontracted on this project.

| | |
|--|---|
| | 5 |
| | 6 |

☐ Anticipated amount to be subcontracted to minority and/or women-owned businesses on this project.

| | |
|--|---|
| | 5 |
| | 6 |

TRENCH SAFETY

Bidder acknowledges that included in the appropriate bid items of his bid and in the Total Bid Price are costs for complying with the Florida Trench Safety Act, Florida Statutes 553.60 – 553.64. The bidder further identifies the costs of such compliance to be summarized below:

| Trench Safety Measure (Description) | Units of Measure (LF/SF) | Unit (Quantity) | Unit Cost | Extended Cost |
|--|--------------------------------|----------------------|-------------------------|-------------------------|
| A. <input type="text"/> | <input type="text"/> | <input type="text"/> | \$ <input type="text"/> | \$ <input type="text"/> |
| B. <input type="text"/> | <input type="text"/> | <input type="text"/> | \$ <input type="text"/> | \$ <input type="text"/> |
| C. <input type="text"/> | <input type="text"/> | <input type="text"/> | \$ <input type="text"/> | \$ <input type="text"/> |
| D. <input type="text"/> | <input type="text"/> | <input type="text"/> | \$ <input type="text"/> | \$ <input type="text"/> |

Total: \$

The bidder certifies that all trench excavation done within his control in excess of five feet (5') in depth shall be in accordance with the Occupational Safety and Health Administration's excavation safety standards, C.F.R. s. 1926.650 Subpart P., and the Florida Trench Safety Act, Florida Statutes 553.60-553.64.

Failure to complete the above may result in the bid being declared non-responsive.

DATE:
(SIGNATURE)

STATE OF: COUNTY OF:

PERSONALLY APPEARED BEFORE ME, the undersigned authority,

(Name of Individual Signing)

who, after first being duly sworn by me,
 affixed his/her signature in the space provided above on this
 day of , 20 .

NOTARY PUBLIC

My Commission Expires:

CONTRACT PAYMENT METHOD

The City of Fort Lauderdale has implemented a Procurement Card (P-Card) program which changes how payments are remitted to its vendors. The City is transitioning from traditional paper checks to credit card payments via MasterCard or Visa as part of this program.

This allows you as a vendor of the City of Fort Lauderdale, to receive your payment fast and safely. No more waiting for checks to be printed and mailed.

In accordance with Article 7, item 7.6 of the contract, payments on this contract will be made utilizing the City's P-Card. Accordingly, bidders must presently have the ability to accept these credit cards or take whatever steps necessary to implement acceptance of a card before the start of the contract term, or contract award by the City.

Please indicate with which credit card you prefer to be paid:

☐ Master Card

☐ Visa Card

Company Name:

Signature:

Print Name Title:

NON-COLLUSION STATEMENT:

By signing this offer, the vendor/contractor certifies that this offer is made independently and *free* from collusion. Vendor shall disclose below any City of Fort Lauderdale, FL officer or employee, or any relative of any such officer or employee who is an officer or director of, or has a material interest in, the vendor's business, who is in a position to influence this procurement.

Any City of Fort Lauderdale, FL officer or employee who has any input into the writing of specifications or requirements, solicitation of offers, decision to award, evaluation of offers, or any other activity pertinent to this procurement is presumed, for purposes hereof, to be in a position to influence this procurement.

For purposes hereof, a person has a material interest if they directly or indirectly own more than 5 percent of the total assets or capital stock of any business entity, or if they otherwise stand to personally gain if the contract is awarded to this vendor.

In accordance with City of Fort Lauderdale, FL Policy and Standards Manual, 6.10.8.3,

3.3. City employees may not contract with the City through any corporation or business entity in which they or their immediate family members hold a controlling financial interest (e.g. ownership of five (5) percent or more).

3.4. Immediate family members (spouse, parents and children) are also prohibited from contracting with the City subject to the same general rules.

Failure of a vendor to disclose any relationship described herein shall be reason for debarment in accordance with the provisions of the City Procurement Code.

NAME**RELATIONSHIPS**

-

In the event the vendor does not indicate any names, the City shall interpret this to mean that the vendor has indicated that no such relationships exist.

LOCAL BUSINESS PRICE PREFERENCE

Section 2-199.2, Code of Ordinances of the City of Fort Lauderdale, (Ordinance No. C-12-04), provides for a local business preference.

In order to be considered for a local business preference, a bidder must include the Local Business Preference Certification Statement of this ITB, as applicable to the local business preference class claimed **at the time of bid submittal**:

Upon formal request of the City, based on the application of a Local Business Preference the Bidder shall within ten (10) calendar days submit the following documentation to the Local Business Preference Class claimed:

A) Copy of City of Fort Lauderdale current year business tax receipt, **or** Broward County current year business tax receipt, **and**

B) List of the names of all employees of the bidder and evidence of employees' residence within the geographic bounds of the City of Fort Lauderdale or Broward County, as the case may be, such as current Florida driver license, residential utility bill (water, electric, telephone, cable television), or other type of similar documentation acceptable to the City.

Failure to comply at time of bid submittal shall result in the bidder being found ineligible for the local business preference.

THE COMPLETE LOCAL BUSINESS PREFERENCE 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_CH2AD_ARTVFI_DIV2PR_S2-186LOBUPRPR

Definitions: The term "Business" shall mean a person, firm, corporation or other business entity which is duly licensed and authorized to engage in a particular work in the State of Florida. Business shall be broken down into four (4) types of classes:

1. Class A Business – shall mean any Business that has established and agrees to maintain a permanent place of business located in a non-residential zone and staffed with full-time employees within the limits of the City **and** shall maintain a staffing level of the prime contractor for the proposed work of at least fifty percent (50%) who are residents of the City.
2. Class B Business - shall mean any Business that has established and agrees to maintain a permanent place of business located in a non-residential zone and staffed with full-time employees within the limits of the City **or** shall maintain a staffing level of the prime contractor for the proposed work of at least fifty percent (50%) who are residents of the City.
3. Class C Business - shall mean any Business that has established and agrees to maintain a permanent place of business located in a non-residential zone **and** staffed with full-time employees within the limits of Broward County.
4. Class D Business – shall mean any Business that does not qualify as either a Class A, Class B, or Class C business.

LOCAL BUSINESS PRICE PREFERENCE CERTIFICATION STATEMENT

The Business identified below certifies that it qualifies for the local business price preference classification as indicated herein, and further certifies and agrees that it will re-affirm its local preference classification annually no later than thirty (30) calendar days prior to the anniversary of the date of a contract awarded pursuant to this ITB. Violation of the foregoing provision may result in contract termination.

- | | | | |
|-----|--|---------------|--|
| (1) | | Business Name | <p>is a Class A Business as defined in City of Fort Lauderdale Ordinance No. C-17-26, Sec.2-186. A copy of the City of Fort Lauderdale current year Business Tax Receipt <u>and</u> a complete list of full-time employees and evidence of their addresses shall be provided within 10 calendar days of a formal request by the City.</p> |
| (2) | | Business Name | <p>is a Class B Business as defined in the City of Fort Lauderdale Ordinance No. C-17-26, Sec.2-186. A copy of the Business Tax Receipt <u>or</u> a complete list of full-time employees and evidence of their addresses shall be provided within 10 calendar days of a formal request by the City.</p> |
| (3) | | Business Name | <p>is a Class C Business as defined in the City of Fort Lauderdale Ordinance No. C-17-26, Sec.2-186. A copy of the Broward County Business Tax Receipt shall be provided within 10 calendar days of a formal request by the City.</p> |
| (4) | | Business Name | <p>requests a Conditional Class A classification as defined in the City of Fort Lauderdale Ordinance No. C-17-26, Sec.2-186. Written certification of intent shall be provided within 10 calendar days of a formal request by the City.</p> |
| (5) | | Business Name | <p>requests a Conditional Class B classification as defined in the City of Fort Lauderdale Ordinance No. C-17-26, Sec.2-186. Written certification of intent shall be provided within 10 calendar days of a formal request by the City.</p> |
| (6) | | Business Name | <p>is considered a Class D Business as defined in the City of Fort Lauderdale Ordinance No. C-17-26, Sec.2-186 and does not qualify for Local Preference consideration.</p> |

BIDDER'S
COMPANY:

AUTHORIZED
COMPANY
PERSON:

NAME

SIGNATURE

DATE

CONSTRUCTION BID CERTIFICATION

Please Note: All fields below must be completed. If the field does not apply to you, please note N/A in that field. If you are a foreign corporation, you may be required to obtain a certificate of authority from the department of state, in accordance with Florida Statute §607.1501 (visit <http://www.dos.state.fl.us/>).

Company: (Legal Registration)

Address:

City: State: Zip:

Telephone No. FAX No. Email:

Does your firm qualify for MBE or WBE status: MBE ☐ WBE ☐

If a corporation, state the name of the President, Secretary and Resident Agent. If a partnership, state the names of all partners. If a trade name, state the names of the individuals who do business under the trade name.

| | | | |
|----------------------|----------------------|----------------------|----------------------|
| <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| Name | Title | Name | Title |
| <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| Name | Title | Name | Title |

ADDENDUM ACKNOWLEDGEMENT - Bidder acknowledges that the following addenda have been received and are included in the bid:

| Addendum No. | Date Received | Addendum No. | Date Received | Addendum No. | Date Received | Addendum No. | Date Received |
|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
| <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |

VARIANCES: If you take exception or have variances to any term, condition, specification, or requirement in this bid you must specify such variance in the space provided below or reference in the space provided below all variances contained on other pages within your bid. Additional pages may be attached if necessary. No variances will be deemed to be part of the bid submitted unless such is listed and contained in the space provided below. The City does not, by virtue of submitting a variance, necessarily accept any variances. If no statement is contained in the below space, it is hereby implied that your response is in full compliance with this competitive solicitation. If you do not have variances, simply mark N/A. If submitting your response electronically through BIDS SYNC you must also click the "Take Exception" button.

The below signatory affirms that he has or will obtain all required permits and licenses from the appropriate agencies, and that his firm is authorized to do business in the State of Florida. The below signatory agrees to furnish all labor, tools, material, equipment and supplies, and to sustain all the expense incurred in doing the work set forth in strict accordance with the bid plans and contract documents at the unit prices indicated if awarded a contract. The below signatory has not divulged to, discussed, or compared this bid with other bidders, and has not colluded with any other bidder or parties to this bid whatsoever. Furthermore, the undersigned guarantees the truth and accuracy of all statements and answers contained in this bid. The below signatory also hereby agrees, by virtue of submitting or attempting to submit a bid, that in no event shall the City's liability for bidder's direct, indirect, incidental, consequential, special or exemplary damages, expenses, or lost profits arising out of this competitive solicitation process, including but not limited to public advertisement, bid conferences, site visits, evaluations, oral presentations, or award proceedings exceed the amount of Five Hundred Dollars (\$500.00). This limitation shall not apply to claims arising under any provision of indemnification or the City protest ordinance contained in this competitive solicitation.

Submitted by:

Name (printed)

Date:

Signature

Date:

| | |
|---|--------------------|
| 1 | SURVEY PLAN |
| 2 | DEMOLITION NOTES |
| 3 | DEMOLITION PLANS |
| 4 | CONSTRUCTION NOTES |
| 5 | CONSTRUCTION PLANS |
| 6 | DETAILS |



PROJECT #12376
SW 3RD AVENUE
ON-STREET PARKING IMPROVEMENTS



100 North Andrews Avenue, Fort Lauderdale, Florida 33301

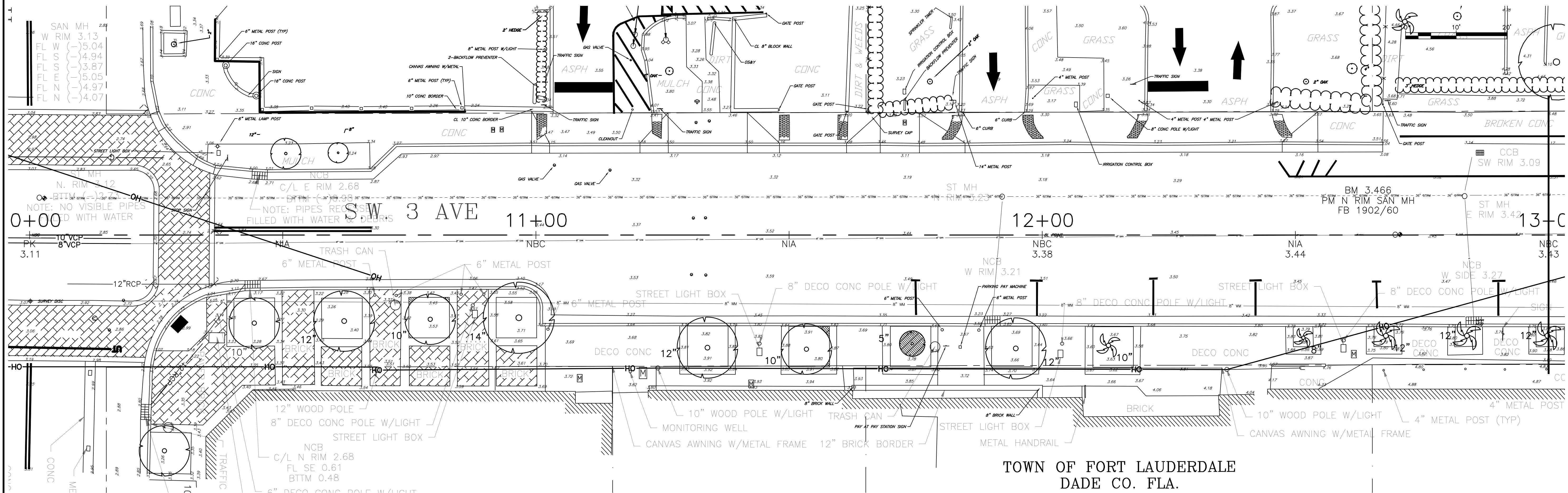
FORT LAUDERDALE CITY COMMISSION

| | |
|-------------------|-----------------------------|
| DEAN J. TRANTALIS | MAYOR |
| HEATHER MORAITIS | COMMISSIONER - DISTRICT I |
| STEVEN GLASSMAN | COMMISSIONER - DISTRICT II |
| ROBERT McKENZIE | COMMISSIONER - DISTRICT III |
| BEN SORENSEN | COMMISSIONER - DISTRICT IV |

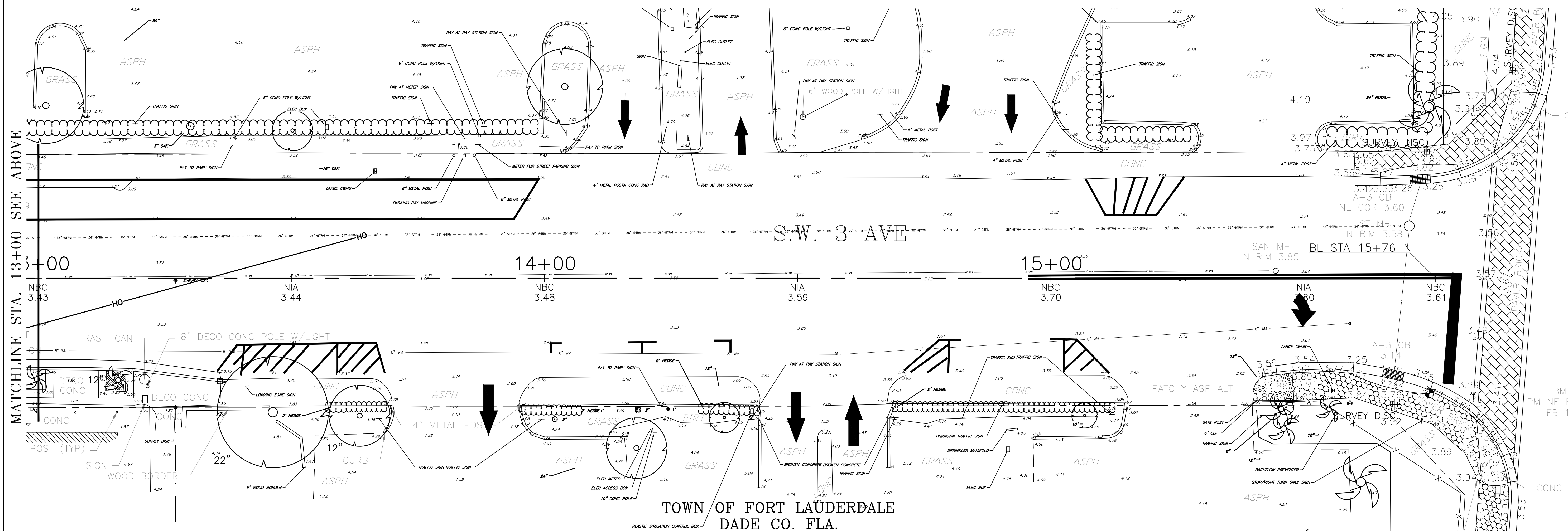
| | | |
|-----------------------|-------------------------|----------------|
| OMAR CASTELLON, P.E. | ASSISTANT CITY ENGINEER | (954) 828-5064 |
| KHANT K. MYAT, P.E. | PROJECT MANAGER II | (954) 828-5061 |
| SHIAU CHING LOW, E.I. | PROJECT MANAGER II | (954) 828-3779 |

| |
|---------------------------------|
| DATE: SEP 2018 |
| CAD FILE: 12376-000-006COVR.DWG |
| DRAWING FILE No.: 4-140-90 |

BID SET



MATCHLINE STA. 13+00 SEE BELOW

TOWN OF FORT LAUDERDALE
DADE CO. FLA.TOWN OF FORT LAUDERDALE
DADE CO. FLA.

BID SET

DESIGNED BY: KHANT MYAT, P.E.
RECORD NO. 78218
DATE: _____

DRAWN BY: _____
CHECKED BY: _____
SCALE: 1\"/>

DATE: SEP 2018
DESIGNED BY: _____
CHECKED BY: _____
SCALE: 1\"/>

CITY OF FORT LAUDERDALE
PUBLIC WORKS DEPARTMENT
ENGINEERING & ARCHITECTURE
100 North Andrews Avenue, Fort Lauderdale, Florida 33301

| NO. | DATE | BY | CHK'D | DESCRIPTION |
|-----|------|----|-------|-------------|
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

PROJECT # 12376
SW 3RD AVENUE
ON-STREET PARKING IMPROVEMENTS
SURVEY PLAN
FORT LAUDERDALE, FLORIDA

SHEET NO. 1

TOTAL: 6
CAD FILE: 12376-001-SITE
DRAWING FILE NO. 4-140-90

GENERAL DEMOLITION SPECIFICATIONS:

1. THE LOCATIONS, ELEVATIONS AND DIMENSIONS OF ALL EXISTING UTILITIES SHOWN ON THIS PLAN HAVE BEEN DETERMINED FROM THE BEST INFORMATION AVAILABLE AND ARE GIVEN FOR THE CONVENIENCE OF THE CONTRACTOR. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR THEIR ACCURACY. PRIOR TO THE START OF ANY DEMOLITION ACTIVITY, THE CONTRACTOR SHALL VERIFY THE LOCATION, ELEVATIONS, AND DIMENSIONS OF ALL EXISTING UTILITIES AND OTHER FEATURES AFFECTING THE WORK PRIOR TO DEMOLITION. THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER OF ANY DISCREPANCIES WHICH MAY EFFECT THE DEMOLITION WORK.
2. CHAPTER 553.851 OF THE FLORIDA STATUTES REQUIRES THAT AN EXCAVATOR NOTIFY ALL UTILITIES A MINIMUM OF TWO (2) WORKING DAYS PRIOR TO EXCAVATING.
3. THE CONTRACTOR SHALL FURNISH ALL MATERIALS, LABOR, SUPERVISION, AND EQUIPMENT REQUIRED FOR THE ORDERLY DEMOLITION AND REMOVAL OF EXISTING STRUCTURES, PAVEMENT AND UTILITIES AS SHOWN ON THE DRAWINGS AND DESCRIBED HEREIN.
4. THE CONTRACTOR IS REQUIRED TO FAMILIARIZE HIMSELF WITH THE STRUCTURES TO BE DEMOLISHED.
5. THE DRAWINGS INDICATE THE SCOPE OF DEMOLITION WHERE DEMOLITION IS REQUIRED.
6. PROTECT AND SAVE ALL UTILITIES, UNLESS OTHERWISE NOTED.
7. ALL THE CONCRETE AND PAVEMENT TO BE REMOVED MUST BE SAW CUT CLEAN AND STRAIGHT PRIOR TO REMOVAL
8. ALL EXISTING STRUCTURES, PAVEMENTS, SLABS, FOUNDATIONS, STEPS AND OTHER ON-SITE EXISTING FEATURES INDICATED ON THE DRAWINGS TO BE REMOVED SHALL BE DEMOLISHED AND REMOVED BY THE CONTRACTOR (AS APPLICABLE TO PROJECT).
9. ALL EXISTING SEWERS, PIPING AND UTILITIES SHOWN ARE NOT TO BE INTERPRETED AT THE EXACT LOCATION, OR AS THE ONLY OBSTACLES THAT MAY OCCUR ON THE SITE. CONTRACTOR SHALL VERIFY EXISTING CONDITIONS AND PROCEED WITH CAUTION AROUND ANY ANTICIPATED FEATURES. GIVE NOTICE TO ALL UTILITY COMPANIES REGARDING DESTRUCTION AND REMOVAL OF ALL SERVICE LINES AND CAP ALL LINES BEFORE PROCEEDING WITH THE WORK.
10. THE CONTRACTOR SHALL COORDINATE WITH THE APPROPRIATE UTILITY COMPANY PRIOR TO REMOVAL OR RELOCATION OF ANY ELECTRICAL, TELEPHONE, CABLE AND/OR GAS LINES. SUFFICIENT TIME SHALL BE PROVIDED FOR RELOCATION AND CLOSE COORDINATION WITH THE UTILITY COMPANY TO PROVIDE A SMOOTH TRANSITION IN UTILITY SERVICE.
11. CONTRACTOR MUST STOP OPERATION AND NOTIFY THE OWNER/ENGINEER FOR PROPER DIRECTION IF ANY ENVIRONMENTAL OR HEALTH RELATED CONTAMINANT IS ENCOUNTERED DURING THE DEMOLITION/EXCAVATION PROCESS.
12. REMOVE AND LEGALLY DISPOSE OF ALL OTHER RUBBISH, RUBBLE, AND DEBRIS. COMPLY WITH ALL APPLICABLE LAWS AND REGULATIONS GOVERNING DISPOSAL OF WASTES AND DEBRIS.
13. CONTINUOUS ACCESS AND OPERATION SHALL BE MAINTAINED FOR THE SURROUNDING PROPERTIES AND BUILDINGS AT ALL TIMES DURING CONSTRUCTION.
14. PRIOR TO DEMOLITION OCCURRING ALL EROSION CONTROL DEVICES ARE TO BE INSTALLED.
15. ALL SIGNS OUTSIDE THE DEMOLITION AREA ARE TO REMAIN UNLESS OTHERWISE SPECIFIED.
16. ALL EXISTING UTILITIES WITHIN THE DEMOLITION SITE AREA SHALL BE ADJUSTED, REMOVED OR RELOCATED AT THE CONTRACTOR'S EXPENSE. ACTUAL WORK SHALL BE COORDINATED BY THE CONTRACTOR DIRECTLY W/ THE APPROPRIATE UTILITY COMPANY. ALL EXPENSES SHALL BE INCLUDED IN THE CONTRACTOR'S BID.
17. THE CONTRACTOR SHALL LOCATE ALL UNDERGROUND UTILITIES BEFORE EXCAVATION.
18. ALL TRASH, DEBRIS AND OTHER MATERIAL REMOVED FROM THE SITE SHALL BE PROPERLY DISPOSED OF BY THE CONTRACTOR IN ACCORDANCE WITH ALL LOCAL, STATE, AND FEDERAL REGULATIONS.

PRE-DEMOLITION RESPONSIBILITIES

1. UPON RECEIPT OF NOTICE OF AWARD, THE CONTRACTOR SHALL ARRANGE A PRE-DEMOLITION CONFERENCE TO INCLUDE ALL INVOLVED GOVERNMENTAL AGENCIES, ALL AFFECTED UTILITY OWNERS, THE OWNER, THE ENGINEER AND THE CONTRACTOR.
2. PRIOR TO DEMOLITION, CONTRACTOR TO PROVIDE FOR THE OWNER A LISTING OF THE FACILITIES THE CONTRACTOR WILL UTILIZE FOR RECYCLING AND DISPOSAL OF SPECIFIC MATERIALS. CONTRACTOR TO SPECIFY THE MATERIALS INTENDED FOR RECYCLING AND THE MATERIALS INTENDED FOR DISPOSAL FOR OWNER'S APPROVAL.
3. PRIOR TO BEGINNING DEMOLITION, THE CONTRACTOR SHALL VERIFY THE SIZE, LOCATION, ELEVATION, AND MATERIAL OF ALL EXISTING UTILITIES WITHIN THE AREA OF DEMOLITION.
4. EXISTING UTILITY LOCATIONS SHOWN ON THESE PLANS ARE APPROXIMATE. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR THE ACCURACY OF EXISTING UTILITIES SHOWN OR FOR ANY EXISTING UTILITIES NOT SHOWN.
5. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DAMAGE TO ANY EXISTING UTILITIES FOR WHICH IT FAILS TO REQUEST LOCATIONS FROM THE UTILITY OWNER. THE CONTRACTOR IS RESPONSIBLE, AS WELL, FOR DAMAGE TO ANY EXISTING UTILITIES WHICH ARE PROPERLY LOCATED.
6. THE LOCATIONS OF EXISTING UTILITIES AND STORM DRAINAGE SHOWN ON THE PLANS HAVE BEEN DETERMINED FROM THE BEST INFORMATION AVAILABLE AND ARE GIVEN FOR THE CONVENIENCE OF THE CONTRACTOR. ENGINEER ASSUMES NO RESPONSIBILITY FOR INACCURACY. PRIOR TO THE START OF ANY DEMOLITION ACTIVITY, IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO MAKE ARRANGEMENTS FOR THE FIELD LOCATIONS AND FOR ANY RELOCATION'S OF THE VARIOUS EXISTING UTILITIES WITH THE UTILITY OWNERS, WHICH SHALL BE DONE IN A TIMELY MANNER TO MINIMIZE IMPACT ON DEMOLITION SCHEDULE. ANY DELAY CAUSED BY THE CONTRACTOR BY THE RELOCATION OF UTILITIES SHALL BE INCIDENTAL TO THE CONTRACT AND NO EXTRA COMPENSATION WILL BE ALLOWED.
7. SUNSHINE STATE ONE CALL OF FLORIDA, INC. REQUIRES THE CONTRACTOR TO CALL TWO (2) FULL BUSINESS DAYS (BUT NOT MORE THAN FIVE) PRIOR TO BREAKING GROUND TO FIND OUT WHERE BURIED FACILITIES (ELECTRICAL, GAS, TELEPHONE, CABLE, WATER) ARE LOCATED.

DEMOLITION SAFETY

1. ALL DEMOLITION SHALL BE DONE IN A SAFE MANNER, SPECIFICALLY, THE RULES AND REGULATIONS OF THE OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA), THE FLORIDA DEPARTMENT OF TRANSPORTATION (FDOT) AND THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) SHALL BE STRICTLY OBSERVED.
2. PROVIDE ADEQUATE PROTECTION FOR PERSONS AND PROPERTY AT ALL TIMES. EXECUTE THE WORK IN A MANNER TO AVOID HAZARDS TO PERSONS AND PROPERTY AND PREVENT INTERFERENCE WITH THE USE OF AND ACCESS TO ADJACENT BUILDINGS. STREETS AND SIDEWALKS SHALL NOT BE UNNECESSARILY BLOCKED BY DEBRIS AND EQUIPMENT.
3. IF PETROLEUM PRODUCTS ARE FOUND WHILE DEMOLISHING, PETROLEUM WASTE SHALL BE DISPOSED OF IN ACCORDANCE WITH ALL LOCAL, STATE AND FEDERAL REGULATIONS.

PAVEMENT DEMOLITION

1. WHERE EXISTING PAVEMENT IS TO BE REMOVED, SAW-CUT THE SURFACING LEAVING A UNIFORM AND STRAIGHT EDGE WITH MINIMUM DISTURBANCE TO THE REMAINING ADJACENT SURFACING. IF DEMOLITION RESULTS IN RAVELING OF SAW CUT SURFACE , RE-CUT BACK FROM THE RAVELED EDGE PRIOR TO RESTORATION.
2. WHERE EXISTING PAVEMENT, CURB, CURB AND GUTTER, SIDEWALK, DRIVEWAY, OR VALLEY GUTTER IS REMOVED FOR INLETS, MANHOLES, APPURTENANCES, FACILITIES OR STRUCTURES, SAID PAVEMENT, ETC., SHALL BE REPLACED AND RESTORED IN EQUAL OR BETTER CONDITION THAN THE ORIGINAL. CONTRACTOR SHALL PROVIDE ALL NECESSARY LABOR, MATERIALS, EQUIPMENT, TOOLS, SUPPLIES, AND OTHER EQUIPMENT AS REQUIRED.
3. CONTRACTOR MAY LIMIT SAW-CUT AND PAVEMENT REMOVAL TO ONLY THOSE AREAS WHERE IT IS REQUIRED AS SHOWN ON THIS PLAN; HOWEVER, IF ANY DAMAGE IS INCURRED ON ANY OF THE SURROUNDING PAVEMENT, SIDEWALK, BUILDINGS, UTILITIES, ETC., THEN THE CONTRACTOR SHALL BE RESPONSIBLE FOR IT'S REMOVAL AND REPAIR TO EQUAL OR BETTER QUALITY.

DEMOLITION PERMITTING

1. IT IS THE CONTRACTOR'S RESPONSIBILITY TO OBTAIN ANY REQUIRED PERMITS FOR DEMOLITION FROM RESPONSIBLE REGULATORY AGENCIES WHILE FULLY ACKNOWLEDGING AND COMPLYING WITH ALL REQUIREMENTS PRIOR TO COMMENCING DEMOLITION WORK.
2. IT IS THE CONTRACTOR'S SOLE RESPONSIBILITY TO DETERMINE THE EXTENT OF DEMOLITION, RECYCLING OR REUSE REQUIRED IN ORDER TO PERFORM THE CONTRACT WORK FOR THIS PROJECT. THE CONTRACTOR SHALL CONDUCT SITE VISITS AND SHALL EXAMINE ALL OF THE INFORMATION WITHIN THESE DOCUMENTS: ALL DISCREPANCIES AND/OR OMISSIONS SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER PRIOR TO BID SUBMITTAL.
3. THE CONTRACTOR SHALL COORDINATE WITH OWNER PRIOR TO COMMENCEMENT OF ANY WORK. ACTUAL REMOVAL AND/OR RELOCATION OF ALL EXISTING LANDSCAPING WITHIN DEMOLITION AREAS TO BE CONDUCTED BY A LANDSCAPE CONTRACTOR. IT IS THE RESPONSIBILITY OF THE SITEWORK DEMOLITION CONTRACTOR TO COORDINATE DEMOLITION ACTIVITIES WITH THE LANDSCAPE CONTRACTOR. THE CONTRACTOR IS RESPONSIBLE FOR REMOVING AND PRESERVING TREES AS INDICATED ON THE PLANS. THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING A TREE REMOVAL PERMIT OR ANY OTHER APPLICABLE PERMIT TO REMOVE, RELOCATE, OR PRESERVE EXISTING LANDSCAPE & TREES.

DEMOLITION PERMITTING (CONT'D):

4. ANY TREES FOR REMOVAL FOUND TO BE GREATER THAN OR EQUAL TO THREE (3) INCHES IN DIAMETER AT BREAST HEIGHT (DBH) WILL REQUIRE A PERMIT WITH THE BROWARD COUNTY ENVIRONMENTAL PROTECTION AND GROWTH MANAGEMENT DEPARTMENT (BCEP/GMD).
5. SHOULD REMOVAL AND/OR RELOCATION ACTIVITIES DAMAGE THE LIGHTING, STORM INLET STRUCTURES, OR OTHER STRUCTURES DESIGNATED TO BE SAVED, THEN THE CONTRACTOR SHALL PROVIDE NEW MATERIALS/STRUCTURES IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.

DEMOLITION EROSION AND SEDIMENT CONTROL NOTES:

1. THE SCHEDULING, SEQUENCING AND CONTROL MEASURES, WHICH ARE OUTLINED HEREIN, ARE SUBJECT TO THE FINAL DEFINITION BY THE CONTRACTOR WHO WILL BE SELECTED TO PERFORM THE WORK AND WILL BE RESPONSIBLE FOR IMPLEMENTATION AND COMPLIANCE.
2. PRIOR TO DEMOLITION, THE CONTRACTOR SHALL BE REQUIRED TO SUBMIT A DEMOLITION SCHEDULE DEPICTING EACH PHASE OF THE WORK. THE CONTRACTOR SHALL ALSO BE REQUIRED TO SUBMIT AN EROSION AND SEDIMENT CONTROL PLAN ENCOMPASSING THE PRINCIPALS AND THE REQUIREMENTS DESCRIBED HEREIN AND A SCHEDULE FOR THEIR IMPLEMENTATION AND MAINTENANCE FOR THE PROJECT DURATION.
3. DURING DEMOLITION, THE CONTRACTOR SHALL TAKE ALL REASONABLE MEASURES TO ENSURE AGAINST POLLUTING, SILTATION OR DISTURBANCE TO SUCH AN EXTENT AS TO CAUSE AN INCREASE IN TURBIDITY TO THE EXISTING DRAINAGE SYSTEMS AND ADJACENT WATER BODIES AND WETLANDS, IN COMPLIANCE WITH ALL PERMIT REQUIREMENTS RELATED TO SUCH MEASURES.
4. METHODS MAY INCLUDE DEMOLITION OF TEMPORARY CONTROL STRUCTURES SUCH AS SEDIMENT BASINS, SEDIMENT CHECKS, SILT BARRIERS, SILT SCREENS, TURBIDITY BARRIERS OR THE BEST MANAGEMENT PRACTICES AVAILABLE TO THE INDUSTRY.
5. EROSION AND SEDIMENT CONTROL INSTALLATIONS SHALL BE MAINTAINED THROUGHOUT THE DEMOLITION PERIOD AND UNTIL NEW VEGETATIVE GROWTH HAS BEEN ESTABLISHED.
6. THROUGHOUT THE DEMOLITION PERIOD, THE CONTRACTOR SHALL INSPECT DAILY THE PROTECTIVE INSTALLATIONS FOR FAILURE OR SIGNS OF FAILURE OR MALFUNCTION AND EFFECT REPAIRS OR REPLACEMENT IMMEDIATELY UPON DISCOVERY.
7. INLETS AND CATCH BASINS, EXISTING ON-SITE AND OFF-SITE, SHALL BE PROTECTED FROM SEDIMENT STORM RUNOFF WITH FILTER FABRIC AND HAY BALES OVER GRATES.
8. THE CONTRACTOR SHALL PROMPTLY REMOVE ALL MUD, DIRT OR OTHER MATERIALS TRACKED OR SPILLED ONTO EXISTING PUBLIC ROADS AND FACILITIES DUE TO DEMOLITION.
9. DEWATERING ACTIVITIES WILL NOT RESULT IN ANY DISCHARGE OF TURBID WATER FROM THE PROJECT SITE WITHOUT PROPER EROSION AND SEDIMENT CONTROL AND APPROVAL FROM ENGINEER.
10. PHASING OF EROSION CONTROL DEMOLITION SHALL BE RECOMMENDED AS FOLLOWS:
 - 10.1. PLACEMENT OF PERIMETER PROTECTIVE MEASURES (SILT FENCE, HAY BALES, TURBIDITY BARRIERS, ETC.) AROUND ON-SITE FEATURES TO BE RETAINED, AT POINTS OF OFF-SITE DISCHARGE AND AROUND WORK AREAS TO BE EXCAVATED OR FILLED.
 - 10.2. REROUTE RUNOFF FROM AREAS OUTSIDE OF THE DEMOLITION AREA TO MINIMIZE FLOW THROUGH AREAS TO BE DISTURBED BY DEMOLITION. BERM, SWALES AND OTHER MEANS USED FOR SUCH CONVEYANCE SHALL BE VEGETATED AND MEASURES TAKEN TO PROVIDE PROTECTION UNTIL STABILIZATION OCCURS (AS APPLICABLE TO THE PROJECT).
 - 10.3. SELECT LOCATIONS FOR PLACEMENT OF EXCAVATED MATERIAL, WHERE SUITABLE FOR FILL OR UNSUITABLE MATERIAL, AND CONSTRUCT CONTAINMENT BERMS AROUND THE AREA. THE USE OF STRIPING FOR THIS PURPOSE MAY ACCELERATE BERM REVEGETATION. CONSTRUCT TEMPORARY OUTLETS FOR CONTAINMENT AREAS WITH SCREENS, HAY BALES, SETTLING BASINS OR OTHER MEASURES TO PREVENT SILT TRANSPORT.
 - 10.4. SELECT / DESIGNATE ACCESS ROUTING FOR DEMOLITION EQUIPMENT AND VEHICLES AND PROVIDE PERIMETER PROTECTIVE MEASURES WHERE EXISTING TERRAIN WILL BE SUBJECT TO DISRUPTION BY SUCH TRAFFIC.
 - 10.5. CONSTRUCT ABOVE GROUND OR OTHER CONTAINMENT AREAS FOR DEMOLITION AREA RUNOFF. PROVIDE SCREENS, HAY BALES, ETC. TO FILTER DISCHARGE FROM THOSE AREAS.
 - 10.6. SPOIL MOUNDS SHALL NOT BE LEFT FOR MORE THAN ONE WEEK PRIOR TO REPLACEMENT UNLESS PROTECTIVE CONTAINMENT MEASURES IN THE WORK AREA ARE APPLIED.
 - 10.7. GRASSING, SODDING, ETC. SHALL BE IN PLACE IMMEDIATELY UPON COMPLETION OF REGRADING, SWALE SLOPES AND THE CONSTRUCTED OR DISTURBED AREAS.
11. THE CONTRACTOR IS REQUIRED TO ADHERE TO THE REQUIREMENT OF THE NATIONAL POLLUTION DISCHARGE ELIMINATION SYSTEM (NPDES). THE CONTRACTOR SHALL INSTITUTE BEST MANAGEMENT PRACTICES (BMPs) TO ENSURE COMPLIANCE WITH THE NPDES PROGRAM AND TO MINIMIZE THE IMPACT TO PUBLIC STORMWATER FACILITIES. A NOTICE OF INTENT (NOI) SHALL BE FILED PRIOR TO BEGINNING CONSTRUCTION ACTIVITIES.
12. PRIOR TO CONSTRUCTION, A SILT FENCE IN ACCORDANCE WITH CITY'S DETAIL SILT FENCE SHALL BE ERECTED AS NOTED ON PLANS. ALL PROPOSED CATCH BASINS WILL HAVE THEIR INLETS PROTECTED BY THE INSTALLATION OF FILTER FABRIC INTO THE FRAME AND GRATE. THIS SILT FENCE AND FILTER FABRIC WILL REMAIN IN PLACE DURING THE ENTIRE DURATION OF CONSTRUCTION.
13. CONTRACTOR WILL BRACE ALL EXISTING LANDSCAPING TO REMAIN PRIOR TO BEGINNING ANY WORK AND WILL ENSURE THEIR STABILIZATION THROUGHOUT THE ENTIRE CONSTRUCTION PROCESS. EXISTING SOD DISTURBED BY CONSTRUCTION THAT IS NOT AFFECTED BY PROPOSED GRADING WILL BE RESTORED TO ITS ORIGINAL STATE UPON COMPLETION OF CONSTRUCTION. SODDED SLOPES STEEPER THAN 4 HORIZONTAL TO 1 VERTICAL WILL BE PEGGED.
14. ALL WASTE GENERATED FROM THE CONSTRUCTION SHALL BE DISCARDED IN ACCORDANCE WITH ALL APPLICABLE STATE, LOCAL AND FEDERAL REGULATIONS. CONTRACTOR IS TO OBTAIN ALL APPLICABLE CODES AND BECOME FAMILIAR WITH STATE, LOCAL AND FEDERAL REGULATIONS PRIOR TO BEGINNING CONSTRUCTION. REGULATIONS CAN BE FOUND, BUT NOT LIMITED TO, DEPARTMENT OF ENVIRONMENTAL RESOURCE MANAGEMENT AND DEPARTMENT OF ENVIRONMENTAL PROTECTION.
15. TO ENSURE THAT OFF-SITE VEHICLE TRACKING OF SEDIMENTS AND THE GENERATION OF DUST IS MINIMIZED, CONTRACTOR IS TO PUT INTO PRACTICE THE METHODS DETAILED IN FDOT INDEX 106 (LATEST VERSION) AND BMPs.
16. DUST GENERATED FROM CONSTRUCTION WILL BE MINIMIZED BY DAILY WATERING OF THE SITE.
17. AT ANY TIME DURING CONSTRUCTION THAT THE SILT FENCING IS DISTURBED, THE SILT FENCING SHALL BE RESTORED TO ITS ORIGINAL STATE WITHIN 24 HOURS. AT NO TIME DURING CONSTRUCTION SHALL WORK BE PERFORMED WITHOUT THE INTEGRITY OF THE SILT FENCING SECURED.
18. A QUALIFIED INSPECTOR, PROVIDED BY THE OPERATOR, SHALL INSPECT ALL POINTS OF DISCHARGE INTO NEARBY SURFACE WATER OF THE STATE AND SFWMD. THE INSPECTION WILL OCCUR AT LEAST ONCE EVERY SEVEN CALENDAR DAYS AND WITHIN 24 HOURS OF THE END OF A STORM THAT IS 0.5 INCHES OR GREATER. INSPECTION INCLUDES THE WRITTEN RECORDING OF THE CONDITION OF ALL DISCHARGE POINTS, INTEGRITY OF SILT FENCING, DAILY DUST CONTROL MEASURES, VEHICULAR TRAFFIC AND CONSTRUCTION MATERIAL STORAGE AND DISPOSAL. WRITTEN RECORD OF ALL INSPECTIONS WILL BE STORED BY THE OPERATOR DURING CONSTRUCTION.
19. THE INSPECTION REPORT WILL INCLUDE, BUT IS NOT LIMITED TO, THE FOLLOWING INFORMATION: NAME AND QUALIFICATION OF PERSONNEL MAKING THE INSPECTION, DATE OF INSPECTION, RAINFALL DATE, MAJOR OBSERVATIONS RELATING TO THE SWPPP, ACTIONS TAKEN BY CONTRACTOR AND ANY INCIDENT OF NONCOMPLIANCE WITH PERMIT. WHERE AN INSPECTION DOES NOT IDENTIFY ANY INCOMPLIANCE, THE REPORT SHALL CONTAIN A CERTIFICATION THAT THE FACILITY IS IN COMPLIANCE WITH THE SWPPP AND THE PERMIT.
20. THE PERMITTEE SHALL RETAIN A COPY OF THE SWPPP AND ALL REPORTS, RECORDS AND DOCUMENTATION REQUIRED BY THE PERMIT AT THE CONSTRUCTION SITE, OR AN APPROPRIATE ALTERNATIVE LOCATION AS SPECIFIED IN THE NOTICE OF INTENT, FROM THE DATE OF PROJECT INITIATION TO THE DATE OF FINAL STABILIZATION. THE PERMITTEE SHALL RETAIN COPIES OF SWPPP AND ALL REPORTS REQUIRED BY THIS PERMIT, AND RECORDS OF ALL DATA USED TO COMPLETE THE NOTICE OF INTENT TO BE COVERED BY THE PERMIT, FOR A PERIOD OF AT LEAST THREE (3) YEARS FROM THE DATE THAT THE SITE IS FINALLY STABILIZED.

INTERRUPTION OF EXISTING UTILITIES

1. ANY DEMOLITION WORK THAT REQUIRES INTERRUPTION OF SERVICE TO ANY CUSTOMER SHALL BE DONE SO WITH A MINIMUM OF SEVENTY-TWO (72) HOUR NOTICE TO, AND WRITTEN APPROVAL BY, THE APPROPRIATE UTILITY COMPANY. THE CONTRACTOR SHALL ARRANGE A MEETING WITH THE LOCAL JURISDICTIONAL AGENCIES AND OTHER GOVERNING AGENCIES, AND OTHER AFFECTED UTILITIES PRIOR TO SCHEDULING THE SHUT DOWN TO ASSESS THE SCOPE OF WORK. ALL SYSTEM SHUT DOWNS SHALL BE SCHEDULED BY THE CONTRACTOR AT SUCH TIME THAT SYSTEM DEMAND IS LOW. THIS GENERALLY REQUIRES NIGHT TIME WORK BY THE CONTRACTOR AND REQUIRES FULL TIME INSPECTION BY A REPRESENTATIVE OF THE UTILITY. ALL COST FOR OVERTIME WORK BY THE REPRESENTATIVE OF THE UTILITY SHALL BE BORNE BY THE CONTRACTOR. EACH CUSTOMER AFFECTED BY THE SHUT DOWN SHALL BE PROVIDED, MINIMUM, FORTY-EIGHT (48) HOURS WRITTEN NOTIFICATION BY THE CONTRACTOR.

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1. ANY DEMOLITION WORK THAT REQUIRES INTERRUPTION OF SERVICE TO ANY CUSTOMER SHALL BE DONE SO WITH A MINIMUM OF SEVENTY-TWO (72) HOUR NOTICE TO, AND WRITTEN APPROVAL BY, THE APPROPRIATE UTILITY COMPANY. THE CONTRACTOR SHALL ARRANGE A MEETING WITH THE LOCAL JURISDICTIONAL AGENCIES AND OTHER GOVERNING AGENCIES, AND OTHER AFFECTED UTILITIES PRIOR TO SCHEDULING THE SHUT DOWN TO ASSESS THE SCOPE OF WORK. ALL SYSTEM SHUT DOWNS SHALL BE SCHEDULED BY THE CONTRACTOR AT SUCH TIME THAT SYSTEM DEMAND IS LOW. THIS GENERALLY REQUIRES NIGHT TIME WORK BY THE CONTRACTOR AND REQUIRES FULL TIME INSPECTION BY A REPRESENTATIVE OF THE UTILITY. ALL COST FOR OVERTIME WORK BY THE REPRESENTATIVE OF THE UTILITY SHALL BE BORNE BY THE CONTRACTOR. EACH CUSTOMER AFFECTED BY THE SHUT DOWN SHALL BE PROVIDED, MINIMUM, FORTY-EIGHT (48) HOURS WRITTEN NOTIFICATION BY THE CONTRACTOR.

TEMPORARY DEMOLITION FACILITIES

1. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO ARRANGE OR SUPPLY TEMPORARY WATER SERVICE, SANITARY FACILITIES AND ELECTRICITY TO ITS EMPLOYEES AND SUBCONTRACTORS FOR THEIR USE DURING DEMOLITION.
2. MAINTENANCE OF TRAFFIC (MOT) IN THE PUBLIC RIGHT-OF-WAY SHALL BE IN ACCORDANCE WITH THE MUTCD, THE CITY OF FORT LAUDERDALE, BROWARD COUNTY, AND FDOT.
3. ALL OPEN TRENCHES AND HOLES ADJACENT TO ROADWAYS OR WALKWAYS SHALL BE PROPERLY MARKED AND BARRICADED TO ASSURE THE SAFETY OF BOTH VEHICULAR AND PEDESTRIAN TRAFFIC.
4. NO TRENCHES OR HOLES NEAR WALKWAYS OR IN ROADWAYS OR THEIR SHOULDERS ARE TO BE LEFT OPEN DURING NIGHTTIME HOURS WITHOUT EXPRESS WRITTEN PERMISSION OF THE CITY OR RESPECTIVE GOVERNING AGENCY.

WASTE MANAGEMENT PLAN

1. IMPLEMENT A WASTE MANAGEMENT PLAN FOR APPROVED BY THE OWNER. PROVIDE HANDLING, CONTAINERS, STORAGE, SIGNAGE, TRANSPORTATION AND OTHER ITEMS AS NEEDED TO IMPLEMENT THE WASTE MANAGEMENT PLAN DURING THE ENTIRE DURATION OF THE CONTRACT.
2. DESIGNATE A WASTE MANAGEMENT COORDINATOR TO BE RESPONSIBLE FOR IMPLEMENTING, MONITORING AND REPORTING STATUS OF WASTE MANAGEMENT WORK PLAN. COORDINATOR SHALL BE PRESENT AT PROJECT SITE FULL TIME FOR DURATION OF PROJECT.
3. TRAIN WORKERS, SUBCONTRACTORS AND SUPPLIERS ON PROPER WASTE MANAGEMENT PROCEDURES, AS APPROPRIATE FOR THE WORK OCCURRING AT THE PROJECT SITE.
4. DISTRIBUTE A WASTE MANAGEMENT PLAN BEFORE WORK BEGINS. REVIEW PLAN PROCEDURES AND LOCATION ESTABLISHED FOR SALVAGE, RECYCLING AND DISPOSAL.

RECYCLING DEMOLITION WASTE

1. SEPARATE RECYCLABLE WASTE FROM OTHER WASTE MATERIALS, TRASH AND DEBRIS. SEPARATE RECYCLABLE WASTE BY TYPE AT THE PROJECT SITE TO THE MAXIMUM EXTENT PRACTICAL.
2. PROVIDE APPROPRIATELY MARKED CONTAINERS OR BINS FOR CONTROLLING RECYCLABLE WASTE UNTIL THEY ARE REMOVED FROM THE PROJECT SITE. INCLUDE A LIST OF ACCEPTABLE AND UNACCEPTABLE MATERIALS AT EACH CONTAINER AND BIN.
 - 2.1. INSPECT CONTAINERS AND BINS FOR CONTAMINATION AND REMOVE CONTAMINATED MATERIALS IF FOUND.
3. STOCKPILE: PROCESSED MATERIALS ON-SITE WITHOUT INTERMIXING WITH OTHER MATERIALS. PLACE, GRADE AND SHAPE STOCKPILES TO DRAIN SURFACE WATER. COVER TO PREVENT WINDBLOWN DUST.
4. STOCKPILE MATERIALS AWAY FROM DEMOLITION AREA. DO NOT STORE WITHIN DRIP LINE OF REMAINING TREES.
5. STORE COMPONENTS OFF THE GROUND AND PROTECT FROM THE WEATHER.
6. REMOVE RECYCLABLE WASTE OFF THE OWNER'S PROPERTY AND TRANSPORT TO RECYCLING RECEIVER OR PROCESSOR.
7. ASPHALTIC CONCRETE PAVING: BREAK UP AND TRANSPORT PAVING TO ASPHALT RECYCLING FACILITY.
8. CONCRETE: REMOVE REINFORCEMENT AND OTHER METALS FROM CONCRETE AND SORT WITH OTHER METALS.
9. MASONRY: MASONRY WASTE SHALL INCLUDE WHOLE OR BROKEN BRICK AND CONCRETE MASONRY UNITS. WHOLE MASONRY UNITS SHALL BE CLEANED AND REUSED OR DONATED. BROKEN MASONRY SHALL BE CRUSHED AND USED AS FILL FOR OFFSITE AREAS. REMOVE METAL REINFORCEMENT, ANCHORS AND TIES FROM MASONRY AND SORT WITH OTHER METALS.
10. METALS: METALS FROM REINFORCED CONCRETE, REINFORCED MASONRY, STRUCTURAL STEEL MEMBERS, FLASHING AND SHEET METAL, CONDUIT PIPE, SIDING, PIPING AND WIRING SHALL BE SEPARATED BY TYPE.
 - 10.1. STRUCTURAL STEEL: STACK MEMBERS ACCORDING TO THEIR SIZE, TYPE AND LENGTH.
 - 10.2. REMOVE BOLTS, NUTS, WASHERS AND OTHER ROUGH HARDWARE.
11. SITE-CLEARING WASTE SHALL BE RECYCLED BY CHIPPING BRUSH, BRANCHES AND TREES, THEN HAUL TO NEAREST WOOD RECYCLING CENTER.

DISPOSAL OF WASTE

1. GENERAL: EXCEPT FOR ITEMS OR MATERIALS TO BE SALVAGED, RECYCLED OR OTHERWISE REUSED, REMOVE WASTE MATERIALS FROM PROJECT SITE AND LEGALLY DISPOSE OF THEM IN A LANDFILL OR OTHER PERMITTED DISPOSAL FACILITY.
 - 1.1. EXCEPT AS OTHERWISE SPECIFIED, DO NOT ALLOW WASTE MATERIALS THAT ARE TO BE DISPOSED OF TO ACCUMULATE ON-SITE.
 - 1.2. REMOVE AND TRANSPORT DEBRIS IN A MANNER THAT WILL PREVENT SPILLAGE ON ADJACENT SURFACES AND AREAS.
2. BURNING: DO NOT BURN WASTE MATERIALS.
3. DISPOSAL: TRANSPORT WASTE MATERIALS OFF THE OWNER'S PROPERTY AND LEGALLY DISPOSE OF THEM.

ABBREVIATIONS LEGEND

INV. = PIPE INVERT ELEVATION
E.O.P. = EDGE OF PAVEMENT
NGVD = NATIONAL GEODETIC VERTICAL DATUM
NAVD = NORTH AMERICAN VERTICAL DATUM

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| APPROVED FOR THE CLIENT DATE: 7/26/18 | PREPARED BY P.E. DATE: 7/26/18 | TEL: (954) 828-5081 |
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| DRAWN BY: DATE: SEP 2018 | DESIGNED BY: SCALE: N/A | CHECKED BY: SCALE: N/A |
| WD | KM | SC |
| FIELD BOOK | | |

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| CITY of FORT LAUDERDALE PUBLIC WORKS DEPARTMENT ENGINEERING & ARCHITECTURE 100 North Andrews Avenue, Fort Lauderdale, Florida 33301 |
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| REVISITONS | | DESCRIPTION | |
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| PROJECT # 12376 SW 3RD AVENUE ON-STREET PARKING IMPROVEMENTS DEMOLITION NOTES FORT LAUDERDALE, FLORIDA |
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| SHEET NO. 2 |
| TOTAL: 6 |
| CAD FILE: 12376-MULTI-NOTE |
| DRAWING FILE NO. 4-140-90 |





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| SHEET NO. | |
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| DRAWING FILE NO. 4-140-90 | |





























BID SET

PROJECT # 12376
SW 3RD AVENUE
ON-STREET PARKING IMPROVEMENTS
DEMOLITION PLAN
FORT LAUDERDALE, FLORIDA

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| SHEET NO. | |
| 3 | |
| TOTAL: | 6 |
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Exhibit 3 p. 51

GENERAL CONSTRUCTION NOTES:

1. NO CONNECTIONS FOR THE PURPOSE OF OBTAINING WATER SUPPLY DURING CONSTRUCTION SHALL BE MADE TO ANY FIRE HYDRANT OR BLOW-OFF STRUCTURE WITHOUT FIRST OBTAINING PERMISSION AND A CONSTRUCTION METER FROM THE CITY OF FORT LAUDERDALE.
2. THE CONTRACTOR MUST USE EXTREME CARE TO AVOID DAMAGE OR DISRUPTION TO ANY EXISTING UTILITIES, WHETHER SHOWN ON THE PLANS OR NOT. ALL PLAN LOCATIONS ARE APPROXIMATE AND SHALL BE FIELD VERIFIED. CONTRACTOR IS TO CONTACT SUNSHINE STATE ONE CALL OF FLORIDA AT 1-800-432-4770 OR 811 AND ALL OTHER PARTICIPATING UTILITIES 2 FULL BUSINESS DAYS PRIOR TO CONSTRUCTION FOR FIELD MARKUP LOCATIONS OF EXISTING UTILITIES AND FACILITIES.
3. THE CONTRACTOR MUST INFORM THE CITY AT LEAST 48-HOURS IN ADVANCE OF CONSTRUCTION, IN WRITING, IF ANY CONFLICT IS DISCOVERED DURING POT HOLE OPERATIONS FOR CLARIFICATION BY THE CITY.
4. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO NOTIFY THE UTILITIES DEPARTMENT OF THE CITY OF FORT LAUDERDALE AT LEAST TWO (2) BUSINESS DAYS IN ADVANCE TO COORDINATE ANY ACTIVITY TO BE PERFORMED BY THE CITY'S UTILITIES DEPARTMENT.
5. CONTRACTOR SHALL NOT DISTURB AREAS OUTSIDE EXISTING RIGHTS-OF-WAY, UNLESS TO REGRADE TO MATCH PROPOSED SIDEWALK & DRIVEWAY ELEVATIONS.
6. IN GENERAL, EXISTING STRUCTURES AND UTILITIES ARE NOTED AS EXISTING AND/OR SHOWN IN THIN LINES. NEW CONSTRUCTION IS IN HEAVY LINES AND/OR UNDERLINED.
7. ALL WORK WITHIN STATE DEPARTMENT OF TRANSPORTATION (FDOT) RIGHT-OF-WAYS SHALL BE IN CONFORMANCE WITH FDOT SPECIFICATIONS AND PERMIT REQUIREMENTS.
8. ALL WORK WITHIN BROWARD COUNTY RIGHT-OF-WAYS SHALL BE IN CONFORMANCE WITH THE BROWARD COUNTY MINIMUM STANDARDS AND/OR PERMIT REQUIREMENTS.
9. CONTRACTOR SHALL COMPLY WITH ALL LOCAL CITY, COUNTY AND STATE REGULATIONS PERTAINING TO THE CLOSING OF PUBLIC STREETS FOR USE OF TRAFFIC DURING CONSTRUCTION.
10. CONTRACTOR SHALL PREPARE AND SUBMIT MAINTENANCE OF TRAFFIC (MOT) PLANS TO FDOT, CITY OF FORT LAUDERDALE, AND BROWARD COUNTY, AS REQUIRED, FOR WORK TO BE DONE WITHIN THEIR RIGHT OF WAY PRIOR TO COMMENCEMENT OF WORK. SPECIFIC AGENCY MOT REQUIREMENTS ARE THE SOLE RESPONSIBILITY OF THE CONTRACTOR.
11. STATIONS SHOWN ON THE DRAWINGS ARE BASED ON THE ESTABLISHED BASELINE AND SHALL NOT BE CONSIDERED AS DISTANCES OR AS A MEASURE OF THE LINEAR FOOTAGE OF PIPE TO BE INSTALLED.
12. CONTRACTOR SHALL MAINTAIN ACCESS TO PRIVATE PROPERTY AT ALL TIMES.
13. ALL OPEN TRENCHES AND HOLES ADJACENT TO ROADWAY OR WALKWAY SHALL BE PROPERLY MARKED AND BARRICADED TO ASSURE THE SAFETY OF BOTH VEHICULAR AND PEDESTRIAN TRAFFIC.
14. TRENCHES OR HOLES NEAR WALKWAYS, IN ROADWAYS OR THEIR SHOULDERS SHALL NOT BE LEFT OPEN DURING NIGHT TIME HOURS WITHOUT ADEQUATE PROTECTION.
15. CONTRACTOR SHALL PROMPTLY REPAIR AND RESTORE EXISTING PAVEMENT, SIDEWALKS, CURBS, DRIVEWAYS, PIPES, RESIDENTIAL AND COMMERCIAL SPRINKLER LINES, CONDUIT, CABLES, ETC. AND LANDSCAPE AREAS DAMAGED AS A RESULT OF CONSTRUCTION ACTIVITIES.
16. CONTRACTOR SHALL PROVIDE TEMPORARY FENCING AS REQUIRED BY AGENCIES HAVING JURISDICTION OVER THE PROJECT AND/OR WHEN REQUIRED FOR PUBLIC SAFETY.
17. THE CONTRACTOR SHALL BE RESPONSIBLE AT ALL TIMES THROUGHOUT THE DURATION OF CONSTRUCTION AND UNTIL ACCEPTANCE OF WORK, FOR THE PROTECTION OF EXISTING AND NEWLY INSTALLED UTILITIES FROM DAMAGE OR DISRUPTION OF SERVICE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR TAKING SUCH MEASURES AS NECESSARY TO PROTECT THE HEALTH, SAFETY AND WELFARE OF THOSE PERSONS HAVING ACCESS TO THE WORK SITE.
18. CONTRACTOR SHALL ADJUST TO GRADE ALL EXISTING UTILITY CASTINGS INCLUDING VALVE BOXES, MANHOLES, HAND HOLES, PULL BOXES, INLETS AND SIMILAR STRUCTURES IN CONSTRUCTION AREA TO BE OVERLAYED WITH ASPHALT.
19. EXISTING TRAFFIC SIGNS SHALL BE RESET UPON COMPLETION PER BROWARD COUNTY TRAFFIC ENGINEERING STANDARDS. COST SHALL BE CONSIDERED INCIDENTAL. CONTRACTOR SHALL REPAIR OR REPLACE DAMAGED TRAFFIC SIGNAL LOOPS PER BROWARD COUNTY TRAFFIC ENGINEERING SPECIFICATIONS; COST SHALL BE INCIDENTAL.
20. CONTRACTOR SHALL RESTORE EXISTING PAVEMENT AND PAVEMENT MARKINGS/SIGNAGE TO ORIGINAL PRE-CONSTRUCTION CONDITION OR AS OTHERWISE SPECIFIED IN CONTRACT DOCUMENTS. THIS WORK SHALL BE CONSIDERED INCIDENTAL.
21. ALL CONSTRUCTION WITHIN FDOT RIGHT OF WAY MUST CONFORM WITH FDOT SPECIFICATIONS, STANDARDS, AND PERMIT REQUIREMENTS. NO WORK SHALL COMMENCE WITHIN FDOT RIGHT OF WAY WITHOUT AN FDOT PERMIT. FULL LANE WIDTH RESTORATION TO MATCH EXISTING PAVEMENT SECTION IS REQUIRED IN ACCORDANCE WITH FDOT STANDARDS FOR PROPOSED WORK WITHIN FDOT RIGHT OF WAY.
22. CONTRACTOR SHALL VERIFY ALL UTILITY LOCATIONS AND ELEVATIONS BEFORE STARTING CONSTRUCTION.
23. ELEVATIONS SHOWN HEREON ARE BASED ON THE NORTH AMERICAN VERTICAL DATUM 1988 (NAVD 88).

GENERAL NOTES – TRAFFIC CONTROL PLAN

1. THE TRAFFIC CONTROL PLANS FOR THE PROJECT SHALL COMPLY WITH THE LATEST EDITION OF THE FDOT ROADWAY AND TRAFFIC DESIGN STANDARDS, INDEX NO. 600-870. MUTCD AND THE STANDARD SPECIFICATIONS. THE CONTRACTOR'S RESPONSE TIME TO ALL REPORTED MALFUNCTIONS OF TRAFFIC SIGNALS WITHIN THE PROJECT LIMITS SHALL BE NO MORE THAN TWO (2) HOURS AND SHALL RESTORE ALL MALFUNCTIONING TRAFFIC SIGNAL EQUIPMENT TO ITS LEVEL OF OPERATION PRIOR TO THE MALFUNCTIONING WITHIN TWENTY-FOUR (24) HOURS. DURING THIS TIME THE CONTRACTOR SHALL PROVIDE AT HIS EXPENSE TEMPORARY TRAFFIC CONTROL DEVICES, FLAGGLER PERSONNEL AND LAW ENFORCEMENT PERSONNEL AS NECESSARY TO MAINTAIN A SAFE AND EFFICIENT FLOW OF TRAFFIC AT THE AFFECTED WORK ZONE. THE ENGINEER OR THE CITY OF FORT LAUDERDALE SHALL APPROVE ALL MODIFICATIONS PRIOR TO THEIR IMPLEMENTATION.
2. THE CONTRACTOR SHALL MAINTAIN PROPER OPERATION OF ALL TRAFFIC SIGNAL LOOP ASSEMBLIES AND LOOP DETECTORS WITHIN THE PROJECT LIMITS. THE CONTRACTOR SHALL CORRECT ALL LOOP ASSEMBLY/DETECTOR MALFUNCTIONS WITHIN 24 HOURS OF NOTIFICATION OF SUCH MALFUNCTIONS BY THE ENGINEER.
3. THE AGENCY RESPONSIBLE FOR MAINTENANCE OF THE TRAFFIC SIGNALS AND RELATED EQUIPMENT IS BROWARD COUNTY TRAFFIC ENGINEERING.
4. A REGULATORY SPEED OF 25 MPH SHALL BE POSTED WITHIN THE LIMITS OF THE WORK ZONE.
5. EXISTING SIGNS AND PAVEMENT MARKINGS THAT CONFLICT WITH CONSTRUCTION SIGNS AND MARKINGS SHALL BE REMOVED DURING CONSTRUCTION. ALL EXISTING SIGNS THAT ARE REMOVED SHALL BE STOCKPILED IN A SECURE PLACE AND REINSTALLED AFTER CONSTRUCTION. REMOVE AND REPLACE ANY GROUND MOUNT SIGN BY USE OF INDEX NO. 611.
6. THE CONTRACTOR SHALL MAINTAIN EXISTING DRAINAGE PATTERNS AND PREVENT ADVERSE FLOODING OF THE TRAVEL LANES DURING CONSTRUCTION.
7. THE CONTRACTOR SHALL OBTAIN WRITTEN AUTHORIZATION FROM THE CITY OF FORT LAUDERDALE FOR ANY AND ALL CONSTRUCTION ACTIVITIES TO BE PERFORMED AT NIGHT. NO LANE CLOSURE SHALL BE ALLOWED BETWEEN THE HOURS OF 6:00 AM TO 9:00 AM AND 4:00 PM TO 7:00 PM, MONDAY THROUGH FRIDAY UNLESS APPROVED BY THE ENGINEER. LANE/ROAD CLOSURE OF 72 HOURS OR MORE REQUIRES REVOCABLE LICENSE APPROVAL.
8. THE CONTRACTOR SHALL NOTIFY THE APPROPRIATE UTILITY COMPANY TWO (2) BUSINESS DAYS IN ADVANCE OF ANY EXCAVATION INVOLVING ITS UTILITIES, SO THAT A COMPANY REPRESENTATIVE CAN BE PRESENT. THE LOCATION OF THE UTILITIES SHOWN IN THE PLANS ARE APPROXIMATE ONLY. THE EXACT LOCATION SHALL BE DETERMINED BY THE CONTRACTOR DURING CONSTRUCTION. SEE SPECS FOR LIST OF UTILITY COMPANIES.
9. TRAFFIC CONTROL ON ALL COUNTY RIGHTS-OF-WAY SHALL MEET THE ADDITIONAL REQUIREMENTS OF THE BROWARD COUNTY ENGINEERING DEPARTMENT.
10. CONTRACTOR SHALL PREPARE AND SUBMIT MAINTENANCE OF TRAFFIC PLAN (MOT) WHERE REQUIRED BY FEDERAL, STATE, COUNTY, OR LOCAL AGENCIES HAVING JURISDICTION. CONTRACTOR SHALL OBTAIN ALL REQUIRED APPROVALS AND PERMITS ASSOCIATED WITH THE MOT'S. ALL MOT'S TO BE ATS CERTIFIED.
11. THE CONTRACTOR SHALL ALSO COORDINATE THE CONSTRUCTION SCHEDULE WITH FDOT, BROWARD COUNTY AND THE CITY OF FORT LAUDERDALE TO AVOID LANE CLOSURES WHICH WOULD ADVERSELY AFFECT TRAFFIC DURING RUSH HOUR.

LEGEND

ABBREVIATIONS

- | | |
|--------------|---|
| C.L.F. | = CHAIN LINK FENCE |
| CMP | = CORRUGATED METAL PIPE |
| CONC. | = CONCRETE |
| F.H. | = FIRE HYDRANT |
| GAS | = GAS MAIN |
| INV. | = PIPE INVERT |
| OHW | = OVERHEAD WIRES |
| R/W | = RIGHT-OF-WAY LINE |
| RCP | = REINFORCED CONCRETE PIPE |
| SAN | = SANITARY SEWER PIPE |
| SMH | = SANITARY MANHOLE |
| S.V. | = SEWER VALVE |
| T.O.P. | = TOP OF PIPE |
| UNK. | = UNKNOWN TREE TYPE |
| U.T.O. | = UNABLE TO OBTAIN DATA |
| U.V. | = UNKNOWN VALVE |
| W.V. | = WATER VALVE |
| B.C.H.C.E.D. | = BROWARD COUNTY HIGHWAY CONSTRUCTION AND ENGINEERING DEPARTMENT. |

GENERAL NOTES-BROWARD COUNTY TRAFFIC ENGINEERING DEPT.

ALL PARTIES NOTE THE FOLLOWING:

1. DIRECTIONAL BORES, UTILITY CONNECTIONS, THE PLACEMENT OF MOT AND ADVANCE SIGNAGE MAY BY THEIR PLACEMENT, DAMAGE/DESTROY THE COMMUNICATIONS CABLE/CONDUIT LOCATED INSIDE AND OUTSIDE THE PROJECT AREA. ADDITIONALLY, CURB/GUTTER/SIDEWALK REMOVAL/PLACEMENT, RELOCATION OF TREES, LANDSCAPING ACTIVITIES AND IRRIGATION ACTIVITIES ARE POTENTIAL CAUSES FOR DAMAGE TO BCTED'S COMMUNICATION CABLE/CONDUIT. ALL PARTIES SHALL EXERCISE EXTREME CAUTION WHEN WORKING IN PROXIMITY TO THE COMMUNICATIONS CABLE/CONDUIT.
2. ANY ABOVE PROJECT ACTIVITY, INCIDENTAL OR OTHERWISE, WHICH IMPACTS OR DAMAGES THE COMMUNICATIONS CABLE/CONDUIT, SHALL BE SUBJECT TO THE FOLLOWING NOTES AND CONDITIONS BELOW:

COMMUNICATION NOTES:

THE AGENCY RESPONSIBLE FOR MAINTENANCE OF THE TRAFFIC SIGNALS AND RELATED EQUIPMENT IS BROWARD COUNTY TRAFFIC ENGINEERING DIVISION (BCTED). ALL SYSTEM COMMUNICATIONS EQUIPMENT, CABLEING AND RELATED MATERIAL SHALL COMPLY WITH BROWARD COUNTY'S LATEST EDITION OF THE MINIMUM STANDARDS AS EXPRESSED IN THE "STANDARDS AND SPECIFICATIONS COMMUNICATION INFRASTRUCTURE" DOCUMENT. PLEASE REFER TO (BCTED'S) COMMUNICATIONS POLICIES AND PROCEDURES FOR ADDITIONAL INFORMATION. BROWARD COUNTY TRAFFIC ENGINEERING DIVISION SHALL NOT ACCEPT ANY PROJECTS THAT DO NOT MEET THESE STANDARDS AND SPECIFICATIONS. IF FIBER OPTIC PULL BOXES ALREADY EXIST AT AN INTERSECTION, NO ADDITIONAL FIBER OPTIC PULL BOXES SHALL NEED TO BE INSTALLED. FOR A COPY OF THESE STANDARDS REFER TO THE BROWARD COUNTY WEB SITE AT WWW.BROWARD.ORG/TRAFFIC UNDER PUBLICATIONS.

IF THERE ARE COPPER INTERCONNECT CABLE/S WITHIN YOUR PROJECT LIMITS OR WITHIN 1500 FEET OF YOUR PROJECT LIMITS, CONTACT THE TRAFFIC SIGNAL TECHNICIAN III AT TECCOMMUNICATIONS@BROWARD.ORG OR 954-847-2761.

IF THERE ARE FIBER OPTIC CABLE/S WITHIN YOUR PROJECT LIMITS OR WITHIN 1500 FEET OF YOUR PROJECT LIMITS CONTACT THE COMMUNICATIONS MANAGER AT TECCOMMUNICATIONS@BROWARD.ORG OR 954-847-2745.

ALL BCTED COMMUNICATIONS CABLES/CONDUIT SHALL BE LOCATED A MINIMUM OF 48 HOURS IN ADVANCE.

BROWARD COUNTY TRAFFIC ENGINEERING DIVISION
PROCEDURE FOR NOTIFICATION OF COMMUNICATION
DISRUPTION

COPPER INTERCONNECT CABLE NOTIFICATION CONTACT PERSON
WHEN COMMUNICATIONS TO AN INTERSECTION MUST BE DISRUPTED BY A CONTRACTOR TO PERFORM WORK, THE CONTRACTOR SHALL PROVIDE TWO DAY ADVANCE NOTICE IN WRITING TO THE BROWARD COUNTY TRAFFIC ENGINEERING DIVISION. THIS NOTIFICATION SHALL BE CONVEYED VIA ELECTRONIC MAIL (EMAIL) TO THE TRAFFIC SIGNAL TECHNICIAN III AT TECCOMMUNICATIONS@BROWARD.ORG. NOTIFICATION SHALL INCLUDE CONTACT PERSON, TELEPHONE NUMBER, PURPOSE, LOCATION AND DURATION. THE DISRUPTION SHALL LAST FOR NO MORE THAN 3 CONSECUTIVE BUSINESS DAYS. WHERE POSSIBLE, THE DISRUPTION SHALL BE DURING OFF PEAK HOURS BEGINNING AT 9:00AM AND ENDING AT 3:00PM.

FIBER OPTIC CABLE NOTIFICATION CONTACT PERSON
WHEN COMMUNICATIONS TO AN INTERSECTION MUST BE DISRUPTED BY A CONTRACTOR TO PERFORM WORK, THE CONTRACTOR SHALL PROVIDE TWO DAY ADVANCE NOTICE IN WRITING TO THE BROWARD COUNTY TRAFFIC ENGINEERING DIVISION. THIS NOTIFICATION SHALL BE CONVEYED VIA ELECTRONIC MAIL (EMAIL) TO THE COMMUNICATIONS MANAGER AT TECCOMMUNICATIONS@BROWARD.ORG. NOTIFICATION SHALL INCLUDE CONTACT PERSON, TELEPHONE NUMBER, PURPOSE, LOCATION AND DURATION. THE DISRUPTION SHALL LAST FOR NO MORE THAN 3 CONSECUTIVE BUSINESS DAYS. WHERE POSSIBLE, THE DISRUPTION SHALL BE DURING OFF PEAK HOURS BEGINNING AT 9:00AM AND ENDING AT 3:00PM.

INCLUDE THE FOLLOWING IN ANY NOTICE OF UTILITY OWNERSHIP OR WITHIN A "UTILITY OWNERS/CONTACT PERSON" TABLE:

COPPER INTERCONNECT TABLE – (TIM MILLER) BROWARD COUNTY TRAFFIC ENGINEERING DIVISION (BCTED) 954-847-2761

FIBER OPTIC CABLE – (ROBERT BLOUNT) BROWARD COUNTY TRAFFIC ENGINEERING DIVISION (BCTED) 954-847-2745

MAINTENANCE OF TRAFFIC SCHOOL/PEDESTRIAN

THE MAINTENANCE OF TRAFFIC PLAN, PROVIDED BY THE CONTRACTOR, SHALL INCLUDE PROVISIONS FOR PEDESTRIAN AND/OR SCHOOL STUDENT TRAFFIC AS WELL AS VEHICULAR TRAFFIC. THE FOLLOWING ARE MINIMUM REQUIREMENTS:

1.THE SAFE WALK ROUTE FOR ALL SCHOOL STUDENTS WITHIN THE VICINITY OF THE CONSTRUCTION ZONE SHALL BE MAINTAINED DURING STUDENT ARRIVAL AND DISMISSAL TIMES. IF THE CURRENT WALKING SURFACE CANNOT BE MAINTAINED, THEN A TEMPORARY WALKABLE SURFACE SHALL BE CREATED. THE SAFE WALK ROUTE SHALL BE SEPARATED FROM THE CONSTRUCTION ACTIVITY DURING THE ENTIRE LENGTH OF THE PROJECT ENCOMPASSING THE ENTIRE WALK ROUTE WITH PROPER PEDESTRIAN OPENINGS AT DESIGNATED CROSSINGS IN COMPLIANCE WITH FDOT DESIGN STANDARDS INDEX NO. 600 AS WELL AS MEETING ALL ADA REQUIREMENTS.

2.ALL CONSTRUCTION EQUIPMENT ACTIVITY AROUND ANY DESIGNATED CROSSWALK SHALL CEASE TO OPERATE DURING THE STUDENT ARRIVAL AND DISMISSAL TIMES. ALL CONSTRUCTION EQUIPMENT ACTIVITY ADJACENT TO A DESIGNATED WALK ROUTE SHALL CEASE OPERATING UNLESS SATISFACTORILY BARRICADED FROM THE WALK ROUTE.

3.IN THE CASE THAT A DESIGNATED CROSSING OR ANY PORTION OF THE DESIGNATED WALK ROUTE CANNOT BE MAINTAINED, THE CONTRACTOR SHALL NOTIFY THE SPECIAL PROJECTS COORDINATOR AT BROWARD COUNTY TRAFFIC ENGINEERING DIVISION, (954) 847-2600, A MINIMUM OF TEN (10) WORKING DAYS PRIOR TO CLOSING THAT ROUTE IN ORDER TO ESTABLISH AN ALTERNATE CROSSING/ROUTE.

4.IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO INSTALL ANY NECESSARY PAVEMENT, ROAD ROCK, PAVEMENT MARKINGS AND SIGNAGE AND/OR ANY PEDESTRIAN SIGNALIZATION AND/OR SIGNAL MODIFICATION TO ACCOMMODATE AN EXISTING OR ALTERNATE WALK ROUTE THROUGHOUT THE ENTIRE LENGTH OF THE PROJECT.

5.IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO PROVIDE STATE CERTIFIED SCHOOL CROSSING GUARDS OR OFF DUTY POLICE OFFICERS TO CROSS STUDENTS AT ALL LOCATIONS OTHER THAN THOSE PREVIOUSLY DESIGNATED. THE CONTRACTOR MAY USE FLAGMEN, BUT ONLY IF THEY ARE STATE CERTIFIED AS A SCHOOL CROSSING GUARD.

6.THIRTY (30) DAYS PRIOR TO THE BEGINNING OF CONSTRUCTION THE CONTRACTOR SHALL NOTIFY THE SPECIAL PROJECTS COORDINATOR AT BROWARD COUNTY TRAFFIC ENGINEERING DIVISION, (954) 847-2600 OR AT BROWARD@TRAFFIC.ORG TO DISCUSS ALL NECESSARY SAFETY MEASURES.

7.IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO NOTIFY THE FOLLOWING BROWARD COUNTY SCHOOL BOARD PUPIL TRANSPORTATION DEPARTMENT PERSONNEL IF CONSTRUCTION SHALL IMPACT ANY BUS ROUTES:

RUTH MASTERS ROUTING (754) 321-4400 EXT. # 2309
RUTH.MASTERS@BROWARDSCHOOLS.COM
VINCENT HARRELL STUDENT TRANSPORTATION & FLEET SERVICE (754) 321-4472
VINCENT.HARRELL@BROWARDSCHOOLS.COM
MARY TOCHTERMANN STUDENT TRANSPORTATION & FLEET SERVICE(754) 321-4400
EXT. # 2006 MARY.TOCHTERMANN@BROWARDSCHOOLS.COM

UPON COORDINATION WITH THE AFOREMENTIONED PERSONNEL, AND IF DEEMED NECESSARY, A PRE-CONSTRUCTION MEETING SHALL BE HELD TO DETERMINE ALL BUS ROUTES AND TO MAKE ANY NECESSARY ARRANGEMENTS FOR REROUTING. THE SPECIAL PROJECTS COORDINATOR FROM THE BROWARD COUNTY TRAFFIC ENGINEERING DIVISION, (954) 847-2600, SHALL BE NOTIFIED AND MAY ATTEND THE PRE-CONSTRUCTION MEETING.

8.THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING AN APPROVED MAINTENANCE OF TRAFFIC PLAN (MOT), SPECIFYING THE ABOVE SCHOOL/PEDESTRIAN CONDITIONS, THROUGH THE BROWARD COUNTY TRAFFIC ENGINEERING DIVISION OR THE LOCAL MUNICIPALITY, DEPENDING ON THE ROADWAY JURISDICTION. THE CONDITIONS OUTLINED IN THE MOT ARE FULLY EFFECTIVE AS PART OF THE PROPOSED IMPROVEMENTS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ENSURING THAT ALL WORK ASSOCIATED WITH THE PROJECT IS IN COMPLIANCE WITH ALL THE REQUIREMENTS OF THE APPROVED MOT.

9.THE CONTRACTOR SHALL ENSURE THAT THERE ARE NO SPEED LIMIT SIGNS INSTALLED WITHIN THE DESIGNATED REDUCED SPEED SCHOOL ZONE AT ANY TIME THROUGHOUT THE PROJECT.

LEGEND:

| SYMBOL | DESCRIPTION |
|--------|-------------------------------|
| | WATER METER BOX |
| | EXISTING VALVE |
| | PROPOSED VALVE |
| | FIRE HYDRANT |
| | BENCH MARK |
| | TREE |
| | NAIL IN BOTTLE CAP |
| | NAIL IN ASPHALT |
| | EXISTING GAS LINE |
| | EXISTING WATER MAIN |
| | EXISTING BURIED TELEPHONE |
| | EXISTING TELEPHONE |
| | EXISTING UNDERGROUND ELECTRIC |
| | EXISTING FORCE MAIN |
| | EXISTING OVERHEAD WIRES |
| | EXISTING CABLE TELEVISION |
| | EXISTING CHAIN LINK FENCE |
| | EXISTING WOOD FENCE |
| | EXISTING ELEVATION |
| | SOIL BORING LOCATION MARK |
| | SOIL TYPE SEPARATION MARK |
| | PROPOSED FORCE MAIN |
| | PUMP STATION |
| | MANHOLE NUMBER |
| | CONFLICT MANHOLE NUMBER |
| | PROPOSED SANITARY SEWER |
| | SAN. SEWER LATERAL (DOUBLE) |
| | SAN. SEWER LATERAL (SINGLE) |

NOTE: THIS LEGEND IS INTENDED FOR MOST SANITARY SEWER AND STORM SEWER PROJECTS, HOWEVER, THERE ARE PROJECTS USING ADDITIONAL SYMBOLS. THESE SYMBOLS SHALL BE LOCATED ON OTHER SHEETS.

| | |
|---|-------|
| FORWARDER KELLY M. YAT, P.E. REG. No. 76218 | DATE: |
| DATE: | DATE: |

| | | | | | |
|-----------|----------|--------------|--------|-------------|-------------|
| DRAWN BY: | DATE: | DESIGNED BY: | SCALE: | CHECKED BY: | FIELD BOOK: |
| WD | SEP 2018 | N/A | KM | SCL | |

| |
|--|
| CITY of FORT LAUDERDALE PUBLIC WORKS DEPARTMENT ENGINEERING & ARCHITECTURE 100 North Andrews Avenue, Fort Lauderdale, Florida 33301 |
|--|

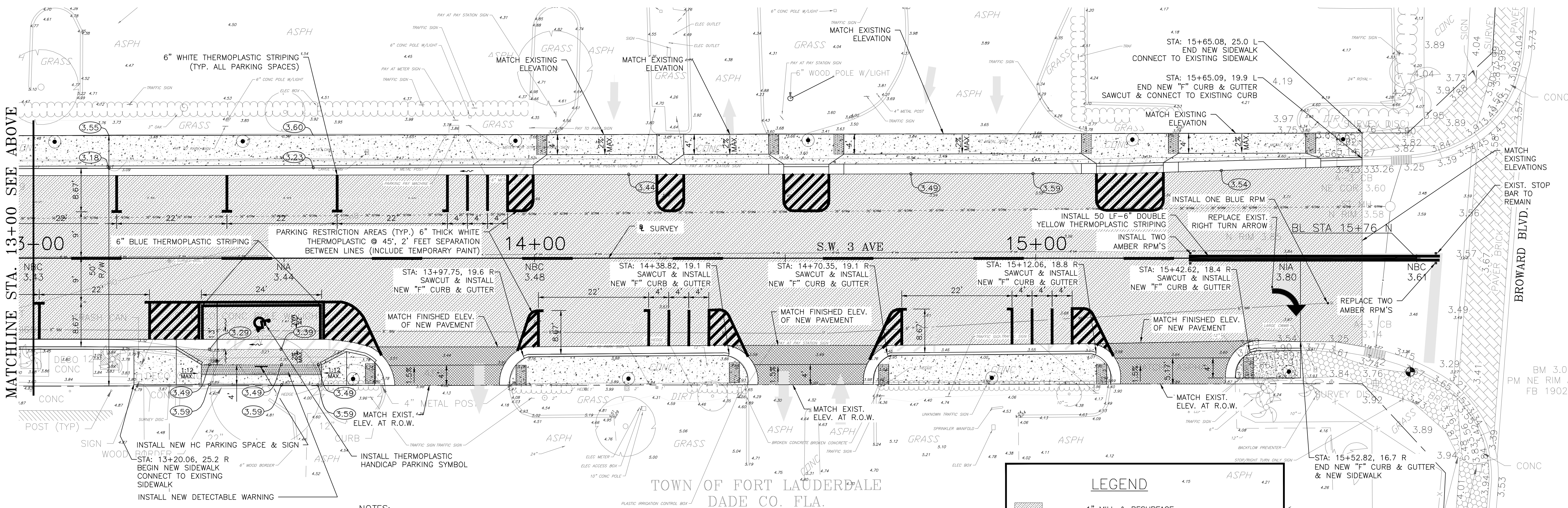
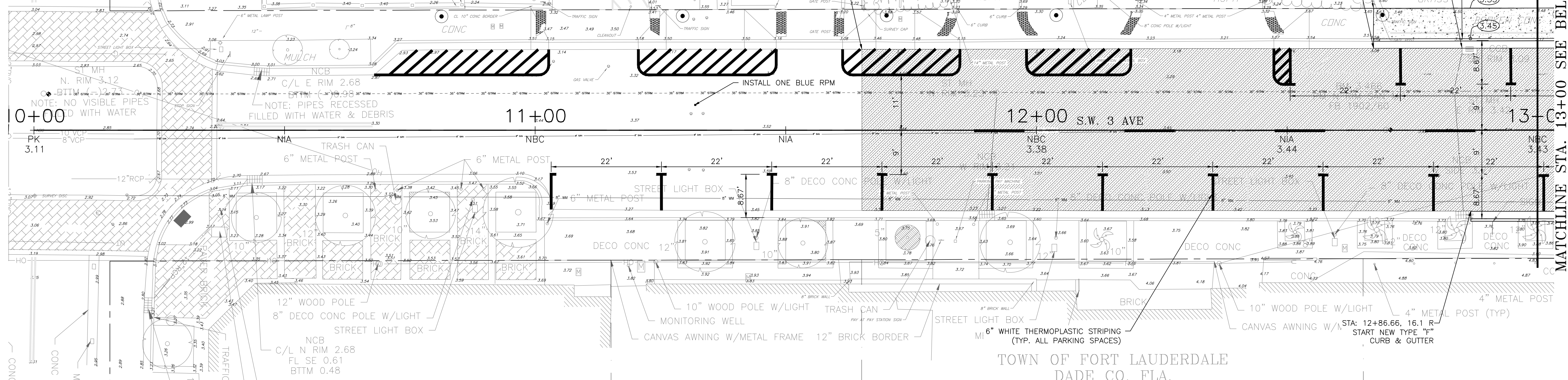
| REVISIONS | DATE | BY | CHK'D | DESCRIPTION |
|-----------|------|----|-------|-------------|
| NO. | | | | |

| | |
|--|------------------|
| PROJECT # 12376 SW 3RD AVENUE ON-STREET PARKING IMPROVEMENTS CONSTRUCTION NOTES FORT LAUDERDALE, FLORIDA | |
| SHEET NO. | 4 |
| TOTAL: | 6 |
| CAD FILE: | 12376-MULTI-NOTE |
| DRAWING FILE NO. | 4-140-90 |

BID SET

HIMMARSHÉE ST.

SAN MH
W RIM 3.13
FL W (-)5.04
FL S (-)4.94
FL E (-)3.87
FL N (-)5.05
FL N (-)4.97
FL N (-)4.07

***NOTE:**

CONTRACTOR TO ENSURE HANDICAP PARKING SPACE IS GRADED @ 2% MAX. SLOPE IN ALL DIRECTIONS AND THAT DRAINAGE PATTERNS ARE MAINTAINED TO ENSURE STORM WATER FLOWS TO AN INLET TO PREVENT PONDING.

NOTES:

- CONTRACTOR SHALL ACHIEVE MINIMUM OF 0.3% SLOPE TO DIRECT STORM WATER TO THE EXISTING CATCH BASIN AS SHOWN.
- ALL SIDEWALK CONSTRUCTION SHALL INCLUDE HARMONIZATION OF PROPERTY AT BACK OF SIDEWALK UP TO 2' INTO THE PRIVATE PROPERTIES TO MEET NEW SIDEWALK ELEVATIONS. SIDEWALK CONSTRUCTION SHALL INCLUDE ALL ADA RAMPS, DETECTABLE WARNINGS, AND UTILITY METER BOX ADJUSTMENTS, AS SHOWN ON THE PLANS.
- THE CONTRACTOR SHALL MILL & RESURFACE 1" OF THE ROAD AS SHOWN AND SHALL NOTIFY THE CITY'S PROJECT MANAGER OR INSPECTOR IF THE EXIST. PAVEMENT THICKNESS IS FOUND TO BE CONSISTENTLY LESS THAN 1". THE CONTRACTOR SHALL MATCH EOP TO PROPOSED CURB & GUTTER ELEVATIONS AS SHOWN.
- SOLAR LIGHTING INSTALLATION SHALL INCLUDE REMOVAL AND DISPOSAL OF EXIST. MATERIAL FROM AREA EXCAVATED FOR POLE FOUNDATION. TRIMMING AND DISPOSAL OF TREE BRANCHES THAT ARE IN CONFLICT WITH THE SOLAR PANELS SHALL BE INCLUDED AT NO ADDITIONAL COST TO THE CITY. EXACT LOCATION OF LIGHTING MAY BE FIELD ADJUSTED.

LEGEND

- 1" MILL & RESURFACE
- NEW CONCRETE
- EXISTING CONCRETE
- MILL & RESURFACE TO VARIOUS DEPTHS
- STORMWATER FLOW DIRECTION
- INSTALL SOLAR LIGHTING PER DETAIL ON SHT. 6



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DESIGNED BY: DATE: SEP 2018
DRAWN BY: WD
CHECKED BY: KM
SCALE: 1" = 10'
FIELD BOOK: 33301

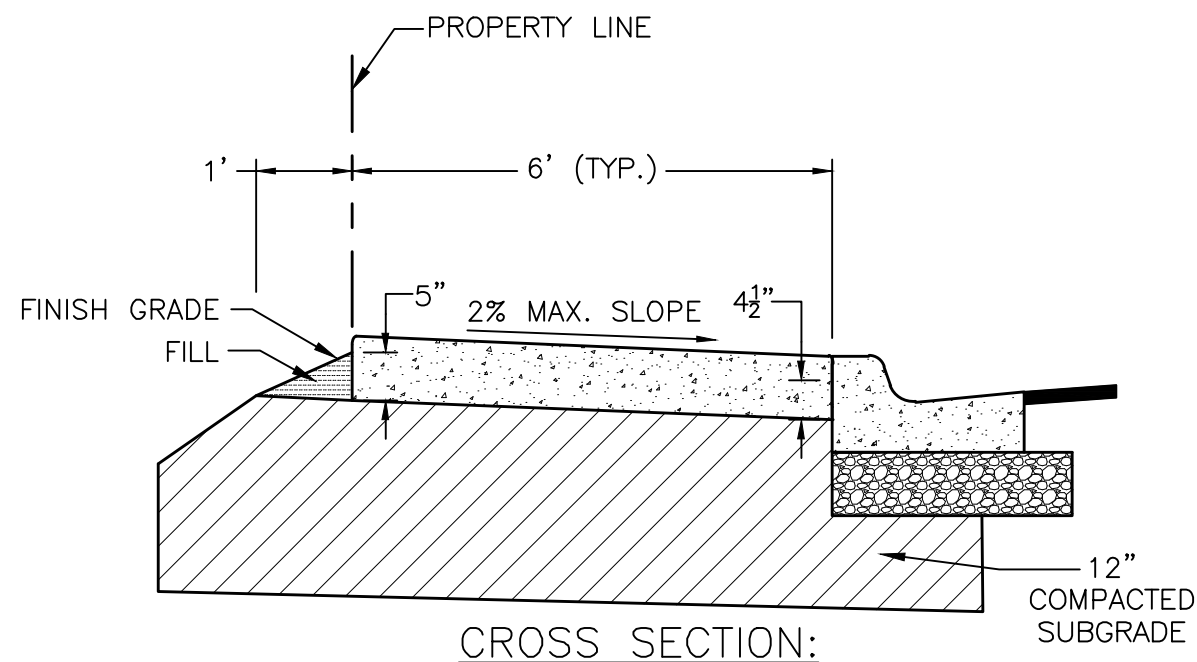
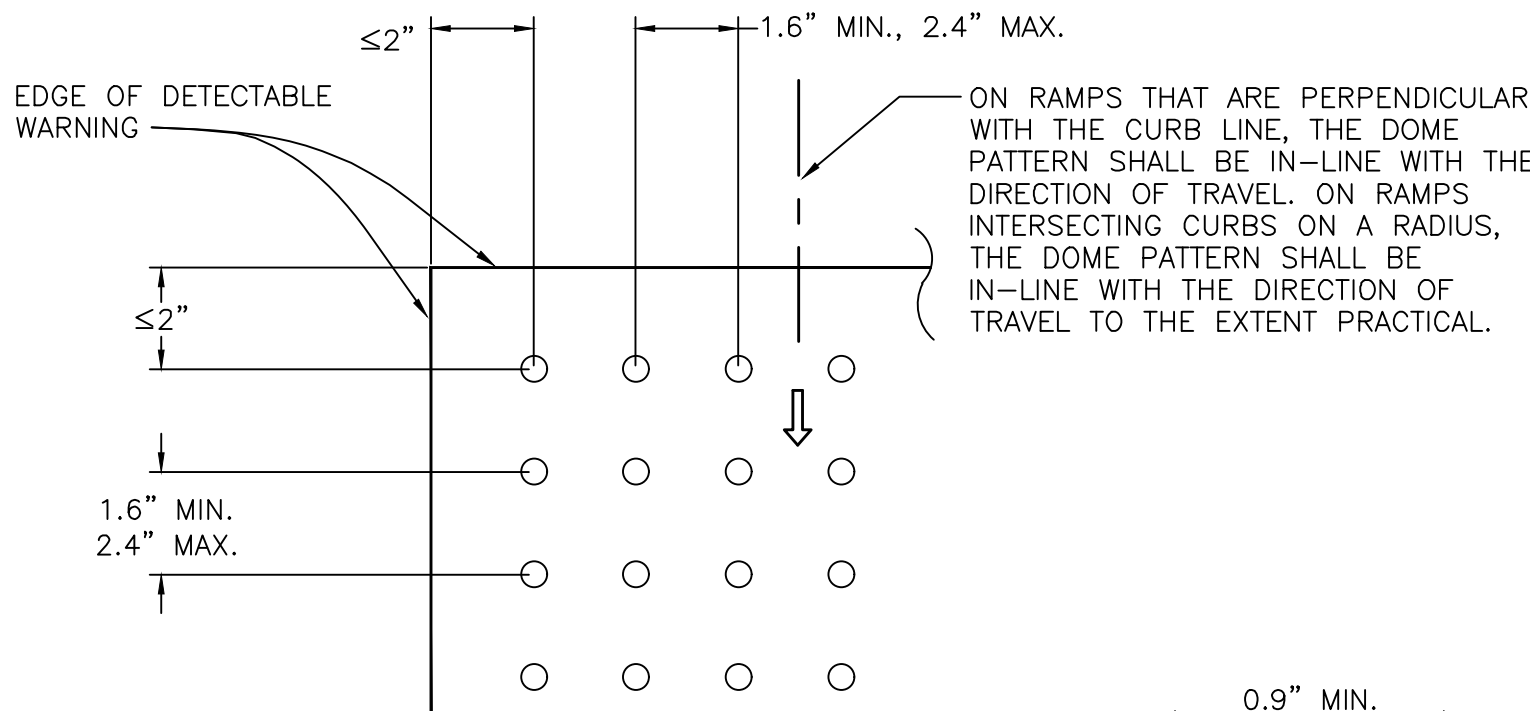
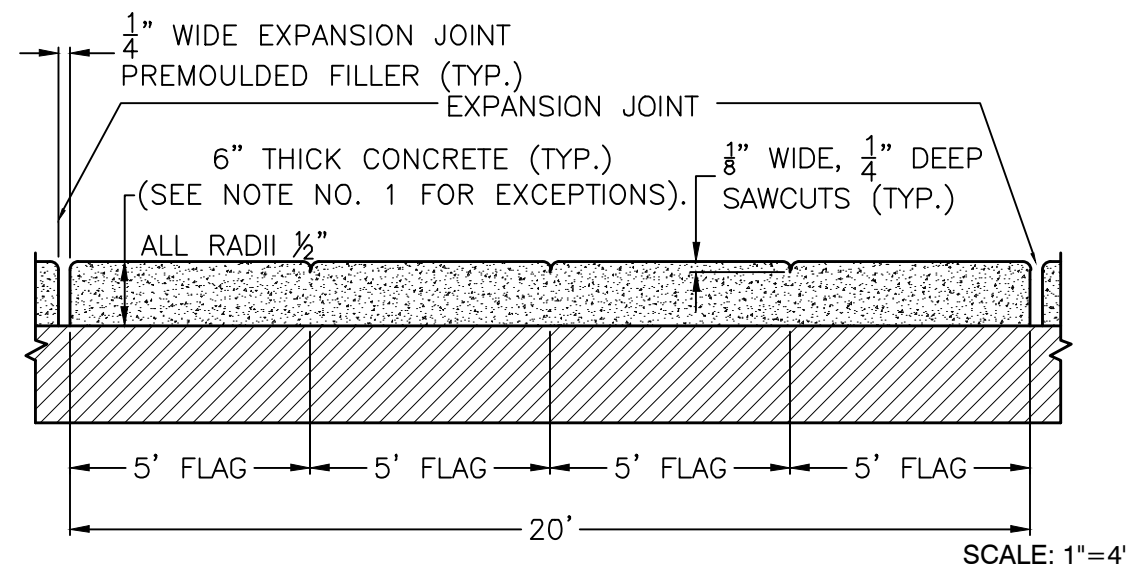
CITY OF FORT LAUDERDALE
PUBLIC WORKS DEPARTMENT
ENGINEERING & ARCHITECTURE
100 North Andrews Avenue, Fort Lauderdale, Florida 33301
TEL: (954) 828-5061
FAX: (954) 828-5074

| NO. | DATE | BY | CHK'D | REVISIONS | DESCRIPTION |
|-----|------|----|-------|-----------|-------------|
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PROJECT # 12376
SW 3RD AVENUE
ON-STREET PARKING IMPROVEMENTS
CONSTRUCTION PLAN
FORT LAUDERDALE, FLORIDA

SHEET NO. 5
TOTAL: 6
CAD FILE: 12376-005-CIVL
DRAWING FILE NO. 4-140-90

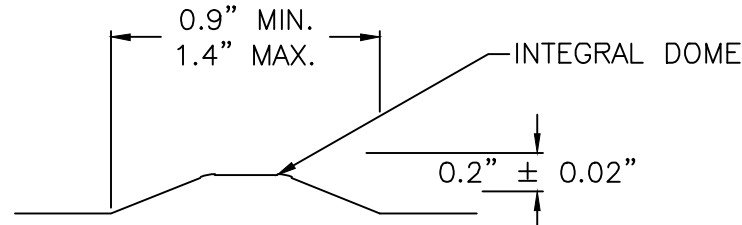
BID SET



NOTE:
ALL SIDEWALK CURB RAMPS SHALL HAVE DETECTABLE WARNING SURFACE THAT EXTEND THE FULL WIDTH OF RAMP AND IN THE DIRECTION OF TRAVEL 24 INCHES FROM THE BACK OF THE CURB.

CURB RAMP DETECTABLE WARNING DETAIL

SCALE: N/A



TRUNCATED DOME

C4.6

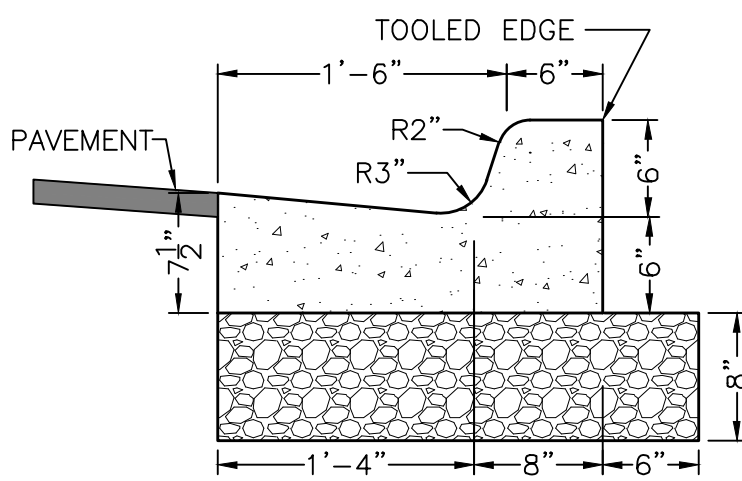
NOTES:

1. ALL CONCRETE SIDEWALKS & PARKING AREAS SHALL BE A MINIMUM 6" THICK.
2. CONCRETE STRENGTH SHALL BE 3000 P.S.I.(MIN.)
3. THE USE OF REINFORCEMENT WILL NOT BE PERMITTED.
4. SIDEWALK SLOPES SHALL MEET THE REQUIREMENTS OF THE AMERICANS WITH DISABILITIES ACT (ADA).

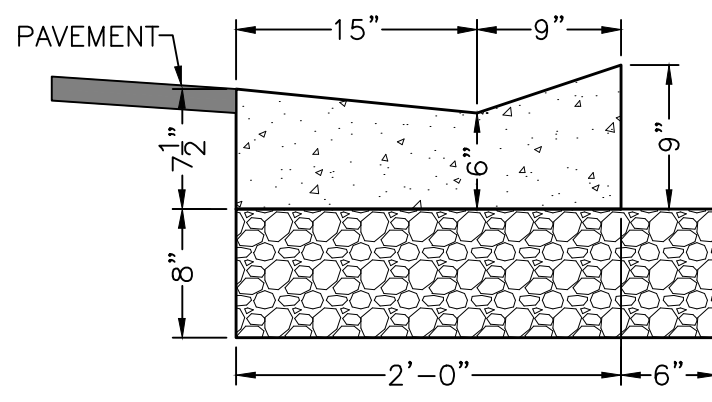
SIDEWALK CONSTRUCTION

SCALE: 1"=2'

C2.1



TYPE 'F' CURB & GUTTER



DROP CURB

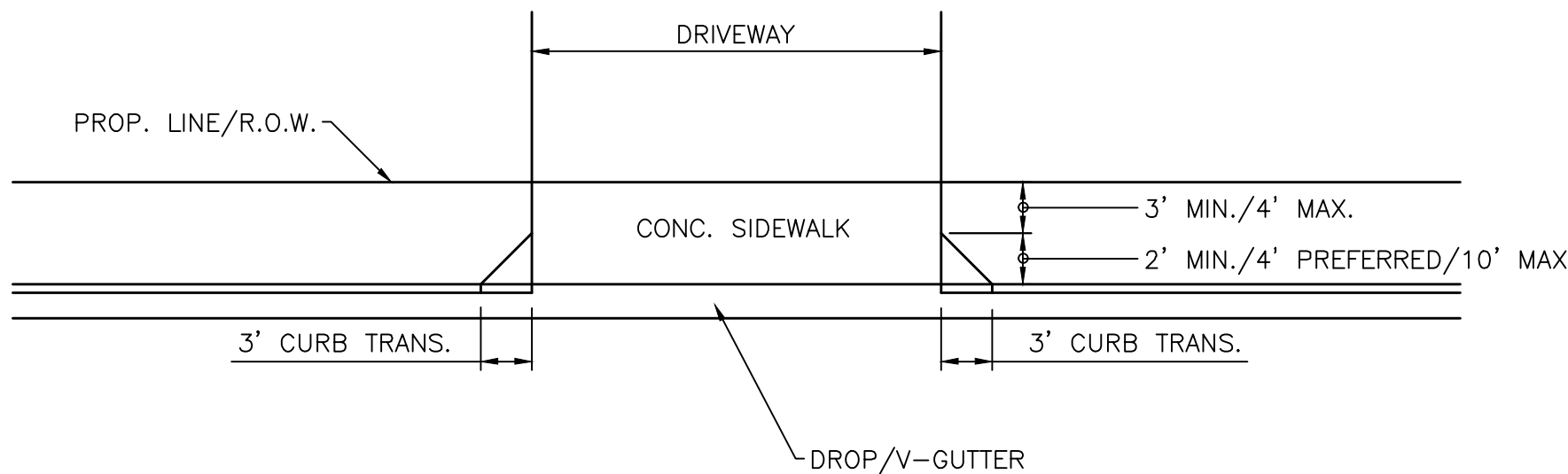
NOTE:

1. ALL CURBS SHALL HAVE 8" MIN THICK LIMESTONE BASE, COMPACTED TO 98% MAX DENSITY PER AASHTO T-180
2. ALL CONCRETE STRENGTH SHALL BE 3000 PSI (MIN. 28 DAY)

STANDARD CURB DETAILS

SCALE: 1" = 1'-0"

C3.1

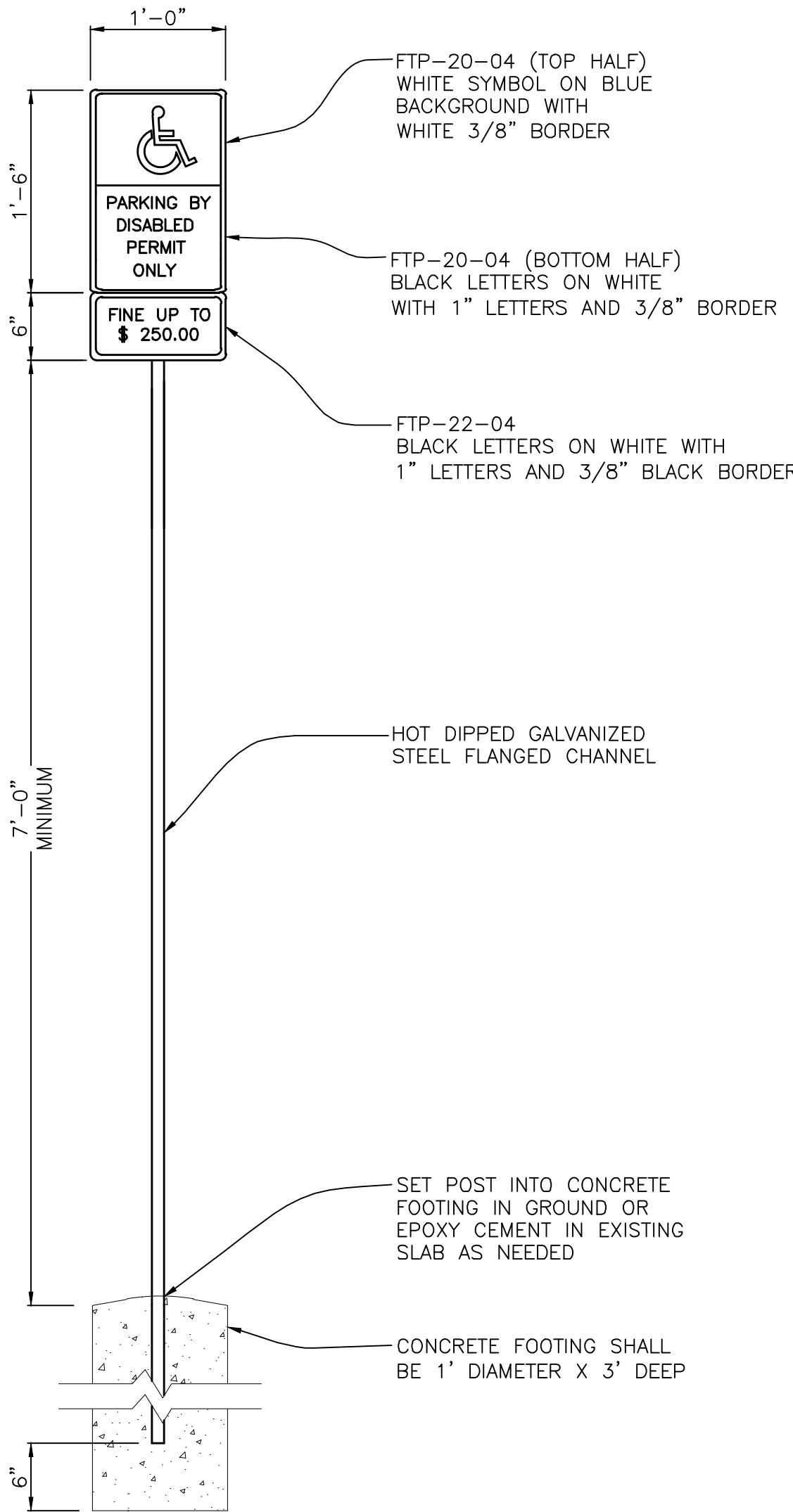


SIDEWALK DETAIL AT DRIVEWAYS

SCALE: N/A

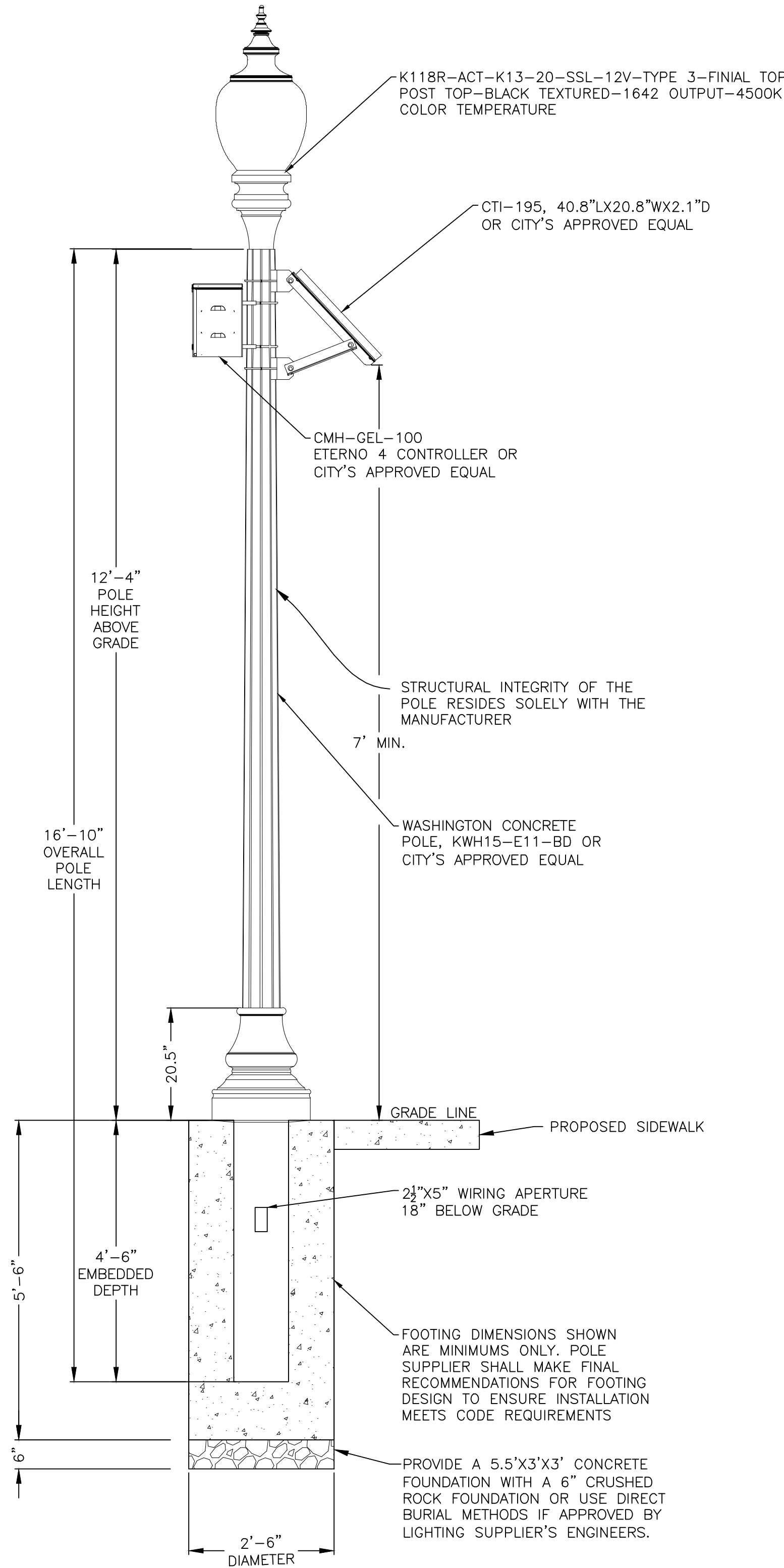
NOTES:

1. SIDEWALKS SHALL BE CONSTRUCTED IN ACCORDANCE WITH CITY OF FORT LAUDERDALE STANDARDS AND SPECIFICATIONS (SEE DETAIL C1.3).
2. SIDEWALKS ADJOINING 24' DRIVES, ALLEYS, OR STREETS SHALL HAVE A DETECTABLE WARNING SURFACE THAT EXTENDS THE FULL WIDTH OF THE SIDEWALK IN THE DIRECTION OF TRAVEL. THE MINIMUM LENGTH OF THE DETECTABLE WARNING SURFACE SHALL BE 24" FROM THE EDGE OF DRIVEWAYS, EDGE OF SIDE ROADS, OR STREETS.
3. SIDEWALKS SHALL BE CONTINUOUS THROUGH ALL DRIVEWAYS REGARDLESS OF DRIVEWAY WIDTH.
4. USE DETECTABLE WARNING SURFACES ONLY FOR DRIVEWAYS 24' OR WIDER.



HANDICAP SIGN

SCALE: N/A



SOLAR POLE & FOUNDATION

SCALE: 1" = 20'

DESIGNED BY: KHANT MYAT, P.E.
DATE: SEP 2018
REVISIONS: 78218
DATE:

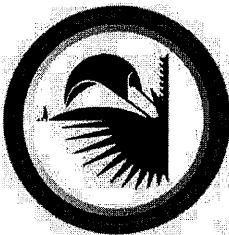
DATE: SEP 2018
DESIGNED BY: KM
CHECKED BY: SCL
FIELD BOOK:

CITY OF FORT LAUDERDALE
PUBLIC WORKS DEPARTMENT
ENGINEERING & ARCHITECTURE
100 North Andrews Avenue, Fort Lauderdale, Florida 33301

| NO. | DATE | BY | CHK'D | DESCRIPTION |
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PROJECT # 12376
SW 3RD AVENUE
ON-STREET PARKING IMPROVEMENTS
DETAILS
FORT LAUDERDALE, FLORIDA

SHEET NO. 6
TOTAL: 6
CAD FILE: 12376-006-DETL
DRAWING FILE NO. 4-140-90



FINANCE DEPARTMENT

PRE-PROPOSAL MEETING SIGN-IN SHEET



DATE: 11/29/2018

TIME: 11:00

☒ AM ☐ PM

OPENING DATE: 12/18/2018

PROCUREMENT CONTACT: James Hemphill

DTB 1222-993
RFP#:

SW 3rd Ave. On-Street Parking Improvements

DTB
RFP-TITLE:

NAME COMPANY

PHONE

EMAIL

| | | | |
|------------------|-------------------------|--------------|---|
| Natalie Shaoy | Florida Blacktop Inc. | 954-943-9766 | floridablacktop@gmail.com |
| Craig Grillo | Sesco Lighting | 561-324-8866 | CGrillo@SescoLighting.com |
| MEHRDAD MAHMOUDZ | SAGARIS CORP. | 954-688-3407 | MEHRDAD@SAGARISCORP.COM |
| Iader Ierreao | Automatrol, Corp | 754-423-9053 | iader@automatrol.com |
| JOHN MELNICOFF | Solar Outdoor Light | 954-254-9319 | JEM54@aol.com |
| Shiau Ching Low | City of Fort Lauderdale | 954-828-3779 | shiau@cityofftlauderdale.gov |
| FRED ASBAGHI | SUNUP ENTERPRISES | 954-818-3111 | slaw@fortlauderdale.gov |
| James Hemphill | City of Fort Lauderdale | 954-828-5143 | FRED.SUNUP@FLCITY.COM Jhemphill@cityofftlauderdale.gov |

City of Fort Lauderdale

Bid 12222-993



City of Fort Lauderdale • Procurement Services Division
100 N. Andrews Avenue, 619 • Fort Lauderdale, Florida 33301
954-828-5933 Fax 954-828-5576
purchase@fortlauderdale.gov

ITB No. 12222-993
SW 3RD AVENUE ON-STREE PARKING IMPROVEMENTS

ADDENDUM NUMBER 1

DATE December 14, 2018

The following Addendum is hereby made a part of the Plans and Specifications and shall be included with all contract documents:

Acknowledge receipt of this Addendum by inserting its number and date on the Construction Bid Certification.
All changes are in bold, red italics.

1. **Replace:** SOLAR POLE BASE (See revised SOLAR POLE & FOUNDATION detail on sheet 6 of 6 as attached)

2. Bid due date has been changed to: December 27, 2018

All other terms, conditions, and specifications remain unchanged.

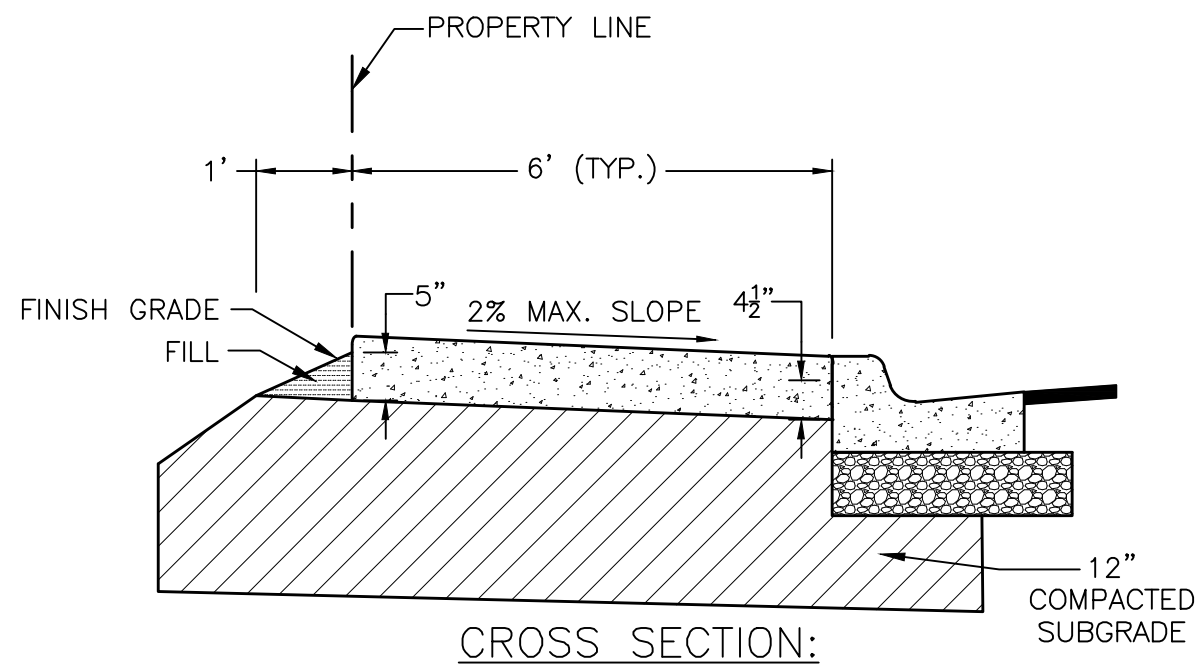
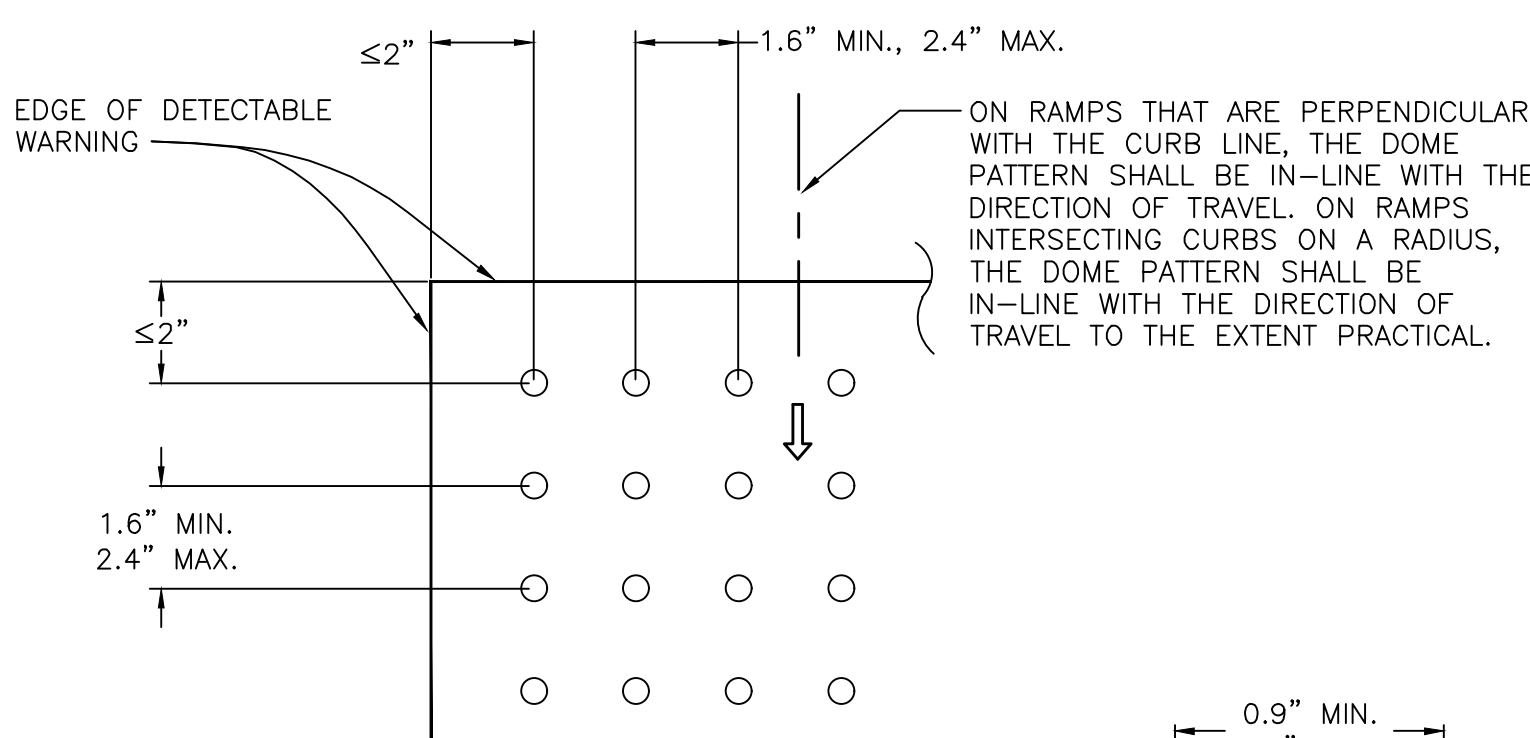
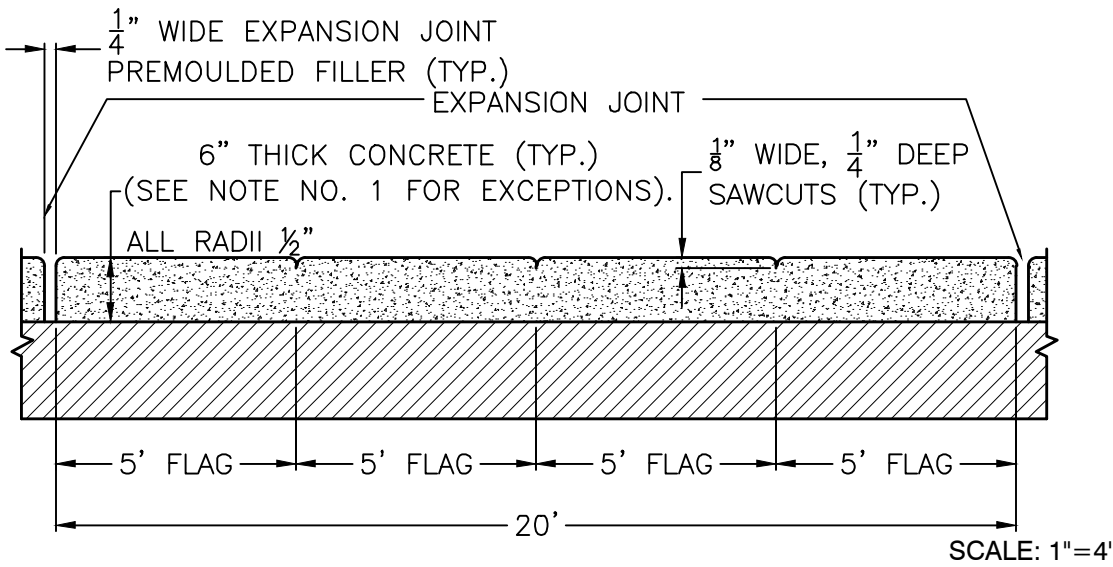
James T. Hemphill
Senior Procurement Specialist

Company Name: _____
(please print)

Bidder's Signature: _____

Date: _____

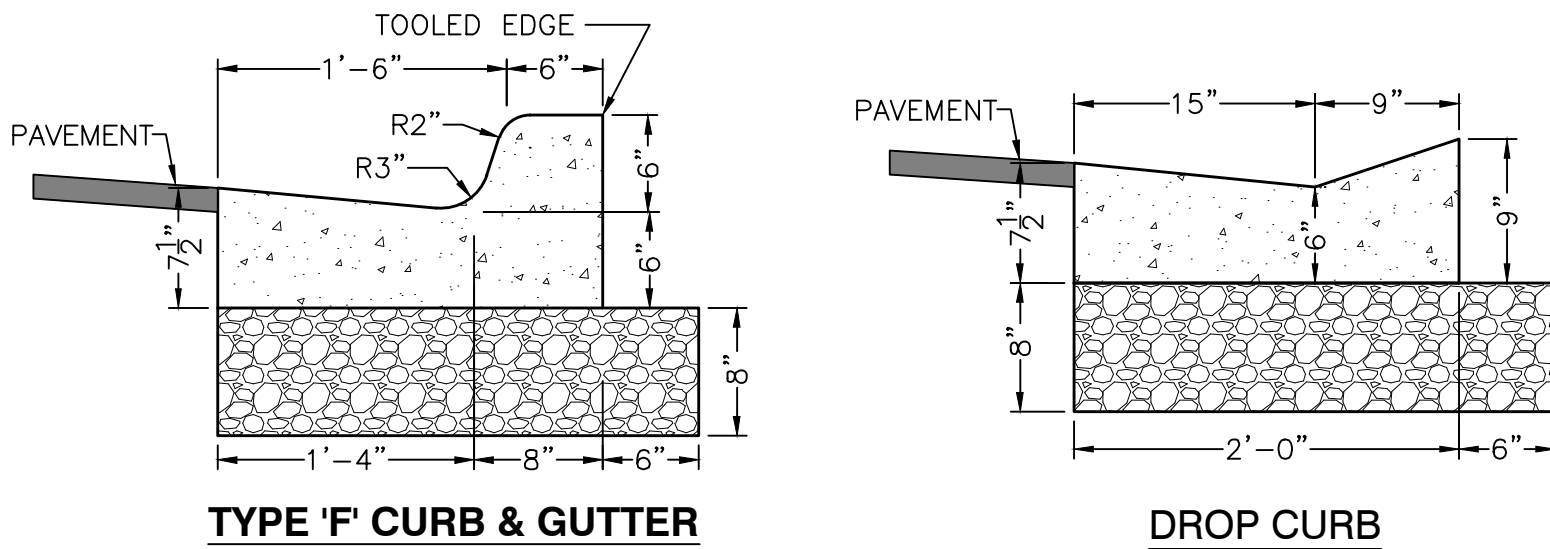
Z:\12000\300-399\12376\DESIGN\DRAWINGS\CURRENT\12376-006-DETL.DWG



- NOTES:
1. ALL CONCRETE SIDEWALKS & PARKING AREAS SHALL BE A MINIMUM 6" THICK.
 2. CONCRETE STRENGTH SHALL BE 3000 P.S.I.(MIN.)
 3. THE USE OF REINFORCEMENT WILL NOT BE PERMITTED.
 4. SIDEWALK SLOPES SHALL MEET THE REQUIREMENTS OF THE AMERICANS WITH DISABILITIES ACT (ADA).

SIDEWALK CONSTRUCTION

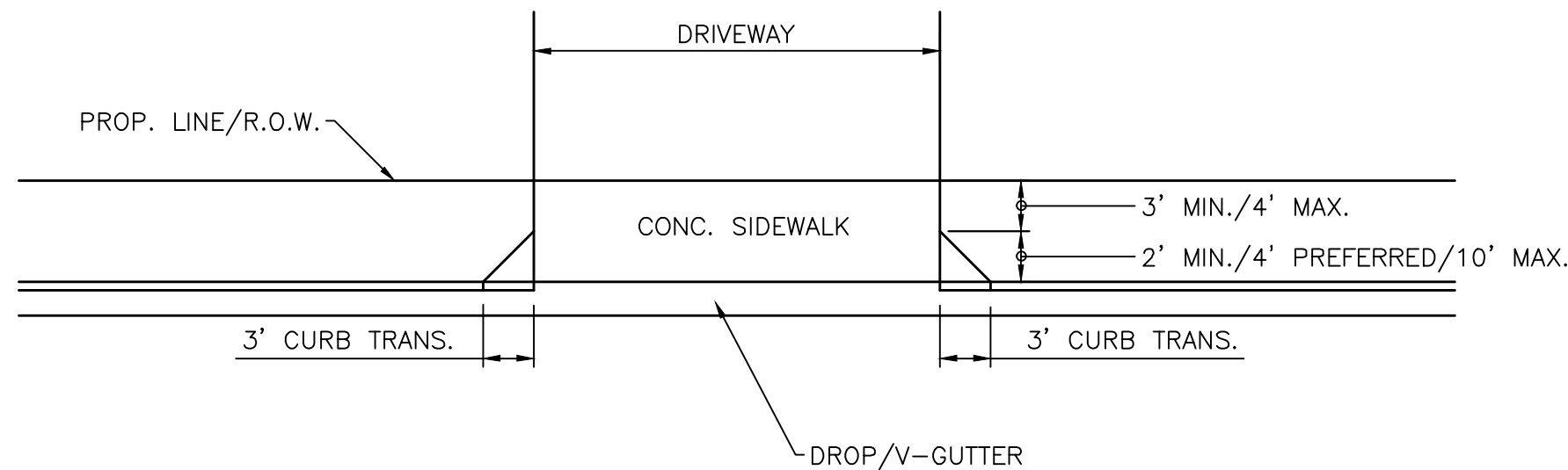
SCALE: 1"=2'



- NOTE:
1. ALL CURBS SHALL HAVE 8" MIN THICK LIMESTONE BASE, COMPACTED TO 98% MAX DENSITY PER AASHTO T-180
 2. ALL CONCRETE STRENGTH SHALL BE 3000 PSI (MIN. 28 DAY)

STANDARD CURB DETAILS

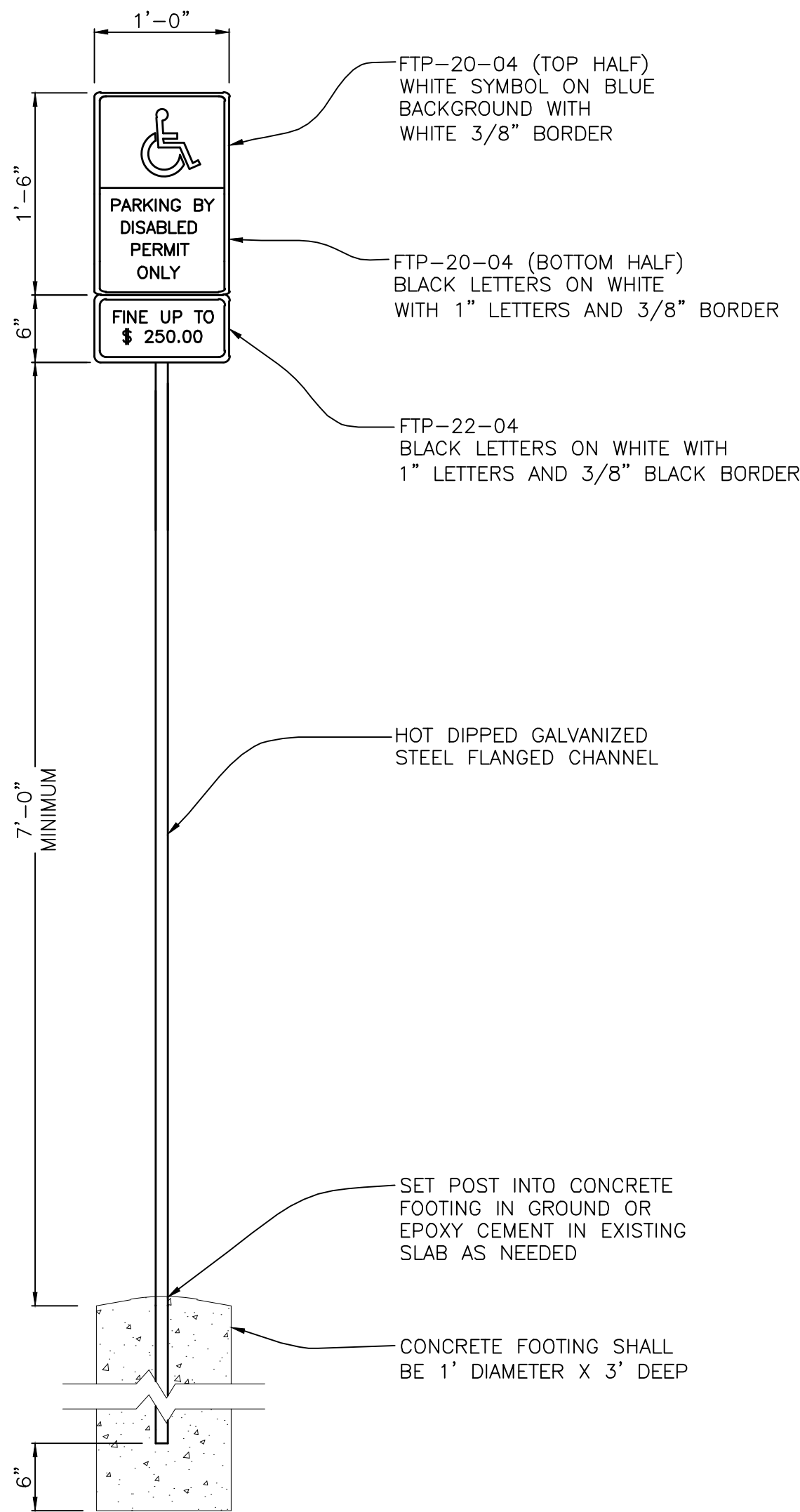
SCALE: 1" = 1'-0"



- NOTES:
1. SIDEWALKS SHALL BE CONSTRUCTED IN ACCORDANCE WITH CITY OF FORT LAUDERDALE STANDARDS AND SPECIFICATIONS (SEE DETAIL C1.3).
 2. SIDEWALKS ADJOINING 24' DRIVES, ALLEYS, OR STREETS SHALL HAVE A DETECTABLE WARNING SURFACE THAT EXTENDS THE FULL WIDTH OF THE SIDEWALK IN THE DIRECTION OF TRAVEL. THE MINIMUM LENGTH OF THE DETECTABLE WARNING SURFACE SHALL BE 24" FROM THE EDGE OF DRIVEWAYS, EDGE OF SIDE ROADS, OR STREETS.
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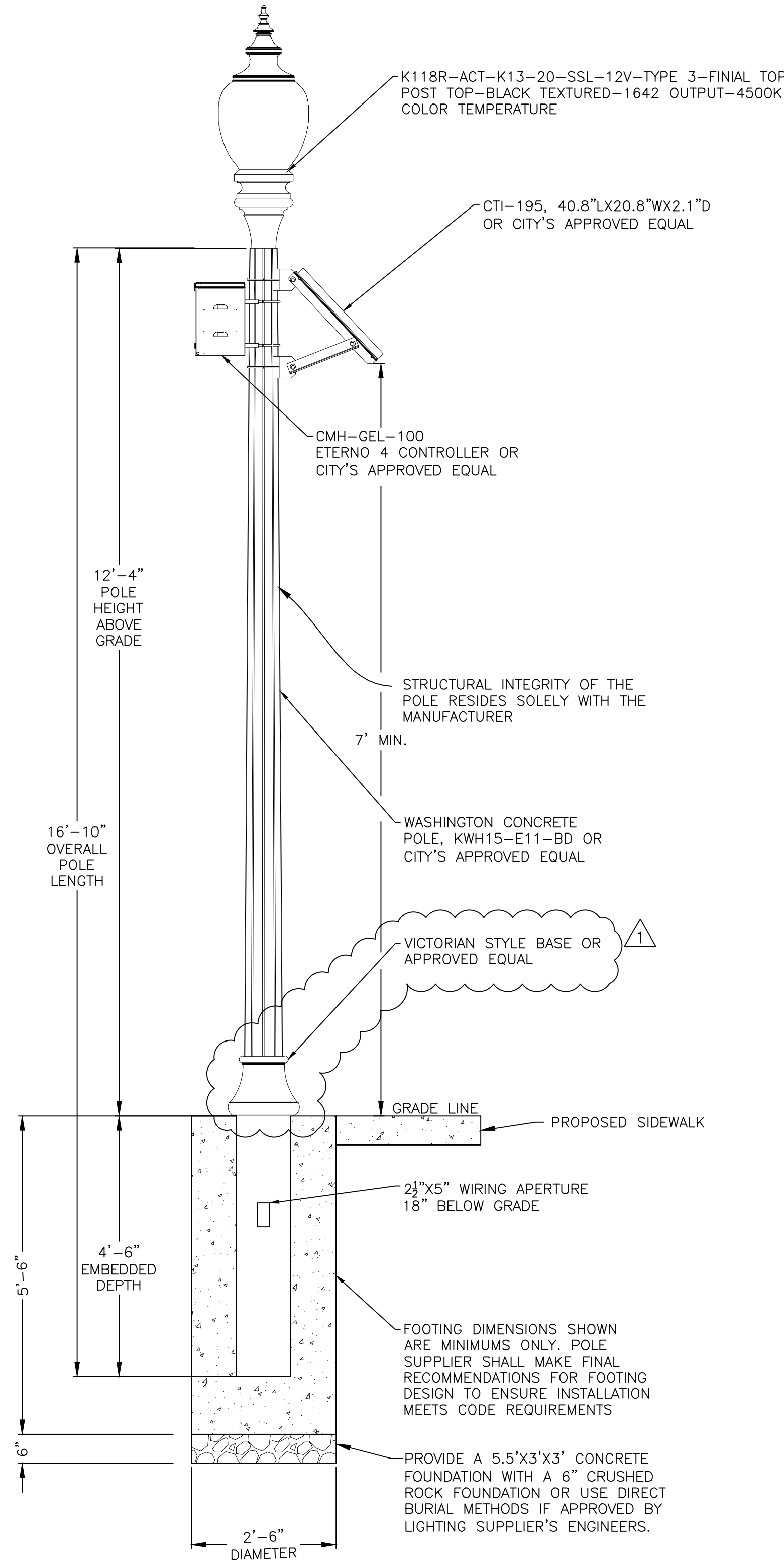
SIDEWALK DETAIL AT DRIVEWAYS

SCALE: N/A



HANDICAP SIGN

SCALE: N/A



SOLAR POLE & FOUNDATION

SCALE: 1" = 2'

DESIGNED BY: KHANT MYAT, P.E.
DATE: SEP 2018
REVISION: No. 78218
CHECKED BY: SCL
FIELD BOOK: 33301

DATE: SEP 2018
DESIGNED BY: SCL
CHECKED BY: SCL
FIELD BOOK: 33301

CITY OF FORT LAUDERDALE
PUBLIC WORKS DEPARTMENT
ENGINEERING & ARCHITECTURE
100 North Andrews Avenue, Fort Lauderdale, Florida 33301

| NO. | DATE | BY | CHK'D | DESCRIPTION | |
|-----|----------|----|-------|-------------|------|
| | | | | POLE | BASE |
| 1 | 12/13/18 | WD | KM | POLE | BASE |
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PROJECT # 12376
SW 3RD AVENUE
ON-STREET PARKING IMPROVEMENTS
DETAILS
FORT LAUDERDALE, FLORIDA

SHEET NO. 6
TOTAL: 6
CAD FILE: 12376-006-DETL
DRAWING FILE NO. 4-140-90

BID SET



City of Fort Lauderdale • Procurement Services Division
100 N. Andrews Avenue, 619 • Fort Lauderdale, Florida 33301
954-828-5933 Fax 954-828-5576
purchase@fortlauderdale.gov

ITB No. 12222-993
SW 3RD AVENUE ON-STREE PARKING IMPROVEMENTS

ADDENDUM NUMBER 2

DATE December 17, 2018

The following Addendum is hereby made a part of the Plans and Specifications and shall be included with all contract documents:

Acknowledge receipt of this Addendum by inserting its number and date on the Construction Bid Certification.
All changes are in bold, red italics.

- 1. CLARIFICATION:** In SPECIAL CONDITIONS, Item 07. Required Licenses/Certifications, The following additional certification shall be added to this section: **Certified by the Broward County Central Examining Board of Engineered Construction Trades: Class 3A – Engineered Road Builder.**

All other terms, conditions, and specifications remain unchanged.

James T. Hemphill
Senior Procurement Specialist

Company Name: _____

(please print)

Bidder's Signature: _____

Date: _____



City of Fort Lauderdale • Procurement Services Division
100 N. Andrews Avenue, 619 • Fort Lauderdale, Florida 33301
954-828-5933 Fax 954-828-5576
purchase@fortlauderdale.gov

ITB No. 12222-993
SW 3RD AVENUE ON-STREE PARKING IMPROVEMENTS

ADDENDUM NUMBER 3

DATE December 27, 2018

The following Addendum is hereby made a part of the Plans and Specifications and shall be included with all contract documents:

Acknowledge receipt of this Addendum by inserting its number and date on the Construction Bid Certification.

1. The bid end date has changed to **January 3rd, 2019**

All other terms, conditions, and specifications remain unchanged.

James T. Hemphill

Asst. Procurement and Contracts Manager

Company Name: _____

(please print)

Bidder's Signature: _____

Date: _____

Question and Answers for Bid #12222-993 - SW 3rd Avenue On-Street Parking Improvements

Overall Bid Questions

Question 1

What is the estimated budget? (Submitted: Nov 19, 2018 8:30:44 PM EST)

Answer

- Between \$350,000 - \$400,000 (Answered: Nov 26, 2018 1:37:13 PM EST)

Question 2

Please confirm pre bid time. (Submitted: Nov 26, 2018 1:03:51 PM EST)

Answer

- Pre-Bid Conference(s) Nov 29, 2018 11:00:00 AM EST

Attendance is optional

Location: City of Fort Lauderdale Transportation and Mobility Building

290 NE 3rd Ave. - Fort Lauderdale FL 33301 1st floor Conf. Room (Answered: Nov 26, 2018 1:34:56 PM EST)

Question 3

Per the preconstruction meeting site visit, can you please confirm if we are matching the style of pole on the plans or the style of pole currently existing on SW 3rd Ave. on the opposite side of this project's scope?

(Submitted: Dec 3, 2018 11:04:57 AM EST)

Answer

- The proposed street lights in the drawing is the same as the existing street lights except for one is solar and one is not.

And we would keep it solar. (Answered: Dec 4, 2018 2:40:13 PM EST)

Question 4

Please confirm if a general contractor license is required for this project or if an underground utility license would be acceptable? (Submitted: Dec 4, 2018 11:58:34 AM EST)

Answer

- Underground Utility license is unacceptable. GC license required (Answered: Dec 4, 2018 2:30:10 PM EST)

Question 5

What part of the scope requires a GC license? We have performed the same scope of work for the City of Fort Lauderdale under our annual contract while only having an Underground Utility license, and/or Broward County minor roads 3B license. We also have CBE certification with Broward County and DBE certification with the State. To limit the contractors bidding this project by requiring a GC license seems to exclude other contractors that are fully qualified. (Submitted: Dec 11, 2018 2:24:12 PM EST)

Answer

- At this point, a General Contractors license is required for this project. If the Project manager determines additional acceptable licenses, it will be indicated in an addendum. (Answered: Dec 14, 2018 11:59:17 AM EST)