
PROJECT SPECIFICATIONS

CITY OF LAKE WORTH

**TROPICAL DRIVE AND BARTON ROAD
INFRASTRUCTURE IMPROVEMENTS**



BID ISSUE

**LAKE WORTH BID # IFB 16-115
FINANCE PROJECT #s MP 1610 and LS 1610**

April 2016

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INFRASTRUCTURE IMPROVEMENTS

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BIDDING REQUIREMENTS

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City of Lake Worth
FINANCE OFFICE

INVITATION FOR BID

BID # IFB 16-115
FINANCE PROJECT #s MP 1601 and LS 1610

**TROPICAL DRIVE AND BARTON ROAD INFRASTRUCTURE
IMPROVEMENTS PROJECT**

Bid Submission Deadline

Day/ Date: Tuesday/ May 10, 2016
Time: 3:00PM
Location: Procurement Office
7 North Dixie Highway – 2nd Floor
Lake Worth, FL 33460

Pre-Bid Conference Meeting

Day/ Date: Tuesday/April 26, 2016
Time: 10:00AM
Location: City Hall Conference Room - 1st Floor
7 North Dixie Highway
Lake Worth, FL 33460

Deadline for Questions

Day/ Date: Thursday/April 28, 2016

Deadline for Issuing Addenda

Day/ Date: Wednesday/May 4, 2016



FINANCE OFFICE
7 North Dixie Highway
Lake Worth, FL 33360
TEL: 561-586-1651

**INVITATION FOR BID
IFB # 16-115**

**TROPICAL DRIVE AND BARTON ROAD INFRASTRUCTURE
IMPROVEMENTS PROJECT**

The City of Lake Worth is soliciting bids from responsible and experienced contractors to perform construction services for the Tropical Drive and Barton Road Infrastructure Improvements Project.

The scope of work is inclusive of all necessary improvements to construct roadway improvements, sidewalk, curb and gutter, watermain, sanitary sewer improvements, swale construction, new striping and signage and all other associated work for a complete neighborhood infrastructure improvement project. This project is being partially funded through Federal Community Development Block Grant (CDBG) funds.

Section 3 companies are encouraged to bid to the Invitation for Bid and bid advertisement.

Bid documents may be downloaded at the City's website at: www.LakeWorth.org. Hard copies of bid documents may also be acquired from the Finance Office at 7 North Dixie Highway, Lake Worth, FL 33460.

Time is of the essence. Any bid received after **3:00PM on May 10, 2016**, whether by mail or otherwise, will be returned unopened. The time of receipt shall be determined by the time clock located in the Finance Office. Bids shall be placed in a sealed envelope, marked in the lower left-hand corner with the bid number, title, date, and hour bids are scheduled to be received. Bidders are responsible for insuring that their bid is stamped by office personnel by the deadline indicated.

A non-mandatory Pre-Bid meeting is scheduled for 10:00AM on Tuesday, April 26, 2016, located at City Hall, 7 North Dixie Highway, Lake Worth, FL 33460. City Hall Conference Room, 1st Floor.

All bids must be delivered or mailed to:

City of Lake Worth, Finance Office – 2nd Floor
7 North Dixie Hwy.
Lake Worth, FL 33460

ENVELOPES CONTAINING BIDS MUST BE IDENTIFIED AS BID # 16-115. Bids shall be accompanied by a certified check, cashier's check, or Bid Bond in an amount not less than 5% of bid.


Hirut Darge, Purchasing Agent

PUBLISH: April 10, 2016
Palm Beach Post

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FOR
TROPICAL DRIVE AND BARTON ROAD INFRASTRUCTURE
IMPROVEMENTS PROJECT**

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SECTION 1 - SCOPE OF WORK

Tropical Drive and Barton Road Infrastructure Improvements Project

The City of Lake Worth is soliciting bids from responsible and experienced contractors to perform construction services for the Tropical Drive and Barton Road Infrastructure Improvements Project.

The scope of work is inclusive of all necessary improvements to construct roadway improvements, sidewalk, curb and gutter, watermain, sanitary sewer improvements, swale construction, new striping and signage and all other associated work for a complete neighborhood infrastructure improvement project. This project is being partially funded through Federal Community Development Block Grant (CDBG) funds.

All work shall be constructed in accordance with the plans as designed by AECOM (URS) Inc. and in accordance with the Florida Department of Transportation's (FDOT) design specifications and standards and City of Lake Worth's Standards and Details available on the City's website at www.lakeworth.org.

The project is being bid and awarded as a unit price contract and quantities are located within this Invitation for Bid on Form B3.

END OF SECTION 1 – SCOPE OF WORK

SECTION 2 – SPECIAL TERMS

1. **Pre-Bid Conference**

A Pre-Bid Conference is scheduled at 10:00AM on Tuesday, April 26, 2016 at the City Hall Conference Room, 7 North Dixie Highway, Lake Worth, Florida 33460 to provide potential bidders the opportunity to ask questions and receive clarification concerning the project.

2. **Time of Completion and Liquidated Damages**. The work to be performed under this project shall commence on the date of Notice to Proceed. The work shall be substantially completed within **forty eight (48) weeks** after the date of such notice, and fully completed within **fifty two (52) weeks**, with such extensions of time as are provided for in the General Terms and Conditions. Liquidated damages for delay are agreed to be \$500 per calendar day.

3. **Permits and Fees**. In accordance with the Public Bid Disclosure Act, the Contractor will be required to make payment to the City of Lake Worth for following permits or licenses, impact, inspection or other fees for this Project under the Contract: (F.S. 218.80)

(Permit)
N/A

(Fee/Amount or calculation)
N/A

4. **Licenses**. Each Bidder shall have the following licenses at the time of bid submittal or its bid may be disqualified:

- State of Florida General Contractor license OR
- State of Florida Underground Utility Contractor license

Each Bidder will also be required, at the time of contract execution, to have a business tax receipt or certificate of registration in accordance with the following:

- No person, contractor or subcontractor may conduct business within the City without a business tax receipt or certificate of registration.
- A contractor who holds a valid countywide contractor's license, in addition to a county business tax receipt shall register with the City.
- Any person engaging in any business, occupation or profession within the City without a permanent business location or branch office in the City, but holding a valid and currently effective business tax receipt issued by the county or another incorporated municipality, shall be issued a certificate of registration upon registering with the business tax official.

5. **Construction Bond.**

Payment and Performance Bonds are required and included in this bid package.

6. **Insurance.** Prior to execution of the resulting contract derived from this IFB, the awarded bidder shall obtain and maintain in force at all times during the term of the resulting contract insurance coverage as required herein. All insurance policies shall be issued by companies authorized to do business under the laws of the State of Florida. The Certificates shall clearly indicate that the selected bidder has obtained insurance of the type, amount, and classification as required for strict compliance with this provision and that no material change or cancellation of the insurance shall be effective without thirty (30) days prior written notice to the City. Compliance with the foregoing requirements shall not relieve the selected bidder of its liability and obligations under the resulting contract.

- A. The selected bidder shall maintain, during the life of the contract, commercial general liability, including public and contractual liability insurance in the amount of \$1,000,000.00 per occurrence (\$2,000,000.00 aggregate) to protect the bidder from claims for damages for bodily and personal injury, including wrongful death, as well as from claims of property damages which may arise from any operations under the contract, whether such operations be by the bidder or by anyone directly or indirectly employed by or contracting with the bidder.
- B. The selected bidder shall maintain general automobile liability insurance for owned and hired vehicles (optional / per case basis) of at least \$1,000,000 combined single limit.
- C. The selected bidder shall carry Workers' Compensation Insurance and Employer's Liability Insurance for all employees as required by Florida Statutes.

All insurance, other than Workers' Compensation, to be maintained by the selected bidder shall specifically include the CITY as an "Additional Insured". Selected bidder will need to supply additional insured endorsements.

7. **Other Special Conditions:**

a. This project is funded in part through Community Development Block Grant (CDBG) funds provided by Palm Beach County Department of Economic Sustainability. The project is thereby subject to Federal Davis Bacon Act requirements and other Federal requirements. The applicable wage decision and Federal Requirement forms are provided in this Invitation to Bid package.

b. Work hours are from 7am to 6pm, Monday through Friday and on Saturday, from 8am to 6pm. Neither the prime contractor nor any subcontractor shall be allowed to perform one hundred percent (100%) of their work on this project on nights, weekends, or County recognized holidays, and shall assure that the prime contractor and all subcontractors shall, at a minimum, perform work on this project for the duration of one regular working day. Due to this is being a grant funded project, the Municipality may request DES for a waiver to the above requirement should the nature of the project so necessitate, and in such instance, DES may, at its discretion, grant the Municipality such waiver. No work on Sunday & Holiday, unless a waiver is authorized by both Public Services and DES with at least a 48 hours advanced notice.

c. The Section 3 report is a requirement for this project. Section 3 companies are encouraged to bid. The local Workforce Investment Board, Inc. may be able to assist with recruiting from low income populations. Contractors can contact:

Michelle Dryer, Director of Community Partnership
(561) 340-1060 x2487, MDryer@CareerSourcePBC.com

The services to be provided under this IFB are set to commence upon the City's issuance of a notice to proceed. Due to the nature of the services, the notice to proceed may be by oral communication to the selected bidder. All bidders must have all necessary equipment and/or personnel to immediately commence upon receipt of the notice to proceed.

END OF SECTION 2 – SPECIAL TERMS

SECTION 3 - MINIMUM QUALIFICATIONS

CHECKLIST

Contractors must meet the following minimum requirements in order to be considered for award.

Contractors not meeting these requirements will be disqualified. All decisions of the City are final.

- 1) Contractor must have served as prime contractor for a minimum of two similar (2) projects involving similar scope of work (roadway construction, watermain, storm drainage) and similar size projects within the last thirty six (36) months.

Complete Form A1 - Contractor's Prior Experience Form

- 2) Contractor must possess an active General Contractor license OR Underground Utility Contractor license in the State of FL. Please submit a copy of the license with this bid submittal package.

END OF SECTION 3 – MINIMUM QUALIFICATIONS

City of Lake Worth

IFB # 16-115
CONTRACTOR'S PRIOR EXPERIENCE FORM

Contractor must provide two (2) references for each project identified to satisfy the minimum experience requirements. A reference person must be someone who has personal knowledge of the Contractor's and Subcontractor's performance. The reference person must have been informed that they are being used as a reference so that the City may check references.

Contractor' Name: _____

PROJECT (FIRST PROJECT)

Name of Project: _____

Project Location: _____

Description of Project: _____

Describe the project construction elements (type of project, road lanes, number of employees used on project, time frame for completion, etc.) completed by the Contractor, Sub-Contractors, and/or Suppliers:

_____ Description

of any Change Orders: _____

Contract Name: _____ Contract Amount: _____

Project Start Date: _____ Project End Date: _____

Contact Name & Title: _____

Phone Number: (_____) _____ Email Address: _____

Note: Use an additional sheet with the same format to list other projects as proof of prior experience.

Contractor' Name: _____

PROJECT (SECOND PROJECT)

Name of Project: _____

Project Location: _____

Description of Project:

Describe the project construction elements (type of project, road lanes, number of employees used on project, time frame for completion, etc.) completed by the Contractor, Sub-Contractors, and/or Suppliers:

Description of any Change Orders: _____

Contract Name: _____ Contract Amount: _____

Project Start Date: _____ Project End Date: _____

Contact Name & Title: _____

Phone Number: (_____) _____ Email Address: _____

Note: Use an additional sheet with the same format to list other projects as proof of prior experience.

SECTION 4 - INSTRUCTIONS TO BIDDERS

1. HOW TO SUBMIT A BID:

a. **The original and two (2) copies** of your bid must be submitted in a sealed envelope, marked on the outside lower left-hand corner of the envelope with the Bid number, title, and date and hour bids are scheduled to be received. Sealed bids shall be mailed or hand-delivered to:

**City of Lake Worth – Finance Office – 2nd Floor
7 North Dixie Highway
Lake Worth, FL 33460**

b. Time is of the essence and any bid received after the closing date and time indicated on the cover of this IFB, whether by mail or otherwise, will be returned unopened and will not be considered. The time of receipt shall be determined by the time clock located in the Procurement Office. Bidders are responsible for insuring that their bid is stamped by City personnel by the deadline indicated. The City shall in no way be responsible for delays caused by any occurrence.

c. Bids submitted by telephone, telegram, facsimile or email shall not be accepted.

d. Submission of a Bid implies a full understanding of this IFB. Any misunderstanding as to such terms by the Bidder will not relieve the Bidder from performance.

e. This IFB consists of this document along with all addenda, plans, drawings and/or technical specifications incorporated or attached to this IFB, all of which are incorporated herein by this reference.

2. THE BID PACKAGE. Each bid submitted in response to this IFB shall contain the following documents:

Minimum Requirements and Checklist and Form A1

- B1 Bid Package Cover Sheet
- B2 Bid
- B3 Schedule of Bid Items
- B4 Substitution Sheet
- B5 Schedule of Subcontractors
- B6 Contractor Verification
- B7 Reference List
- B8 Drug Free Certification
- B9 Trench Safety Compliance Form
- B10 Contractor's Existing and Projected Workload
- ___ Bid bond or deposit
- ___ Copies of required licenses, certificates or registrations
- ___ Forms Packet for Federally Funded Projects
- ___ Sample of Daily Reporting Form and Employee Sign-In Sheet
- ___ Any issued Addenda

The Bid Submission Package, and any other required documents must be returned in order for the bid to be considered and responsive.

AVOID BID REJECTION: Bids may be rejected for noncompliance to requirements after review by the Procurement Office. All bids must be submitted on the provided Bid forms and **signed in ink by an officer authorized to bind the Bidder where applicable.**

3. COMPLETION OF BID SUBMISSION PACKAGE.

a. It is the responsibility of the bidder to insure that all pages are included. All Bidders are advised to closely examine this IFB.

b. **All bids must be submitted on the provided Bid forms (B1 – B10).** Bids submitted on Bidder's letterhead or quotation forms will not be accepted.

c. Bid forms must be neatly written in ink or typed, and must be signed in ink by an officer or employee having authority to bind the bidder (where a signature is required). **Failure to submit a duly signed bid shall be cause for rejection of the bid.**

4. ERRORS/ERASURES/CORRECTIONS

a. **Bids having erasures or corrections must be initialed in ink by the Bidder.** If a correction is necessary, draw a single line through the entered figure and enter the corrected figure above it and initial the correction. Any illegible entries, pencil bids or corrections not initialed may not be accepted.

b. In the event of mathematical extension error(s), the unit price will prevail and the bidder's total offer will be corrected accordingly. In the event of addition errors, the extended line item will prevail and the bidder's total will be corrected accordingly.

c. Bidders shall not be allowed to modify their bids after the bid opening time and date. Bid files may be examined during normal working hours, after bid opening, by appointment only.

d. Bidder represents that it has taken all necessary steps to ascertain the nature and location of the work and that it has investigated and satisfied itself as to the general and local conditions which can affect the performance of the work, including: (i) conditions relating to access, egress, transportation, debris disposal, parking and storage of materials; (ii) availability of labor; and (iii) physical conditions at the site. Any failure by Bidder to take these steps will not relieve the Bidder from the responsibility for estimating properly the difficulty and cost of successfully performing the work without additional expense to Owner.

5. BID PRICES. All prices shall remain valid for **one hundred twenty (120)** days after the date of bid closing or other time stated in the Special Terms. Prices must be stated in the units specified on the Bid form.

6. SUBSTITUTIONS. If Bidder wishes to offer a substitution for a specified item of materials or equipment, the proposed substitution must be listed on the Substitution Sheet. In each case, the difference in price between the base bid and the price for the proposed substitution shall be specified or if there is no price difference that shall be specifically indicated. The Bid shall reflect the Bidder's price for the item specified in the Schedule of Bid items; not the proposed substitution. The best value bid will be established considering the base Bid, not any proposed substitution.

7. SUBCONTRACTING. If a Bidder intends to subcontracts any portion of the work, the Schedule of Subcontractors form must be fully completed and submitted with the bid. The name, address, phone number and extent of work and value of the work to be performed should be included for all sub-contractors. The City reserves the right to reject any bid if the bid names a subcontractor who has previously failed in the proper performance of an award, or failed to deliver on time contracts of a similar nature, or who is not in a position to perform under this award. The City reserves the right to inspect all facilities of any subcontractor in order to make a determination as to the foregoing. **The Schedule of Subcontractors form must be completed with the listing of anticipated subcontractors. Failure to submit the completed form may result in the City rejecting the bid.**

8. BID BONDS OR DEPOSITS

Each bid must be accompanied by a certified check, cashier's check or bid bond in the amount of five percent (5%) of the total bid. Only the following types of bonds or deposits will be accepted:

1. Bid bond signed by a surety company authorized to do business in the State of Florida.
2. Cashier Check of any national or state bank.
3. Certified check drawn on a financial institution acceptable to the City of Lake Worth

All checks and bonds must be made payable to the City of Lake Worth. The City reserves the right to hold the bid security until a contract is properly executed. If any bidder presented with a contract fails to execute such contract with the City, the City may be entitled to retain the deposit or enforce the bond. Bid deposits of unsuccessful bidders will be returned after execution of a contract.

9. CERTIFICATION AND LICENSES. Bidder must include with its bid package a copy of all applicable certificates and licenses and a current Business Tax Receipt in the name of the Bidder submitting the Bid from the County in which the Bidder's principal place of business is located. If awarded the contract, any Bidder who is not required to have a Business License from the City will be required to obtain a Certificate of Registration from the City of Lake Worth prior to contract execution.

10. NO LOBBYING – CONE OF SILENCE. In accordance with the Palm Beach County Lobbyist Registration Ordinance and Section 2-112(k) the City's procurement code, the City's procurement cone of silence will be in effect as of the due date for proposals in response to this IFB. A complete copy of the City's procurement code is available on-line at municode.com under the City's code of ordinances (sections 2-111 – 2-117). All Bidders are highly encouraged to review the same. In summary, the cone of silence prohibits communication between certain City officials, employees and agents and any entity or person seeking to be awarded a contract (including their representatives, lobbyists and potential subcontractors). The cone of silence terminates at the time of award, rejection of all response or some other action by the City to end the selection process

11. CONFLICT OF INTEREST AND ETHICS REQUIREMENTS. This IFB is subject to the State of Florida Code of Ethics and the Palm Beach County Code of Ethics. Accordingly, there are prohibitions and limitations on the employment of City officials and employees and contractual relationships providing a benefit to the same. Bidders are highly encouraged to review both the Florida Code of Ethics and the Palm Beach County Code of Ethics in order to insure compliance with the same.

Further, any Bidder coming before the City Commission for an award of a contract and who has made an election campaign contribution in an amount that is more than one hundred dollars (\$100.00) to any elected official of the City Commission, who is a current sitting member of the Commission, must disclose such election campaign contribution, verbally and in writing, in their responsive proposal to this IFB.

12. OFFICE OF THE INSPECTOR GENERAL

In accordance with Palm Beach County ordinance number 2011-009, this IFB and resulting Agreement may be subject to investigation and/or audit by the Palm Beach County Inspector General. The Inspector General of Palm Beach County has the authority to investigate and audit matters relating to the negotiation and performance of this contract and in furtherance thereof may demand and obtain records and testimony from the contractor and its subcontractors and lower tier subcontractors. The contractor understands and agrees that in addition to all other remedies and consequences provided by law, the failure of the contractor or its subcontractors or lower tier subcontractors to fully cooperate with the Inspector General when requested may be deemed by the municipality to be a material breach of this contract justifying its termination. Bidder/Proposer should review Palm Beach County ordinance number 2011-009 in order to be aware of its rights and/or obligations under such ordinance and as applicable.

13. PUBLIC ENTITY CRIMES. Pursuant to section 287.133, Florida Statutes, a person or affiliate

who has been placed on the convicted vendor list maintained by the State of Florida may not submit a bid to the City as agent for the ECR Board for 36 months following the date of being placed on the convicted vendor list.

14. INQUIRIES AND ADDENDA. Any and all inquiries on the scope of work, specifications, additional requirements, attachments, terms and general conditions or instructions, or any issue, must be directed in writing, by US mail, fax or email to:

Hirut Darge, Purchasing Agent
City of Lake Worth, Finance Office
7 N. Dixie Hwy.
Lake Worth, FL 33460
E-mail: hdarge@lakeworth.org
(561) 586-1651

Any addenda or other modification to the Bid documents will be issued by the City prior to the date and time of Bid closing, as a written addenda distributed to all prospective bidders who have obtained the bid package directly from the City or its authorized representative. Such written addenda or modification shall be part of the Bid documents and shall be binding upon each Bidder. Each Bidder is required to acknowledge receipt of any and all addenda in writing and submit with their bid. No Bidder may rely upon any oral or verbal modification or interpretation in preparing its bid. No interpretation of this IFB will be made for any bidder, except by written addendum.

15. ACCEPTANCE; REJECTION; CANCELLATION. In accordance with the City's procurement code, this IFB may be cancelled and may or may not be re-bid when determined to be in the best interests of the City. Any or all bids may be accepted or rejected in whole or in part, when determined to be in the best interests of the City. The City also reserves the right to reject the bid of any Bidder who has previously failed in the performance of an award or to deliver contracts of a similar nature on time or who is not in a position to perform properly under this award. The City reserves the right to inspect all facilities of bidders. Any bid received without an authorized signature or past the submittal deadline will be rejected.

Any withdrawal or cancellation of this Invitation for Bid, either before or after selection of a bidder, shall be without liability or obligation on the part of the City or its employees. Any action, selection or failure to select a successful bidder to this Invitation for Bid shall be without any liability or obligation of the part of the City or its employees.

The City reserves the right to waive any non-material irregularities and technicalities, except timeliness and signature requirements. Additionally, bids may be considered irregular and may be rejected if the bid: 1) does not strictly conform to the requirements of this IFB; 2) is incomplete; 3) any Bid Form is altered; 4) contains additions not called for; 5) is conditional; 6) contains prices that are, in the opinion of the City, unbalanced either in excess or below the reasonable cost analysis values; 7) bids is in excess of the approved budget for the project.

16. SELECTION OF BIDDER WITH WHOM TO CONTRACT. The selection of a bidder with whom to contract shall be based on the lowest responsive, responsible bidder using the following criteria:

1. Qualifications;
2. Skill and experience based on reference verification;
3. Amount of the bid in relation to the needed goods & services and in relation to other bids received; and,
4. Adherence to the specifications and requirements of the IFB.
5. Past Performance

6. Content of the bid

17. POSTING OF AWARD TABULATIONS. The selected bidder will be notified in writing with intent to award a contract. Recommended awards will be posted and available for review by interested parties at the Procurement Office, 7 North Dixie Highway, Lake Worth FL 33460 for 5 business days.

18. CONTRACT. The City and successful bidder will be contractually bound only if and when a written contract between the parties is executed by the City. If a contract with the first lowest responsive, responsible bidder is not executed, the City can reject all bids and rebid the project, or go to the next lowest responsive, responsible bidder to determine if the bidder is eligible to enter into a contract.

19. PROCUREMENT CODE. Palm Beach County's procurement code is to be followed for Federally Funded projects.

20. COSTS. All costs incurred by any party in responding to this Invitation for Bid are the sole responsibility of the Bidder including any costs, fees or expenses associated with a protest.

21. PROTEST PROCEDURE. Any actual Bidder who is aggrieved in connection with this IFB may protest such procurement. The protest must be filed with the City in accordance with Palm Beach County Purchasing Code protest requirements. A complete copy of the county's code is available on-line at municode.com under the County's code of ordinances, section 2-55. There are strict deadlines for filing a protest. Failure to abide by the deadlines will result in a waiver of the protest.

Sec. 2-55. Protested solicitations and awards.

(a) Right to protest. After posting of the recommended awardee, any bidder or proposer who is aggrieved in connection with the recommended award may protest in writing to the director of purchasing. The right to protest is limited to those procurements of goods or services solicited through an invitation for bid or a request for proposal. Recommended awards less than the mandatory bid or proposal amount cannot be protested.

(b) Notice of protest. The protest shall be submitted within five (5) business days after posting of the award recommendation. The protest shall be in writing and shall identify the protestor and the solicitation, and shall include a factual summary of the basis of the protest. Such protest is considered filed when it is received and date/time stamped by the department of purchasing. Neither the director of purchasing nor a special master shall consider any issue not submitted in writing within the time frame specified for the notice of protest.

22. CITY IS DOCUMENT GATEKEEPER. This IFB is issued directly by the City and the City shall be the sole distributor of all addenda and/or revisions to these documents. It is the responsibility of the Bidder to confirm the legitimacy of procurement opportunities or notices directly with the Procurement Office. The City is not responsible for any solicitations advertised by subscriptions, publications, websites (other than the City's) or other sources not connected with the City and the Bidder should not rely on such sources for information regarding any solicitation made by the City of Lake Worth.

23. PUBLIC RECORDS REQUESTS DURING BID OPENINGS

Sec. 255.0518, Fla. Stat., requires that when the bids are open, they must be opened at a public meeting (held in accordance with sec. 286.011, Fla. Stat.); the name of each bidder and the price submitted on each bid must be announced; and the name of each bidder and the price must be made available by the City upon request. Sealed bids or proposals received by the City in response to an invitation to bid are exempt from public records disclosure requirements until the City provides a notice of decision or thirty (30) days after the opening of the proposal / bid. If the City rejects all bids or proposals submitted in response to an invitation to bid or request for proposals and the City concurrently provides notice of its intent to reissue the competitive solicitation, the rejected bids or proposals remain exempt from public records disclosure until such time as the City provides notice of

a decision or intended decision concerning the competitive solicitation or until the City withdraws there issued competitive solicitation. A bid, proposal, or reply is not exempt for longer than twelve (12) months after the initial City notice rejecting all bids, proposals, or replies. Requests for bid or proposal documents should be submitted to the City Clerk's Office. Documents may be inspected without charge, but a charge will be incurred to obtain copies.

24. DISCLOSURE AND DISCLAIMER. The information contained herein is provided solely for the convenience of the Bidders. It is the responsibility of each Bidder to assure itself that information contained herein is accurate and complete. Neither the City, nor its advisors provide any assurances as to the accuracy of any information in this IFB. Any reliance on the contents of this IFB regarding the project or scope of thereof, or on any oral communications with City representatives or advisors, shall be at each Bidder's own risk. Bidders should rely exclusively on their own investigations, interpretations and analyses in connection with this matter. This IFB is being provided by the City without any warranty or representation, express or implied, as to its content, accuracy or completeness and no Bidder or other party shall have recourse to the City if any information herein contained shall be inaccurate or incomplete. No warranty or representation is made by the City that any bid or proposal conforming with these requirements will be selected for consideration, negotiation or approval.

Any action taken by the City in response to bids or proposals made pursuant to this IFB or in making any award or failure or refusal to make any award pursuant to such bids or proposals, or in any cancellation of award, or in any withdrawal or cancellation of this RFP, either before or after issuance of an award, shall be without any liability or obligation on the part of the City, or their advisors.

Any recipient of this IFB who responds hereto fully acknowledges all the provisions of this Discloser and Disclaimer and agrees to be bound by the terms hereof. Any proposal submitted pursuant to this IFB is at the sole risk and responsibility of the party submitting such proposal.

25. COMPLIANCE. All bids or proposals received in accordance with this IFB shall be subject to applicable Florida Statutes governing public records including without limitation Chapter 119, Florida Statutes.

26. CONSTRUCTION CONTRACT/RETAINAGE. It is the City's intent to withhold retainage on all construction contracts generally in accordance with the provisions of section 218.735 (8)(a-g), Florida Statutes. Federally funded projects require a minimum of 5% retainage to be held until all project documents are found in compliance. The City's procurement code requires 10% retainage to be withheld until the project is at least 50% complete at which time retainage may be reduced to 5%.

END OF SECTION 4 - INSTRUCTIONS TO BIDDERS

BID PACKAGE COVER SHEET

IFB # 16-115	Project Title: Tropical Drive and Barton Road Infrastructure Improvements Project
---------------------	--

Bidder Company Name:

Enclose the following documents:

- _____ 1. Bid Package Cover Sheet. (B1)
- _____ 2. Prior Experience. (A1)
- _____ 3. Bid (B2) **Must be signed.**
- _____ 4. Schedule of Bid Items (B3) **Must be signed.**
- _____ 5. Substitution Sheet (B4). If none, mark "none".
- _____ 6. Schedule of Sub-contractors (B5). If none, mark "none".
- _____ 7. Contractor Verification (B6). Check the license and insurance requirements to ensure that you will comply and attach copies of current licenses.
- _____ 8. Reference List (B7)
- _____ 9. Drug Free Certification (B8)
- _____ 10. Trench Safety Compliance Form (B9)
- _____ 11. Contractor's Existing and Projected Workload (B10)
- _____ 12. Bid bond or Deposit
- _____ 13. Copies of Licenses, Certifications and Registrations (Contractor to Supply)
- _____ 14. Form's Packet for Federally Funded Projects
- _____ 15. Sample of your Daily Reporting Form and Employee Sign-In Sheet
- _____ 16. Any issued Addenda

Clearly mark the outside lower left corner of the Envelope with the Invitation for Bid number and title, and the Date and Time for the bid closing deadline.

THIS PAGE AND THE FOLLOWING PAGES ARE TO BE RETURNED WITH YOUR BID.

Submit ONE (1) ORIGINAL and TWO (2) PHOTOCOPIES of your Bid package.

AVOID BID REJECTION:

All bids must be submitted on the provided Bid forms with each form completed and signed where requested. Signatures must be in ink and by a person authorized to bind the Bidder.

BID

Tropical Drive and Barton Road Infrastructure Improvements Project

IFB # 16-115

Proposal of: _____
(Bidder Company Name)

Bid Amount: \$ _____

(Write Dollar Figure Here)

Bidder agrees to furnish, unless otherwise provided, all implements, machinery, equipment, transportation, tools, materials, supplies, labor and other things necessary for the performance and completion of the work for the amount indicated above.

The undersigned Bidder hereby declares that:

1. This bid is made in good faith, without collusion or fraud and is fair and competitive in all respects.
2. The Bidder has carefully and to his full satisfaction examined the attached Scope of Work, Special Terms, General Conditions, technical specifications, and form of bonds, if applicable, together with the accompanying plans, and Bidder has read all issued addenda issued.
3. Bidder has made a full examination of the site and is familiar with the site conditions that may impact its performance.
4. There is enclosed a bid guarantee consisting of five percent (5%) of bid price in the amount of \$_____.
5. Upon receipt of a Notice of Intent to Award the contract the Bidder shall: 1) commence obtaining a Performance Bond, a Payment Bond, and Certificate(s) of Insurance immediately after receiving a Notice of Intent to Award, and 2) immediately obtain a Certificate of Registration for engaging in business from the City, as such documents will be required prior to execution of a Contract.
6. Bidder understands that the contract time starts on the date of Notice to Proceed.
7. Bidder furthermore agrees that, in case of failure on his part to execute a Contract and provide all required documents within ten (10) calendar days of receipt of the Contract for execution, the offer to contract may be withdrawn and the check, bond, or other security accompanying his bid and the money payable thereon, shall become the property of the City, by forfeit as agreed liquidated damages.
8. The Bidder states that this bid is the only bid for this project in which Bidder is interested; and Bidder shall not be a sub-contractor or **sub**-subcontractor on this project.
9. The work shall be substantially completed within **forty eight (48) weeks** after the date of such notice, and fully completed within **fifty two (52) weeks**, with such extensions of time as are provided for in the General Terms and Conditions.

(B3)

IFB # 16-115

SCHEDULE OF UNIT BID ITEMS

In accordance with the specifications and Scope of Work included with this bid, following is the recommended unit prices in order to evaluate the total bid as submitted with your proposal. These prices are intended to equal the total base bid as submitted at the top of page 19 of the IFB. These prices are used as a tool for the evaluation of the bid(s).

Item No	Description	EST QTY	Units	Unit Cost	Value
WATER UTILITIES					
1	Furnish and install 4" PVC (Polyvinyl Chloride) C-900 water main pipe including all thrust blocks, restraining joints, disinfection and appurtenances needed to deliver a functioning water distribution system.	30	LF		
2	Furnish and install 6" PVC (Polyvinyl Chloride) C-900 water main pipe including all thrust blocks, restraining joints, disinfection and appurtenances needed to deliver a functioning water distribution system.	50	LF		
3	Furnish and install 8" PVC (Polyvinyl Chloride) C-900 water main pipe including all thrust blocks, restraining joints, disinfection and appurtenances needed to deliver a functioning water distribution system.	3500	LF		
4	Furnish and install 12" PVC (Polyvinyl Chloride) C-900 water main pipe including all thrust blocks, restraining joints, disinfection and appurtenances needed to deliver a functioning water distribution system.	3500	LF		
5	Furnish and install 4" DIP (Ductile Iron Pipe) water main pipe including all thrust blocks, restraining joints, disinfection and appurtenances needed to deliver a functioning water distribution system.	40	LF		
6	Furnish and install 6" DIP (Ductile Iron Pipe) water main pipe including all thrust blocks, restraining joints, disinfection and appurtenances needed to deliver a functioning water distribution system.	400	LF		
7	Furnish and install 8" DIP (Ductile Iron Pipe) water main pipe including all thrust blocks, restraining joints, disinfection and appurtenances needed to deliver a functioning water distribution system.	150	LF		
8	Furnish and install 12" DIP (Ductile Iron Pipe) water main pipe including all thrust blocks, restraining joints, disinfection and appurtenances needed to deliver a functioning water distribution system.	310	LF		
9	Cut, cap and place out of service existing water main up to 4".	40	EA		
10	Grout and place out of service existing water main 6" and above.	900	LF		
11	Furnish and install air release valve. This item includes, but is not limited to, air release valve, strapping saddle, corporation stop, manhole/vault and all appurtenances necessary for the complete system.	4	EA		

12	Furnish and install 1" Short Single water service including poly pipe, saddle, corporation stop and curb stop, including all appurtenances and site restoration. Includes connecting new service from new water main with new meter to the relocated/existing front yard meter box.	15	EA		
13	Furnish and install 1" Long Single water service including poly pipe, saddle, corporation stop and curb stop, including all appurtenances and site restoration. Includes connecting new service from new water main with new meter to the relocated/existing front yard meter box.	20	EA		
14	Furnish and install 1" Short Double water service including poly pipe, saddle, corporation stop and curb stop, including all appurtenances and site restoration. Includes connecting new service from new water main with new meter to the relocated/existing front yard meter box.	15	EA		
15	Furnish and install 1" Long Double water service including poly pipe, saddle, corporation stop and curb stop, including all appurtenances and site restoration. Includes connecting new service from new water main with new meter to the relocated/existing front yard meter box.	25	EA		
16	Water service (1") transfer from rear to front of property – complete water service installation including abandonments of existing meter location and private service line, installation of contractor furnished materials, completion of right of entry forms, plumbing permits, installation of private service line to the existing house valve location, meter yoke, expansion nut, tail piece and complete restoration. Includes relocating the existing meter and box to the front of the property, furnishing and installing 1" water service and connecting of new services to the relocated meter.	101	EA		
17	Furnish and install Compact Ductile Iron Fittings (Tees, Elbows, Crosses, etc.).	6.8	TONS		
18	Furnish and install 12"x12" stainless steel tapping saddle assembly, including valve, appurtenances and all site restoration.	1	EA		
19	Furnish and install 12"x8" stainless steel tapping saddle assembly, including valve, appurtenances and all site restoration.	2	EA		
20	Furnish and install 6" x 6" stainless steel tapping sleeve assembly, including valve, appurtenances and all site restoration.	1	EA		
21	Furnish and install 12" resilient wedge gate valve and appurtenances.	6	EA		
22	Furnish and install 8" resilient wedge gate valve and appurtenances.	5	EA		
23	Furnish and install 6" resilient wedge gate valve and appurtenances.	14	EA		
24	Furnish and install 2" resilient wedge gate valve and appurtenances.	1	EA		
25	Furnish and install fire hydrant assemblies on proposed water main, including tee, valve and appurtenances.	6	EA		
26	Reconnect existing fire hydrant to proposed water main.	5	EA		
27	Furnish and install new watermain interconnection assembly, master meter and pre-cast vault.	1	LS		
28	Furnish and install sampling point.	11	EA		
29	Removal & disposal of tree.	5	EA		
	Water Utility Subtotal:				

SEWER UTILITIES					
30	Relining of 8" VCP sewer pipe, including bypass and cleaning 6-10"	5000	LF		
31	Relining of 6" sewer lateral	120	EA		
32	Furnish and install new 6" PVC-SDR 26 (Polyvinyl Chloride) cleanout	120	EA		
33	Manhole Adjustment	20	EA		
	Sewer Utility Subtotal:				
ROADWAY CONSTRUCTION					
34	Roadway Demolition removal of existing asphalt, and base	2100	SY		
35	Furnish and Place 3/4" Type S-III Asphalt	11500	SY		
36	Furnish and Place 1-1/2" Type S-III Asphalt	14000	SY		
37	Furnish and Place 8" Limerock base course (incl. gravel shoulder)	2100	SY		
38	Furnish and Place 12" Stabilized subgrade	2100	SY		
39	Mill existing asphalt pavement, 3/4" average depth	23000	SY		
40	Concrete sidewalk, 4" thick	2800	SY		
41	6" Concrete Driveways	400	SY		
42	Concrete driveway apron and sidewalk demolition and disposal	3000	SY		
43	Monolithic vertical curb, gutter and sidewalk	160	SY		
44	Concrete Curb Removal	300	LF		
45	Swale Reconstruction	1	CY		
46	Sod (Bahia)	2000	SY		
47	Remove and Reinstall Wood Fence and Gate (N. Ridge Road)	1	LS		
	Roadway Construction Subtotal:				
PAVEMENT MARKINGS & SIGNAGE					
48	Thermoplastic, STD, White, Solid, 6"	100	LF		
49	Thermoplastic, STD, White, Solid, 12"	1000	LF		
50	Thermoplastic, STD, White, Solid, 18"	800	LF		
51	Thermoplastic, STD, White, Solid, 24"	350	LF		
52	Thermoplastic, Double, Yellow, Solid, 6"	400	LF		
53	Retro-Reflective Pavement Markers	11	EA		
54	Detectable Warnings	450	SF		
55	Misc. Pavement Markings and Signage	1	LS		
	Pavement Markings & Signage Subtotal:				
SUB TOTAL BASE BID (HARD COSTS)					
SOFT COSTS					
56	Mobilization	1	LS		
57	Maintenance of Traffic (per FDOT Index 600 and FDOT Standard Specifications 536)	1	LS		
58	Bonds and Insurance	1	LS		
59	Allowance	1	LS	\$70,000.00	
60	Permits (Palm Beach County Health Department Clearances)	1	LS		
61	Preconstruction Video	1	LS		

62	Provide National Pollutant Discharge Elimination System Permit (NPDES) and dewatering permit from applicable agencies. Contractor shall be limited to a maximum of one and one-half (1.5%) of the Sub Total Base Bid Price.	1	LS		
63	Record Drawings	1	LS		
SUB TOTAL (SOFT COSTS)					
GRAND TOTAL BID PRICE					

Name of Firm: _____

Print Name: _____ Title: _____

SIGNATURE: _____ **Date:** _____

SUBSTITUTION SHEET

This form must be completed if Bidder proposes to deviate from any contract requirements including, but not limited to, proposed material specifications, proposed method, construction schedule, or phasing plan.

Associated "Add" or "Deduct" must be provided.

DESCRIPTION OR MAKE BID ITEM NO. SPECIFIED	PROPOSED SUBSTITUTION	ADD	DEDUCT
_____	_____	\$ _____	\$ _____
_____	_____	\$ _____	\$ _____
_____	_____	\$ _____	\$ _____
_____	_____	\$ _____	\$ _____
_____	_____	\$ _____	\$ _____
_____	_____	\$ _____	\$ _____
_____	_____	\$ _____	\$ _____
_____	_____	\$ _____	\$ _____
_____	_____	\$ _____	\$ _____
_____	_____	\$ _____	\$ _____
_____	_____	\$ _____	\$ _____
_____	_____	\$ _____	\$ _____

IFB # 16-115

SCHEDULE OF SUBCONTRACTORS

The following is a complete list of all sub-contractors utilized for this project:

Dollar amount of subcontract work

1.	_____	_____	\$ _____
	(company name)	(type of work)	
	_____	_____	
	(address)	(tel. #)	
	_____	_____	
	(zip code)	(federal I.D. #)	
2.	_____	_____	\$ _____
	(company name)	(type of work)	
	_____	_____	
	(address)	(tel. #)	
	_____	_____	
	(zip code)	(federal I.D. #)	
3.	_____	_____	\$ _____
	(company name)	(type of work)	
	_____	_____	
	(address)	(tel. #)	
	_____	_____	
	(zip code)	(federal I.D. #)	

Total dollar amount to be awarded to sub-contractors (this page) \$ _____

Authorized Signature: _____

Note: The above schedule of subcontractors will become a part of the Contract documents. Changes made to the above schedule of subcontractors after the contract has been executed must be submitted in writing to the Project Engineer for approval prior to that sub-contractor performing any work.

IFB # 16-115

CONTRACTOR VERIFICATION FORM

BIDDER:

Name of Firm: _____

Address: _____

Telephone: () _____

Fax: () _____

Email: _____

CONTRACTOR OF RECORD (if same, state "same as above"):

Name: _____

Address: _____

Telephone: () _____

Email: _____

State License # _____ **(ATTACH APPLICABLE COPY)**

County License # _____ **(ATTACH APPLICABLE COPY)**

Type of License: _____

Unlimited _____ (yes/no)

If "NO", Limited to what trade? _____

Is the Contractor/Licensee a full-time employee of Bidder?

____ Yes ____ No ____ N/A

Will the Contractor/Licensee be in responsible charge of the work performed and installed under this contract?

____ Yes ____ No ____ N/A

City License: **(ATTACH COPY OF CITY REGISTRATION OR BUSINESS TAX RECEIPT – May be obtained from City Construction Services)**

Failure to fully or accurately complete this form may be cause for rejection of the bid.

Tropical Dr. and Barton Rd. Infrastructure Improvements Project

IFB # 16-115

LIST OF REFERENCES

NOTE: If you completed A1 this form may be omitted.

1. Owner's Name & Address: _____

Project: _____

Contact Person: _____

Telephone: () _____ Fax: () _____ E-Mail: _____

2. Owner's Name & Address: _____

Project: _____

Contact Person: _____

Telephone: () _____ Fax: () _____ E-mail: _____

3. Owner's Name & Address: _____

_____ Project:

Contact Person: _____

Telephone: () _____ Fax: () _____ E-Mail: _____

IFB # 16-115

DRUG FREE WORKPLACE CERTIFICATION

The undersigned Bidder, in accordance with Florida Statute 287.087 hereby certifies that

_____ does:
(Name of Business)

1. Publish a statement notifying employees that the unlawful manufacture, distribution, dispensing, possession, or use of a controlled substance is prohibited in the workplace and specifying the actions that will be taken against employees for violation of such prohibition.
2. Inform employees about the dangers of drug abuse in the workplace, the business' policy of maintaining a drug-free workplace, any available drug counseling, rehabilitation, and employee assistance programs, and the penalties that may be imposed upon employees for drug abuse violations.
3. Give each employee engaged in providing the commodities or contractual services that are under this bid a copy of the statement specified in subsection (1).
4. In the statement specified in subsection (1), notify the employees that, as a condition of working on the commodities, or contractual services that are under bid, the employee will abide by the terms of the statement, and will notify the employer of any conviction of, or plea of guilty, or *nolo contendere* to any violation of Chapter 1893, or of any controlled substance law of the United States, or any State, for a violation occurring in the workplace no later than five (5) days after such conviction.
5. Impose a sanction on, or require the satisfactory participation in a drug abuse assistance, or rehabilitation program, if such is available in the employee's community, by any employee who is so convicted.
6. Make a good faith effort to continue to maintain a drug-free workplace through implementation of this section.

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

Bidders Authorized Signature

Print Name: _____

Date

FLORIDA TRENCH SAFETY COMPLIANCE

This form is required where Contractor will perform trench excavation which exceeds a depth of 5 feet.

If Not Applicable - Check this Box and sign below.

In accordance with the Florida Trench Safety Act, F.S. 553.63, Bidder acknowledges:

1. The trench safety standards applicable to this bid and contract are either:

Included in the specifications for this bid or

Are identified as: _____

2. Bidder will comply with all applicable trench safety standards and any special shoring requirements applicable to the Project.

3. Included in the various items of the Bid and in the Total Bid Price are costs for complying with the Florida Trench Safety Act, which costs are summarized below.

Note: Included in the various bid items on Form B-3 are costs for compliance with trench safety standards, including sheeting and shoring. Costs on this Form B-10 shall be consistent with Form B-3. The bid items for trench safety compliance on Form B-3 must equal the total amount for trench safety compliance indicated below.

	Trench Safety Measure (Description)	Cost per Linear Foot	Linear Feet	Extended Cost
A.	_____	_____	_____	_____
B.	_____	_____	_____	_____
C.	_____	_____	_____	_____
	Shoring Safety Measure (Description)	Cost per Square Foot	Square Feet	Extended Cost
D.	_____	_____	_____	_____
E.	_____	_____	_____	_____
F.	_____	_____	_____	_____

FAILURE TO COMPLETE THE ABOVE MAY RESULT IN THE BID BEING REJECTED.

Bidder Firm: _____

Authorized Signature: _____

Date: _____

IFB # 16-115

Contractor's Existing and Projected Workload Form

List all major construction projects your firm has in process, giving the name of project, owner, engineer, contract amount, percent complete, and scheduled completion date. Include additional pages as required.

Failure to fully and accurate complete this form may result in disqualification of the Bid.

Project Name	Owner	Engineer	Contract Amount	Percent Complete	Scheduled Completion Date

BIDDER'S BOND

KNOW ALL MEN BY THESE PRESENTS, that we:

_____ (the "Principal"), and

_____ (the "Surety"),

a corporation authorized to do business as a surety in the State of Florida, bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally and firmly by these presents in the full and just sum of

_____ Dollars (\$ _____) good and lawful money of the

United States of America, to be paid upon demand of the **City of Lake Worth, Florida**.

WHEREAS, the Principal is about to submit, or has submitted a bid in response to an Invitation for Bid issued by the City of Lake Worth; and

WHEREAS, the Principal desires to file this Bond in accordance with law, in lieu of a certified bidder's check otherwise required to accompany its Bid.

NOW THEREFORE, the conditions of this obligation are such that if the Bid is accepted by the City of Lake Worth. the Principal shall within ten (10) calendar days after receipt of a contract, execute said contract and upon the terms, conditions and price set forth in the Invitation for Bid and Bid, in the form and manner required by the City of Lake Worth, Florida, in an amount of one hundred percent (100%) of the total contract price, as indicated in the Bid, in form and with security satisfactory to the City, then this obligation is to be void, otherwise to be and remain in full force and virtue in law; and the Surety shall, upon failure of the Principal to comply with any or all of the foregoing requirements within the time specified above, immediately pay to the City upon demand the amount hereof, not as a penalty but as liquidated damages.

IN TESTIMONY THEREOF, the Principal and Surety have caused these present to be duly signed and sealed this _____ day of _____, 2014.

Bidder as PRINCIPAL:

SURETY:

Company: _____

Company: _____

Signature: _____

Signature: _____

Print Name: _____

Print Name: _____

Title: _____

Title: _____

Address: _____

CONTRACT PERFORMANCE BOND

BY THIS BOND, we, _____, as Principal and _____, a Corporation, as Surety, whose address is _____, are bound to the City of Lake Worth, hereinafter called CITY, for the sum of \$_____, for payment of which we bind ourselves, our heirs, personal representatives, successors, and assigns, jointly and severally.

THE CONDITION OF THIS BOND is that if Principal:

1. Performs the Contract dated _____, 20__ between Principal and CITY, Contract No._____, the Contract being made a part of this bond by reference, in the time and in the manner prescribed in the Contract and;
2. Pays CITY all loss, damages, expenses, costs, and attorney's fees, including appellate proceedings, the CITY sustains because of a default by Principal under the Contract and;
3. Performs the guarantee of all-work and materials furnished under the Contract for the time specified in the Contract;

then this bond is void; otherwise it remains in full force. Whenever Principal shall be, and declared by CITY to be in default under the Contract, the CITY having performed CITY'S obligations thereunder, the Surety may promptly remedy the default or shall promptly:

- (1) Complete the Contract in accordance with its terms and conditions; or
- (2) Obtain a bid or bids for completing the Contract in accordance with its terms and conditions, and upon determination by Surety of the lowest responsible bidder, or, if the CITY elects, upon determination by the CITY and the Surety jointly of the lowest responsible bidder, arrange for a contract between such bidder and CITY, and make available as the work progresses (even though there should be a default or a succession of defaults under the Contract or Contracts of completion arranged under this Paragraph) sufficient funds to pay the costs of completion, less the balance of the Contract price; but not exceeding, including other costs and damages for which the Surety may be liable hereunder, the amount set forth in the first paragraph hereof. The term "balance of the Contract price" as used in this paragraph, shall mean the total amount payable by CITY to Principal under the Contract and any amendments thereto, less the amount properly paid by CITY to Principal.

Any changes in or under the Contract Documents and compliance or noncompliance with any formalities connected with the Contract or the changes does not affect Surety's obligation under this bond. Any increase in the total contract amount as authorized by the CITY shall accordingly increase the Surety's obligation by the same dollar amount of said increase. The Principal shall be responsible for notification to Surety of all such changes.

Surety expressly acknowledges its obligations and liabilities for liquidated damages suffered by CITY under the provisions of the Contract Documents.

See subsection (2) of Section 255.05, Florida Statutes as amended for the notice and time limitations for claimants.

Dated on _____, 20__

PRINCIPAL:

By: _____

Signature

Attest as to the signature of Principal Title

Title

(SEAL)

Address: _____

SURETY:

Signature

By: _____

Attest as to the signature of Surety Title

Title

(SEAL)

Address: _____

NOTE: Date of Bond must not be prior to date of Contract. If Contractor is a Partnership, all partners must execute bond.

IMPORTANT: Surety companies executing bonds **must** appear and remain on the U.S. Treasury Department's most current list (Federal Register), during construction, guarantee and warranty periods, and be authorized to transact business in the State of Florida.

CONTRACT PAYMENT BOND

BY THIS BOND, WE, _____, as Principal and _____, a Corporation, as Surety, whose address is _____, are bound to the City of Lake Worth, hereinafter called CITY, in the sum of \$_____, for payment of which we bind ourselves, our heirs, personal representatives, successors, and assigns, jointly and severally.

THE CONDITION OF THIS BOND is that if Principal:

1. Promptly makes payment to all claimants and lienors supplying Principal with labor, materials and suppliers, used directly or indirectly by Principal in the prosecution of the work provided for in the Contract dated _____, 20____, between Principal and CI TY for construction of _____, Contract No. _____, the Contract being made a part of this bond by reference, in the time and in the manner prescribed in the Contract, and;

2. Pays CITY all losses, damages, expenses, costs, and attorney's fees, including appellate proceedings, the CITY sustains because of a default by Principal under the Contract; then this bond is void; otherwise it remains in full force.

Any changes in or under the Contract Documents and compliance or noncompliance with any formalities connected with the Contract or the changes, does not affect Surety's obligation under this bond. Any increase in the total contract amount as authorized by the CITY shall accordingly increase the Surety's obligation by the same dollar amount of said increase. The Principal shall be responsible for notification to Surety of all such changes.

See Section 255.05, Florida Statutes as amended for the notice and time limitations for claimants.

Dated on _____, 2014

PRINCIPAL:

By: _____
Signature

Attest as to the signature of Principal

Title

Title

(SEAL)

Address: _____

SURETY:

By: _____

Signature

Attest as the signature of Surety Title

(SEAL)

Address: _____

NOTE: Date of Bond must not be prior to date of Contract. If Contractor is a Partnership, all partners must execute bond.

IMPORTANT: Surety companies executing bonds **must** appear and remain on the U.S. Treasury Department's most current list (Federal Register), during construction, guarantee and warranty periods, and be authorized to transact business in the State of Florida.

CITY OF LAKE WORTH

LIENOR'S PAID IN FULL AFFIDAVIT

STATE OF FLORIDA }
COUNTY OF PALM BEACH }

Sealed Bid / Project No. _____

Project Name _____

Before me the undersigned authority, authorized to administer oaths and take acknowledgements, personally appeared _____ who, after being first and duly sworn, upon oath disposes and says that all lienors contracting directly with or directly employed by them and all bills, ages, fees, claims or other charges in connection with the above stated project incurred by _____ have been paid in full.

IN WITNESS WHEREOF I have hereunto set my hand and seal this _____ day of _____, 20____.

Lienor's Name
(Company Name) (SEAL)

Signed By _____

Print Name:

Title

STATE OF FLORIDA }
COUNTY OF PALM BEACH } SS:

The foregoing instrument was acknowledged before me this _____ day of _____, 20____,

By _____ and who is personally

known to me or produced _____ as identification and who did take an oath.

(Notary Public)

(SEAL)

PARTIAL RELEASE OF LIEN - Subcontractor

The undersigned lienor, in consideration of the partial payment in the amount of \$ _____ hereby waives and releases its lien and right to claim a lien of labor, services or materials furnished from

_____, 20 ____ through _____, 20____ to:
(Insert date) (Insert date)

Contractor Company Name

On the job of THE CITY OF LAKE WORTH for the construction of:

Sealed Bid/Project No. _____

Project Name _____

This release does not cover any retention of labor, services, or materials furnished after the date specified. Dated on _____, 20____

Lienor's Name: _____ (SEAL)
(company name)

Signed By: _____

Printed Name: _____

Title: _____

STATE OF FLORIDA }
COUNTY OF PALM BEACH } SS:

Sworn to and subscribed before me this ____ day of _____, 20____, a Notary Public

appeared _____ of _____ who

acknowledged that he/she executed the above PARTIAL RELEASE OF LIEN on behalf of the Corporation and its free act deed.

Signature of Notary Public

Print, Type, or Stamp Name of Notary

Personally Known _____

Produced Identification _____

Type of Identification Produced _____

THE CITY OF LAKE WORTH

PARTIAL RELEASE OF LIEN-Contractor

The undersigned lienor, in consideration of the partial payment in the amount of \$ _____ hereby waives and releases its lien and right to claim a lien of labor, services or _____ materials _____ furnished _____ from _____, 20 ____ through _____, 20 ____:
(Insert date) (Insert date)

On the job of THE CITY OF LAKE WORTH for the construction of:

Sealed Bid/Project

No. No. _____

Project Name _____

This release does not cover any retention of labor, services, or materials furnished after the date specified. Dated on _____, 20 ____

Lienor's Name: _____ (SEAL)

(company name)

Signed By: _____

Printed Name: _____

Title: _____

STATE OF FLORIDA }
COUNTY OF PALM BEACH } SS:

Sworn to and subscribed before me this ____ day of _____, 20 ____, a Notary Public

appeared _____ of _____

who

acknowledged that he/she executed the above PARTIAL RELEASE OF LIEN on behalf of the Corporation and its free act deed.

Signature of Notary Public

Print, Type, or Stamp Name of Notary

Personally Known _____

Produced Identification _____

Type of Identification Produced _____

THE CITY OF LAKE WORTH
FINAL RELEASE OF LIEN- Subcontractor

KNOW ALL MEN BY THESE PRESENTS, that

_____ (subcontractor company name)
for and in consideration of

_____ Dollars (\$ _____)
(total amount of contract)

paid to me/us by _____, the contractor for the City of Lake Worth, Florida, on the project listed below, receipt of which is hereby acknowledged, do hereby release and waive all liens, lien rights, claims or demands for labor, services or materials of any kind whatsoever which I/we now have or might have against the property, building, and/or for any incidental expense for the construction of

_____ (project name) _____ (project number)

_____ (property address)

or in otherwise improving said property.

The undersigned acknowledges that, under Florida law, the contractor, owner and other parties have a right to rely upon this waiver and release and that making any false statements shall constitute perjury and punishment can be made in accordance with the provisions of the law.

IN WITNESS WHEREOF I have hereunto set my hand and seal this _____ day
of _____, 20____.

_____ (subcontractor company name)

By _____

WITNESS:

Print Name: _____

_____ Title _____

STATE OF FLORIDA }
COUNTY OF PALM BEACH } SS:

The foregoing Release was acknowledged before me this _____ day of _____, 200____
by _____, who is personally known to me or produced _____ as identification and who did not take an oath.

(Seal) _____
Notary Public
Commission Number _____

THE CITY OF LAKE WORTH

FINAL RELEASE OF LIEN

KNOW ALL MEN BY THESE PRESENTS, that

_____ (contractor company name)

for and in consideration of

_____ Dollars (\$ _____)
(total amount of contract)

paid to me/us by the City of Lake Worth, Florida, receipt of which is hereby acknowledged, do hereby release and quit claim to the City of Lake Worth, Florida, the Owner, its successors or assigns, all liens, lien rights, claims or demands of any kind whatsoever which I/we now have or might have against the property, building, and/or for any incidental expense for the construction of

_____ (project name) _____ (project number)

_____ (property address)

thereon or in otherwise improving said property.

IN WITNESS WHEREOF I have hereunto set my hand and seal this

_____ day of _____, 20__.

_____ (SE
AL)
(contractor company name)

By: _____
(name)

Title: _____

STATE OF FLORIDA }
COUNTY OF PALM BEACH } SS:

_____ personally appeared before me this _____ day
of _____, 20__, and acknowledged before me that he/she executed the foregoing Partial Release of Lien. I relied upon the following form of identification:

- _____ personally known to me;
- _____ produced drivers license _____
- _____ other (describe) _____

Notary Public
[Seal:]

TECHNICAL SPECIFICATIONS

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SECTION 01000 - GENERAL REQUIREMENTS

PART 1 - GENERAL

1.01 DESCRIPTION

A. Scope of Work: The work to be done consists of the furnishing of all labor, materials and equipment, and the performance of all work included in this Contract. The summary of the Work is presented in Section 01010: Summary of Work.

B. Work Included:

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

1.02 CONTRACT DOCUMENTS

A. The Technical Specifications consist of three (3) parts: General, Products and Execution. The General part of a Specification contains General Requirements which govern the work. Products and Execution Parts modify and supplement the General Requirements by detailed requirements for the

work and shall always govern whenever there appears to be a conflict.

B. Intent:

1. Work not specified in the Specifications, but involved in carrying out their intent or in the complete and proper execution of the work, is required and shall be performed by the CONTRACTOR as though it were specifically delineated or described.
2. The silence of the Specifications as to any detail, or the omission from them of a detailed description concerning any work to be done and materials to be furnished, shall be regarded as meaning that only the best general practice is to prevail and that only material and workmanship of the best quality is to be used, the interpretation of these Specifications shall be made upon that basis.

1.03 MATERIALS AND EQUIPMENT

A. Manufacturer:

1. All transactions with the manufacturers or sub-CONTRACTORS shall be through the CONTRACTOR.
2. Any two (2) or more pieces of material or equipment of the same kind, type or classification, and being used for identical types of service, shall be made by the same manufacturer.

B. Delivery:

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

1.04 INSPECTION AND TESTING

A. General:

1. For tests specified to be made by the CONTRACTOR, the testing personnel shall make the necessary inspections and tests and the reports thereof shall be in such form as will facilitate checking to determine compliance with the Contract Documents. Five (5) copies of the reports shall be submitted and authoritative certification thereof must be furnished to the CONSULTANT as a prerequisite for the acceptance of any material or equipment.

2. If, in the making of any test of any material or equipment, it is ascertained by the CONSULTANT that the material or equipment does not comply with the Contract Documents, the CONTRACTOR will be notified thereof and he will be directed to refrain from delivering said material or equipment, or to remove it promptly from the site or from the work and replace it with acceptable material, without cost to the CITY.
3. Tests of electrical and mechanical equipment and appliances shall be conducted in accordance with the recognized federal, state and local law test codes and manufacturer recommendation.

B. Costs:

1. All inspection and testing of materials furnished under this Contract will be provided by the CONTRACTOR, unless otherwise expressly specified.
2. Materials and equipment submitted by the CONTRACTOR as the equivalent to those specifically named in the Contract may be tested by the CITY for compliance. The CONTRACTOR shall reimburse the CITY for the expenditures incurred in making such tests of materials and equipment which are rejected for non-compliance.

C. Certificate of Manufacture:

1. CONTRACTOR shall furnish CONSULTANT authoritative evidence in the form of Certificate of Manufacture that the materials to be used in the work have been manufactured and tested in conformity with the Contract Documents upon Project completion.
2. These certificates shall be notarized and shall include copies of the results of physical tests and chemical analyses, where necessary, that have been made directly on the product or on similar products of the manufacturer.

D. Start up Tests

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

1.05 CARE AND PROTECTION OF PROPERTY

The CONTRACTOR shall be responsible for the preservation of all public and private property, and shall use every precaution necessary to prevent damage thereto. If any direct or indirect damage is done to public or private property by or on account of any act, omission, neglect, or misconduct in the execution of the work on the part of the CONTRACTOR, such property shall be restored by the CONTRACTOR, at his expense, to a condition similar or equal to that existing before the damage was done, or he shall make good the damage in other manner acceptable to the CONSULTANT.

1.06 MEASUREMENT AND PAYMENT

Payments will be made on completion of each phase of the Work and acceptance by the CITY shall be made pursuant to this Contract.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01010 - SUMMARY OF WORK

PART 1 - GENERAL

1.01 WORK COVERED BY CONTRACT DOCUMENTS/REQUIREMENTS INCLUDED

A. The work under this project consists of:

The City of Lake Worth is seeking the services of a qualified Contractor to perform the following in accordance with the Tropical Drive and Barton Street Construction Drawings. This general summary is not intended to be complete and all inclusive of the required work Items:

1. Install approximately 3,500 LF of 12" PVC C-900, 3,500 LF of 8" PVC C-900, 55 LF of 6" PVC C-900 and 40 LF of 4" PVC C-900; install approximately 220 LF of 12" Ductile Iron Pipe (DIP), 120 LF of 8" DIP, 430 LF of 6" DIP, and 45 LF of 4" DIP of potable water main including fire hydrants and appurtenances; provide 72 new residential front yard service connections and relocate 101 from the back of the lot to the front yard.
2. Relining approximately 4,900 LF of 8" VCP trunk line including 120 laterals (6") and provide respective clean outs.
3. Road roadway reconstruction, manhole adjustment, pavement markings and signage.
4. Sidewalk, driveway and drainage swale reconstruction and sodding.

C. Omission of a specific item or component of a system obviously necessary for the proper functioning of the equipment or system shall not relieve the Contractor of the responsibility of furnishing the item as part of the work at no additional expense to the Owner.

D. Except as specifically noted elsewhere, Contractor(s) shall provide and pay for all labor, materials, equipment, tools, construction equipment and machinery, transportation, water, heat, utilities, and temporary facilities necessary for the proper execution and completion of work.

E. Concurrent with the installation of the water main, drainage or sanitary sewer improvements and when shown on the project construction drawings, the work includes swale development and improvements on both sides of the streets in the project area. Work includes re-grading, driveway apron reconstruction and all surface restoration.

F. Restoration shall immediately follow the acceptance of required system testing and be performed as required by Section 02960 RESTORATION OF SURFACE IMPROVEMENTS.

1.02 RELATED REQUIREMENTS

- A. Measurement and Payment Procedures: Section 01025
- B. Construction Facilities and Temporary Controls: Section 01500
- C. Restoration of Surface Improvements: Section 02960

1.03 CONTRACTS

- A. Construct the Work in accordance with Section 01025: Measurement and Payment Procedures.

1.04 CONTRACTOR'S USE OF SITE/PREMISES

- A. Contractor shall limit their use of the premises for Work and storage, to the areas designated.
- B. Coordinate use of premise under direction of CITY and/or CONSULTANT.
- C. Assume full responsibility for the protection and safekeeping of Products under this Contract, stored on the site.
- D. Move any stored Products, under Contractor's control, which interfere with operations of the CITY, other contractors or the general public.

1.05 SAFETY AND OSHA COMPLIANCE

- A. The Contractor shall comply in all respects with all Federal, State and Local safety and health regulations. Copies of the Federal regulations may be obtained from the U.S. Department of Labor, Occupation Safety and Health Administration (OSHA), Washington, DC 20210 or their regional offices.
- B. The Contractor shall comply in all respects with the applicable Workman's Compensation Laws.

PART 2 – PRODUCTS

- 2.01 All materials shall be per City of Lake Worth Approved Product List Manufacturers, or Approved Equal. Preferences are given to materials MADE IN THE UNITED STATES OF AMERICA, as well as, ductile iron fittings supplied by American Cast Iron Pipe Company from Brazil, Sigma Corporation from China, and Star-Pipe Products from the United States and China; and Electronic Marking System (EMS) full-range makers by 3M from Mexico.

2.02 SALVAGED MATERIALS

In the absence of special provisions to the Contract, salvaged materials, equipment or supplies that occur are the property of the CITY and shall be cleaned, stored and delivered to the CITY as directed by the CITY's Project Manager.

2.03 CERTIFIED CHEMICALS

The Contractor shall use U.S. Department of Agriculture certified chemicals only during performance of all work under this contract. All chemicals used during project construction or furnished for project whether herbicide, pesticide, disinfectant, polymer, reactant or other classification, must show approval of either EPA or USDA and be accompanied by an MSDS. Use of all such chemicals and disposal of residue shall be in strict conformance with manufacturer's instructions.

PART 3 – EXECUTION

3.01 CONTRACTOR SUPERVISION

- A. As required by the Contract Documents, the Contractor's Project Representative (Superintendent) shall be on site at all times and actively engaged in controlling and coordinating all on site project activities including direction and oversight of self-performed and subcontractor work activities.
- B. The Superintendent/Contractor's Project Representative shall have the full authority to receive instructions to execute the orders or directions of the CITY and CONSULTANT.

3.02 GENERAL

- A. The Contractor shall, prior to entering any section, prepare Pre Construction video and digital photographs, in accordance with Section 01390 VIDEO SITE SURVEY, of each property and Right-of-Way (ROW) areas to determine existing site conditions. Together the video and photographs will provide the basis for the condition of restoration required in Section 02960 RESTORATION OF SURFACE IMPROVEMENTS.
- B. The Contractor shall notify all property owners / residents forty-eight (48) hours prior to working in public Rights-of-Way or easements affecting or adjoining their properties. Notification shall be by hand-delivered flyer that shall contain the following information:
 - 1. Project Name
 - 2. Date of Commencement
 - 3. Description of Work

4. Name of Contractor
5. Name of Contractor's Representative
6. Local Phone Number of Contractor's Representative

The CITY must approve the Contractor's notification prior to issuance. Contractor must submit Contractor's Notification to CITY and CONSULTANT in writing within one (1) week prior to working in public Right-Of-Ways (ROW) or easements affecting for adjoining property owner's property.

- C. The Contractor shall, prior to the removal of any fences, erect temporary fences to secure the owner's property. These temporary fences shall be of 4' high woven wire (2" x 4" grid), on the T line post 10' on centers. These fences shall run along the easement line and will remain in place until the permanent fence is re-erected.
- D. The Contractor shall not start major construction activities, such as pipeline and structure excavations, or preparation for major activities, such as setting wellpoints and header pipe, just prior to extended holiday periods such as the typical week taken off at the end of each year.

3.03 NPDES COMPLIANCE

- A. Prior to the commencement of work, the Contractor must obtain the permit coverage for stormwater discharge from large and small construction activities and must implement appropriate pollution prevention techniques and SWPPP to minimize erosion and sedimentation to properly manage the stormwater runoff. The Contractor shall prepare a NPDES Site Plan including sketches and Best Management Practice procedures for review and comment from the Project Manager. The NPDES Site Plan shall include the control of stormwater, ground water and subsurface water during dewatering operations.

(DEP adopted Rule 62-621.300 (4), F.A.C., with specific provisions for requesting permit coverage for the management of stormwater discharge from large and small construction activities.)

- B. The permit coverage for construction activities is to be obtained by submitting DEP form 62-621.300 (4) (b) Notice of Intent (NOI) to Use Generic Permit for Stormwater Discharge from Large and Small Construction Activities and by preparing and implementing a Stormwater Pollution Prevention Plan (SWPPP). After construction is complete, Notice of Termination (NOT) to discontinue the permit coverage is to be submitted by utilizing form 62-621.300 (6).
- C. For additional information contact NPDES Stormwater Section at:
Florida Department of Environmental Protection

Tallahassee, FL 32399-2400
(850) 921-9904

3.04 PROTECTION OR REMOVAL OF UTILITY LINES

- A. Prior to construction the Contractor shall locate for physical location, elevation and dimensions and adequately uncover existing utilities, (within the path of its proposed work), to determine possible conflicts. By starting underground constructions, the Contractor has agreed that it is fully responsible for any and all damages and/or delays that may arise from not having adequately locating the underground utilities. This applies to underground utilities that are shown on the project construction drawings and those that have been physically marked in the field by the various locating organizations or agencies.
- B. Information provided on the plans may be used as an approximate guide to assist the Contractor, however, the Contractor shall rely on actual field investigation to assure that all of the existing utilities are accurately located prior to commencement of its work.
- C. Existing structures reflect the best available information, but it shall be the Contractor's responsibility to acquaint itself with all information and to avoid conflict with existing conditions. Contractor shall protect all existing utility lines that are to be retained, or utility line constructed during excavation operations, from damage during excavation and backfilling; if damaged, repair at Contractor's expense.
- D. Existing Utility Lines to be Retained: Contractor shall repair damaged lines that are not shown on drawings, or locations of which are not known to Contractor in sufficient time to avoid further damage.
- E. Uncharted or incorrectly charted underground utilities that are discovered during construction shall be incorporated into the project As-Builts with vertical and horizontal coordinates.
- F. Prior to commencement of any excavation, the Contractor shall comply with Florida Statute 553.851 for the protection of underground gas lines and underground telecommunication lines.

END OF SECTION

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SECTION 01025 - MEASUREMENT AND PAYMENT PROCEDURES

PART 1 GENERAL

1.01 GENERAL

- A. The Contractor shall receive and accept the compensation provided in the Bid and the Contract as full payment for furnishing all materials, labor, tools and equipment, for performing all operations necessary to complete the work under the Contract, and also in full payment for all loss or damages arising from the nature of the work, or from any discrepancy between the actual quantities of work and quantities herein estimated by the CONSULTANT, or from the action of the elements or from any unforeseen difficulties which may be encountered during the execution of the work until the final acceptance by the CITY.
- B. The prices stated in the Bid include all costs and expenses for taxes, labor, equipment, materials, commissions, transportation charges and expenses, patent fees and royalties, labor for handling materials during inspection, together with any and all other costs and expenses for performing and completing the work as shown on the Drawings and specified herein. The basis of payment for an item at the unit price shown in the proposal shall be in accordance with the description of that item in this Section.
- C. The Contractor's attention is again called to the fact that the quotations for the various items of work are intended to establish a total price for completing the work in its entirety. Should the Contractor feel that the cost for any item of work has not been established by the Bid Form or Payment Items, he shall include the cost for that work in some other applicable bid item, so that his proposal for the project does reflect his total price for completing the work in its entirety.

1.02 MEASUREMENT

- A. The quantities for payment under this Contract shall be determined by actual measurement of the completed items, in place, ready for service and accepted by the CITY, in accordance with the applicable method of measurement therefore contained herein.

1.03 AUTHORITY

- A. Measurement methods delineated in the FDOT Standard Specifications for Road and Bridge Construction 2015 Edition, or the individual specification sections complement the criteria of this section. In the event of conflict, the

Contractor shall notify the CITY in writing. In determining the resolution, the CITY shall consider the requirement of the individual specification section, FDOT requirements and this Section.

- B. Any requirements of the Contract Documents, i.e., technical specifications or project construction drawings for which the method of payment is not explicitly defined are considered to be incidental costs and should be included in other pay items as appropriate.

1.04 RELATED SECTIONS:

- A. Testing Allowance
- B. Applications for Payments: Section 1027
- C. Shop Drawings, Working Drawings, and Samples: Section 01340
- D. Schedule of Values: Section 01370
- E. Change Order Procedures: Section 01153
- F. Field Engineering: Section 01050
- G. Record Drawing Requirements: Section 01705
- H. Testing Specific Utility Systems
 - 1. Refer to Section 02513 PUBLIC WATER DISTRIBUTION SYSTEMS for applicable and specific requirements. Contractor is responsible for all testing costs associated with these systems.

1.05 ALLOWANCES

- A. Allowance identified on the Schedule of Bid Items relates to Unforeseen Utility Conflicts (water and sewer), Unforeseen Sewer Service Repairs, and Support of Existing Power Pole during Excavation and Installation.
- B. When a Testing Allowance is identified on the Schedule of Bid Items, the following applies:
 - 1. Costs in Testing Allowance includes engaging a certified testing agency; execution of tests; and reporting results as approved by the CITY and CONSULTANT.
 - 2. Costs not included in the Testing Allowance:

- a. Costs of testing services used by Contractor separate from Contract Document requirements
 - b. Testing agency's stand-by time.
 - c. Costs of retesting upon failure of previous tests as determined by the CONSULTANT.
3. Only those items qualified for CITY's reimbursement shall be considered. Such items may include water quality testing of dewatering activities, geotechnical, concrete strength cylinders, special compaction and proctor testing, etc. All predetermined items shall have written, advance approval of the CITY.
4. Payment Procedures:
- a. Submit two (2) copies of the testing and/or inspecting firm's invoice and copies of the Test Reports with next Application for Payment to the CITY.
 - b. Reimbursement to the Contractor upon proof of payment (to the testing and/or inspecting firm) on approval by the CONSULTANT.
- C. When other allowances, such as SFWMD dewatering permit application fees, or coordination with FPL/AT&T/ Comcast or other utility are identified on the Schedule of Bid Items, the following applies:
1. Only those items qualified for CITY reimbursement shall be considered. All items shall have written, advance approval of the CITY.
 2. Payment Procedures:
 - a. Submit two (2) copies of the agreed invoicing format with proof of payment (as applicable) with next Application for Payment.

1.06 SCHEDULE OF VALUES

- A. Submit Schedule of Values at the Pre-Construction Meeting.
- B. The Schedule of Values shall be a computer generated original. When the Contractor's proposed Schedule of Values is accepted by the CITY, it shall become the basis for the Application for Payment.

- C. Contractor shall only revise the accepted Schedule of Values to identify, as separate line items approved on a Field Order or Change Order. The CITY may issue a Field Order substituting or modifying Schedule of Value items.

1.07 APPLICATIONS FOR PAYMENT

- A. Submit five (5) copies of each Application for Payment (AFP). After certification by the CONSULTANT, the CONSULTANT will retain one (1) copy, one (1) copy will be returned to the Contractor and three (3) copies will be forwarded to the CITY for review, authorization and processing.

- B. Content and Format: Utilize Schedule of Values for listing items in Application for Payment outlining the following:

- 1. Provide a column for each of the following:

- a. Item Number
- b. Item Description
- c. Quantity
- d. Unit of measurement
- e. Scheduled Value
- f. Change Orders
- g. Work Completed:
 - 1. Previous Period (Quantity and Value)
 - 2. This Period (Quantity and Value)
- h. To Date (Quantity and Value)
- i. Percentage of Completion
- j. Balance to Finish
- k. Retainage

NOTE: There is no column for "Materials Stored", the CITY does not pay for items ordered and/or stored on site. As defined later in this Section, payment for pay items are paid for once the item is installed, measured in place, completed and accepted.

- C. Application for Final Payment must be marked FINAL. Contractor must

include in the FINAL AFP package, proof of payment and final settlement with the CITY with regards to any temporary and/or construction water meters used during the course of the project.

- D. When existing Right-Of-Way (ROW) irrigation must be disturbed due to pipeline installation or swale development, any existing irrigation lines shall be marked on the Contractors drawings prior to or at the time of temporary cutting-&-capping. The replacement of existing irrigation in the Public Right-Of-Way as the result of pipeline installation or swale development is NOT a pay item. Replacement of existing ROW irrigation shall be incidental to the Unit Price of the pipeline or swale development.

1.08 MEASUREMENT OF AND PAYMENT FOR WORK

- A. **Monthly Payments to the Contractor.** The Contractor shall plan its work for construction on the basis of twelve (12) monthly pay periods per year. So long as the work is prosecuted in compliance with the provisions of the Contract, the Contractor will, on or about the last day of the pay period, make an approximate estimate, in writing on a form approved by the CITY of the proportionate value of the work done, items, and locations of the work performed up to and including the last day of the period then ending. The CONSULTANT will then review such estimate and make the necessary recommendations to the Contractor for revision. The Contractor shall revise the Application for Payment and resubmit to the CONSULTANT for review and Certification. **Redlined Applications for Payment will not be accepted by the CITY.** If the Contractor and the CONSULTANT do not agree on the approximate estimate of the proportionate value of the work done for any pay period, the determination of the CONSULTANT shall be binding. The amount of such estimate after deducting ten percent (10%) and all previous payments, shall be due and payable to the Contractor in accordance with the Florida Prompt Payment Act, §218.70 Florida Statutes, as may be amended from time to time.
- B. **Substantiating Data:** When the CONSULTANT requires substantiating information, Contractor shall submit data justifying quantities and dollar amounts in question. Contractor shall provide three (3) copies of data with cover letter for each copy of submittal showing application number and date, and line item by number and description.

1.09 MEASUREMENT AND PAYMENT - UNIT PRICES

- A. Measurement methods delineated in individual specification sections complement criteria of this section. In event of conflict, requirements of individual specification section govern.

B. Contractor shall take daily and weekly measurements and compute quantities. The Contractor shall review and sign these daily and weekly measurements with the CONSULTANT. The CONSULTANT shall also sign-off on the weekly measurement sheets indicating the CONSULTANT's progressive concurrence with the quantities. The Contractor shall transmit the signed-off weekly measurement sheets to the CONSULTANT. These measurement sheets shall be used to form the basis of the quantities claimed on the Application For Payment.

C. Unit Quantities

1. Quantities indicated in the Schedule of Bid Items are for bidding and contract purposes only. Quantities and measurements supplied or placed in the Work and verified by the Consultant and CITY determine payment.
2. If the actual Work requires more or fewer quantities than those quantities indicated in the bid items, Contractor shall provide the required quantities at the unit sum/prices contracted.

D. Payment Includes: Full compensation for required labor, products, tools, equipment, facilities, transportation, services and incidentals; erection; application or installation of an item of the Work; and overhead and profit.

E. Final payment for Work governed by unit prices will be made on the basis of the actual measurements and quantities accepted by the CONSULTANT and CITY, multiplied by the unit sum/price for Work, which is incorporated in or made necessary by the Work.

1.10 Measurement of Quantities:

A. Weigh Scales: Inspected, tested and certified by the applicable State of Florida Weights and Measures department within the past year.

B. Platform Scales: Of sufficient size and capacity to accommodate the conveying vehicle.

C. Metering Devices: Inspected, tested and certified by the applicable State of Florida Weights and Measures Department within the past year.

D. Measurement by Weight: Concrete reinforcing steel rolled or formed steel or other metal shapes will be measured by handbook weights. Welded assemblies will be measured by handbook or scale weight.

E. Measurement by Volume: Measured by cubic dimension using mean length, width and height or thickness.

- F. Measurement by Area: Measured by square dimension using mean length and width or radius.
- G. Linear Measurement: Measured by linear dimension, at the item centerline. Minor offsets (less than a total of five (5) feet) will not be measured for payment. Measurement shall be along the horizontal axis at finished grade.
- H. Stipulated Sum/Price Measurement: Items measured by weight, volume, area, or linear means or combination, as appropriate, as a completed and accepted item or unit of the Work.
- I. Payment for Work does not indicate acceptance. Work items previously paid for may require additional work effort to bring them into compliance with the requirements of the specific technical specifications and/or project drawings.

1.11 UNIT OF MEASURE – SCHEDULE OF BID PRICES

- A. Payment for furnishing and installing those items cited in the Schedule of Bid Items and subsequent Schedule of Values is noted herein. Refer to items applicable to the project. If “remove and replace” is indicated on the project construction drawings (by either annotation or line weight), then the item descriptions below include the removal and proper disposal of the existing items.
- B. Water Main
 - 1. Payment for water main and restraining devices shall be determined by the number of linear feet of pipe furnished, installed in place, compacted, restored, tested and approved.
 - 2. Payment to furnish and install DI Compact MJ fittings shall be at the unit price bid per ton for such fittings furnished in accordance with the Contract Documents. Weight shall be based on published weights provided by the fitting manufacturer.
 - 3. Payment to install pigging wyes, caps for line flushing, fill and flush assemblies, and all temporary sampling points, including all appurtenances, shall be at the unit price bid for each item.
 - 4. Pipe Lines for Water Mains: These items include all necessary labor and equipment, including clearing and preparing pipe corridor, removal of existing utilities as shown on the plans, * excavation of any type including rock & muck, hand trimming excavation, complying with the State of Florida Trench Safety Act, pipe bedding with insitu material, sheeting, shoring, dewatering (where required), pipe, restraining devices, Mega-Stop bell protection system, electronic markers (3M Full Range EMS Marker),

metallic pipe location tape & locating wire, sleeves, concrete thrust blocks, backfill, compaction, density testing, swabbing / flushing, temporary plugs, pressure testing and as-built verification and documentation.

5. This pay item includes restraining devices for all piping and fittings to be restrained as shown on the plans.
6. This pay item includes all restoration (e.g. sidewalks, asphalt, sod, replacement of existing irrigation pipe and sprinkler heads, etc.) due to piping installation that is not included in other bid items. Sod shall be St. Augustine where irrigation exists and Bahia where no irrigation exists. Excludes swale restoration which will be paid under a separate item.

C. Valves

1. Valves: By the unit. Includes furnishing and installing valve and valve and furnishing & installing fittings, restraining devices, electronic markers (3M Full Range EMS Marker), concrete collar (where required), accessories and installation, complete and accepted.
2. This pay item includes restraining devices as required.
3. This pay item includes all restoration (e.g. sidewalks, asphalt, sod, replacement of existing irrigation pipe and sprinkler heads, etc.). Excludes swale restoration which will be paid under a separate item.

D. Tapping Assemblies

1. Payment for tapping assembly installations will be based on the installation of each item, complete, including tapping sleeve and valve, box and cover (as required), testing, and all appurtenances.
2. This pay item includes restraining devices as required.
3. This pay item includes all restoration (e.g. sidewalk, asphalt, sod, replacement of existing irrigation pipe and sprinkler heads, etc.). Excludes swale restoration which will be paid under a separate item.

E. Hydrants

1. Payment for removing and salvaging or disposal of fire hydrants shall be at the unit price bid per each and shall constitute full compensation for but not limited to removal of the hydrant assembly, plugging the existing main, transporting to a designated site within the City or disposal as directed by the Engineer and all restoration work. Materials to be salvaged shall be delivered to the Owner at no additional cost.

2. Payment to furnish and install fire hydrant assemblies on the new water main shall be at the unit price bid per each and shall include but is not limited to hydrant, tee, tapping sleeve, valve, piping, and all appurtenances.
3. Payment reconnect existing fire hydrant assemblies on proposed water main shall be at the unit price bid per each and shall include but is not limited to tee, valve, piping, and all appurtenances.
4. This pay item includes all restoration (e.g. sidewalks, asphalt, sod, replacement of existing irrigation pipe and sprinkler heads, etc.). Excludes swale restoration which will be paid under a separate item.

F. Master Meter

1. Payment for furnishing and installing the 12” master meter will be based on the installation of each item, complete, including concrete vault, cover, testing and all appurtenances as shown on the Drawings.
2. This pay item includes all restoration (e.g. sidewalks, asphalt, sod, replacement of existing irrigation pipe and sprinkler heads, etc.) as well as removal and plugging for all temporary installations. Excludes swale restoration which will be paid under a separate item.

G. Sampling Points

1. Payment for sampling points will be based on the installation of each item, complete, including all appurtenances shown on the Drawings
2. This pay item includes all restoration (e.g. sidewalks, asphalt, sod, replacement of existing irrigation pipe and sprinkler heads, etc.) as well as removal and plugging for all temporary installations. Excludes swale restoration which will be paid under a separate item.

H. Water Services

1. Payment for new water services will be based on the installation of each item, complete, including meter boxes or touch read lids, poly pipe, corporation stop, saddle, curb stop and all appurtenances.
2. Payment for transferring services from rear to front of property will include abandonments of exiting meter location and private service line, including right of entry forms, plumbing permits, installation of private service line to the existing house valve location and the relocation of the existing meter to the front of property, complete, meter boxes or touch read lids, poly pipe, corporation stop, saddle, curb stop and all appurtenances.

3. This pay item includes connecting the new service from the new water main to the relocated/existing front yard meter box.
4. Payment for water service casing pipe shall be determined by the number of linear feet of pipe furnished, installed in place, compacted, restored, tested, and approved
5. This pay item includes all restoration (e.g. sidewalks, asphalt, sod, replacement of existing irrigation pipe and sprinkler heads, etc.). Excludes swale restoration which will be paid under a separate item.

I. Line Stops

1. Payment for line stops will be based on the installation of each item, including but not necessarily limited to: furnishing and installing line stop equipment; installing and removing tapping sleeve and valve; plugging existing pipe; abandoning existing waterline as necessary including all fittings and restraints; all excavation; permanent and temporary shoring of the excavation; groundwater control, treatment and disposal; bedding, backfill and compaction; and clean up.
2. This pay item includes all restoration (e.g. sidewalks, asphalt, sod, replacement of existing irrigation pipe and sprinkler heads, etc.). Excludes swale restoration which will be paid under a separate item.

J. Remove and Dispose of Asbestos Concrete Pipe

1. Payment for removal and disposal of asbestos concrete pipe shall be determined by the number of linear feet of pipe removed and disposed including but not limited to: proper and safe removal of the buried asbestos cement pipe, proper bagging in leak tight plastic (with total of 6 mil thickness) for the Class II non-friable asbestos containing materials, transportation and delivery to the Solid Waste Authority operated Landfill, proper ACP materials documentation and use of personal protective equipment.
2. This pay item includes clearing and preparing pipe corridor, excavation of any type including rock & muck, hand trimming excavation, complying with the State of Florida Trench Safety Act, sheeting, shoring, dewatering (where required) and all restoration (e.g. sidewalks, asphalt, sod, replacement of existing irrigation pipe and sprinkler heads, etc.). Excludes swale restoration which will be paid under a separate item.

K. Abandon Water Main

1. Payment for non-asbestos concrete water main abandonment shall be determined by the number of linear feet of pipe abandoned in place as directed under hard surface areas.
2. Pipe shall be filled with flowable grout fill under hard surface areas.
3. This pay item includes all preparation for and verification of grouting completion.
4. This pay item includes all restoration (e.g. sidewalks, asphalt, sod, replacement of existing irrigation pipe and sprinkler heads, etc.). Excludes swale restoration which will be paid under a separate item.

L. Cut and Cap – Abandon in Place Water Main

1. Payment for water main abandonment for non-asbestos concrete pipe shall be determined by the number of locations cut and capped, complete in green or landscaped areas.
2. This item includes all labor and materials required for each location cut and capped in green or landscaped areas.
3. This pay item includes all restoration (e.g. sidewalks, asphalt, sod, replacement of existing irrigation pipe and sprinkler heads, etc.). Excludes swale restoration which will be paid under a separate item.

M. Cured-in-Place Sewer Trunk Line Rehabilitation

1. The Contract unit price bid for this item shall include compensation for labor, material and equipment required to reline sanitary sewer trunk line.
2. Payment shall be at the Contract unit price (linear feet) installed, complete and accepted. The minimum length shall be that deemed necessary to effectively span the pipelining distance of the necessary repair unless otherwise specified.
3. This pay item includes all restoration (e.g. sidewalks, asphalt, sod, replacement of existing irrigation pipe and sprinkler heads, etc.). Excludes swale restoration which will be paid under a separate item.

N. Cured-in-Place Sewer Lateral Rehabilitation

1. The Contract unit price bid for this item shall include compensation for labor, material and equipment required to reline sanitary sewer laterals.
2. Payment shall be at the Contract unit price (per each) installed, complete and accepted.

3. This pay item includes all restoration (e.g. sidewalks, asphalt, sod, replacement of existing irrigation pipe and sprinkler heads, etc.). Excludes swale restoration which will be paid under a separate item.

O. Concrete Sidewalk

1. Concrete sidewalk replacement shall include removal and disposal of the demolished sidewalk portions, compaction of the sidewalk replacement area, density testing, formwork, concrete, installation of the sidewalk, finishing, curing agent, preparation of and testing concrete cylinders, restoration, sod replacement of existing irrigation pipe and sprinkler heads (to match existing quality and quantity), and all other work and materials required for a complete installation.
2. Payment shall be at the Contract unit price (per square foot, measured length times the width) installed, complete and accepted.
3. Sidewalk replacement beyond the limits established by the project construction drawings will not be considered for payment.

P. Driveway Apron Restoration (Asphalt and Concrete)

1. Driveway Apron Restoration shall include all work necessary to repair affected driveways including, but not necessarily limited to: all excavation, removal and disposal of the damaged aprons, removal and disposal of temporary materials; saw cutting; tack coat; compaction; adjusting castings and utility boxes; forms; reinforcing; doweling; concrete; aggregate material; hot mix asphalt pavement; finishing, jointing and curing of concrete; all applicable testing; removal and disposal of surplus and unsuitable materials; replacement or repair of utilities, drainage systems, structures, and miscellaneous property; clean-up, restoration, sod replacement of existing irrigation pipe and sprinkler heads (to match existing quality and quantity), and all other work and materials required for a complete installation
2. Payment shall be at the Contract unit price (per square yard installed, complete and accepted).

Q. Driveway Apron Restoration (Brick Paver)

1. Driveway Apron Restoration shall include all work necessary to repair affected driveways including, but not necessarily limited to: all excavation; removal and storage of the removed aprons; compaction; adjusting castings and utility boxes; placement of existing pavers; all applicable testing; removal and disposal of surplus and unsuitable materials; replacement or repair of utilities, drainage systems, structures, and miscellaneous property; clean-up, restoration, sod replacement of existing irrigation pipe and

sprinkler heads (to match existing quality and quantity), and all other work and materials required for a complete installation.

2. Payment shall be at the Contract unit price (per square yard installed, complete and accepted).

R. Monolithic Vertical Curb, Gutter and Sidewalk

1. Monolithic curb, gutter and sidewalk shall include all work necessary to construct the Monolithic curb, gutter and sidewalk including but not necessarily limited to: removal, disposal, excavation, grading and compaction.
2. Payment shall be at the Contract unit price (per lineal feet installed, complete and accepted).

S. Swale Reconstruction and Sodding

1. Swale Reconstruction and Sodding shall include all work necessary to construct the swale including but not necessarily limited to: excavation, washed stone base (as necessary), grading, and sodding.
2. Payment shall be at the Contract unit price (per square yard installed, complete and accepted).

T. Flowable Fill

1. Payment shall be at the Contract unit price (per cubic yard installed, complete and accepted)

U. Trench Restoration (Pervious)

1. Trench restoration shall include all work necessary to restore affected unpaved areas as indicated in the construction drawings including, but not necessarily limited to: sod, replacement of existing irrigation pipe and sprinkler heads, etc. due to piping installation that is not included in other bid items. Sod shall be St. Augustine where irrigation exists and Bahia where no irrigation exists. Excludes swale restoration which will be paid under a separate item.
2. Payment shall be at the Contract unit price (per linear foot of trench, complete and accepted).

V. Trench Restoration (Paved Areas)

1. Furnish and install asphalt replacement to the extent and locations shown on the construction drawings.

2. Replacement shall be asphaltic concrete.
3. Payment shall be at the Contract unit price (per linear foot of trench, complete and accepted).
4. This bid item includes the adjustment of manhole and covers.

W. Concrete Curb Removal

1. Removal of existing concrete curb to the extent and locations shown on the construction drawings
2. Payment shall be at the Contract unit price (per linear feet of curb, complete and accepted).

X. Roadway Demolition

1. Removal of existing asphalt and base to the extent and locations shown on the construction drawings.
2. Removal of existing driveway apron to the extent and locations shown on the construction drawings
3. Payment shall be at the Contract unit price (per square yard of roadway, complete and accepted).

Y. Roadway Construction

1. Furnish and place stabilized subgrade, limerock base course and asphalt replacement to the extent and locations shown on the construction drawings.
2. Payment shall be at the Contract unit price (per square yard of roadway item, complete and accepted).
3. This bid item includes the adjustment of manhole and covers.

Z. Roadway Milling

1. Milling of existing asphalt pavement to the extent and locations shown on the construction drawings.
2. Payment shall be at the Contract unit price (per square yard of roadway, complete and accepted).

AA. Pavement Markings

1. The Contract unit price bid for this item shall include compensation for all labor, material and equipment.

2. Pavement markings shall be installed per detail included in the drawings.
3. Traffic Striping and Pavement Marking: Measure lineal feet or each provided (as indicated on schedule) of traffic striping and pavement marking material applied.
4. Reflective Pavement Markers: Measure on the basis of providing each reflective marker required.

BB. Mobilization/Demobilization, Bonds, Insurance & General Requirements

1. Payment for the General Conditions shall be made per item and shall be full compensation for preparatory work and operations in mobilizing and demobilizing for the project including but not limited to, those operations necessary for the movement of personnel, equipment, supplies and incidentals to and from the project site, Maintenance of Traffic, for establishment of temporary offices, buildings, safety equipment, sanitary and other facilities and compliance with permit conditions for permits secured by either the Owner or Contractor.
2. MOT plans shall be required for work within City of Lake Worth R-O-W.
3. Audio Video Documentation shall be performed pre and post construction as specified in Section 01390 VIDEO AND PHOTOGRAPHIC SITE SURVEY.
4. The cost of bonds, permits, required insurance and any other pre-construction expense necessary for the start of the work shall also be included in the General Conditions.

CC. NPDES Compliance

1. Payment for NPDES compliance shall include the preparation of the NPDES Plan, development and compilation of the BMPs, site implementation and documentation of inspections.
2. Contractor shall refer to the Schedule of Bid Items for instructions on the method of calculation for this Pay Item. Any bidder who enters an amount greater than the 1.5% limit for this pay item may be disqualified and the CITY and Consultant may not evaluate their bid proposal. This cost shall be shown on the Schedule of Values.
3. Partial payments for the NPDES compliance shall be made in accordance with the following schedule:

Percent of Original Contract Amount Earned	Allowable percent of NPDES Compliance
10	10
25	25
50	50
75	No additional payment
Final Payment	100

DD. Record Drawings

1. Payment for Record Drawings shall be made at the Contract lump sum price and shall be full compensation for preparation and maintenance of the Record Drawings as specified in technical specification 01340 SHOP DRAWING REQUIREMENTS and the requirements of this Special Conditions.
2. Partial payments for the Record Drawings shall be made in accordance with the following schedule:

Percent of Original Contract Amount Earned	Allowable percent of lump sum price for Record Drawings
10	10
25	25
50	50
75	No additional payment
Final Payment	100

3. Contractor shall submit updated As-Built Drawings with each Pay Application Request.

EE. Indemnification

1. Payment under this item is in accordance with of the Front-End Contract Documents.

PART 2 PRODUCTS - Not Used.

PART 3 EXECUTION - Not Used.

* SPECIAL NOTE:

The CITY retains the option to utilize up to 20% of the excess material from excavation and trenching operations. If the CITY exercises this option, Contractor shall stockpile the excess material and deliver to the CITY's facility as directed by the CITY's Representative.

END OF SECTION

SECTION 01027 - APPLICATION FOR PAYMENT

PART 1 - GENERAL

1.01 DESCRIPTION

- A. Scope of Work: Submit Applications for Payment to the CONSULTANT in accordance with schedule established by Conditions of the Contract and Agreement between CITY and Contractor.
- B. Related requirements described elsewhere:
 - 1. Agreement:
 - 2. Application for Payment Form.
 - 3. Progress Schedules: Section 01310.
 - 4. Schedule of Values: Section 01370
 - 5. Construction Photographs: Section 01380.
 - 6. Contract Closeout: Section 01700.
 - 7. Project Record Documents: Section 01720.

1.02 FORMAT REQUIRED

- A. Submit applications typed on form acceptable to CITY, Documents (Application for Payment Form), with itemized data typed on 8-1/2 inch x 11 inch or 8-1/2 inch x 14-inch white paper continuation sheets.

1.03 PREPARATION OF APPLICATION FOR EACH PROGRESS PAYMENT

- A. Application Form:
 - 1. Fill in required information, including that for Change Orders executed prior to date of submittal of application.
 - 2. Fill in percent complete for each activity and dollar value to agree with respective percents.
 - 3. Execute certification with signature of a responsible officer of Contract firm.
- B. Continuation Sheets:

1. Fill in total list of all scheduled component items of work, with item number and scheduled dollar value for each item.
2. Fill in dollar value in each column for each scheduled line item when work has been performed. Round off values to nearest dollar, or as specified for Schedule of Values.
3. List each Change Order executed prior to date of submission, at the end of the continuation sheets. List by Change Order Number, and description, as for an original component item of work.
4. As provided for in the "Application for Payment" form, the Contractor shall certify, for each current pay request, that all previous progress payments received from the CITY, under this Contract, have been applied by the Contractor to discharge in full all obligations of the Contractor in connection with Work covered by prior Applications for Payment, and all materials and equipment incorporated into the Work are free and clear of all liens, claims, security interest and encumbrances. Contractor shall attach to each Application for Payment like affidavits by all subcontractors.

1.04 SUBSTANTIATING DATA FOR PROGRESS PAYMENTS

- A. Contractor shall submit suitable information, with a cover letter identifying:
 1. Project.
 2. Application number and date.
 3. Detailed list of enclosures.
- B. Submit one (1) copy of data and cover letter for each copy of application.
- C. The Contractor is to maintain an updated set of drawings to be used as record drawings in accordance with Section 01720: Project Record Documents. As a prerequisite for monthly progress payments, the Contractor is to submit the updated record drawings for review by the CITY and the CONSULTANT.
- D. Each monthly application for payment shall incorporate the corresponding "monthly progress status report" prepared per the requirements of Section 01310: Progress Schedule.
- E. Contractor shall submit a duly executed letter from surety consenting to payment due and progress to date.
- F. Provide construction photographs in accordance with Section 01380: Construction Photographs.

1.05 PROGRESS PAYMENT PROCEDURES

- A. The Contractor will prepare and submit four (4) original monthly invoices for work completed during the one-month period. Application For Payment shall be submitted in the format of the sample form provided by the CITY. All information must be completed for the pay application to be accepted. CITY's purchase order number for the project must be placed on each application. The Application for Payment must be submitted at least three (3) days in advance in an electronic format for review by the CITY and CONSULTANT for approval. **Redlined Applications for Payment will not be accepted by the CITY.**
- B. If the Application for Payment and support data are not approved, the Contractor is required to submit new, revised or missing information according to the CONSULTANT's instructions. Otherwise, the Contractor shall prepare and submit to the CITY or CONSULTANT an invoice in accordance with the estimate as approved. CITY will pay Contractor, in accordance with Florida Prompt Payment Act, §218.70, Florida Statutes, as may be amended from time to time.
- C. Each Application For Payment shall be accompanied by an updated project schedule (three-week ahead schedule) along with the Construction/Progress photographs and Project Record Drawings in accordance with Section 01720: PROJECT RECORD DOCUMENTS and 01380: CONSTRUCTION PHOTOGRAPHS or as directed by the CITY. Any Application For Payment that is received without these items will be returned to the Contractor without review.
- D. The Contractor shall prepare a schedule of values by phases of work to show a breakdown of the Contract Sum corresponding to the payment request breakdown and progress schedule line items. The schedule of values must also show dollar value for each unit of work scheduled. Approved Change Order items shall be added as separate line items.
- E. Prior to initial payment request, the Contractor shall submit the following documents to the CITY and Consultant for their review and approval:
 - 1. List of principle subcontractors and suppliers.
 - 2. Schedule of values.
 - 3. Shop drawing log.
 - 4. Project schedule.

1.06 PREPARATION OF APPLICATION FOR FINAL PAYMENT

- A. Fill in Application form as specified for progress payments. Provide

information as required by the General Conditions and Section 01700: Contract Closeout.

- B. Furnish evidence of completed operations insurance in accordance with the General Conditions.
- C. Provide Final Release of Lien and other closeout submittals as required by the General Conditions.

1.07 SUBMITTAL PROCEDURES

- A. Submit Applications for Payment to the CITY at the time stipulated in the Agreement. Review the percents complete with the CONSULTANT and resolve any conflicts or discrepancies.
- B. Number of copies for each Final Application for Payment:
 - 1. CITY: Two (2) copies.
 - 2. CONSULTANT: One (1) copy
 - 3. Contractor: As required for its needs.
- C. When the CONSULTANT finds Application properly completed and correct, it will transmit the certificate for payment to the CITY, with copy for the Contractor.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

- 3.01 Upon receipt by CONSULTANT and CITY of Contractor's written Notice of Final Completion of its work under this Contract, CONSULTANT and CITY shall verify all work has been completed on the project. When all work has been verified as complete, and the Contractor submits the items listed below, the Contractor may submit a final Application For Payment:
- A. Complete work listed as incomplete at the time of Substantial Completion and obtain CONSULTANT certification of completed Work.
 - B. Provide copy of records indicating notification to all subcontractors and material suppliers of Contractor's Performance and Payment Bonds.
 - C. Transfer operational, access, security and similar provisions to CITY; remove temporary facilities, tools and similar items.

END OF SECTION

SECTION 01041 - PROJECT COORDINATION

PART I – GENERAL

1.01 REQUIREMENTS INCLUDED

A. The Contractor shall:

1. Coordinate work of its employees and subcontractors.
2. Expedite its work to assure compliance with schedules.
3. Coordinate its work with that of work by CITY.
4. Comply with orders and instructions of CONSULTANT.

1.02 RELATED REQUIREMENTS

- A. Section 01010: Summary of Work.
- B. Section 01027: Applications for Payment.
- C. Section 01200: Project Meetings.
- D. Section 01310: Progress Schedules.
- E. Section 01340: Shop Drawings, Work Drawings and Samples.
- F. Section 01500: Construction Facilities and Temporary Controls.
- G. Section 01700: Contract Closeout.

1.03 CONSTRUCTION ORGANIZATION & START-UP

A. CONSULTANT shall establish on-site lines of authority and communications:

1. Schedule and conduct pre-construction meeting and progress meetings as specified in Section 01200: PROJECT MEETINGS.
2. Establish procedure for:
 - a. Submittals
 - b. Reports and records
 - c. Recommendations

- d. Coordination of drawings
 - e. Schedules
 - f. Resolution of conflicts
3. Interpret Contract Documents:
 - a. Transmit written interpretations to Contractor, and to other concerned parties.
 4. Assist in Obtaining permits and approvals:
 - a. Verify that Contractor and subcontractors have obtained inspections for Work and for temporary facilities.
 5. Control the use of Site:
 - a. Allocate space for Contractor's use for field offices, sheds, and work and storage areas.
 6. Inspection and Testing:
 - a. Inspect work to assure performance in accord with requirements of Contract Documents.
 - b. Administer special testing and inspections of suspect Work.
 - c. Reject Work, which does not comply with requirements of Contract Documents.
 - d. Coordinate Testing Laboratory Services:
 1. Verify that required laboratory personnel are present.
 2. Verify that tests are made in accordance with specified standards.
 3. Review test reports for compliance with specified criteria.
 4. Recommend and administer any required re-testing.

1.04 CONTRACTOR'S DUTIES

A. Construction Schedules:

1. Prepare a detailed schedule of basic operations.

2. Monitor schedules as work progresses:
 - a. Identify potential variances between scheduled and probable completion dates for each phase.
 - b. Recommend to CITY adjustments in schedule to meet required completion dates.
 - c. Document changes in schedule; submit to CITY, CONSULTANT and to involved subcontractors.
 3. Observe work of each subcontractor to monitor compliance with schedule.
 - a. Verify that labor and equipment are adequate for the work and the schedule.
 - b. Verify that product procurement schedules are adequate.
 - c. Verify that product deliveries are adequate to maintain schedule.
 - d. Report noncompliance to CONSULTANT, with recommendation for changes.
- B. Process Shop Drawings, Product Data and Samples:
1. Prior to submittal to CONSULTANT, review for compliance with Contract Documents:
 - a. Field dimensions and clearance dimensions.
 - b. Relation to available space.
 - c. Effect of any changes on the work of any subcontractor.
- A. Review Drawings prepared by Mechanical and Electrical subcontractors:
1. Prior to submittal to CONSULTANT, review for compliance with Contract Documents:
- B. Prepare Coordination Drawings as required to resolve conflicts and to assure coordination of the work of, or affected by, mechanical and electrical trades, or by special equipment requirements.
1. Submit to CONSULTANT.

2. Reproduce and distribute copies to concerned parties after CONSULTANT review.
- C. Maintain reports and records at job site, available to CONSULTANT and CITY.
1. Daily log of progress of work.
 2. Records.
 - a. Contracts.
 - b. Purchase orders.
 - c. Materials and equipment records.
 - d. Applicable handbooks, codes and standards.
 3. Maintain file of record documents.

1.05 CONTRACTOR'S CLOSE-OUT DUTIES

- A. Mechanical and Electrical equipment start-up:
1. Coordinate checkout of utilities, operational systems and equipment.
 2. Organize initial start-up and testing.
 3. Record dates of start of operation of systems and equipment.
 4. Submit to CITY written notice of beginning of warranty period for equipment put into service.
- B. At completion of Work, conduct an inspection to assure that:
1. Specified cleaning has been accomplished.
 2. Temporary facilities have been removed from site.
- C. Substantial Completion:
1. Conduct an inspection to develop a list of Work to be completed or corrected.
 2. Assist CONSULTANT in inspection.

3. Supervise correction and completion of work of subcontractors.

1.06 CONSULTANT'S CLOSE-OUT DUTIES

A. Final Completion:

1. When Contractor determines that work is finally complete, conduct an inspection to verify completion of Work.

B. Administration of Contract closeout:

1. Receive and review Contractor's final submittals.
2. Transmit to CITY with recommendations for action.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

END OF SECTION

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SECTION 01050 - FIELD ENGINEERING

PART 1 - GENERAL

1.01 DESCRIPTION

A. Scope of Work: Contractor to provide Field Engineering service for the Project.

1. Survey work required in execution of Project.
2. The method of field staking for the construction of the Work shall be at the option of the Contractor. The CITY has provided the engineering surveys, if available, necessary to establish reference points which in the CITY's judgment are necessary to enable the Contractor to proceed with its work.
3. The accuracy of any method of staking shall be the responsibility of the Contractor. All engineering for vertical and horizontal control shall be the responsibility of the Contractor.
4. The Contractor shall be held responsible for the preservation of all stakes and marks. If any stakes or marks are carelessly or willfully disturbed by the Contractor, the Contractor shall not proceed with any work until it has established such points, marks, lines and elevations as may be necessary for the prosecution of the Work.
5. The Contractor shall retain the services of a registered land surveyor licensed in the State of Florida to identify existing control points and maintain a survey during construction.

B. Related Requirements Described Elsewhere:

1. Summary of Work: Section 01010.
2. Project Record Documents: Section 01720.

1.02 QUALIFICATIONS OF SURVEYOR

A. Qualified registered land surveyor, acceptable to the CITY.

1.03 SURVEY REFERENCE POINTS

A. Locate and protect control points prior to starting site work, and preserve all permanent reference points during construction.

1. Make no changes or relocations without prior written notice to the Consultant.
2. Report to the CONSULTANT when any reference point is lost or destroyed, or requires relocation because of necessary changes in grades or locations.
3. Require surveyor to replace Project control points which may be lost or destroyed at no additional cost to the CITY. Establish replacement based on original survey control.

1.04 PROJECT SURVEY REQUIREMENTS

- A. Establish a minimum of two (2) permanent benchmarks each on site.
 1. Record locations, with horizontal and vertical data, on Project Record Documents.
- B. Establish lines and levels, locate and lay out, by instrumentation and similar appropriate means.
- C. From time to time, verify layouts by same methods.

1.05 RECORDS

- A. Maintain a complete, accurate log of all control and survey work as it progresses.
- B. At the end of the project, submit a certified site survey at 1-inch equals 30 feet scale on 24 inches by 36 inches sheet. Survey shall include: all topographic features, at least every 100 feet, along the installed fence line, at the inside edge of the 12-foot sodden area, and the property/R-O-W line.

1.06 SUBMITTALS

- A. Submit name and address of surveyor to the CONSULTANT.
- B. On request of the CONSULTANT, submit documentation to verify accuracy of Field Engineering work.
- C. Submit certificate signed by a registered surveyor certifying that elevations are in conformance with the Contract Documents, or if not in conformance, certify as to variances from the Contract Documents.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

END OF SECTION

SECTION 01065 - PERMITS AND FEES

PART 1 – GENERAL

- A. The Contractor shall obtain **all** permits and licenses related to its work, including but not limited to, the necessary construction permits. Cost of permit fees shall be paid by Contractor. CITY to be invoiced at actual cost without markup.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.01 NPDES COMPLIANCE

- A. In addition to other required field permitting, prior to the commencement of work, the Contractor must obtain the permit coverage for stormwater discharge from large and small construction activities and must implement appropriate pollution prevention techniques and SWPPP to minimize erosion and sedimentation to properly manage the stormwater runoff. The Contractor shall prepare a NPDES Site Plan including sketches and Best Management Practice procedures for review and comment from the Project Manager. The NPDES Site Plan shall include the control of stormwater, ground water and subsurface water during dewatering operations.

(DEP adopted Rule 62-621.300 (4), F.A.C., with specific provisions for requesting permit coverage for the management of stormwater discharge from large and small construction activities.)

- B. The permit coverage for construction activities is to be obtained by submitting DEP form 62-621.300 (4) (b) Notice of Intent (NOI) to Use Generic Permit for Stormwater Discharge from Large and Small Construction Activities and by preparing and implementing a Stormwater Pollution Prevention Plan (SWPPP). After construction is complete, Notice of Termination (NOT) to discontinue the permit coverage is to be submitted by utilizing form 62-621.300 (6).
- C. For additional information contact NPDES Stormwater Section at:

Florida Department of Environmental Protection Tallahassee, FL 32399-2400 (850) 921-9904

END OF SECTION

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SECTION 01100 - SPECIAL PROJECT PROCEDURES

PART 1 - GENERAL

1.01 PUBLIC NUISANCE

- A. The Contractor shall not create a public nuisance including, but not limited to, encroachment on adjacent lands, flooding of adjacent lands, or excessive noise.
- B. Sound levels measured by the Consultant shall not exceed 50 dBA from 7 P.M. to 7 A.M. or 60 dBA 7 A.M. to 7 P.M. This sound level shall be measured at the exterior of the nearest exterior wall of the nearest residence. Levels at the equipment shall not exceed 85 dBA at any time. Sound levels in excess of these values are sufficient cause to have the work halted until equipment can be quieted to these levels. Work stoppage by the Consultant of Owner for excessive noise shall not relieve the Contractor of the other portions of this Specification including, but not limited to, completion dates and bid amounts.
- C. Construct all work to prevent run-off from flowing off site.
- D. No extra charge may be made for time lost due to work stoppage resulting from the creation of a public nuisance.
- E. The Contractor shall notify all property owners/residents, forty-eight (48) hours prior to working in public rights-of-ways or easements affecting or adjoining their properties. Notification shall be hand-delivered flyer that shall contain the following information:
 - 1. Project Name
 - 2. Date of Commencement
 - 3. Description of Work
 - 4. Name of Contractor
 - 5. Name of Contractor's Representative
 - 6. Local phone number of Contractor's Representative.

The CITY shall approve the Contractor's notification prior to issuance of flyer to the public. Contractor must submit Contractor's Notification to CITY and CONSULTANT in writing within one (1) week prior to working in public Right-of-Ways (ROW) or easements affecting or adjoining property owner's

property.

1.02 HAULING AND CONSTRUCTION OPERATIONS

- A. The Contractor shall keep its haul route and work area(s) neat and clean, and shall bear all responsibility for the cleanup of any spill which occurs during the transport of material to be disposed of. The Contractor shall immediately clean up any such spill or waste. If the Contractor fails to clean up such spill, or waster immediately, the CITY shall have the right to clean up or arrange for its clean up and charge to the Contractor all costs, including engineering, administrative costs and overhead, incurred by the CITY in connection with such cleanup. The CITY may also charge to the Contractor any cost incurred or penalties imposed on the CITY as a result of any spill, dump or discard. Under no circumstances is this material to be discharged into the waterways or any place other than where authorized to do so by the appropriate authority. The term "Contractor" as used in this section shall include the Contractor's Subcontractors and other Contractors.
- B. The general requirements for vehicles hauling such waste materials are as follows: Transport vehicle must be of type(s) approved for this application by the State of Florida. Vehicles must be loaded within legal weight limits and operated safely within all traffic and speed regulations.
- C. The routes used by the Contractor for the conveyance of this material on a regular basis shall be subject to approval by the governing authority having jurisdiction over such routes. To the extent possible, the use of residential streets shall be prohibited.
- D. Provide protection for plans designated to remain. Replace damaged plants.
- E. Provide barriers to prevent unauthorized entry to site and to protect existing facilities and adjacent properties from damage.
- F. Provide flag person(s) and necessary traffic control devices when trucks or construction equipment is entering or leaving the site.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

END OF SECTION

SECTION 01110 - ENVIRONMENTAL PROTECTION PROCEDURES

PART 1 GENERAL

1.01 SCOPE OF WORK

- A. The work covered by this Section consists of furnishing all labor, materials and equipment and performing all work required for the prevention of environmental pollution in conformance with applicable federal, state and local laws and regulations, during and as the result of construction operations under this Contract. For the purpose of this Specification, 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; adversely affect plants or animals; or degrade the utility of the environment for aesthetic and/or recreational purposes.
- B. The control of environmental pollution requires consideration of air, water and land, and involves management of noise and solid waste, as well as other pollutants.
- C. The Contractor shall schedule and conduct all work in a manner that will minimize the erosion of soils in the area of the work. Provide erosion control measures required to prevent silting, muddying, or pollution of wetlands, streams, rivers, impoundments, lakes, stormwater ponds, etc. All erosion control measures shall be in place in an area prior to any construction activity in that area and shall be maintained throughout construction. Specific requirements for erosion and sedimentation controls are specified in Section 02270. The Contractor will be required to meet all the conditions specified in the permits and in the Specifications.
- D. All specific conditions attached to existing permits for this site shall be included in the sedimentation and erosion control measures.

1.02 APPLICABLE REGULATIONS

- A. The Contractor shall comply with all applicable Federal, State and local laws and regulations and applicable permits and their specific conditions concerning environmental pollution control and abatement.

1.03 NOTIFICATIONS

- A. The CITY and/or CONSULTANT will notify the Contractor in writing of any non-compliance with the foregoing provisions or of any environmentally objectionable acts and corrective action to be taken. State or local agencies responsible for verification of certain aspects of the environmental protection

requirements shall notify the Contractor in writing, through the CITY or CONSULTANT, of any non-compliance with State or local requirements. The Contractor shall, after receipt of such notice from the CITY or Consultant or from the regulatory agency through the CITY and/or CONSULTANT, immediately take corrective action. Such notice, when delivered to the Contractor or their authorized representative at the site of the work, shall be deemed sufficient for the purpose. If the Contractor fails or refuses to comply promptly, the CITY may issue an order stopping all or part of the work until satisfactory corrective action has been taken. No part of the time lost due to any such stop orders shall be made the subject of a claim for extension of time or for excess costs or damages by the Contractor unless it is later determined that the Contractor was in compliance.

1.04 IMPLEMENTATION

- A. Prior to commencement of the Work, the CONTRACTOR shall meet with the CITY and CONSULTANT to develop mutual understandings relative to compliance with this provision and administration of the environmental pollution control program.
- B. The Contractor shall remove temporary environmental control features, when approved by the CITY or CONSULTANT, and incorporate permanent control features into the project at the earliest practicable time.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 EROSION CONTROL

- A. The Contractor shall provide positive means of erosion control such as shallow run on and run off ditches around construction to carry off surface water. Erosion control measures, such as siltation basins, hay check dams, mulching, jute netting and other equivalent techniques, shall be used as appropriate. Flow of surface water into excavated areas shall be prevented. Ditches around construction area shall also be used to carry away water resulting from dewatering of excavated areas. If dewatering is necessary and exceeds SFWMD thresholds, a dewatering plan must be prepared by a certified Registered Professional Engineer in the State of Florida and submitted to the CITY and CONSULTANT; then submitted and approved by the South Florida Water Management District prior to the commencement of work requiring dewatering. Contractor must comply with permits. However, no water from dewatering activities may be discharged offsite. At the completion of the Work, ditches shall be backfilled and the ground surface restored to original condition.

3.02 PROTECTION OF STREAMS AND CANALS

- A. Care shall be taken by Contractor to prevent, or reduce to a minimum, any damage to any ditch or the stormwater outfall canal, from pollution by debris, sediment or other material, or from the manipulation of equipment and/or materials in or near such ditches. Water that has been used for washing or processing, or that contains oils or sediments that will reduce the quality of the water in the ditch, shall not be directly returned to the ditch. Such waters will be diverted through a settling basin or filter approved by the CITY or CONSULTANT and meet required standards before being directed into the ditches and other water bodies.
- B. The Contractor shall not discharge water from dewatering operations directly into any live or intermittent stream, channel, wetlands, surface water or any storm sewer. Water from dewatering operations shall be treated by filtration, settling basins, or other approved method to reduce the amount of sediment contained in the water to allowable levels.
- C. All preventative measures shall be taken by Contractor to avoid spillage of petroleum products and other pollutants. In the event of any spillage, prompt remedial action shall be taken in accordance with a contingency action plan approved by the Florida Department of Environmental Protection. Contractor shall submit two (2) copies of approved contingency plans to the CITY and CONSULTANT.

3.03 PROTECTION OF LAND RESOURCES

- A. Land resources within the project boundaries and outside the limits of permanent work shall be restored to a condition, after completion of construction that will appear to be natural and not detract from the appearance of the project. Contractor shall confine all construction activities to areas shown on the Drawings.
- B. Outside of areas requiring earthwork for the construction of the new facilities, the Contractor shall not deface, injure, or destroy trees or shrubs, nor remove or cut them without prior approval from the CITY and CONSULTANT. No ropes, cables, or guys shall be fastened to or attached to any existing nearby trees for anchorage unless specifically authorized by the CITY and CONSULTANT. Where such special emergency use is permitted, first wrap the trunk with a sufficient thickness of burlap or rags over which softwood cleats shall be tied before any rope, cable, or wire is placed. The Contractor shall in any event be responsible for any damage resulting from such use.
- C. Where trees may possibly be defaced, bruised, injured, or otherwise damaged by the Contractor's equipment, dumping or other operations, protect such

trees by placing barricades around them. Monuments and markers shall be protected similarly before beginning operations near them.

- D. Any trees or other landscape feature scarred or damaged by the Contractor's equipment or operations shall be restored as nearly as possible to its original condition.

All trimming or pruning shall be performed in an approved manner by experienced workmen with saws or pruning shears. Tree trimming with axes will not be permitted.

Climbing ropes shall be used where necessary for safety. Trees that are to remain, either within or outside established clearing limits, that are subsequently damaged by the Contractor and are beyond saving as determined by the CITY and/or CONSULTANT shall be immediately removed and replaced.

- E. The locations of the Contractor's storage, and other construction structures required temporarily in the performance of the Work, shall be cleared as shown on the Drawings. Drawings showing storage facilities shall be submitted for approval of the CITY and CONSULTANT.

- F. If the Contractor proposes to construct temporary roads or embankments and excavations for work areas, it shall submit the following for approval at least thirty (30) days prior to scheduled start of such temporary work.

1. A layout of all temporary roads, excavations and embankments to be constructed within the work area.
2. Details of temporary road construction.
3. Drawings and cross sections of proposed embankments and their foundations, including a description of proposed materials.

- G. The Contractor shall remove all signs of temporary construction facilities such as haul roads, work areas, structures, foundations of temporary structures, stockpiles of excess of waste materials, or any other vestiges of construction as directed by the CITY and CONSULTANT. The disturbed areas shall be prepared and seeded as described in Section 02486 SEED, MULCH and FERTILIZER, or as approved by the CONSULTANT.

- H. All debris and excess material will be disposed of in approved areas as noted on the Drawings.

3.04 PROTECTION OF AIR QUALITY

- A. Burning. No open fires or burning will be permitted. If need dictates burning of any kind, Contractor must obtain prior approval of CITY and obtain appropriate permits from the state and local government agencies.
- B. Dust Control. The Contractor will be required to maintain all excavations, embankment, stockpiles, access roads, waste areas, borrow areas, and all other work areas within or without the project boundaries free from dust which could cause the standards for air pollution to be exceeded, and which would cause a hazard or nuisance to others.
- C. An approved method of stabilization consisting of sprinkling or other similar methods will be required to control dust. The use of petroleum products is prohibited.
- D. Sprinkling, to be approved, must be repeated at such intervals as to keep all parts of the disturbed area at least damp at all times, and the Contractor must have sufficient competent equipment on the job to accomplish this if sprinkling is used. Dust control shall be performed as the work proceeds and whenever a dust nuisance or hazard occurs, as determined by the CITY and/or CONSULTANT.

3.05 MAINTENANCE OF POLLUTION CONTROL FACILITIES DURING CONSTRUCTION

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

END OF SECTION

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SECTION 01153 - CHANGE ORDER PROCEDURES

PART 1 – GENERAL

1.01 SCOPE:

- A. The CITY, without invalidating the Contract, may make adjustments to bid item quantities by adding to or deducting from the quantities on the Schedule of Bid Items, as the Work progresses. These adjustments shall be in accordance with the unit or line item price set forth on the Schedule of Bid Items and are tracked as Work progresses, and approved on the monthly Application for Payment form.

1.02 REQUIREMENTS INCLUDED

- A. Promptly implement Change Order procedures.
 - 1. Provide full written data required to evaluate change.
 - 2. Maintain detailed records of work done on a time and material/force account basis.
 - 3. Provide full documentation to CONSULTANT on request.
- B. Designate in writing the member of Contractor's organization.
 - 1. Who is authorized to accept changes in the Work.
 - 2. Who is responsible for informing others in the Contractor's employ the authorization of changes in the Work.
- C. CITY will designate in writing the person who is authorized to execute Change Orders.

1.03 RELATED REQUIREMENTS

- A. Bid Form.
- B. Agreement.
- C. General Conditions.
- D. Supplementary Conditions.
- E. Section 01027: Application for Payment.
- F. Section 01310: Progress Schedule.

- G. Section 01370: Schedule of Values.
- H. Section 01630: Substitutions and Product Options.
- I. Section 01700: Contract Closeout.

1.04 DEFINITIONS

- A. Change Order: See General Conditions.
- B. Construction Change Authorization: A written order to the Contractor, signed by CITY and CONSULTANT, which amends the Contract Documents as described, and authorizes Contractor to proceed with a change that affects the Contract Sum or the Contract Time, for inclusion in a subsequent Change Order.
- C. Field Order: A written order, instructions, or interpretations, signed by CONSULTANT making minor changes in the Work not involving a change in Contract Sum or Contract Time.

1.05 PRELIMINARY PROCEDURES

- A. CONSULTANT may initiate changes by submitting a Proposal Request to Contractor. Request will include:
 - 1. Detailed description of the change, products, and location of the change in the Project.
 - 2. Supplementary or revised Drawings and Specifications.
 - 3. The projected time span for making the change, and a specific statement as to whether overtime work is, or is not, authorized.
 - 4. A specific period of time during which the requested price will be considered valid.
 - 5. Such request is for information only, and is not an instruction to execute the changes, nor to stop work in progress.
- B. Contractor may initiate changes by submitting a written notice to Consultant containing:
 - 1. Description of the proposed changes.
 - 2. Statement of the reason for making the changes.

3. Statement of the effect on the Contract Sum and the Contract Time.
4. Statement of the effect on the Work of separate contractors.
5. Documentation supporting any change in Contract Sum or Contract Time, as appropriate.

1.06 CONSTRUCTION-CHANGE AUTHORIZATION

- A. In lieu of Proposal Request, CONSULTANT may issue a construction change authorization for Contractor to proceed with a change for subsequent inclusion in a Change Order.
- B. Authorization will describe changes in the Work, both additions and deletions, with attachments of revised Contract Documents to define details of the change, and will designate the method of determining any change in the Contract Sum and any change in Contract Time.
- C. CITY and CONSULTANT will sign and date the Construction Change Authorization as authorization for the Contractor to proceed with the changes.
- D. Contractor shall sign and date the Construction Change Authorization to indicate agreement with the terms therein.

1.07 DOCUMENTATION OF PROPOSALS AND CLAIMS

- A. Support each quotation for a lump-sum proposal, and for each unit price which has not previously been established, with sufficient substantiating data to allow CONSULTANT to evaluate the quotation.
- B. On request provide additional data to support time and cost computations:
 1. Labor required.
 2. Equipment required.
 3. Products required.
 - a. Recommended sources of purchase and unit cost.
 - b. Quantities required.
 4. Taxes, insurance, and bonds.
 5. Credit for work deleted from Contract, similarly documented.

6. Overhead and profit.
 7. Justification for any change in Contract Time.
- C. Support each claim for additional costs, and for work done on a time-and-material/force account basis, with documentation as required for a lump-sum proposal, plus additional information:
1. Name of CITY's authorized agent who ordered the work, and the date of the order.
 2. Dates and times work was performed, and by whom.
 3. Time record, summary of hours worked, and hourly rates paid.
 4. Receipts and invoices for:
 - a. Equipment used, listing dates and times of use.
 - b. Products used, listing of quantities.
 - c. Subcontractors.
- D. Document requests for substitutions for products as specified in Section SC01630.

1.08 PREPARATION OF CHANGE ORDERS

- A. CONSULTANT will initiate each Change Order.
- B. Change Order will describe changes in the Work, both additions and deletions, with attachments of revised Contract Documents to define details of the change.
- C. Change Order will provide an accounting of the adjustment in the Contract Sum and in the Contract Time.

1.09 LUMP-SUM/FIXED PRICE CHANGE ORDER

- A. Content of Change Orders will be based on, either:
 1. CONSULTANT's Proposal Request and Contractor's Responsive Proposal as mutually agreed between CITY and Contractor; or
 2. Contractor's Proposal for a change, as recommended by the CONSULTANT.
- B. CITY and CONSULTANT will sign and date the Change Order as authorization for the Contractor to proceed with the changes.

C. Contractor shall sign and date the Change Order to indicate agreement with the terms therein.

1.10 UNIT PRICE CHANGE ORDER

A. Content of Change Orders will be based on, either:

1. CONSULTANT's definition of the scope of the required changes; or
2. Contractor's Proposal for a change, as recommended by CONSULTANT; or
3. Survey of completed work.

B. The amounts of the unit prices to be:

1. Those stated in the Agreement.
2. Those mutually agreed upon between CITY and Contractor.

C. When quantities of each of the items affected by the Change Order can be determined prior to start of the work:

1. CITY and CONSULTANT will sign and date the Change Order as authorization for Contractor to proceed with the changes.
2. Contractor shall sign and date the Change Order to indicate agreement with the terms herein.

D. When quantities of the items cannot be determined prior to start of the work:

1. CONSULTANT will issue a construction change authorization-directing Contractor to proceed with the change on the basis of unit prices.
2. At completion of the change, CONSULTANT will determine the cost of such work based on the unit prices and quantities used.
 - a. Contractor shall submit documentation to establish the number of units of each item and any claims for change in Contract Time.
3. CONSULTANT will sign and date the Change Order to establish the change in Contract Sum and in Contract Time.
4. CITY and Contractor will sign and date the Change Order to indicate their agreement with the terms therein.

1.11 TIME AND MATERIAL/FORCE ACCOUNT CHANGE ORDER/ CONSTRUCTION CHANGE AUTHORIZATION

- A. CONSULTANT will issue a Construction Change Authorization directing Contractor to proceed with the changes.
- B. At completion of the change, Contractor shall submit itemized accounting and supporting data as provided in the Article "Documentation of Proposals and Claims" of this Section.
- C. CONSULTANT will determine the allowable cost of such work, as provided in General Conditions and Supplementary Conditions.
- D. CONSULTANT will sign and date the Change Order to establish the change in Contract Sum and in Contract Time.
- E. CITY and Contractor will sign and date the Change Order to indicate their agreement therewith.

1.12 CORRELATION WITH CONTRACTOR'S SUBMITTALS

- A. Contractor shall periodically revise Schedule of Values and Request for Payment forms to record each change as a separate item of work, and to record the adjusted Contract Sum.
- B. Contractor shall periodically revise the Construction Schedule to reflect each change in Contract Time.
 - 1. Contractor shall revise sub-schedules to show changes for other items of work affected by the changes.
- C. Upon completion of work under a Change Order, Contractor shall enter pertinent changes in Record Documents.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

END OF SECTION

SECTION 01200 - PROJECT MEETINGS

PART 1 - GENERAL

1.01 DESCRIPTION

A. Scope of Work:

1. The Consultant shall schedule and administer pre-construction meeting, monthly progress meetings, and specifically called meetings throughout the progress of the Work. The Consultant shall:
 - a. Prepare agenda for meetings.
 - b. Make physical arrangements for meetings.
 - c. Preside at meetings.
2. Representatives of Contractor, subcontractors and suppliers attending meetings shall be qualified and authorized to act on behalf of the entity each represents.
3. The Contractor shall attend meetings to ascertain that work is expedited consistent with Contract Documents and construction schedules. The Consultant shall record the pre-construction meeting and each progress meeting in its entirety, and shall provide the Consultant with a voice recording, having good quality and clarity, and a typed transcript of the minutes of each meeting. A copy of the minutes of each progress meeting shall be available five (5) business days after the meeting.

B. Related Requirements Described Elsewhere:

1. Progress Schedules: Section 01310.
2. Shop Drawings, Working Drawings, and Samples: Section 01340.
3. Security and Safety Procedures for Infrastructure Projects: Section 01540
4. Project Record Documents: Section 01720.

1.02 PRE-CONSTRUCTION MEETING

- A. The Consultant shall schedule a preconstruction meeting no later than ten (10) days after date of issuance of Award letter.
- B. Location: A local site, convenient for all parties, designated by the Consultant.
- C. Attendance:

1. CITY's representative.
 2. Consultant and Consultant's professional consultants.
 3. Resident project representative.
 4. Contractor and its superintendent.
 5. Major subcontractors.
 6. Representatives of major suppliers and manufacturers as appropriate.
 7. Governmental and Utilities representatives as appropriate.
 8. Others as requested by the Contractor, CITY and Consultant.
- D. The purpose of the pre-construction meeting is to designate responsible personnel and establish a working relationship. Matters requiring coordination will be discussed and procedures for handling such matters established. The suggested agenda should include:
1. Distribution and discussion of:
 - a. List of major subcontractors and suppliers.
 - b. Projected schedules.
 - c. Schedule of Values
 - d. NPDES plan
 2. Critical work sequencing: Relationships and coordination with other contracts and/or work.
 3. Major equipment deliveries and priorities.
 4. Project coordination: Designation and responsible personnel.
 5. Procedures and processing of:
 - a. Field decisions.
 - b. Proposal requests.
 - c. Request for Information.

- d. Submittals.
 - e. Change Orders.
 - f. Applications for Payment.
6. Submittal of Shop Drawings, project data and samples.
 7. Adequacy of distribution of Contract Documents.
 8. Procedures for maintaining Record Documents.
 9. Use of premises:
 - a. Office, work and storage areas.
 - b. CITY's requirements.
 - c. Access and traffic control.
 10. Construction facilities, controls and construction aids.
 11. Temporary utilities.
 12. Safety and first aid procedures.
 13. Check of required Bond and Insurance certifications.
 14. Completion time for Contract and liquidated damages.
 15. Request for extension of Contract Time.
 16. Weekly job meeting for all involved.
 17. Security procedures.
 18. Procedures for making partial payments.
 19. Guarantees on completed work.
 20. Equipment to be used.
 21. Staking of work.
 22. Project inspection.

23. Labor requirements.
24. Laboratory testing of material requirements.
25. Provisions for material stored on site.
26. Requirements of other organizations.
27. Rights-of-way and easements.
28. Housekeeping procedures.
29. Liquidated damages.
30. Posting of signs.
31. Pay request submittal dates.
32. Equal opportunity requirements.

1.03 PROGRESS MEETINGS

- A. The Consultant shall schedule and conduct regular periodic meetings. The progress meetings will be held every thirty (30) days and at other times as required by the progress of the Work. The first meeting shall be held within thirty (30) days after the preconstruction meeting or thirty (30) days or less after the date of Notice to Proceed.
- B. Hold called meetings as required by progress of the Work.
- C. Location of the meetings: Site selected by Consultant.
- D. Attendance:
 1. Consultant and its representatives as needed.
 2. Contractor.
 3. CITY's representatives.
 4. Subcontractors (active on the site).
 5. Others as appropriate to the agenda (suppliers, manufacturers, other subcontractors, etc.).

- E. The Consultant shall preside at the meetings and provide for keeping minutes and distribution of the minutes to the CITY, Consultant and others. The purpose of the meetings will be to review the progress of the Work. The agenda will include but not be limited to the following:
1. Review approval of minutes of previous meeting.
 2. Review of work progress since previous meeting and work scheduled (3-week look ahead schedule).
 3. Field observations, problems, and conflicts.
 4. Problems which impede construction Schedule.
 5. Review of off-site fabrication, delivery schedules.
 6. Corrective measures and procedures to regain projected schedule.
 7. Status of approved construction schedule.
 8. Progress schedule during succeeding work period.
 9. Coordination of schedules.
 10. Review status of submittals, expedite as required.
 11. Maintenance of quality standards.
 12. Pending changes and substitutions.
 13. Shop Drawing problems.
 14. Review proposed changes for:
 - a. Effect on construction schedule and on completion date.
 - b. Effect on other contracts of the Project.
 15. Construction schedule.
 16. Critical/long lead items.
 17. Other business.
- F. The Contractor is to attend monthly progress meetings and is to study previous meeting minutes and current agenda items, and be prepared to

discuss pertinent topics and provide specific information including but not limited to:

1. Status of all submittals and what specifically is being done to expedite them.
 2. Status of all activities behind schedule and what specifically will be done to regain the schedule.
 3. Status of all material deliveries, latest contact with equipment manufacturer and specific actions taken to expedite materials.
 4. Status of open deficiencies and what is being done to correct the same.
- G. The Contractor is to provide a current submittal log at each progress meeting in accordance with Section 01340: Shop Drawings, Working Drawings and Samples.

1.04 SPECIAL MEETINGS

- A. The Contractor may be required to attend certain City Hall meetings to inform the public before commencement or during progress of the project to discuss specific issues.

PART 2- PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01310 - PROGRESS SCHEDULE

PART 1 - GENERAL

1.01 DESCRIPTION

A. Scope of Work:

1. Prior to Pre-Construction Meeting, Contractor shall prepare and submit to the CONSULTANT initial construction schedule(s) demonstrating complete fulfillment of all Contract requirements utilizing a Critical Path Method (hereinafter referred to as CPM) in planning, coordinating and performing the Work under this Contract (including all activities of subcontractors, equipment vendors and suppliers). The principles and definition CPM terms used herein shall be as set forth in the Associated General Contractors of America (AGC) publication, The Use of CPM in Construction, A Manual for General Contractors and the Construction Industry, latest edition, but the provisions of this Specification shall govern the planning, coordinating and performance of the Work. Assumed notice to proceed date for this schedule shall be ninety (90) days from bid opening date.
2. After issuance of Notice To Proceed, Contractor shall submit revised progress schedules on a bi-weekly basis. No partial payments shall be approved until there is an approved construction progress schedule on hand.

B. Related Requirements Described Elsewhere:

1. Summary of Work: Section 01010
2. Applications for Payment: Section 01027
3. Change Order Procedures: Section 01153
4. Project Meetings: Section 01200
5. Shop Drawings, Working Drawings, and Samples: Section 01340
6. Schedule of Values: Section 01370

1.02 QUALIFICATIONS

- A. A statement of computerized CPM capability shall be submitted by Contractor in writing prior to the award of the Contract and shall verify that either Contractor's organization has in-house capability to use the CPM technique or

that Contractor will employ a CPM consultant who is so qualified.

- B. In-house capability shall be verified by description of construction projects to which Contractor or Contractor's consultant has successfully applied computerized CPM and shall include at least two (2) projects valued at least half the expected value of this Project.

1.03 FORM OF SCHEDULES

- A. Maximum Sheet Size: 24 inches by 36 inches.

1.04 CONTENT OF SCHEDULES

- A. Construction Progress Schedule:

1. Show the complete sequence of construction by activity.
2. Show the dates for the beginning of, and completion of, each major element of construction in no more than a two (2) week increment scale. Specifically list, but not limit to:
 - a. Obtaining all permits/construction easements (if needed)
 - b. Shop Drawing submitted/review time
 - c. Site clearing/filling
 - d. Site utilities
 - e. Pipeline installation
 - f. Roadway installation
 - g. Subcontractor work
 - h. Equipment installations
 - i. Finishing
 - j. Instrumentation
 - k. Painting
 - l. Operator training
 - m. Testing
 - n. Start-up
 - o. Receipt of spare parts
3. Show projected percentage of completion for each item, as of the first day of each month.
4. Show projected dollar cash flow requirements for each month of construction and for each activity as indicated by the approved Schedule of Values.

- B. Submittals schedule for Shop Drawings and Samples shall be in accordance with Section 01340: Shop Drawings, Product Data and Samples. Indicate on

the Schedule the following:

1. The dates for Contractor's submittals.
 2. The dates of submittals for CITY-furnished products, if applicable.
 3. The dates for approved submittals that will be required from the CONSULTANT.
- C. A typewritten list of all long lead items (equipment, materials, etc.).
- D. To the extent that the progress schedule or any revised progress schedule shows anything not jointly agreed upon or fails to show anything jointly agree upon, it shall not be deemed to have been approved by the CONSULTANT. Failure to include any element of work required for the performance of this Contract shall not excuse the Contractor from completing all work required within any applicable Completion Date, notwithstanding the CONSULTANT's approval of the progress schedule.

1.05 PROGRESS REVISIONS

- A. Indicate progress of each activity to date of submission.
- B. Show changes occurring since previous submission of schedule:
1. Major changes in scope.
 2. Activities modified since previous submission.
 3. Revised projections of progress and completion.
 4. Other identifiable changes.
- C. Provide a narrative report as needed to define:
1. Problem areas, anticipated delays, and the impact on the schedule.
 2. Corrective action recommended, and its effect.
 3. The effect of changes on schedules of other prime contractors.
- D. If the Work falls behind the critical path schedule by two (2) weeks or more, the Contractor must prepare a recovery schedule.

1.06 SUBMISSIONS

- A. Submittal Requirements.

1. Logic network and/or time phased bar chart, computer generated.
 2. Computerized network analysis:
 - a. Sort by early start
 - b. Sort by float
 - c. Sort by predecessor/successor
 3. Narrative description of the logic and reasoning of the schedule.
- B. Within ten (10) working days after the conclusion of the CONSULTANT's review of initial schedule, Contractor shall revise the network diagram as required and resubmit the network diagram and a tabulated schedule produced therefrom. The revised network diagram and tabulated schedule shall be reviewed and accepted or rejected by the CONSULTANT within fifteen (15) working days after receipt. The network diagram and tabulated schedule when accepted by the CONSULTANT shall constitute the Project work schedule unless a revised schedule is required due to substantial changes in the work scope, a change in Contract Time or a recovery schedule is required and requested.
- C. Acceptance. The finalized schedule will be acceptable to the CONSULTANT, when in the opinion of the CONSULTANT; it demonstrates an orderly progression of the Work to completion in accordance with the Contract requirements. Such acceptance will neither impose on the CONSULTANT responsibility for the progress or scheduling of the Work nor relieve Contractor from full responsibility therefore. The finalized schedule of Shop Drawing submittals will be acceptable to the CONSULTANT, when in the opinion of the CONSULTANT, it demonstrates a workable arrangement for processing the submittals in accordance with the requirements. The finalized Schedule of Values (lump sum price breakdown), as applicable, will be acceptable to the CONSULTANT as to form and content, when in the opinion of the CONSULTANT, it demonstrates a substantial basis for equitably distributing the Contract Sum. When the network diagram and tabulated schedule have been accepted, The Contractor shall submit to the CONSULTANT five (5) copies of the time-scaled network diagram, five (5) copies of a computerized tabulated schedule in which the activities have been sequenced by numbers, five (5) copies of a computerized tabulated schedule in which the activities have been sequenced by early starting date, and five (5) copies of a computerized, tabulated schedule in which activities have been sequenced by total float, and five (5) copies sorted by predecessor/successor.

- D. Revised Work Schedules. Contractor, if requested by the CONSULTANT, shall provide a revised work schedule if, at any time, the CONSULTANT considers the completion Date to be in jeopardy because of "activities behind schedule." The revised work schedule shall include a new diagram and tabulated schedule conforming to the requirements of Paragraph 1.09, herein, designed to show how Contractor intends to accomplish the work to meet the completion date. The form and method employed by Contractor shall be the same as for the original work schedule. No payment will be made if activities fall more than two (2) weeks behind schedule and a revised work schedule is not furnished.
- E. Schedule Revisions. The CONSULTANT may require Contractor to modify any portions of the work schedule that become infeasible because of "activities behind schedule" or for any other valid reason. An activity that cannot be completed by its original latest completion date shall be deemed to be behind schedule. No change may be made to the sequence, duration or relationships of any activity without approval of the CONSULTANT.

1.07 DISTRIBUTION

- A. Contractor shall distribute copies of the reviewed schedules to:
1. CONSULTANT
 2. Jobsite file
 3. Subcontractors
 4. Other concerned parties
 5. CITY (two copies)
- B. Instruct recipients to report promptly to the Contractor, in writing, any problems anticipated by the projections shown in the schedules.

1.08 CHANGE ORDERS

- A. Upon approval of a Change Order, the approved changes shall be reflected in the next scheduled revision or update submittal by Contractor.

1.09 CPM STANDARDS

- A. CPM, as required by this Section, shall be interpreted to be generally as outlined in the Associated General Contractor's (AGC) publication, The Use of CPM in Construction, A Manual for General Contractors and the Construction Industry, Copyright 1976.

B. Work schedules shall include a graphic network and computerized, tabulated schedules as described below. To be acceptable the schedule must demonstrate the following:

1. A logical succession of work from start to finish.
2. Definition of each activity.
3. A logical flow of work crews/equipment (crews are to be defined by manpower category and man-hours; equipment by type and hours).
4. Show all work activities and interfaces including submittals as well as major material and equipment deliveries.

C. Networks.

1. The CPM network, or diagram, shall be in the form of a time-scaled diagram of the customary activity-on-type and may be divided in to a number of separate pages with suitable notation relating the interface points among the pages. Individual pages shall not exceed 36 inches by 60 inches. Notation on each activity line shall include a brief work description and a duration, as described in Paragraph 1.09D., herein.
2. All construction activities and procurement shall be indicated in a time-scaled format, and a calendar shall be shown on all sheets along the entire sheet length. Each activity arrow shall be plotted so the beginning and completion dates of such activity can be determined graphically by comparison with the calendar scale. All activities shall be shown using the symbols that clearly distinguish between critical path activities, non-critical path activities and float for each non-critical activity. All non-critical path activities shall show estimated performances time and float time in scaled form.

D. The duration indicated for each activity shall be in calendar days and shall represent the single best time considering the scope of the Work and resources planned for the activity including time for inclement weather. Except for certain non-labor activities, such as curing concrete or delivering materials, activity durations shall not exceed fourteen (14) days nor be less than one (1) day unless otherwise accepted by the CONSULTANT.

E. Tabulated Schedules. The initial schedule shall include the following minimum data for each activity.

1. Activity Beginning and Ending Numbers, single activity numbers may be used.

2. Duration.
 3. Activity Description.
 4. Early Start Date (Calendar Dated).
 5. Early Finish Date (Calendar Dated).
 6. Identified Critical Path.
 7. Total Float (Note: No activity may show more than 20 days float).
 8. Cost of Activity.
 9. Equipment Hours by type, man power/hours by crew or trade.
- F. Project Information. Each tabulation shall be prefaced with the following summary data.
1. Project Name.
 2. Contractor.
 3. Type of Tabulation (Initial or Updated).
 4. Project Duration.
 5. Project Scheduled Completion Date.
 6. Effective or Starting Date of the Schedule.
 7. New Projects Completion Date and Project Status, if an updated or revised schedule.
 8. Actual Start Date and Finish Date for all update schedules.

1.10 SCHEDULE MONITORING

- A. At not less than monthly intervals or when specifically requested by CONSULTANT, Contractor shall submit to the CONSULTANT a computer printout of an updated schedule for those activities that remain to be completed.
- B. The updated schedule shall be submitted in the form, sequence, and number of copies requested for the initial schedule.

1.11 PROGRESS MEETINGS

For the monthly progress meeting, Contractor shall submit a revised CPM schedule and a 3-week look-ahead schedule, showing all activities in progress, uncompleted or scheduled to be worked during the weeks. The 3 weeks include the current week plus the next 2 weeks. All activities shall be from the approved CPM and must be as shown on the CPM unless behind or ahead of schedule.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

END OF SECTION

SECTION 01340 - SHOP DRAWINGS, WORKING DRAWINGS AND SAMPLES

PART 1 - GENERAL

1.01 DESCRIPTION

A. Scope of Work:

1. The Contractor shall submit to the CONSULTANT for review, approval or for acknowledgment, items such as Shop Drawings, Test Reports and Product Data on materials and equipment (hereinafter in this Section called Data), and material samples (hereinafter in this Section called Samples) as they are required for the proper control of work, including but not limited to those Shop Drawings, Data and Samples for materials and equipment specified elsewhere in the Specifications and in the Contract Drawings.
2. With the Contractor's executed agreement and Bond Submittal, the Contractor shall submit to the CONSULTANT a complete list of preliminary Data on items for which Shop Drawings are to be submitted. Included in this list shall be the names of all proposed manufacturers furnishing specified items. Review of this list by the CONSULTANT shall in no way expressed or implied relieve the Contractor from submitting complete Shop Drawings and providing materials, equipment, etc., fully in accordance with the Specifications. This procedure is required in order to expedite final review of Shop Drawings. The Contractor shall include Shop Drawing review time on the Project schedule (see section 01310).
3. The Contractor is to maintain an accurate updated submittal log and will bring this log to each scheduled progress meeting with the City and the CONSULTANT. This log should include the following items:
 - a. Submittal-Description and Number assigned.
 - b. Date to CONSULTANT.
 - c. Date returned to Contractor.
 - d. Status of Submittal (Approved as Noted, Rejected/Re-submit).
 - e. Date of Resubmittal and Return (as applicable).
 - f. Date material release for fabrication.
 - g. Projected date of fabrication.

- h. Projected date of delivery to site.
- i. Status of O&M manuals submittal.
- j. Specification Section.
- k. Drawings Sheet Number.

B. Related Requirements Described Elsewhere:

- 1. General Conditions:
- 2. Progress Schedules: Section 01310.
- 3. Material and Equipment: Section 01600.
- 4. Project Record Documents: Section 01720.
- 5. Operating and Maintenance Data: Section 01730.

1.02 CONTRACTOR'S RESPONSIBILITY

- A. The Contractor shall furnish the CONSULTANT a schedule of Shop Drawings submittals fixing the respective dates for the submission of Shop Drawings, the beginning of manufacture, testing and installation of materials, supplies and equipment. This schedule shall indicate those that are critical to the progress schedule.
- B. The Contractor shall not begin any of the work covered by a Shop Drawing, Data, or a Sample returned for correction until a revision or correction thereof has been reviewed and returned to him, by the CONSULTANT, with approval.
- C. The Contractor shall submit to the CONSULTANT all drawings and schedules sufficiently in advance of construction requirements to provide no less than twenty-one (21) calendar days for checking and appropriate action from the time the Consultant receives them.
- D. All submittals shall be accompanied with a transmittal letter prepared in duplicate containing the following information:
 - 1. Date.
 - 2. Project Title and Number.

3. Contractor's name and address.
 4. The number of each Shop Drawings, Project Data, and Sample submitted.
 5. Notification of Deviations from Contract Documents.
 - a. The Contractor shall indicate in **bold type** at the top of the cover sheet of submittal of Shop Drawing if there is a deviation from Contract Drawings, Project Specifications and referenced specifications or codes.
 - b. The Contractor shall also list any deviations from Contract Drawings, Project Specifications and referenced specifications or codes and identify in "green" ink prominently on the drawings.
 6. Submittal Log Number conforming to Specification Log Number.
- E. The Contractor shall submit SIX (6) COPIES OF SHOP DRAWINGS TO THE CONSULTANT. The CONSULTANT will review the submittal and return to the Contractor three (3) copies with appropriate review comments.
- F. The Contractor shall be responsible for and bear all costs of damages which may result from the ordering of any material or from proceeding with any part of work prior to the completion of the review by the CONSULTANT of the necessary Shop Drawings.
- G. The Contractor shall not use Shop Drawings as means of proposing alternate items to demonstrate compliance to Contract requirements.
- H. Each submittal will bear a stamp indicating that Contractor has satisfied Contractor's obligations under the Contract Documents with respect to Contractors review and approval of that submittal.
- I. Drawings and schedules shall be checked and coordinated with the work of all trades and sub-contractors involved, before they are submitted for review by the CONSULTANT and shall bear the Contractor's stamp of approval as evidence of such checking and coordination. Drawings or schedules submitted without this stamp of approval shall be returned to the Contractor for resubmission.

1.03 CONSULTANT'S REVIEW OF SHOP DRAWINGS

- A. The CONSULTANT's review of Shop Drawings, Data and Samples as submitted by the Contractor, will be to determine if the items(s) conform to the information in the Contract Documents and are compatible with the design concept. The CONSULTANT's review and exceptions, if any, will not

constitute an approval of dimensions, connections, quantities, and details of the material, equipment, device, or item shown.

- B. The review of drawings and schedules will be general, and shall not be construed:
 - 1. As permitting any departure from the Contract requirements.
 - 2. As relieving the Contractor of responsibility for any errors, including details, dimensions, and materials.
 - 3. As approving departures from details furnished by the Consultant, except as otherwise provided herein.
- C. If the drawings or schedules as submitted describe variations and show a departure from the Contract requirements which the CONSULTANT finds to be in the interest of the City and to be so minor as not to involve a change in Contract Price or time for performance, the CONSULTANT may return the reviewed drawings without noting an exception.
- D. "Approved As Noted" - Contractor shall incorporate CONSULTANT's comments into the submittal before release to manufacturer. The Contractor shall send a letter to the CONSULTANT acknowledging the comments and their incorporation into the Shop Drawing.
- E. "Amend And Resubmit" - Contractor shall resubmit the Shop Drawing to the CONSULTANT. The resubmittal shall incorporate the CONSULTANT's comments highlighted on the Shop Drawing.
- F. "Rejected" - Contractor shall resubmit Shop Drawing for review by Consultant.
- G. Resubmittals will be handled in the same manner as first submittals. On resubmittals the Contractor shall direct specific attention, in writing or on resubmitted Shop Drawings, to revisions other than the corrections requested by the CONSULTANT on previous submissions. The Contractor shall make any corrections required by the CONSULTANT.
- H. If the Contractor considers any correction indicated on the drawings to constitute a change to the Contract Drawings or Specifications, the Contractor shall give written notice thereof to the CONSULTANT.
- I. When the Shop Drawings have been completed to the satisfaction of the CONSULTANT, the Contractor shall carry out the construction in accordance therewith and shall make no further changes therein except upon written instructions from the CONSULTANT.

- J. No partial submittals will be reviewed. Submittals not deemed complete will be stamped "Rejected" and returned to the Contractor for resubmittal. Unless otherwise specifically permitted by the CONSULTANT, make all submittals in groups containing all associated items for:
 - 1. Systems.
 - 2. Processes.
 - 3. As indicated in specific Specifications Sections.
- K. All drawings, schematics, manufacturer's product Data, certifications and other Shop Drawing submittals required by a system specification shall be submitted at one time as a package to facilitate interface checking.
- L. Only the CONSULTANT shall utilize the color "red" in marking Shop Drawing submittals.
- M. For any submittal returned to the Contractor marked "Amend and Submit" or "Rejected," Contractor shall pay CITY a resubmittal fee of \$250.00. Monies shall be deducted from monies owed Contractor by CITY monthly and incorporated into a Change Order at completion of the contract.

1.04 SHOP DRAWINGS

- A. Shop Drawings shall be complete and detailed and shall consist of fabrication, erection and setting drawings and schedule drawings, manufacturer's scale drawings, and wiring and control diagrams. Cuts, catalogs, pamphlets, descriptive literature, and performance and test data, shall be considered only as supportive information. As used herein, the term "manufactured" applies to standard units usually mass-produced; and "fabricated" means items specifically assembled or made out of selected materials to meet individual design requirements.
- B. Manufacturer's catalog sheets, brochures, diagrams, illustrations and other standard descriptive data shall be clearly marked to identify pertinent materials, product or models. Delete information which is not applicable to the Work by striking or cross-hatching.
- C. Each Shop Drawing shall have a blank area 3-1/2 inches by 3-1/2 inches, located adjacent to the title block. The title block shall display the following:
 - 1. Project Title and Number.
 - 2. Name of Project building or structure.

3. Number and title of the Shop Drawing.
4. Date of Shop Drawing or revision.
5. Name of Contractor and subcontractor submitting drawing.
6. Supplier/manufacturer.
7. Separate detailer when pertinent.
8. Specification title and number.
9. Specification section.
10. Application Contract Drawing Number.

D. Data on materials and equipment include, without limitation, materials and equipment lists, catalog data sheets, cuts, performance curves, diagrams, materials of construction and similar descriptive material. Materials and equipment lists shall give, for each item thereon, the name and location of the supplier or manufacturer, trade name, catalog reference, size, finish and all other pertinent Data.

1.05 WORKING DRAWINGS

- A. When used in the Contract Documents, the term "Working Drawings" shall be considered to mean the Contractor's plan for temporary structures such as temporary bulkheads, support of open cut excavation, support of utilities, ground water control systems, forming and false work; for underpinning; and for such other work as may be required for construction but does not become an integral part of the Project.
- B. Working Drawings shall be signed by a registered Professional Consultant, currently licensed to practice in the State of Florida.

1.06 SAMPLES

- A. The Contractor shall furnish, for the approval of the Consultant, samples required by the Contract Documents or requested by the CONSULTANT. Samples shall be delivered to the CONSULTANT as specified or directed. The Contractor shall prepay all shipping charges on samples. Materials or equipment for which samples are required shall not be used in work until approved by the CONSULTANT.
- B. Samples shall be of sufficient size and quantity to clearly illustrate:

1. Functional characteristics of the product, with integrally related parts and attachment devices.
2. Full range of color, texture and pattern.
3. A minimum of two (2) samples of each item shall be submitted.

C. Field samples and mock-ups:

1. Contractor shall erect, at the Project site, at a location acceptable to the Consultant.
2. Size of area: 15 feet long x 6 feet high or that specified in the respective specification section.
3. Fabricate each sample and mock-up complete and finished.
4. Remove mock-ups at conclusion of Work or when acceptable to the Consultant.

D. Each sample shall have a label indicating:

1. Name of Project.
2. Name of Contractor and Subcontractor.
3. Material or Equipment Represented.
4. Place of Origin.
5. Name of Producer and Brand (if any).
6. Location in Project.

Samples of finished materials shall have additional marking that will identify them under the finished schedules.

- E. The Contractor shall prepare a transmittal letter in triplicate for each shipment of samples containing the information required in Paragraph 1.06B above. It shall enclose a copy of this letter with the shipment and send a copy of this letter to the CONSULTANT. Approval of a sample shall be only for the characteristics or use named in such approval and shall not be construed to change or modify any Contract requirements.

- F. Approved samples not destroyed in testing shall be sent to the

CONSULTANT or stored at the site of the Work. Approved Samples of the hardware in good condition will be marked for identification and may be used in the work. Materials and equipment incorporated in work shall match the approved Samples. Samples which failed testing or were not approved will be returned to the Contractor at its expense, if so requested at time of submission.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01370 - SCHEDULE OF VALUES

PART 1 - GENERAL

1.01 DESCRIPTION

A. Scope of Work:

1. Contractor shall submit to the Consultant a Schedule of Values allocated to the various lump sum portions of the Work, within fifteen (15) days of the Notice to Proceed date.
2. Upon request of the Consultant, Contractor shall support the values with data which will substantiate their correctness. The data shall include, but not be limited to quantity of materials, all sub-elements of the activity and their units of measure.
3. Schedule of Values shall establish the actual value for each activity of the Work to be completed taken from the approved Critical Path Method (CPM), and shall be used as the basis for the Contractor's Applications for Payment.

B. Related Requirements Described Elsewhere:

1. Conditions of the Construction Contract.

1.02 FORM AND CONTENT OF SCHEDULE OF VALUES

- A. Type schedule on an 8-1/2 inch by 11 inch or 8-1/2 inch by 14 inch white paper. Contractor's standard forms and computer printout will be considered for approval by the Consultant upon Contractor's request. Identify schedule with:

1. Title of Project and location.
2. Consultant and Project number.
3. Name and address of Contractor.
4. Contract designation.
5. Date of submission.

- B. Schedule shall list the installed value of the component parts of the Work in sufficient detail to serve as a basis for computing item prices for progress payments during construction.

- C. Identify each line item with the number and the title of the respective section of the Specifications.
- D. For each line item, list sub-values of major products or operations under the item.
- E. For the various portions of the Work:
 - 1. Each item shall include a directly proportional amount of the Contractor's overhead and profit.
 - 2. For items on which progress payments will be requested for stored materials, break down the value into:
 - a. The cost of the materials, delivered unloaded, with taxes paid. Paid invoices required for materials. Payment for materials shall be limited to the invoiced amount only.
 - b. The total installed value.
- F. The sum of all lump sum values listed in the schedule shall equal the total Contract Sum.

1.03 UNIT QUANTITIES:

- A. Quantities indicated in the Schedule of Bid Items are for bidding and contract purposes only. Quantities and measurements supplied or placed in the Work and verified by the Consultant and CITY determines payment.
- B. If the actual Work requires more or fewer quantities than those quantities indicated in the bid items, Contractor shall provide the required quantities at the unit sum/prices contracted.

1.04 REVIEW AND RESUBMITTAL

- A. After review by Consultant, Contractor shall revise and resubmit Schedule of Values and Schedule of Unit Material values pursuant to this Section.
- B. Contractor shall resubmit revised Schedules in same manner pursuant to this Section.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01380 - CONSTRUCTION PHOTOGRAPHS

PART 1 - GENERAL

1.01 DESCRIPTION

- A. Scope of Work: The Contractor shall employ a competent professional photographer to take construction record photographs periodically during the course of the Work using a digital camera and a preconstruction video inspection.
- B. Related Requirements Described Elsewhere:
 - 1. General Requirements: Section 01000.
 - 2. Summary of Work: Section 01010.
 - 3. Video and Photographic Site Survey: Section 01390
 - 4. Project Record Documents: Section 01720.

1.02 PHOTOGRAPHY REQUIRED

- A. Photographs taken in conformance with this Section shall be furnished to the Consultant with each Application for Payment.
- B. Views and Quantities Required:
 - 1. Five (5) views of overall Project site monthly, or as directed by the Consultant.
 - 2. Two (2) aerial views of overall Project site after completion of site restoration and landscaping.
 - 3. Provide five (5) 3-inch by 5-inch prints and one (1) 8-inch by 10-inch print of each view, plus one (1) copy in digital format.
 - 4. Additional aerial photographs may be used upon prior approval by the CITY.
- C. In addition to the general progress photographs required, photographs of each tie-in point shall be taken prior to backfill and turned in with the monthly Application for Payment.

1.03 COSTS OF PHOTOGRAPHY

- A. The Contractor shall pay costs for specified photography and prints. Parties requiring additional photography or prints shall pay the photographer directly.

PART 2 - PRODUCTS

2.01 PRINTS

- A. Color:

- 1. Paper: Single weight, color print paper.
- 2. Finish: Smooth surface, glossy.
- 3. Size: 8 inches by 10 inches and 3 inches by 5 inches.
- 4. Paper Weight: Single weight

- B. Identify each print on back, listing:

- 1. Name of Project.
- 2. Orientation of view.
- 3. Date and time of exposure.
- 4. Name and address of photographer.
- 5. Photographer's numbered identification of exposure.

- B. Aerial photographs shall be color.

2.02 NEGATIVES/DIGITAL FILES

- A. The negatives/digital files are to be categorized by month taken and must correspond to the progress photographs that accompany each. At project closeout, the negatives/digital files are to be submitted to the CITY. If the Contractor uses digital photography, then the images shall be provided on CD.

PART 3 - EXECUTION

3.01 TECHNIQUE

- A. Factual Presentation.
- B. Correct exposure and focus.

1. High resolution and sharpness.
2. Maximum depth-of-field.
3. Minimum distortion.

3.02 VIEWS REQUIRED

- A. Photograph from locations to adequately illustrate condition of construction and state of progress.
 1. At successive periods of photography, take at least one (1) photograph from the same overall view as previously.
 2. Consult with the Consultant at each period of photography for instructions concerning views required.
 3. All views to contain a relative dimension reference that is easily recognizable by the average person. In views where dimensions are critical, use of recognizable measuring devices such as a folding ruler, measuring tape in a manner the makings are clear and sharp in the photograph and the device located in close relationship with subject of photograph.

3.03 DELIVERY OF PRINTS

- A. Deliver prints to the CONSULTANT to accompany each Application for Payment.
- B. Distribution of prints as soon as processed is anticipated to be as follows:
 1. CITY: one (1) set.
 2. Consultant: two (2) sets.
 3. Project record file one (1) set stored by Contractor and furnished to Consultant at project completion.
 4. Contractor one (1) set.

END OF SECTION

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SECTION 01390 - VIDEO AND PHOTOGRAPHIC SITE SURVEY

PART 1 - GENERAL

1.01 SECTION INCLUDES:

- A. The work under this Section includes the performance of a Pre and Post Construction Video Survey of the condition of existing facilities, public Rights-of Way (ROW), easements, roads, private property, and other surface features and “before and after” digital still photographs.

1.02 RELATED SECTIONS:

- A. Section 01050 – Field Engineering
- B. Section 01380 – Construction Progress Photographs

1.03 PRE/POST-CONSTRUCTION VIDEO INSPECTION

- A. Prior to start of construction, Contractor shall retain the services of a firm specializing in pre-construction video inspection.
- B. Video inspection shall delineate all aspects of facilities on site and surrounding properties.
- C. Any claims for damages not clearly shown as existing prior to construction shall be paid for by the Contractor, unless conclusive evidence to the contrary is provided.

1.04 SUBMITTALS:

- A. Pre-Construction Video and Photographic Site Survey
 - 1. The Contractor shall submit one (1) copy of the Pre Construction Video Survey with video log to the CITY for review and acceptance.
- B. Post-Construction Video Site Survey
 - 1. At the discretion of the CITY, the requirement for a Post-Construction video may be waived.
 - 2. The Contractor shall submit one (1) copy of the Post-Construction Video Survey with log to the CITY for review.
 - 3. Accompanying this submittal, or as a separate submittal in the event the CITY waives the Post Construction Video, the Contractor shall issue a

letter attesting to having reviewed the Pre Construction Video Survey and confirm restoration of surface attributes.

PART 2 – PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 VIDEO SITE SURVEY

- A. The Contractor shall provide the CONSULTANT with a DVD accurately representing existing conditions of the site to be disturbed by its operations. This DVD shall be submitted at least twenty-one (21) days prior to the start of work on this project.
- B. Recording shall be on a new, high quality, DVD. The camera shall be capable of producing clean color images. The original is to be submitted to the CONSULTANT for review and a copy is to be retained by the Contractor until Final Acceptance. CITY shall receive one (1) copy of the Final Videotaping after approval by the CONSULTANT.
- C. At a minimum, the video shall contain:
 - 1. At the beginning of the video, the project name and date of taping shall be superimposed on the picture.
 - 2. As the location of the video taping progresses, i.e., the individual street name shall be temporally superimposed on the picture.
 - 3. Centerline stationing at 100 feet intervals or clear reference to the individual residences (by street number) and/or business (by street number and name).
 - 4. The video shall be run twice the full length of the project, first facing and proceeding ahead station wise and slightly angled to the right of centerline. The second run shall be the full length of the project facing and proceeding back station wise and slightly angled to the right of centerline.
 - 5. Both shootings shall contain the centerline within the view of the observer. The taping is to be continuous during each run. Areas of special importance / interest may be “zoomed-in” on to provide the necessary details but must be “zoomed-out” to the original view before proceeding.
- D. Audio content
 - 1. Simultaneously record the audio portion during videotaping.

2. Audio recording shall assist in viewer orientation and in any Audio recording will only consist of camera operator commentary.
- E. Prepare a written video log that describes the contents of each tape including:
1. Name of streets and/or easements.
 2. Videotape location designator.
 3. Coverage begin/end, station and location.
 4. Recording date.
- F. The video shall present a clear and accurate representation of existing conditions. If the CITY determines that this intent is not met, the tape shall be returned and the area re-televised at no additional cost to the CITY.
- G. This accepted video along with the still photographs will serve as an aid to the CITY in determining existing conditions. Nothing contained in the video or still photographs will supersede or relieve the CITY from determining the acceptability of restoration.
- H. Prior to Substantial Completion, the Contractor is responsible to review the video and still photographs and prepare a detailed list of surface improvements to be reinstated. This list shall include lawn areas, trees and plants, driveways, driveway aprons, roadways, signage, sprinkler systems, sidewalks, mailboxes and any other existing conditions affected by the work and submit to the CITY for review and approval.

3.02 PHOTOGRAPHIC SURVEY

- A. In addition to the videotape, the Contractor shall take “before and after” digital still photographs of each home and/or property. The photographs of each home and/or property shall consist of a set of photographs (3 minimum) and shall provide property-line to property-line coverage of the roadway, swale and sidewalk areas for each property. The “areas of interest” are the edge of roadway, condition of the swale, type of grass, landscaping within the swale, mail box and driveway apron.
- B. The digital “file” name is to be the address of the property being photographed and shall be incorporated as part of the image. The Contractor shall provide the CITY with the following for review and acceptance:

1. One (1) CD with the digital files in street named/numbered subdirectory and a digital file log.
 2. Two (2) sets of “Before” color prints and one (1) set of “After” color prints of each digital file, with the file name displayed. Color print sets are to be bound with a Table of Contents and divided and tabbed by street name/number.
 3. “Before” photographs (color prints and CD) shall be submitted twenty-one (21) days in advance of the commencement of the work. “After” photographs (color prints and CD) shall be submitted with the final Application For Payment (refer to Section 01380 PROGRESS PHOTOGRAPHS for additional requirements).
- C The Contractor shall provide a bound set of accepted pre-construction photographs to the Consultant to be maintained at the Consultant’s Field Office for use during the project.

END OF SECTION

SECTION 01400 - QUALITY REQUIREMENTS

PART 1 GENERAL

1.01 GENERAL

- A. Contractor is required to follow all technical specification requirements with regards to material quality, certification, placement and installation. If the Contractor has questions concerning these items, it is required to generate and issue a Request For Information to the CITY and Consultant for resolution and or guidance.
- B. In the absence of other quality requirements, FDOT Standard Specifications and Index, of the most current edition, shall prevail.

1.02 RELATED SECTIONS

- A. Section 01025 – Measurement and Payment Procedures
- B. Section 01050 – Field Engineering
- C. Section 01340 – Shop Drawings, Work Drawings and Samples

1.03 Field QA/QC

- A. The Contractor shall monitor quality control over suppliers, subcontractors, products and workmanship, to produce work of specified quality.
- B. Comply with manufacturers' instructions, including each step in sequence.
- C. Should manufacturers' instructions conflict with Contract Documents, issue Request For Information to the Consultant before proceeding.
- D. Comply with specified standards as minimum quality for the work except where more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.
- E. Perform work by persons qualified to produce required and specified quality.
- F. Verify that field measurements are as indicated on shop drawings / catalog cut sheets or as instructed by the manufacturer.
- G. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion, or disfigurement.

1.04 TOLERANCES

- A. Installed tolerances:
 - 1. Plus / minus 0.20 foot radius of plan center
 - 2. Plus / minus 0.05 foot vertical
 - 3. Plus / minus 10% of specified vertical slope
 - 4. Plus / minus 5% uniformity of specified vertical slope measured between any two points of a single run of pipe.
- B. Monitor fabrication and installation tolerance control of products to produce acceptable Work. Do not permit tolerances to accumulate.
- C. Comply with manufacturers' tolerances. Should manufacturers' tolerances conflict with Contract Documents, request clarification from Consultant before proceeding.
- D. Adjust products to appropriate dimensions, position before securing products in place.

1.05 TESTING SERVICES

- A. Contractor required to hire a professional, licensed independent firm to perform tests and other services specified.
- B. Field copies of on site density testing are to be left on site at the completion of each day's testing. The independent firm is required to "map" the results of each day's testing results on the Contractor's.
- C. Certified, signed and sealed test reports will be submitted by the independent firm to the Consultant, CITY and Contractor, indicating observations and results of tests and indicating compliance or non-compliance with Contract Documents.
- D. Cooperate with independent firm; furnish samples of materials, design mix, equipment, tools, storage, safe access, and assistance by incidental labor as requested.
- E. Testing does not relieve Contractor to perform work to Contract requirements.
- F. Re-testing required because of non-conformance to specified requirements shall be performed by the same independent firm on instructions by the CITY or Consultant.

1.06 INSPECTION SERVICES

- A. The CITY shall appoint, employ, and pay inspector for specified services for inspection. These services may be from the Consultant, or from the CITY or any combination of the above.
- B. The Inspector shall perform construction observation, inspections and other services specified in individual specification sections and as required by the CITY and/or Consultant.
- C. The Contractor shall cooperate with Inspector; furnish safe access and assistance by incidental labor as requested. Additionally, the Contractor shall keep the inspection personnel fully informed of the needs, scheduling and progress of the project.
- D. This inspection does NOT relieve the Contractor from performing their own QA/QC on the Work as required in this and other technical specification sections.

1.07 MANUFACTURERS' FIELD SERVICES

- A. When specified in the Contract documents, requiring material or product suppliers or manufacturers to provide qualified staff personnel to observe site conditions, conditions of surfaces and installation, quality of workmanship, start-up of equipment, test, adjust and balance of equipment as applicable, and to initiate instructions when necessary.
- B. Report observations and site decisions or instructions given to applicators or installers that are supplemental or contrary to manufacturers' written instructions.

PART 2 PRODUCTS (Not Used)

PART 3 EXECUTION

3.01 EXAMINATION

- A. The Contractor shall verify that existing site conditions and substrate surfaces are acceptable for subsequent Work. Beginning new Work means acceptance of existing conditions.
- B. Verify that existing substrate is capable of structural support or attachment of new Work being applied or attached.
- C. Perform “receiving” inspection of materials, structures and equipment.

- D. Perform “in-process” inspection as the Work progresses.
- E. Monitor and inspect the work performed by subcontractors as the Work progresses.
- F. Examine and verify specific conditions described in individual technical specification sections.
- G. Notify the CITY and Consultant, forty-eight (48) hours prior to the expected time for inspection purposes and/or the witnessing of pressure testing. All pressure testing shall be witnessed by the CITY and/or Consultant.

END OF SECTION

SECTION 01410 - TESTING LABORATORY SERVICES

PART 1 – GENERAL

1.01 REQUIREMENTS INCLUDED

A. CITY will employ services of an Independent Testing Laboratory to perform specified testing. Contractor shall pay costs of services from allowance specified in Section 01025: Measurement and Payment (Allowances).

1. Contractor shall cooperate with laboratory to facilitate the execution of its required services.
2. Employment of the laboratory shall in no way relieve Contractor's obligations to perform the Work of the Contract.

1.02 RELATED REQUIREMENTS

A. Conditions of the Contract: Inspection and testing required by laws, ordinances, rules, regulations, orders or approvals of public authorities.

1.03 LIMITATIONS OF AUTHORITY OF TESTING LABORATORY

A. Laboratory is not authorized to:

1. Release, revoke, alter or enlarge on requirements of Contract Documents.
2. Approve or accept any portion of the Work.
3. Perform any duties of the Contractor.

1.04 CONTRACTOR'S RESPONSIBILITIES

A. Cooperate with laboratory personnel and/or Consultant, provide access to Work or manufacturer's operations.

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 mixed which require control by the testing laboratory.

D. Furnish copies of Products Test Reports as required.

E. Furnish incidental labor and facilities:

1. To provide access to Work to be tested.
 2. To obtain and handle samples at the Project site or at the source of the product to be tested.
 3. To facilitate inspections and tests
 4. For storage and curing of test samples.
- F. Notify laboratory sufficiently in advance of operations to allow for laboratory assignment of personnel and scheduling of tests.
1. When tests or inspections cannot be performed after such notice, reimburse CITY for laboratory personnel and travel expenses incurred due to Contractor's negligence.
- G. Make arrangements with laboratory and pay for additional samples and tests required for Contractor's convenience.

1.05 SPECIFIC TESTS, INSPECTION AND METHODS REQUIRED (NOT USED)

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.01 PAYMENT

- A. Testing of materials and products will be performed by an independent testing laboratory appointed and paid for per Section 01025 – Measurement and Payment (Allowances).
- B. The CITY will authorize the cost of one (1) series of tests only on the area or item being evaluated. The Contractor shall pay for costs of additional testing as required due to improper performance of Work.
- C. When Work of this Contract, or portions of Work, are completed, notify the testing laboratory or Consultant to perform or witness the tests. Do not proceed with additional portions of Work until results have been verified.

END OF SECTION

SECTION 01500 - CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS

PART 1 – GENERAL

- 1.01 REQUIREMENTS INCLUDED Contractor shall furnish, install and maintain temporary utilities required for construction. Remove on completion of work.
- 1.02 RELATED REQUIRMENTS
- A. General Conditions.
 - B. Section 01010: Summary of Work
- 1.03 REQUIREMENTS OF REGULATORY AGENCIES
- A. Comply with National Electric Code.
 - B. Comply with Federal, State, and local codes and regulations and with utility company requirements.

PART 2 – PRODUCTS

- 2.01 MATERIALS, GENERAL
Materials may be new or used, but must be adequate in capability for the required usage of the CITY, must not create unsafe conditions, and must not violate requirements of applicable codes and standards.
- 2.02 TEMPORARY TELEPHONE SERVICE
- A. Superintendent, foreman or other contractor personnel in charge shall be equipped with a functioning cell phone during the term of the contract.
- 2.03 TEMPORARY WATER
- A. Schedule use and provide deposit to the City's Water Utility Department for a portable hydrant meter. No water shall be taken from the existing water distribution system unless it's through the portable hydrant meter. The Contractor shall install and maintain a certified backflow preventer or check valve on all CITY issued portable hydrant meters; **no exceptions**. Using water from private homes and/or business' is strictly forbidden.
 - B. Water utilization for concrete plaster and mortar shall meet the respective requirements and standards set forth for water utilized in these construction materials.
- 2.04 TEMPORARY SANITARY FACILITIES
- A. Provide sanitary facilities in compliance with Federal, state and local laws and regulations.
 - B. Service, clean and maintain facilities and enclosures.
- 2.05 TEMPORARY CONTROLS
- A. Noise Control: See Section 01100 – Special Project Procedures

B. Dust Control:

1. Provide positive methods and apply dust control materials to minimize raising dust from construction operations, and provide positive means to prevent airborne dust from dispersing into the atmosphere.

C. Pest and Rodent Control:

1. Provide pest and rodent control prior to start of construction to prevent infestation of surrounding neighborhood.
 - a. Employ methods and use materials that will not adversely affect conditions at the site or on adjoining properties.
 - b. Should the use of rodenticides be considered necessary, submit an informational copy of the proposed program to the Consultant. Clearly indicate:
 - 1) The area or areas to be treated
 - 2) The rodenticides to be used, with a copy of the manufacturer's printed instructions.
 - 3) The pollution preventative measures to be employed.
2. The use of any rodenticide shall be in full accordance with the Manufacturer's printed instructions and recommendations.

D. Debris Control:

1. Maintain all areas under Contractor's control free of extraneous debris.
2. Initiate and maintain a specific program to prevent accumulation of debris at construction site, storage and parking areas, or along access roads and haul routes.
 - a. Provide acceptable containers for deposit of debris.
 - b. Prohibit overloading of trucks to prevent spillages on access and haul routes.
 - 1) Provide periodic inspection of traffic areas to enforce requirements.
3. Schedule periodic collection and disposal of debris.
 - a. Provide additional collections and disposals of debris whenever the periodic schedule is inadequate to prevent accumulation.

E. Pollution Control:

1. Provide methods, means and facilities required to prevent contamination of soil, water or atmosphere by the discharge of noxious substances from construction operations.
2. Provide equipment and personnel, perform emergency measures required to contain any spillages, 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.
3. Take special measure 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.
4. Provide systems for control of atmospheric pollutants
 - a. Prevent toxic concentrations of chemicals
 - b. Prevent harmful dispersal of pollutants into the atmosphere

PART 3 – EXECUTION

3.01 GENERAL

- A. Maintain and operate systems to assure continuous service.
- B. Modify and extend systems, as work progress requires.

3.02 REMOVAL

- A. Completely remove temporary materials and equipment when their use is no longer required.
- B. Clean and repair damage caused by temporary installations or use of temporary facilities.

END OF SECTION

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SECTION 01505 – MOBILIZATION

PART I - GENERAL

1.01 DEFINITION AND SCOPE

A. Mobilization shall include the Contractor obtaining of all permits, insurance, and bonds; moving onto the site of all plant and equipment, temporary buildings and other construction facilities; all as required for the proper performance and completion of the Work. Mobilization shall include, but not be limited to, the following principal items:

1. Move onto the site all Contractor's plan and equipment required for first month operations.
2. Install temporary construction power, wiring, and lighting facilities.
3. Establish fire protection plan and safety program.
4. Secure construction water supply.
5. Provide on-site sanitary facilities and potable water facilities as specified.
6. Arrange for and erect Contractor's work and storage yard and employees' parking facilities.
7. Submit all required insurance certificates and bonds.
8. Obtain all required permits.
9. Post all OSHA, EPA, Department of Labor, and all other required notices.
10. Have Contractor's superintendent at the job site full time.
11. Submit a detailed construction CPM schedule acceptable to the Consultant as specified.
12. Submit a Schedule of Values of the Work.
13. Submit a schedule of submittals.

1.02 DEMOBILIZATION

A. Demobilization is the timely and proper removal of all contractor- owned material, equipment or plant, from the job site and the proper restoration or completion of work necessary to bring the site into full compliance with the

Contract Documents.

1.03 PAYMENT FOR MOBILIZATION/DEMOBILIZATION

- A. Contractor shall be limited to a maximum of 3.0 percent of the total price bid for mobilization. The cost of mobilization/demobilization shall be shown in the Schedule of Values.
- B. Demobilization shall be shown in the schedule of values as a minimum 25 percent of the value for mobilization.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

**SECTION 01540 - SECURITY AND SAFETY PROCEDURES FOR
INFRASTRUCTURE PROJECTS**

PART 1 GENERAL

1.01 As a minimum, the Contractor shall provide and assure that all of its personnel have and wear common colored Company shirts, safety vests, hard hats and substantial leather work shoes / boots. Other Personal Protective Equipment (PPE) as required by governing local, state and Federal laws and regulations.

1.02 SECTION INCLUDES

- A. Responsibility for Work Security
- B. Protection of Work in Progress, Materials and Equipment
- C. Protection of Existing Property
- D. Security Program
- E. Entry Control
- F. Personnel Identification
- G. Security Service
- H. Miscellaneous Restrictions

1.03 RELATED SECTIONS

- A. Section 01010 – Summary of Work
- B. Section 01500 - Temporary Facilities and Controls

1.04 RESPONSIBILITY OF WORK SECURITY

- A. Contractor shall, at its expense, at all times conduct all operations under the Contract in a manner to avoid the risk of loss, theft or damage by vandalism, sabotage or other means to any property. Contractor shall promptly take all reasonable precautions that are necessary and adequate against any conditions that involve a risk of loss, theft or damage to its property, at a minimum.
- B. Contractor shall continuously inspect all its work, materials, equipment and facilities to discover and determine any such conditions and shall be solely responsible for discovery, determination and correction of any such condition.

- C. Contractor shall prepare and maintain accurate reports of incidents of loss, theft or vandalism and shall furnish these reports to CITY within three (3) days of each incident.

1.05 PROTECTION OF WORK IN PROGRESS, MATERIALS AND EQUIPMENT

- A. Contractor shall be responsible for and shall bear any and all risk of loss or damage to work in progress, all materials delivered to the site, and all materials and equipment involved in the Work until completion and final acceptance of Work under this Contract. Excluded from Contractor's responsibility is any loss or damage that results from the sole active negligence of the CITY or its representatives.

1.06 PROTECTION OF EXISTING PROPERTY

- A. Contractor shall so conduct its operations as not to damage, close, or obstruct any utility installation, highway, road or other property until permits therefore have been obtained. If facilities are closed, obstructed, damaged or rendered unsafe by Contractor's operations, Contractor shall, at its expense, make such repairs and provide temporary guards, lights and other signals as necessary or required for safety and as will be acceptable to the CITY.
- B. Contractor shall conduct its operation so as not to damage any existing buildings or structures. The Contractor shall verify that means and methods of construction used inside, adjacent to, under or over existing buildings will not cause damage. The Contractor shall provide protection methods that are acceptable to the CITY.
- C. Unless otherwise specifically provided in the Contract, Contractor shall not do any work that would disrupt or otherwise interfere with the operation of any pipeline, telephone, electric, radio, gas, transmission line, ditch or other structure, nor enter upon lands in their natural state until approved by the CITY.
- D. Thereafter, and before it begins such work, Contractor shall give due notice to CITY of its intention to start such work. Contractor shall not be entitled to any extension of time or any extra compensation on account of any postponement, interference or delay caused by any such line, ditch or structure on or adjacent to the site of work.
- E. Contractor shall preserve and protect all cultivated and planted areas and vegetation such as trees, plants, shrubs and grass on or adjacent to the premises, which, as determined by CITY, do not reasonably interfere with the performance of this Contract.
- F. Contractor shall be responsible for damage to any such areas and vegetation

and for unauthorized cutting of trees and vegetation, including, without limitation, damage arising from the performance of its work through operation of equipment or stockpiling of materials. All cost in connection with any repairs or restoration necessary or required by reason of any such damage or unauthorized cutting shall be borne by Contractor.

1.07 SECURITY PROGRAM

- A. At the Pre-Construction Meeting, the CITY will make a final determination on which, if any, of the following requirements are to be implemented.
 - 1. Protect Work existing premises and CITY's operations from theft, vandalism, and unauthorized entry.
 - 2. Initiate program at project mobilization.
 - 3. Maintain program throughout construction period until CITY acceptance precludes the need for Contractor security.

1.08 RESTRICTIONS

- A. Do not allow cameras on site or photographs taken except by written approval of the CITY.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

Not Used.

END OF SECTION

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SECTION 01568 - TEMPORARY EROSION AND SEDIMENTATION CONTROL

PART 1 - GENERAL

1.01 DESCRIPTION

A. Scope of Work:

1. The Work specified in this Section consists of designing, providing, maintaining and removing temporary erosion and sedimentation controls as required by rules and regulations and permit conditions.
2. Temporary erosion controls include, but are not limited to, grassing, mulching, setting, watering and reseeding on-site surfaces and soil and burrow area surfaces and providing interceptor ditches at ends of berms and at those locations which will ensure that erosion during construction will be either eliminated or maintained within acceptable limits as established by the CITY.
3. Temporary sedimentation controls include, but are not limited to silt dams, traps, barriers, and appurtenances at the foot of sloped surfaces which will ensure that sedimentation pollution will be either eliminated or maintained within acceptable limits as established by the CITY.
4. Contractor is responsible for providing effective temporary erosion and sedimentation control and leaving them installed at completion of the Work.

B. Related Work Described Elsewhere:

1. Site Clearing: Section 02230
2. Sedimentation and Erosion Control: Section 02270.

PART 2 - PRODUCTS

2.01 SEDIMENTATION CONTROL

- A. Bales shall be clean, seed-free cereal hay type.
- B. Netting shall be fabricated of material acceptable to the CITY.
- C. Filter stone shall be crushed stone which conforms to Florida Department of Transportation (FDOT) specifications.

D. Concrete block shall be hollow, non-load bearing type.

E. Concrete shall be exterior grade not less than 1-inch thick.

PART 3 - EXECUTION

3.01 SEDIMENTATION CONTROL

A. Install and maintain silt dams, traps, barriers, and appurtenances as shown on the approved descriptions and working drawings. Hay bales which deteriorate and filter stone which is dislodged shall be replaced.

3.02 PERFORMANCE

A. Should any of the temporary erosion and sediment control measures employed by the Contractor fail to produce results which comply with the requirements of the State of Florida, the CITY or Consultant, Contractor shall immediately take whatever steps are necessary to correct the deficiency at its own expense.

END OF SECTION

SECTION 01570 – MAINTENANCE OF TRAFFIC

PART 1 GENERAL

1.01 Contractor shall provide all labor, material and services to perform all operations required for the maintenance and protection of vehicular and pedestrian traffic in conformance to all applicable FDOT laws and regulations and subject to acceptance and permits by Owner, Palm Beach County and FDOT as applicable.

1.02 REFERENCES

A. State of Florida Department of Transportation Standard Specifications for Road and Bridge Construction, Section 102, 2015 Edition (or latest edition)

B. State of Florida Manual of Traffic Control and Safe Practices for Street and Highway Construction, Maintenance and Utility Operations

C. The Manual of Uniform Traffic Control Devices, latest edition

D. ROW Permit

1.03 SUBMITTAL

A. Submit Traffic Control Plans, ROW Permit Applications and Construction Schedule to the Owner, Palm Beach County (if applicable), and the FDOT (if applicable) for review and acceptance 30 days prior to the start of construction.

1.04 SIGNS AND DEVICES

A. Traffic Control and Informational Signs

B. Traffic Cones and Drums, and Lights

C. Traffic Controllers Equipment

1.05 CONSTRUCTION PARKING CONTROL

A. Control vehicular parking to prevent interference with public traffic and parking, access by emergency vehicles and Owner's operations. Contractor's employee's personal vehicles shall NOT be parked "in and around" the project site. Contractor's employee's personal vehicles shall be parked at the storage yard.

1.06 TRAFFIC CONTROLLERS

- A. Provide trained and equipped traffic controllers to regulate traffic when construction operations encroach on public traffic lanes.

1.07 LIGHTS

- A. Use approved barricades with lights during hours of low visibility to delineate traffic lanes and to guide traffic.

1.08 TRAFFIC SIGNS AND DEVICES

- A. At approaches to site and on site, install at crossroads, detours, parking areas, and elsewhere as needed, to direct construction and affected public traffic. The Contractor shall submit traffic control through work zone plans based on FDOT Roadway and Traffic Design Standards, 2015 Edition (or latest edition).
- B. Relocate as Work progresses, to maintain effective traffic control.

1.09 REMOVAL

- A. Remove equipment and devices when no longer required.
- B. Repair damage caused by installation.

1.10 SPECIFIC TRAFFIC CONTROL

- A. Contractor shall maintain through traffic on all public roads at all times unless stated otherwise herein.
- B. Contractor shall maintain access to all vehicular driveways (public or private) at all times. Contractor shall backfill and install temporary rock base as necessary in order to provide safe and functional access to all driveways.
- C. Contractor shall coordinate with the Police and Fire Departments for whom the Contractor will provide satisfactory access at all times.
- D. Contractor shall maintain, at the minimum, one travel lane, in each direction, when performing work within the Palm Beach County Right-of-Way.

1.11 EXECUTION

- A. The Contractor shall arrange its work to cause minimum disturbance to normal pedestrian and vehicular traffic; and shall be held responsible for

providing and maintaining suitable means of access (including emergencies) to all public and private properties during all stages of the construction.

- B. If it becomes necessary to block off an entire street to vehicular traffic during construction (other than for an emergency situation), the Contractor must secure the written authorization of the CITY and Palm Beach County or FDOT as acknowledged as a condition of the Right-of-Way (ROW) permit(s) prior to completely blocking off the roadway.

1.12 UNIT PRICE – MEASUREMENT AND PAYMENT

- A. Refer to Section 01025 - MEASUREMENT AND PAYMENT PROCEDURES.

END OF SECTION

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SECTION 01600 - MATERIAL AND EQUIPMENT

PART 1 - GENERAL

1.01 DESCRIPTION

A. Scope of Work: Material and equipment incorporated into the Work:

1. Manufactured and fabricated products:
 - a. Design, fabricate and assemble in accord with the best engineering and shop practices.
 - b. Manufacture like parts of duplicate units to standard sizes and gauges, to be interchangeable.
 - c. Two (2) or more items of the same kind shall be identical, by the same manufacturer.
 - d. Products shall be suitable for service conditions.
 - e. Equipment capacities, sizes and dimensions shown or specified shall be adhered to unless variations are specifically approved in writing.
2. Do not use material or equipment for any purpose other than that for which it is designed or specified.

1.02 MANUFACTURER'S INSTRUCTIONS FOR INSTALLATION

- A. When Contract Documents require that installation of Work shall comply with manufacturer's printed instructions. Contractor shall obtain and distribute copies of such instructions to parties involved in the installation, including five (5) copies to the Consultant.
1. Maintain one (1) set of complete instructions at the job site during installation and until completion.
- B. Contractor shall handle, install, connect, clean, condition and adjust products in strict accord with such instructions and in conformity with specified requirements.
1. Should job conditions or specified requirements conflict with manufacturer's instructions, consult with Consultant for further instructions.
 2. Do not proceed with Work without clear instructions.

- C. Contractor shall perform work in accordance with manufacturer's instructions. Do not omit any preparatory step or installation procedure unless specifically modified or exempted by Contract Documents.

1.03 TRANSPORTATION AND HANDLING

- A. Contractor shall arrange deliveries of products in accordance with progress schedules, coordinate to avoid conflict with work and conditions at the site.
 - 1. Deliver products in undamaged condition, in manufacturer's original containers or packaging, with identifying labels intact and legible.
 - 2. Immediately on delivery, inspect shipments to assure compliance with requirements of Contract Documents and approved submittals, and that products are properly protected and undamaged.
- B. Contractor shall provide equipment and personnel to handle products by methods to prevent soiling or damage to products or packaging.

1.04 STORAGE AND PROTECTION

- A. The Contractor shall furnish a covered, weather-protected storage structure providing a clean, dry, non-corrosive environment for all mechanical equipment, valves, architectural items, electrical and instrumentation equipment, and special equipment to be incorporated into this Project. Storage or equipment shall be in strict accordance with the "instructions for storage" of each equipment supplier and manufacturer including connection of heaters, placing of storage lubricants in equipment, etc. Corroded, damaged or deteriorated equipment and parts shall be replaced before acceptance of the Project. Equipment and materials not properly stored will not be included in a payment estimate.
- B. Contractor shall store products in accord with manufacturer's instructions, with seals and labels intact and legible.
 - 1. Store products subject to damage by the elements in weather-tight enclosures.
 - 2. Maintain temperature and humidity within the ranges required by manufacturer's instructions.
 - 3. Store fabricated products above the ground, on blocking or skids, prevent soiling or staining. Cover products which are subject to deterioration with impervious sheet coverings, provide adequate ventilation to avoid condensation.

4. Store loose granular materials in a well-drained area on solid surfaces to prevent mixing with foreign matter.
- C. All materials and equipment to be incorporated in the Work shall be handled and stored by the Contractor before, during and after shipment in a manner to prevent warping, twisting, bending, breaking, chipping, rusting, and any injury, theft or damage of any kind whatsoever to the material or equipment.
- D. Contractor shall store under a roof or off the ground cement, sand and lime, and shall be kept completely dry at all times. All structural and miscellaneous steel, and reinforcing steel shall be stored off the ground or otherwise to prevent accumulations of dirt or grease, and in a position to prevent accumulations of standing water and to minimize rusting. Beams shall be stored with the webs vertical. Precast concrete beams shall be handled and stored in a manner to prevent accumulations of dirt, standing water, staining, chipping or cracking. Brick, block and similar masonry products shall be handled and stored in a manner to reduce breakage, chipping, cracking and spalling to a minimum.
- E. All materials, which, in the opinion of the Consultant, have become so damaged as to be unfit for the use intended or specified, shall be promptly removed by the Contractor from the site of the Work, and the Contractor shall receive no compensation for the damaged material or its removal.
- F. Contractor shall 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.
- G. Protection After Installation: Contractor shall provide substantial coverings as necessary to protect installed products from damage from traffic and subsequent construction operations. Remove covering when no longer needed.
- H. The Contractor shall be responsible for all material, equipment and supplies sold and delivered to the CITY under this Contract until final inspection of the Work and acceptance thereof by the CITY. In the event any such material, equipment and supplies are lost, stolen, damaged or destroyed prior to final inspection and acceptance, the Contractor shall replace same without additional cost to the CITY.
- I. Should the Contractor fail to take proper action on storage and handling of equipment supplied under this Contract within seven (7) days after written notice to do so has been given, the CITY retains the right to correct all deficiencies noted in previously transmitted written notice and deduct the cost

associated with these corrections from the Contractor's Contract. These costs may be comprised of expenditures for labor, equipment usage, administrative, clerical, engineering and any other costs associated with making the necessary corrections.

1.05 STORAGE AND HANDLING OF EQUIPMENT ON SITE

A. Because of the long period allowed for construction, special attention shall be given to the storage and handling of equipment on site. As a minimum, the procedure outlined below shall be followed by Contractor:

1. All equipment having moving parts such as gears, electric motors, etc. and/or instruments shall be stored in a temperature and humidity controlled building approved by the Consultant, until such time as the equipment is to be installed.
2. All equipment shall be stored fully lubricated with oil, grease, etc. unless otherwise instructed by the manufacturer.
3. Manufacturer's storage instructions shall be carefully studied by the Contractor and reviewed with the Consultant by him. These instructions shall be carefully followed and a written record of this kept by the Contractor.
4. Moving parts shall be rotated a minimum of once weekly to insure proper lubrication and to avoid metal-to-metal "welding". Upon installation of the equipment, the Contractor shall start the equipment, at least half the load, once weekly for an adequate period of time to insure that the equipment does not deteriorate from lack of use.
5. Lubricants shall be changed upon completion of installation and as frequently as required thereafter during the period between installation and acceptance. Mechanical equipment to be used in the Work, if stored for longer than ninety (90) days, shall have the bearings cleaned, flushed and lubricated prior to testing and startup, at no extra cost to the CITY.
6. Prior to acceptance of the equipment, the Contractor shall have the manufacturer inspect the equipment and certify that its condition has not been detrimentally affected by the long storage period. Such certifications by the manufacturer shall be deemed to mean that the equipment is judged by the manufacturer to be in a condition equal to that of equipment that has been shipped, installed, tested and accepted in a minimum time period. As such, the manufacturer will guarantee the equipment equally in both instances. If such a certification is not given, the equipment shall be judged to be defective. It shall be removed and replaced at the Contractor's expense.

1.06 SPARE PARTS

- A. Spare parts for certain equipment provided under Divisions 11: Equipment; 13: Special Construction; 15: Mechanical; and 16: Electrical have been specified in the pertinent sections of the Technical Specifications. The Contractor shall collect and store all spare parts so required in an area to be designated by the Consultant. In addition, the Contractor shall furnish to the Consultant an inventory listing all spare parts, the equipment they are associated with, the name and address of the supplier, and the delivered cost of each item. Copies of actual invoices for each item shall be furnished with the inventory to substantiate the delivered cost.

1.07 GREASE, OIL AND FUEL

- A. All grease, oil and fuel required for testing of equipment shall be furnished with the respective equipment. The CITY shall be furnished with a year's supply of required lubricants including grease and oil of the type recommended by the manufacturer with each item of equipment supplied.
- B. The Contractor shall be responsible for changing the oil in all drives and intermediate drives of each mechanical equipment after initial break-in of the equipment, which in no event shall be any longer than three (3) weeks of operation.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

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SECTION 01630 - SUBSTITUTIONS AND PRODUCT OPTIONS

PART 1 – GENERAL

1.01 REQUIREMENTS INCLUDED

- A. Contractor shall furnish and install products specified under options and conditions for substitutions stated in this Section.

1.02 RELATED REQUIREMENTS

- A. Information for Bidders and General Conditions.
- B. Section 01410: Testing Laboratory Services.
- C. Section 01700: Contract Closeout.

1.03 PRODUCTS LISTED

- A. Within thirty (30) days after award of Contract, submit to Consultant six (6) copies of complete list of major products which are proposed for installation.
- B. Tabulate products by specification section number and title.
- C. For products specified only by reference standards, list for each such product:
 - 1. Name and address of manufacturer.
 - 2. Trade name.
 - 3. Model or catalogue designation.
 - 4. Manufacturer's data:
 - a. Reference standards.
 - b. Performance test data.

1.04 CONTRACTOR'S OPTIONS

- A. For products specified only by reference standard, select product meeting that standard, by any manufacturer.
- B. For products specified by naming several products or manufacturers, select any one of those products and manufacturers named which complies with Specifications.
- C. For products specified by naming only one or more products or manufacturers

and stating "or equal", select one of those named products or manufacturers. After award of Contract, submit a request as for substitutions, for any product or manufacturer which is not specifically named.

- D. For products specified by naming only one product and manufacturer, there is no option and no substitution will be allowed.

1.05 SUBSTITUTIONS

- A. Within a period of thirty (30) days after award of Contract, Consultant will consider formal requests from the Contractor for substitution of products in place of those specified:

1. After the end of that period, the request will be considered only in case of product unavailability or other conditions beyond the control of the Contract Documents:

- B. Submit a separate request for each substitution. Support each request with:

1. Complete data substantiating compliance of the proposed substitution. Support each request with:
 - a. Product identification, including manufacturer's name and address.
 - b. Manufacturer's literature; identify:
 - 1) Product description.
 - 2) Reference standards.
 - 3) Performance and test data.
 - c. Samples, as applicable.
 - d. Name and address of similar projects on which product has been used, and the date of each installation.
2. Itemized comparison of the proposed substitution with product specified; list significant variations.
3. Data relating to changes in the construction schedule.
4. Any effect of the substitution on separate contracts.
5. List of changes required in other work or products.

6. Accurate cost data comparing proposed substitution with product specified.
7. Designation of required license fees or royalties.
8. Designation of availability of maintenance services and sources of replacement materials.

C. Substitutions will not be considered for acceptance when:

1. They are indicated or implied on Shop Drawings or product data submittals without a formal request from Contractor.
2. They are requested by anyone other than Contractor.
3. Submitted without data relating to changes in construction schedule.
4. Any effect of substitution on separate contracts is not included.
5. A list of changes required in other work or products is not included.
6. Accurate cost data comparing proposed substitution with product specified is not included.
7. Designation of required license fees or royalties is not included.
8. Designation of availability of maintenance services, sources of replacement materials is not included.
9. Acceptance will require substantial revision of Contract Documents.

D. Substitute products shall not be ordered or installed without written acceptance of Consultant.

E. Consultant will determine the acceptability of proposed substitutions. Contractor shall pay all costs associated with Consultant's review.

1.06 CONTRACTOR'S REPRESENTATION

A. In making formal request for substitution Contractor represents that:

1. It has investigated the proposed product and has determined that it is equal to or superior in all respects to that specified.
2. It will provide same warranties or bonds for substitution as for product specified.

3. It will coordinate installation of accepted changes as may be required for the Work to be complete in all respects.
4. It waive claims for additional costs caused by substitution which may subsequently become apparent.
5. It will pay all costs, resulting under separate contracts, which result from the substitution.
6. It will pay all engineering costs for redesign or revision of the Contract Documents.
7. Cost data is complete and includes related costs under this Contract, but not:
 - a. Costs under separate contracts.
 - b. Consultant's costs of redesign or revision of Contract Documents.

1.07 CONSULTANT DUTIES

- A. Review Contractor's requests for substitutions with reasonable promptness.
- B. Notify Contractor in writing of decision to accept or reject requested substitution.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

END OF SECTION

SECTION 01700 - CONTRACT CLOSEOUT

PART 1 - GENERAL

1.01 DESCRIPTION

- A. Scope of Work: Contractor shall comply with requirement stated in Conditions of the Contract and in specifications for administrative procedures in closing out the Work.
- B. Related Requirements Described Elsewhere:
 - 1. Cleaning: Section 01710
 - 2. Project Record Documents: Section 01720
 - 3. Operating and Maintenance Data: Section 01730
 - 4. Warranties and Bonds: Section 01740.

1.02 SUBSTANTIAL COMPLETION

- A. The Work will not be substantially complete, and Contractor may not request substantial completion inspection unless the following submittals and work is completed:
 - 1. All work specified herein and shown on the drawing is complete.
 - 2. Project Record Documents have been submitted and reviewed to the requirements of Section 01720.
 - 3. All deficiencies noted on inspection reports or non-conformances are corrected or the correction plan approved.
 - 4. Contractor to submit evidence of compliance with the requirements of governing authorities.
- B. When the conditions of paragraph 1.02 A. are met the Contractor shall submit to the Consultant:
 - 1. A written notice that it considers the Work, or portion thereof, is substantially complete, and request an inspection.
- C. Within a reasonable time after receipt of such notice, the Consultant will make an inspection to determine the status of completion.

D. When the Consultant finds that the Work is substantially complete, Consultant will:

1. Attend a Substantial Completion walk-through of the facility to include the CITY, Contractor and Consultant and/or Engineer of Record to determine the completeness of the Project and readiness of the facility for occupancy.
2. Prepare and deliver to CITY a Certificate of Substantial Completion with the punchlist of items to be completed or corrected before final inspection.

1.03 FINAL INSPECTION

A. Prior to Contractors request for a final inspection the following submittals and Work must be complete:

1. Project Record Documents must be approved.
2. Equipment and systems have been tested in the presence of the CITY's representative and are operational and training, when applicable.
3. All punchlist items have been corrected.

B. The Consultant will, within reasonable time, make an inspection to verify the status of completion with reasonable promptness after receipt of Contractor's request.

C. Should the Consultant consider that the Work is incomplete or defective:

1. The Consultant will promptly notify the Contractor in writing, listing the incomplete or defective work.
2. Contractor shall take immediate steps to remedy the stated deficiencies, and send another written certification to the Consultant that the Work is complete.
3. The Consultant will within a reasonable amount of time, re-inspect the Work and the Contractor shall be liable for re-inspection fees as described in paragraph 1.04.

D. When the Consultant finds that the Work is acceptable under the Contract Documents, the Contractor may make closeout submittals.

1.04 RE-INSPECTION FEES

A. Should the Consultant perform re-inspections due to failure of the Work to

comply with the claims of status of completion made by the Contractor:

1. Contractor will compensate the CITY for such additional services.
2. CITY will deduct the amount of such compensation from the final payment to the Contractor.

1.05 CONTRACTOR'S CLOSEOUT SUBMITTALS

- A. Warranties and Bonds: To requirements of Section 01740.
- B. Evidence of Payment and Release of Liens: To requirements of General and Supplementary Conditions.
- C. Certificate of Insurance for Products and Completed Operations.
- D. Final Application for Payment
- E. Certificate of Substantial Completion.
- F. Certificate of Final Inspection, Testing, and Acceptance
- G. Closeout of all applicable permits:
 1. State or other jurisdictional permits (as applicable):
 - a. FDOT
 - b. LWDD
 - c. SFWMD
 - d. USACE
 - e. FEC
 - f. CSX
 2. PBC ROW/MOT
 3. PBC Health Department
 4. PBC Building Department
 5. City of Lake Worth Right-of-Way (ROW)
 6. City of Lake Worth Building Department

1.06 FINAL ADJUSTMENT OF ACCOUNTS

- A. Submit a final statement of accounting to the Consultant.

B. Statement shall reflect all adjustments to the Contract Sum:

1. The original Contract Sum.
2. Additions and deductions resulting from:
 - a. Previous change orders or written amendment.
 - b. Allowances.
 - c. Unit prices.
 - d. Deductions for uncorrected work.
 - e. Deductions for liquidated damages.
 - f. Deductions for re-inspection payments.
 - g. Other adjustments.
3. Total Contract Sum, as adjusted.
4. Previous payments.
5. Sum remaining due.

C. Consultant will prepare a final Change Order, reflecting approved adjustments to the Contract Sum which were not previously made by Change Orders.

1.07 FINAL APPLICATION FOR PAYMENT

A. Contractor shall submit the final Application for Payment in accordance with procedures and requirements stated in the Conditions of the Contract.

1.08 RECORD DOCUMENT SUBMITTAL REQUIREMENTS

- A. Submit data on 8 ½ x 11 inch pages in three-ring binders with durable covers.
- B. Prepare binder cover and binder spine with printed title “RECORD DOCUMENT MANUAL”, title of project, and subject matter of binder when multiple binders are required.
- C. Internally subdivide the binder contents with permanent page dividers and tabs.
- D. Contents: Prepare a Table of Contents as follows:

1. Part 1: Directory, listing names, addresses, and telephone numbers of Engineer, Contractor, Subcontractors and major equipment suppliers.
 2. Part 2: Project documents and certificates, including the following:
 - a. Certificate of Substantial Completion with signed-off Substantial Completion punchlist.
 - b. Certificate of Final Acceptance.
 - c. Warranty of Title, form WT-1
 - d. Final Release of Lien
 - e. Pre- and Post-construction videos and photographs on DVD or CD.
 - f. Certifications of closeout of all applicable permits (NPDES, PBC Health Department, SFWMD, LWDD, PBC or CBB Building Permits, etc.)
- E. Submit Operation and Maintenance (O & M) Manuals for all equipment. The O&M Manuals shall include the following information:
- a. Manufacturer's name, address, and telephone number.
 - b. List of equipment
 - c. Parts list for each component
 - d. Operating instructions
 - e. Maintenance instructions for equipment and systems.
- F. Submit to the CITY, one (1) draft copy of the RECORD DOCUMENT MANUAL fifteen (15) days prior to the request for Final Inspection, Testing and Acceptance. This copy will be reviewed and returned prior to Final Inspection, Testing and Acceptance, with the CITY's comments. Revise content of all document sets as required.
- G. Submit one (1) revised FINAL RECORD DOCUMENT MANUAL and six (6) sets for all Operation and Maintenance Manuals, within ten (10) days after Final Inspection, Testing and Acceptance.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.1 CLOSEOUT PROCEDURES

- A. Submit written certification that the Work has been completed in accordance with Contract Documents and is ready for the Substantial Completion and/or Final Completion walk-throughs.
- B. Provide submittals to the Consultant and the CITY that are required by governing or permitting authorities such as Palm Beach County Health Department, Palm Beach County Traffic/Land Development, FDOT, etc. in order to closeout the project.
- C. Submit final Application for Payment identifying total adjusted Contract Sum, previous payments, and full release of retainage.
- D. Final payment and release of retention with NOT be made until the RECORD DOCUMENT MANUALS, Operation and Maintenance Manuals, and the "AFTER" photographic survey, video, and photographs on DVD/CD have been received and accepted by the CITY.

END OF SECTION

SECTION 01705 - RECORD DRAWING REQUIREMENTS

PART 1 GENERAL

1.01 The Record Drawings are prepared by the Contractor and are used to document the actual construction and other conditions noted in the Contract Documents.

1.02 REQUIREMENTS INCLUDE

A. Contractor shall maintain at the site, a record copy of:

1. Drawings
2. Approved Shop Drawings, Product Data and Samples
3. Field Test Records

1.03 RELATED SECTIONS:

- A. Measurement and Payment Procedures – Section 01025
- B. Shop Drawings, Work Drawings, and Samples – Section 01340
- C. Testing Laboratory Services – Section 01410
- D. Substitutions and Product Options – Section 01630

1.04 RELATED REQUIREMENTS

- A. The completed final Record Drawings shall be certified by a Florida Registered Land Surveyor. This certification shall consist of the surveyor's embossed seal bearing his/her registration number, the surveyor's signature and date (of the survey) on each sheet of the drawing set (including the cover and key sheet). Standard Detail sheets are not required to be included in the Record Drawing set. In addition, all Record Drawing sheets shall list the company name, business address, and telephone number of surveyor. Additionally, the Record Drawings shall meet all Minimum Technical Standards (MTS) requirements.
- B. AutoCAD computer generated progress Record Drawings are required to be submitted with each Application For Payment.

1.05 MAINTENANCE OF RECORD DRAWINGS

- A. The Contractor shall maintain full size (24"x36") field drawings to reflect the installed / accepted items of work as the Work progresses. Upon completion of the Work, the Contractor shall submit two (2) sets of full size, signed and sealed Record Drawings and one (1) CD or DVD with the electronic PDF and AutoCAD files (AutoCAD 2010 or newer format). All Record Drawings shall be generated with AutoCAD, and conversions from any other CAD platform to AutoCAD once the drawings are finished are not allowed. Points collected shall be generated with AutoCAD Land Desktop or AutoCAD Civil 3D. An electronic set of the design drawings (including all pertinent XREF's, CTB files, images, etc.) will be furnished to the Contractor by the design engineer at no cost.
- B. Contractor shall label each document, "PROJECT RECORD DRAWING" in neat large printed letters, or by rubber stamp.
- C. Contractor shall maintain documents in a clean, dry, legible condition and in good order. Do not use record documents for construction purposes.
- D. Record information must be created concurrently with construction progress. Contractor shall not conceal any work until required information is recorded.
- E. Contractor shall make documents and samples available for inspection by CITY and CONSULTANT at all times.

1.06 RECORD DRAWINGS

- A. Survey/GPS Points: All points shall be collected via NAD83 FL State Plane coordinates and elevations collected via the NAVD88 vertical datum. All drawings shall be in the proper coordinate base, coordinates shall be called out on the drawings, and all field collected data shall be submitted in comma delimited text electronic format.
- B. Record Drawings shall include complete as installed information including paving and drainage relative to pavement location; concrete curb; gutter and sidewalks; elevations of surface drainage flows to insure proper routings of storm water runoff; location of inlets, manholes, outfalls, endwalls and control structures; as well as pipe inverts, top of grates, rim elevations, and other features that were constructed in the Project.
- C. The Record Drawings shall include complete as installed information of the utility systems, (water, sanitary sewer and storm water systems) including service laterals, sample points, valves, backflow preventers, information relative to location of manholes, valve pits (enclosures), wet wells, lift stations, as well as the inverts and rim elevations, and any other features that were either constructed as part of the project or discovered during the construction of the project. Any and all As-Built utilities that vary from the

design drawing set shall be moved spatially to its correct locations and reflected accordingly in the AutoCAD, PDF, and hard copy Record Drawings.

- D. Dimensional ties to water lines shall be provided, both horizontal and vertical, at a minimum of every 200 linear feet (lf). Each water line dimensional tie shall include centerline stationing and be referenced to the nearest edge of roadway paving with elevation of the top of the pipe.
- E. Contractor's Record Drawings shall include the key sheet / key map with exact system pipe line and valve locations indicated including GPS coordinates.
- F. Computer generated Record Drawings shall be submitted; data in tabular form will not be accepted.
- G. Additionally, GPS coordinates certified by the surveyor, shall be provided for:
 - 1. Water Mains (including raw water as applicable): Valves, fittings, fire hydrants, permanent sample points, service taps and meters.
 - 2. Sanitary Sewers: - Manholes and cleanouts.
 - 3. Stormwater systems: Inlets, manholes and outfalls (including MES).
 - 4. Force Mains: Valves and fittings.
 - 5. Reuse Mains: Valves, fittings, permanent sample points, service taps and meters.
 - 6. Wellfields: Wellheads and valves
 - 7. General: Street light poles, hand-holds and pull boxes
- H. Representative items of work that shall be shown on the Record Drawings as verified, changed or added are shown below:
 - 1. Plans:
 - a. Structure types, location with grade of rim and flow-line elevations.
 - b. Piping system type (water main, gravity sewer, etc.), length, size and elevations.
 - c. Utility type, length, size and elevation in conflict structures

- d. All maintenance access structures, valve pits, valves and hydrants within right-of way.
 - e. Critical spot elevations at high or low intersections and the midpoint of all intersections.
 - f. Sewer laterals.
2. Pavement Marking and Signing Plans: Sign location where installed if different from plans.
- I. Record Drawing shall include the following criteria at a minimum.
- 1. Record Drawings of water lines shall include the following information:
 - a. Top of pipe elevations and horizontal location every 100 linear feet (lf).
 - b. Separation callouts between water main, sanitary sewer mains and laterals, reclaimed water and storm drainage piping and structures.
 - c. Final elevations of surface feature including roadway crown, edge of pavement (roadway and sidewalk) and swale elevations every 200 liner feet (lf).
 - d. GPS locations and elevations of fittings, valves, fire hydrants, permanent sample points and water service taps and meters.
 - e. All tie-ins to existing lines shall be shown in an enlarged detail of the tie-in configuration.
 - f. All water services
 - 2. Record Drawings of all gravity sanitary sewer lines include the following information:
 - a. Rims, inverts and length of piping between structures as well as slopes.
 - b. Separation callouts between water main, sanitary sewer mains and laterals and storm drainage piping and structures.
 - c. The stub ends of all sewer laterals shall be located via GPS and if there are any cleanouts installed on the sewer laterals then the invert elevation of these cleanouts need to be obtained.

- d. Lift station Record Drawings shall consist of top of wet well elevation, invert elevation of the incoming line, bottom of the wet well and of the compound area.
3. Force main Record Drawings shall be prepared the same as the water line Record Drawings.
4. Reclaimed water Record Drawings shall be prepared the same as the water line Record Drawings.
5. Record Drawings of all storm water drainage systems shall include the following information:
 - a. Structures, grate elevations, inverts and diameter and length of pipe line between structures, type of drainage system (conveyance and/or exfiltration) and weir elevations if applicable.
 - b. Separation callouts between water main, sanitary sewer mains and laterals and storm drainage piping and structures.
 - c. Cross section (ROW to ROW) every 50 feet or critical change in elevation and at each inlet showing sidewalk, inlet grate and/or top and bottom of swale/slope, edge of roadway, roadway crown, edge of roadway, grate and sidewalk elevations.
6. All rock and asphalt Record Drawings for parking lot, roadways and swales areas shall consist of the following:
 - a. Rock elevations at all high and low points, and at enough intermediate points to confirm slope consistency and every 50' for roadways.
 - b. Rock elevations shall be taken at all locations where there is a finish grade elevation shown on the design plans.
 - c. All catch basin and manhole rim / grate elevations shall be shown.
 - d. Elevations around island areas are required.
 - e. As constructed elevations 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.
7. Lake and canal bank Record Drawings 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 linear feet (lf) and the top and

bottom of slope/edge of water around the lake or canal, unless otherwise specified. Record Drawings 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. If there are contours indicated on the design plans, then they shall be recorded as well.

- a. Retention area Record Drawings 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 recorded as well.
- b. If a change is made via field order or deviation to any structure, pipeline, etc., a new location shall be noted on the Record Drawings. The Consultant may request additional Record Drawing information to verify horizontal or vertical locations.

1.07 SUBMITTAL

- A. Record Drawings - As a condition precedent to the Contractor's request for Final Inspection, Testing and Acceptance, the Contractor shall furnish to CITY a complete set of full size paper prints, marked-up Record Drawings with "RECORD DRAWINGS" clearly printed on each sheet for review and approval. If there was no change to the drawing, it shall be marked "RECORD DRAWING – NO CHANGE". All final Record Drawing sheets shall be certified, signed and sealed by the Contractor's surveyor.
- B. Additionally, the Contractor shall certify by stamping and signing each Record Drawing sheet indicating the fact that it has been reviewed and accepted.
- C. Initially, two (2) signed and sealed paper prints are to be submitted to the Project Manager for review. Following review by the Consultant and CITY, any comments are to be addressed. On final submission, the following items shall be provided:
 1. Two (2) sets of signed and sealed drawings (24 in. x 36 in.). If sent by mail or courier, the drawings shall be packaged in properly sized shipping tubes.
 2. PDF and AutoCAD electronic files on CD or DVD. All proposed data must be crossed out and the computer generated As-Built data must be easily identified and put on AutoCAD layers other than those used by the Design Engineer, with the text "ASB" preceding the layer name. A bold or different font and line weight may be used. A sample of record data must be added to the legend and shown on each plan/profile sheet.

- D. The electronic files submitted must be in PDF and AutoCAD 2010 or newer format. All digital files are to be copied on CD or DVD. All fonts and linetypes shall be from the standard AutoCAD library. Any attachments to drawings (i.e., XREFs, Images, CTB files, or any such attached files) shall be written to CD or DVD. Original layer states shall be saved in AutoCAD prior to making any changes to drawings using the Layer State Manager under the Layer Properties Manager dialog box. As a minimum requirement, electronic files must include all features that were shown on the approved construction plans.

- E. When identified on the Schedule of Bid Items as a separate pay item, Record Drawings shall be paid for once the FINAL project Record Drawings have been submitted to and accepted by the CITY and CONSULTANT.

PART 2 PRODUCTS - Not Used.

PART 3 EXECUTION - Not Used.

END OF SECTION

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SECTION 01710 – CLEANING

PART 1 - GENERAL

1.01 DESCRIPTION

- A. Scope of Work: Contractor shall execute cleaning, during progress of the Work and at completion of the Work.

1.02 DISPOSAL REQUIREMENTS

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

PART 2 - PRODUCTS

2.01 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 manufacturer of the surface material to be cleaned.
- C. Use cleaning materials only on surfaces recommended by cleaning material manufacturer.

PART 3 - EXECUTION

3.01 DURING CONSTRUCTION

- A. Execute daily cleaning to keep the Work, the site and adjacent properties free from accumulations of waste materials, rubbish and windblown debris, resulting from construction operations or personal activities.
- B. Remove waste materials, debris and rubbish from the site as needed and dispose of at legal disposal areas away from the site.
- C. Contractor shall coordinate and cooperate with the CITY for the routine collection of garbage, debris and recycle materials by assuring access to oversized vehicles. If access to the property owner pick-up points, Contractor shall gather the collection bins, stage them in a pick-up area and then return to the individual property owners after the garbage and/or recycle has been picked-up.

3.02 DUST CONTROL

- A. Clean interior spaces prior to the start of finish painting and continue cleaning on an as-needed basis until paint is finished.
 - B. Schedule operations so that dust and other contaminants resulting from cleaning process will not fall on wet or newly-coated surfaces.
- 3.03 FINAL CLEANING
- 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.
 - B. 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 that the entire Work is clean.

END OF SECTION

SECTION 01720 - PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.01 IN-PROGRESS PROJECT RECORD DOCUMENTS

A. All dimensions and annotations that are noted below shall be included on the progress and final Record Drawings. Contractor shall maintain on site one (1) record copy for the Consultant of the following as it progresses:

1. Drawings:
 - a. Trench bottom elevations
 - b. Top of bedding (when imported bedding is required)
 - c. Pipe invert at each structure
 - d. Station and off-set measurements including grate elevations for structures.
 - e. GPS coordinates/notations
 - f. Mapping of all soil density test results (pass and fail)
2. Specifications
3. Addenda.
4. Change Orders and other modifications of the Contract.
5. Consultant's Field Orders or written instructions.
6. Approved Shop Drawings, Working Drawings and Samples.
7. Field Test records.
8. Maintenance of Traffic (MOT) Plans
9. Construction photographs.

B. Related Requirements Described Elsewhere:

1. Field Engineering: Section 01050.
2. Shop Drawings, Working Drawings and Samples: Section 01340.

3. Construction Photographs: Section 01380.
4. Video and Photographic Site Survey: Section 01390

1.02 RECORDING

- A. Label each document "PROJECT RECORD" in neat large printed letters.
- B. Record information concurrently with construction progress.
 1. Do not conceal any work until required information is recorded.
- C. Drawings: Legibly mark to record actual construction:
 1. Depths of various elements of foundation in relation to finish first floor datum.
 2. Location of existing internal utilities and appurtenances concealed in the construction, referenced to visible and accessible features of the structure.
 3. Field changes of dimension and detail.
 4. Changes made by Field Order or by Change Order.
 5. Details not on original Contract Drawings.
 6. Equipment and piping relocations.
- D. Specifications and Addenda: Legibly mark each section to record:
 1. Manufacturer, trade name, catalog number of Supplier of each product and item of equipment actually installed.
 2. Product substitutions and alternates utilized.
 3. Changes made by Field Order or by Change Order.

1.02 SUBMITTAL

- A. At Contract closeout, deliver Record Documents to the Consultant for the CITY.
- B. Accompany submittal with transmittal letter in duplicate, containing:
 1. Date.

2. Project title and number.
3. Contractor's name and address.
4. Title and number of each Record Document.
5. Signature of Contractor or his authorized representative.

PART 2 - PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

END OF SECTION

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SECTION 01730 - OPERATING AND MAINTENANCE DATA

PART 1 - GENERAL

1.01 DESCRIPTION

A. Scope of Work:

1. Contractor shall compile product data and related information appropriate for CITY's maintenance and operation of products furnished under Contract.
 - a. Prepare operating and maintenance data as specified in this Section and as referenced in other pertinent sections of Specifications.
2. Contractor shall instruct CITY's personnel in maintenance of products and in operation of equipment and systems.

B. Related Requirements Described Elsewhere:

1. Contract Closeout: Section 01700
2. Project Record Documents: Section 01720

1.02 QUALITY ASSURANCE

A. Preparation of data shall be done by personnel:

1. Trained and experienced in maintenance and operation of described products.
2. Familiar with requirements of the Section.
3. Skilled as technical writer to the extent required to communicate essential data.
4. Skilled as draftsman competent to prepare required drawings.

1.03 FORM OF SUBMITTALS

A. Prepare data in form of an instructional manual for use by CITY's personnel.

B. Format:

1. Size: 8-1/2 inches x 11 inches.

2. Paper: 20 pound minimum, white, for typed pages.
3. Text: Manufacturer's printed data, or neatly typewritten.
4. Drawings:
 - a. Provide reinforced punched binder tab, bind in with text.
 - b. Reduce larger drawings and fold to size of text pages but not larger than 14 inches x 17 inches.
5. Provide fly-leaf for each separate product, or each piece of operating equipment.
 - a. Provide typed description of projects and major component parts of equipment.
 - b. Provide identified tabs.
6. Cover: Identify each volume with typed or printed title "OPERATING AND MAINTENANCE INSTRUCTIONS".

List:

- a. Title of Project.
- b. Identity of separate structure as applicable.
- c. Identity of general subject matter covered in the manual.

C. Binders:

1. Commercial quality three-post binders with durable and cleanable plastic covers.
2. Maximum post width: 2 inches.
3. When multiple binders are used, correlate the data into related consistent groups.

1.04 CONTENT OF MANUAL

- A. Neatly typewritten table of contents for each volume, arranged in systematic order.
 1. Contractor, name of responsible principal, address and telephone number.

2. A list of each project required to be included, indexed to content of the volume.
3. List, with each project, name, address and telephone number of:
 - a. Subcontractor or installer.
 - b. A list of each product required to be included, indexed to content of the volume.
 - c. Identify area of responsibility of each.
 - d. Local source of supply for parts and replacement.
4. Identify each product by product name and other identifying symbols as set forth in Contract Documents.

B. Product Data:

1. Include only those sheets which are pertinent to the specific product.
2. Annotate each sheet to:
 - a. Clearly identify specific product or part installed.
 - b. Clearly identify data applicable to installation.
 - c. Delete references to inapplicable information.

C. Drawings:

1. Supplement product data with drawings as necessary to clearly illustrate:
 - a. Relations of component parts of equipment and systems.
 - b. Control and flow diagrams.
2. Coordinate drawings with information in Project Record Documents to assure correct illustration of completed installation.
3. Do not use Project Record Documents as maintenance drawings.

D. Written test, as required to supplement product data for the particular installation:

1. Organize in consistent format under separate headings for different procedures.
 2. Provide logical sequence of instruction of each procedure.
- E. Copy of each warranty, bond and service contract issued.
1. Provide information sheet for CITY's personnel, give:
 - a. Proper procedures in event of failure.
 - b. Instances which might affect validity of warranties or bonds.

1.05 MANUAL FOR MATERIALS AND FINISHES

- A. Submit **six (6) copies** of complete manual in final form to the CITY through the CONSULTANT.
- B. Content: for architectural products, applied materials and finishes:
1. Manufacturer's data, giving full information on products.
 - a. Catalog number, size, composition.
 - b. Color and texture designations.
 - c. Information required for reordering special manufacturing products.
 2. Instructions for care and maintenance.
 - a. Manufacturer's recommendation for types of cleaning agents and methods.
 - b. Cautions against cleaning agents and methods which are detrimental to product.
 - c. Recommend schedule for cleaning and maintenance.
- C. Content, for moisture protection and weather-exposed products:
1. Manufacturer's data, giving full information on products.
 - a. Applicable standards.
 - b. Chemical composition.

- c. Details of installation.
- 2. Instructions for inspection, maintenance and repair.
- D. Additional requirements for maintenance data: Respective sections of Specifications.

1.06 MANUAL FOR EQUIPMENT AND SYSTEMS

- A. Submit five (5) copies of complete manual in final form to the CITY through the CONSULTANT.
- B. Content, for each unit of equipment and system, as appropriate:
 - 1. Description of unit and component parts.
 - a. Function, normal operating characteristics, and limiting conditions.
 - b. Performance curves, engineering data and tests.
 - c. Complete nomenclature and commercial number of replaceable parts.
 - 2. Operating procedures:
 - a. Start-up, break-in, routine and normal operating instructions.
 - b. Regulation, control, stopping, shut-down and emergency instructions.
 - c. Summer and winter operating instructions.
 - d. Special operating instructions.
 - 3. Maintenance procedures:
 - a. Routine operations.
 - b. Guide to "trouble-shooting".
 - c. Disassembly, repair and reassembly.
 - d. Alignment, adjusting and checking.
 - 4. Servicing and lubrication required.
 - 5. Manufacturer's printed operating and maintenance instructions.

6. Description of sequence of operation by control manufacturer.
 7. Original manufacturer's parts list, illustrations, assembly drawings and diagrams required for maintenance.
 - a. Predicted life of parts subject to wear.
 - b. Items recommended to be stocked as spare parts.
 8. As-installed control diagrams by controls manufacturer.
 9. Each contractor's coordination drawings.
 - a. As-installed color coded piping diagrams.
 10. Charts of valve tag numbers, with location and function of each valve.
 11. List of original manufacturer's spare parts, manufacturer's current prices and recommended quantities to be maintained in storage.
 12. Other data as required under pertinent sections of specifications.
- C. Content, for each electric and electronic systems, as appropriate:
1. Description of system and component parts.
 - a. Function, normal operating characteristics, and limiting conditions.
 - b. Performance curves, engineering data and tests.
 - c. Complete nomenclature and commercial number of replaceable parts.
 2. Circuit directories and panelboards.
 - a. Electrical service
 - b. Controls
 - c. Communications
 3. As installed color coded wiring diagrams.
 4. Operating procedures:
 - a. Routine and normal operating instructions.

- b. Sequences required.
- c. Special operating instructions.
- 5. Maintenance procedures:
 - a. Routine operations.
 - b. Guide to "trouble-shooting".
 - c. Disassembly, repair and reassembly.
- 6. Manufacturer's printed operating and maintenance instructions.
- 7. List of original manufacturer's spare parts, manufacturer's current prices, and recommended quantities to be maintained in storage.
- 8. Other data as required under pertinent sections of specifications.
- D. Prepare and include additional data when the need for such data becomes apparent during instruction of CITY's personnel.
- E. Additional requirements for operating and maintenance data: Respective sections of Specifications.

1.07 SUBMITTAL SCHEDULE

- A. Submit two (2) copies of completed data in final form to the CITY through the CONSULTANT no later than thirty (30) days following the Consultant's review of the last shop drawing and/or other submittal specified under Section SC01340.
 - 1. One copy will be returned with comments to be incorporated into final copies.
- B. Submit **six (6) copies** of approved manual in final form directly to the offices of the Consultant, within thirty (30) calendar days of product shipment to the project site and preferably within 30 days after the reviewed copy is received.
- C. Append six (6) copies of addendum to the operation and maintenance manuals as applicable and certificates as specified within thirty (30) days after final inspection and plant start-up test.

1.08 INSTRUCTION OF CITY'S PERSONNEL

- A. Fully instruct CITY's designated operating and maintenance personnel in

operation, adjustment and maintenance of products, equipment and systems.

- B. Review operating and maintenance manual with CITY's operating and maintenance personnel in full detail to explain all aspects of operations and maintenance.
- C. A list shall be provided to the CITY detailing the date, time and attendees of all training sessions.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01740 - WARRANTIES AND BONDS

PART 1 - GENERAL

1.01 DESCRIPTION

A. Scope of Work:

1. Contractor shall compile specified warranties and bonds, as in the City of Lake Worth Contract Documents and as specified in these Specifications.

B. Related Work Described Elsewhere:

1. City of Lake Worth Contract Documents.
2. Contract Closeout: Section 01700.

1.02 SUBMITTAL REQUIREMENTS

- ##### A. Assemble warranties, bonds and service and maintenance contracts, executed by each of the respective manufacturers, suppliers, and subcontractors.

- ##### B. Number of original signed copies required: Two (2) each.

- ##### C. Table of Contents: Neatly typed, in orderly sequence. Provide complete information for each item.

1. Product of work item.
2. Firm, with name of principal, address and telephone number.
3. Scope.
4. Date of beginning of warranty, bond or service and maintenance contract.
5. Duration of warranty, bond or service maintenance contract.
6. Provide information for CITY's personnel:
 - a. Proper procedure in case of failure.
 - b. Instances which might affect the validity of warranty or bond.
7. Contractor, name of responsible principal, address and telephone number.

1.03 FORM OF SUBMITTALS

- A. Prepare in duplicate packets.
- B. Format:
 - 1. Size 8-1/2 inches by 11 inches, punch sheets for standard three (3) post binder.
 - a. Fold larger sheets to fit into binders.
 - 2. Cover: Identify each packet with typed or printed title "WARRANTIES AND BONDS". List:
 - a. Title of Project.
 - b. Name of Contractor.
- C. Binders: Commercial quality, three (3) post binder, with durable and cleanable plastic covers and maximum post width of two (2) inches.

1.04 WARRANTY SUBMITTALS REQUIREMENTS

- A. For all major pieces of equipment, submit a warranty from the equipment manufacturer. The manufacturer's warranty period shall be concurrent with the Contractor's for one (1) year, unless otherwise specified, commencing at the time of final acceptance by the CITY.
- B. The Contractor shall be responsible for obtaining certificates for equipment warranty for all major equipment specified under technical specifications for Divisions 11: Equipment; 13: Special Construction; 15: Mechanical; and 16: Electrical and which has at least a 1 hp motor or which lists for more than \$1,000. The Consultant reserves the right to request warranties for equipment not classified as major. The Contractor shall still warrant equipment not considered to be "major" in the Contractor's one-year warranty period even though certificates of warranty may not be required.
- C. In the event that the equipment manufacturer or supplier is unwilling to provide a one (1) year warranty commencing at the start of the Correction Period, the Contractor shall obtain from the manufacturer a two (2) year warranty commencing at the time of equipment delivery to the job site. This two (2) year warranty from the manufacturer shall not relieve the Contractor of the one (1) year warranty.
- D. The CITY shall incur no labor or equipment cost during the guarantee period.

- E. Guarantee shall cover all necessary labor, equipment and replacement parts resulting from faulty or inadequate equipment design, improper assembly or erection, defective workmanship and materials, leakage, breakage or other failure of all equipment and components furnished by the manufacturer.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

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SECTION 01800 - MISCELLANEOUS WORK AND CLEANUP

PART 1 - GENERAL

1.01 DESCRIPTION

A. Scope of Work:

1. This Section includes operations which cannot be specified in detail as separate items but can be sufficiently described as to the kind and extent to work involved. The Contractor shall furnish all labor, materials, equipment and incidentals to complete the work under this Section.
2. The work of this Section includes, but is not limited to, the following:
 - a. Restoring of driveways and fences.
 - b. Cleaning up.
 - c. Incidental work.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Materials required for this Section shall be of the same quality as materials that are to be restored. Where possible, the Contractor shall reuse existing materials that are removed and then replaced.

PART 3 - EXECUTION

3.01 RESTORING OF DRIVEWAYS AND FENCES

- A. Existing public and private driveways disturbed by the Contractor shall be replaced. Paved drives shall be repaved to the limits and thickness existing prior to construction. Gravel drives shall be replaced and regraded.
- B. The Contractor shall remove, store and replace existing fences during construction. Only the sections directed by the Consultant shall be removed. If any section of fence is damaged due to the Contractor's negligence, it shall be replaced with fencing equal to or better than that damaged, and the work shall be satisfactory to the Consultant.

3.02 CLEAN UP

- A. The Contractor shall remove all construction material, buildings, equipment

and other debris remaining on the job as the result of construction operations and shall render the site of the work in a neat and orderly condition.

3.03 INCIDENTAL WORK

- A. Do all incidental work not otherwise specified, but obviously necessary for the proper completion of the contract as specified and as shown on the Drawings.

END OF SECTION

SECTION 02082 - PUBLIC MANHOLES AND STRUCTURES

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Modular precast concrete manhole and inlet sections with tongue-and-groove joints, risers, transition to lid, frames, covers, anchorage, and accessories.

1.2 RELATED SECTIONS

- A. Section 01025 - Measurement and Payment Procedures
- B. Section 01340 - Shop Drawings, Work Drawings, and Samples
- C. Section 01400 - Quality Requirements
- D. Section 01700 - Contract Closeout
- E. Section 01705 – Record Drawing Requirements
- F. Section 02060 - Aggregate Materials
- G. Section 02320 - Trenching and Excavation
- H. Section 02322 - Dewatering and Drainage
- I. Section 02324 – Backfill
- J. Section 02513 - Public Water Distribution Systems
- K. Section 02536 - Force Mains
- L. Section 02538 – Cured-in-Place Sanitary Sewer Rehabilitation
- M. Section 02740 - Subgrade, Base Course and Asphalt Pavement

1.3 REFERENCES

Not Used.

1.4 UNIT PRICE - MEASUREMENT AND PAYMENT

- A. Refer to Section 01025 – MEASUREMENT AND PAYMENT PROCEDURES

The replacement of existing irrigation (public or private) in the Public ROW as the result of public manholes and structures installation is NOT a pay item. Replacement of existing ROW irrigation (to match existing quality, quantity and size) shall be incidental to the Unit Price of the pipeline, structure or swale development.

1.5 SUBMITTALS FOR REVIEW AND AUTHORIZATION TO PROCEED

- A. Shop Drawings: Indicate location and size of reinforcing steel, manhole locations, inlet locations, elevations, piping, conduit, and any weir control structures, sizes and elevations of penetrations for the following:
 - 1. Precast Manhole (including reinforcing and joint), including Frame and Cover and all brickwork.
 - 2. Precast Structure / Inlet (including reinforcing and joint) including Frame and Cover / Grate (all grates for storm water inlets shall be reticuline with a traffic rating of H-20) and all brickwork.
 - 3. Precast Junction Box and conflict structure (including reinforcing and joint), including Frame and Cover and all brickwork.

1.6 PROJECT RECORD DOCUMENTS

- A. Refer to Section 01700 CONTRACT CLOSEOUT for additional requirements.
- B. Refer to Section 01705 RECORD DRAWING REQUIREMENTS for additional requirements.

1.7 DELIVERY, STORAGE AND HANDLING

- A. Comply with precast concrete manufacturer's instructions for unloading, storing and moving precast manholes and drainage structures. Cracks or broken ends due to improper handling will not be acceptable. Lift holes will not be allowed.
- B. Store precast concrete manholes and drainage structures to prevent damage to Owner's property or other public or private property. Repair property damaged from materials storage.
- C. Mark each precast structure by indentation or waterproof paint showing date of manufacture, manufacturer, and identifying symbols and numbers shown on Drawings to indicate its intended use.

PART 2 PRODUCTS

2.1 MANHOLES (SANITARY)

A. Materials

1. Concrete: 4,000 psi
2. Reinforcement:
 - a. All reinforcement shall be A.S.T.M A615, Grade 60 or 65 ksi welded wire fabric, either smooth or deformed.
 - b. Except when ACI hooks are specifically required, reinforcement top and slab shall be straight embedment.
 - c. All steel bars shall have 1-1/2" minimum cover unless otherwise shown except for precast circular units manufactured under ASTM C-76 or ASTM C-478. Horizontal steel in rectangular structures shall be lapped a minimum of 24 bar diameters at corners.
3. Flexible Gasket: Ram Neck Seal
4. Sanitary Sewer Manhole Coatings:
 - a. Interior Coating: Manhole interior protection shall consist of the following approved processes: ThoRoc, Mainstay, Sewpercoat, Strong Seal or Refratta HAC 100 coating applied in the field.
 - b. Exterior Coating: CARBOLINE (Koppers) Bitumastic 300M
Outside Structure: 1st coat gray or red, 2nd coat black.
5. Manhole Brick: ASTM C32-73 (3-hole) and shall be sound, hard and uniformly burned brick, regular and uniform in shape and size, of compact texture, and satisfactory to the ENGINEER. Brick shall comply with the ASTM Standard Specification for Sewer and Manhole Brick (made from clay or shale). Grade SS brick shall be used for paved inverts and shelves, and grade MS shall be used for walls.
6. Masonry Mortar: ASTM C270-82, Type M - Type II Cement.
7. Manhole Frame and Cover: Traffic rated, conforming to U.S. Foundry No. 230-AB-MC, or equal.

8. Manhole frames and covers shall be the Utility Department Standard as shown on the project construction drawings and of such quality and composition as will make the metal of the casing strong and tough and of even grain. They shall be smooth, free from scale, lumps, blisters and sand holes. No plugging or filling will be allowed. The words "SANITARY SEWER" shall be cast in the cover so as to be plainly visible. Frames and covers shall have a protective coating of black paint. All covers shall have a non-penetrating or concealed type pick hole.

B. Construction

1. Manholes shall be constructed of precast reinforced concrete. Reinforcing for the base section and top shall be as shown on the drawings. Reinforcing for the wall sections shall be as specified in ASTM C478 and shall extend into the tongue and groove of the joints. There shall be a #4 continuous rebar hoop around openings. The base shall be monolithic with the first wall section using a water stop between base and first wall section. Adjustable riser rings are preferred for all manholes.
2. Water stop shall be manhole manufacturer's standard. If the manufacturer does not have a standard, use a 4-inch wide, #10 gauge steel sheet, welded continuous through the joint.
3. Joints shall be tongue and groove suitable for flexible Ram Neck seal gasket.
4. Lifting hooks shall be used throughout. Lift holes will not be allowed.
5. Components of the manhole shall be free of fractures, cracks, and undue roughness. Concrete shall be free of defects that indicate improper mixing or placing, and surface defects such as honeycomb or spalling. The OWNER reserves the right to inspect manholes at the factory.

2.2 INLETS, JUNCTION BOXES, MANHOLES (STORM)

A. Materials

1. Concrete: 4,000 psi.
2. Reinforcement: As stated above.
3. Sizing

- a. Standard structure bottoms 4'-0" diameter and smaller (Alt. A) and 3'-6" square (Alt. B) are designated Type P. Larger standard structure bottoms are designated Type J. Adjustable riser rings are preferred for all structures.
- b. Walls of circular structures (Alt. A) constructed in place may be of non-reinforced concrete or brick or reinforced concrete. Precast and rectangular structures (Alt. B) shall be constructed of reinforced concrete only.
- c. Wall thickness and reinforcement are for either reinforced cast-in-place or precast concrete units except that precast circular units may be furnished with walls in accordance with either ASTM C-478 (up to 96" diameter) or ASTM C-76 Class III B Wall, modified where the elliptical steel cage area is placed in the center one-third of the wall.
- d. Top and floor slab thickness and re-enforcement are precast and cast-in-place construction. Top and floor slabs shall be of Class II concrete. Concrete as specified in ASTM C-478 (4,000 psi) may be used in lieu of Class I and Class II concrete in precast items manufactured in plants which are under the 'Standard Operating Procedures' for the inspection of precast drainage products.
- e. Structure bottoms may be used in conjunction with curb inlet tops Types 1,2,3,4,5,6,9, and 10, and any manhole or junction box unless otherwise shown in the plans or other standard drawings. Alt. B structure bottoms may be used in conjunction with curb inlet Types 7 & 8, or any ditch bottom inlet unless otherwise shown in the plans or other standard drawings.
- f. Rectangular structures may be rotated as directed by the ENGINEER in order to facilitate connections between the structure walls and storm sewer pipes.
- g. The corner fillets shown are necessary for rectangular structures used with circular risers and inlet throats and used on skew with rectangular risers, inlet and inlet throats. Fillets will be required in lieu of the bottom slab of the Alt. B riser when used with the Alt. A box. Each fillet shall be reinforced with 2- #5 bars.

4. Frames, Covers and Grates:

- a. All grates for storm water inlets shall be reticuline with a traffic rating of H-20 as shown on FDOT Standard Index No.232.

- b. Inlet throats, riser or manhole tops shall be secured to structures as shown on FDOT Standard Index No. 201.
- c. For manhole and junction box tops for frames and covers, and for supplementary details, see same FDOT Standard Index No. 201.

PART 3 EXECUTION

3.1 FIELD QUALITY CONTROL

- A. Field inspection will be performed under provisions of Section 01400 QUALITY REQUIREMENTS.

3.2 EXAMINATION

- A. Verify items provided by other sections of Work are properly sized and located.
- B. Verify that the Project is ready to receive the structures.
- C. Verify excavation for manholes is correct.

3.3 PREPARATION

- A. Coordinate placement of inlet and outlet pipe or duct sleeves required by other sections.

3.4 MANHOLE INSTALLATION (WASTEWATER)

- A. Trenches and excavations shall be kept dry while work is in progress. Excavations for manholes and other structures shall be over-excavated and plastic filter fabric (Geotextile), of a sufficient size to envelope the rock support bed shall be placed in the bottom of the excavation, then place a 12 inch thick (or as specified on the project construction drawings) rock support bed of FDOT 57 rock and then install the structure.
- B. The manhole invert shall be carefully shaped to conform to the pipe flow channel. Flow channels within the manholes involving changes of direction or slide slopes shall smoothly direct the flow in accordance with detail drawings. All concrete irregularities shall be plastered with cement mortar in such a manner as to give neat and watertight job. Manholes shall be core-drilled to provide pipe opening when precast hole is not available.

3.5 INSTALLATION OF PIPE INTO MANHOLE (WASTEWATER)

- A. Trenches and excavations shall be kept dry while work is in progress. All pipe penetrations shall be supplied with NPC KOR-N-SEAL flexible pipe-to-manhole connector. Base slab and wall thickness for precast manholes shall be as shown on the detail drawings. Invert shall be constructed as shown on the detail drawings. Steep slopes outside the invert channels shall be avoided. Changes in size and grade shall be made gradually and evenly. Changes in the direction of the sewer and entering branch or branches shall have a true curve; of as large a radius as the size of the manhole will permit. Manhole inverts may be constructed prior to installation by grouting pipe in place with cement mortar and approved joint mix.

3.6 INLET / STRUCTURE INSTALLATION (STORMWATER)

- A. Trenches and excavations shall be kept dry while work is in progress. Appurtenance shall be set to the pipe grade firm and plumb in the location(s) shown on the project construction drawings. Excavations for inlets and other stormwater structures shall be over-excavated and plastic filter fabric (Geotextile), of a sufficient size to envelope the rock support bed shall be placed in the bottom of the excavation, then place a 12 inch thick rock support bed of FDOT 57 rock and then install the structure. Joints shall be cleaned, primed and the required gasket or sealant applied as recommended by the manufacturer. Voids remaining in the joint shall be caulked with anhydrous cement grout on both the inside and outside to make a smooth watertight seal.

3.7 INSTALLATION OF CONDUIT INTO INLET / STRUCTURE

- A. Trenches and excavations shall be kept dry while work is in progress. The diameter for the pipe opening in the structure shall be 6 inches larger than the outside diameter of the pipe. Pipe shall penetrate the inside wall of the inlet/structure a minimum of 2-inches and a maximum of 4-inches. After pipe is set, the space between the pipe and inlet/structure wall shall be filled with brick and hydraulic cement or sealed in accordance with the project construction drawings. Refer to Section 02538 SANITARY SEWER SYSTEM and 02630 STORM DRAINAGE for discipline specific requirements. Base slab and wall thickness for precast structures shall be as shown on the detail drawings. Slopes within the inlet / structure bottom shall be avoided.
- B. If inlet / structure contains a weir of other water elevation control structure, the weir wall shall incorporate the bleed down orifice with the opening bottom set at the normal control elevation. The top of the weir wall shall be set at the design elevation that shall be between 6" and 12" below the bottom of the structure top slab or inlet grate.

3.8 FRAMES AND COVERS

- A. The manhole, inlet and structure frames and covers shall be adjusted as required to meet final grades and set firmly in mortar so that the top of cover will be flush with the finished grade in paved areas (following the cross slope / slope of roadways and/or driveways) and 1-inch above the finished grade in unpaved areas, unless shown otherwise on the project construction drawings.
- B. Contractor shall provide an external preformed rubber joint seal to prevent ground water infiltration into sewer system. The seal shall be multi-section with a neoprene rubber top section and all lower sections made of Ethylene Propylene Diene Monomer (EPDM) rubber with a minimum thickness of 1.5 mm. Each unit shall consist of a top and bottom section and shall have mastic on the bottom of the bottom section. The mastic shall be a non-hardening butyl rubber sealant and shall seal to the cone/top slab of the manhole/catch basin and over the lip of the casting. Contractor shall submit joint seal detail for approval in accordance with SECTION 01340 Shop Drawings, Working Drawings and Samples.

END OF SECTION

SECTION 02230 - SITE CLEARING

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 clearing work, as indicated on the drawings, as specified herein or both, except for items specifically indicated as NIC ITEMS in the drawings.
- B. Under this section, the CONTRACTOR shall do all clearing, grubbing, root-raking, and necessary clean-up operations in connection with the construction of the work and its related sitework.
- C. The work shall consist of the removal and disposal of trees, stumps, roots, limbs, brush, fences (chain link, wood, etc.), decorative or masonry walls, etc. from all project areas as designated on the drawings as specified herein, and as directed by the ENGINEER on the site. Fencing and walls removed shall be neatly placed on adjacent property if requested by CITY or property owner. Otherwise, the CONTRACTOR shall dispose of them offsite. Trees or shrubs shall be placed on adjacent property if requested by CITY or property owner.
- D. The CONTRACTOR shall remove all refuse, asphalt pavement, concrete pavement, glass, metal, stone, plaster, lumber, paper materials, and any and all trash found in clearing and adjacent areas as directed by the ENGINEER.
- E. The CONTRACTOR shall furnish all services, labor, transportation, materials, and equipment necessary for the performance of these operations. All clearing and cleanup operations shall be accomplished to the complete satisfaction of the CITY.
- F. The CONTRACTOR shall strip all existing topsoil and stockpile it on-site in locations approved by the OWNER's Representative. All topsoil material shall be stockpiled within a haul distance of 3,000 feet.

1.3 MATERIALS OWNERSHIP

- A. Except for materials indicated to be stockpiled or to remain on OWNER's property, cleared materials shall become the CONTRACTOR's property and shall be removed from the site.

1.4 PROJECT CONDITIONS

- A. Traffic: Minimize interference with adjoining roads, streets, walks, and other adjacent occupied or used facilities during site-clearing operations.
- B. Salvable Improvements: Carefully remove items indicated to be salvaged and store on OWNER's premises where indicated.
- C. Notify utility locator service for area where Project is located prior to site clearing.
- D. CONTRACTOR shall verify existing grades prior to performing work under this section. If existing grades are at variance with the drawings, notify the OWNER and receive instructions prior to proceeding. No additional compensation will be considered resulting from grade variances once site clearing has commenced.
- E. All benchmarks and monuments shall be protected during construction. If disturbed or destroyed, they shall be replaced in original position by a licensed surveyor at the CONTRACTOR's expense.
- F. Protect areas outside limits of disturbance from encroachment by construction personnel or equipment, regardless of property ownership. Access shall be by specific, written permission or easement only.

PART 2 PRODUCTS

- 2.1 CONTRACTOR shall provide and use all necessary equipment and materials to perform work.

PART 3 EXECUTION

3.1 PREPARATION

- A. Provide erosion control measures in accordance with Section 02370, Erosion Control, prior to any construction activity.
- B. Locate and clearly flag trees and vegetation to remain or to be relocated. All trees and vegetation to remain shall be barricaded and protected during the construction process per Article 3.02 of this section.
- C. All trees and shrubs, unless indicated to be removed in the drawings, are to be protected from disturbance, per Article 3.02 of this section, during construction activities. Trees and shrubs indicated to be removed in the drawings not desig-

nated to remain within the area to be graded, whether shown or not on the drawings, shall be cut and the removal of stumps shall comply with Article 3.03 of this section. Burning on site is not permitted, unless otherwise approved by the OWNER and authorities having jurisdiction.

3.2 TREE PROTECTION

- A. Protect existing site improvements to remain, from damage during construction. Restore damaged improvements to their original condition, as acceptable to the OWNER.
- B. Erect and maintain a temporary fence around drip line of individual trees or around perimeter drip line of groups of trees to remain. Remove fence when construction is complete.
- C. Do not excavate within drip line of trees, unless otherwise indicated.
- D. Where excavation for new construction is required within drip line of trees, hand clear and excavate to minimize damage to root systems. Use narrow-tine spading forks, comb soil to expose roots, and cleanly cut roots as close to excavation as possible.
- E. Repair or replace trees and vegetation indicated to remain that are damaged by construction operations, in a manner approved by the OWNER.

3.3 TREE REMOVAL AND TREE PRESERVATION

- A. No trees shall be removed if located outside of the right-of-way.
- B. Within the rights-of-way, no trees with a trunk diameter of 3" or greater at 4-1/2' above grade shall be removed without the approval of the ENGINEER with the exception of Australian Pines, Meleleuca or Florida Holly. Trees shall be evaluated on an individual basis in accordance with following:
 - 1. Type and size of tree.
 - 2. Proximity to proposed and/or existing utility lines and/or exfiltration trench.
 - 3. Change in adjacent grades for swale excavation.
 - 4. Proximity to proposed sidewalk.
 - 5. Proximity to proposed edge of roadway.
 - 6. Living condition of the tree.

- C. If trees are determined to remain, Biobarrier shall be installed in accordance with the Biobarrier detail as shown on the Landscape Plans.

3.4 CLEARING AND GRUBBING

- A. Remove obstructions, trees, shrubs, grass, and other vegetation within the limit of disturbance to permit installation of new construction. Removal includes digging out stumps and obstructions and grubbing roots, unless otherwise specified. In areas outside the building limits where the depth of fill exceeds 8 feet in height, unless otherwise directed by the OWNER, sound trees shall be cut at a height of not more than 6 inches above natural ground.
- B. Fill depressions caused by clearing and grubbing operations with satisfactory soil material, unless further excavation or earthwork is indicated.
 - 1. Place fill material in horizontal layers and compact each layer to a density equal to adjacent original ground as in accordance with Section 02300, Earthwork.

3.5 TOPSOIL STRIPPING

- A. Strip topsoil to full depth encountered in areas indicated to be graded in a manner to prevent intermingling with underlying subsoil or waste materials.
- B. Stockpile sufficient topsoil material to facilitate seeding and landscaping. Stockpile away from edge of excavations without intermixing with subsoil. Grade and shape stockpiles to drain surface water.
- C. Protect soil stockpiles as per Section 02370, Erosion Control and Slope Protection.

3.6 DISPOSAL

- A. Disposal: Remove surplus soil material, unsuitable or excess topsoil, obstructions, demolished materials, and waste materials, including trash and debris, and legally dispose of them off OWNER's property.

3.7 MEASUREMENT AND PAYMENT

- A. Measurement and payment for the item Site Clearing will be made per square yard and will include removal of existing vegetation and unwanted materials and grading per Section 01025.

END OF SECTION

SECTION 02270 - SEDIMENTATION AND EROSION CONTROL

PART 1 GENERAL

1.1 DESCRIPTION

- A. Furnish all labor, materials, equipment and incidentals required and perform all installation, maintenance, removal and area cleanup related to erosion and sedimentation control work as shown on the Drawings and as specified herein. The work shall include, but not necessarily be limited to; installation of temporary access ways and staging areas, silt fences, stone filter boxes, stone filter berms, sediment removal and disposal, device maintenance, removal of temporary devices, temporary mulching, excelsior matting installation and final cleanup. CONTRACTOR is responsible for providing effective temporary erosion and sediment control measures during construction or until final controls become effective.

1.2 RELATED WORK

- A. Section 01110 – Environmental Protection Procedures
- B. Section 01568 – Temporary Erosion and Sedimentation Control
- C. Section 01340 - Shop Drawings, Work Drawings, and Samples
- D. Section 02300 - Earthwork
- E. Section 02486 - Seed, Mulch and Fertilizer

1.3 SUBMITTALS

- A. Submit, in accordance with Section 01340 SHOP DRAWINGS, WORK DRAWINGS, AND SAMPLES, within 10 days after award of Contract, technical product literature for all commercial products, including straw mulch tackifier, to be used for erosion and sedimentation control.

1.4 QUALITY ASSURANCE

- A. Be responsible for the timely installation and maintenance of all sedimentation control devices necessary to prevent the movement of sediment from the construction site to off site areas or into the stream system via surface runoff or underground drainage systems. Measures in addition to those shown on the Drawings necessary to prevent the movement of sediment off site shall be installed, maintained, removed, and cleaned up at the expense of the CONTRACTOR. No additional charges to the OWNER will be considered.
- B. Sedimentation and erosion control measures shall conform to the requirements outlined in the drawings and in The Florida Development Manual.

1.5 UNIT PRICE - MEASUREMENT AND PAYMENT

- A. The Lump Sum item for NPDES Compliance shall include all Sediment and Erosion Control efforts included in this section with measurement and payment in accordance with Section 01025 - MEASUREMENT AND PAYMENT.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Crushed stone for sediment filtration devices, access ways and staging areas shall conform to FDOT "Standards and Specifications for Highway and Bridges".
- B. Berm structural stone shall be rip-rap as follows:
 - 1. Rip-rap shall be sound, durable rock which is roughly rectangular shape and of suitable quality to insure permanence in the condition in which it is to be used. Rounded stones, boulders, sandstone or similar soft stone will not be acceptable. Material shall be free from overburden, spoil, shale and organic material, meet the ENGINEER's approval and be well graded within the following limits:

Weight of Stone Percent Finer by Weight

40 lb	100
12 lb	50
3 lb	0

- C. Sediment Fence

1. Sediment fence shall be a prefabricated commercial product made of a woven, polypropylene, ultraviolet resistant material such as “Envirofence” by Mirafi Inc., Charlotte, NC or equal.
- D. 1/4-in woven wire mesh for filter boxes shall be galvanized steel or hardware cloth.
 - E. Straw mulch shall be utilized on all newly graded areas to protect areas against washouts and erosion. Straw mulch shall be comprised of threshed straw of oats, wheat, barley, or rye that is free from noxious weeds, mold or other objectionable material. The straw mulch shall contain at least 50 percent by weight of material to be 10-in or longer. Straw shall be in an air-dry condition and suitable for placement with blower equipment.
 - F. Latex acrylic copolymer, or organic tackifier shall be a commercial product specifically manufactured for use as straw mulch tackifier.
 - G. An asphalt tackifier shall only be used when temperatures are too low to allow the use of a latex acrylic copolymer and only with prior written approval from the Project Manager and Engineer.
 - H. Erosion control blanket shall be installed in all seeded drainage swales and ditches as shown on the Drawings or as directed by the ENGINEER. Erosion control blanket shall be 100 percent agricultural straw matrix stitch bonded with degradable thread between two photodegradable polypropylene nettings, such as Model S150 Double Net Short-Term Blanket (10 months) by North American Green, Evansville, IN or equal.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Sediment Fence Installation
 1. Sediment fences shall be positioned as indicated on the Drawings and as necessary to prevent off site movement of sediment produced by construction activities as directed by the Project Manager and Engineer.
 2. Dig trench approximately 6-in wide and 6-in deep along proposed fence lines.
 3. Drive stakes, 8-ft on center (maximum) at back edge of trenches. Stakes shall be driven 2-ft (minimum) into ground.
 4. Hang filter fabric on posts carrying to bottom of trench with about 4-in of fabric laid across bottom of trench. Stretch fabric fairly taut along fence length and maintain secure both ways.

5. Backfill trench with excavated material and tamp.
 6. Install pre-fabricated silt fence according to manufacturer's instructions.
- B. Construct filter boxes as detailed on the Drawings, from 1/4-in woven wire mesh or hardware cloth and wood. Fill with crushed stone and place over all drop inlets and manholes to storm drain system as each inlet is completed. This should be done prior to setting casting, if there is a delay between installation of inlet structures or drain manholes and setting of castings. An alternate method is to ring each inlet with a sediment fence.
- C. Stone Filter Berm Installation
1. Place berm structural stone across channel just below lower sandbag wall at work area. Face upstream side of structural berm with crushed stone.
- D. Staging areas and access ways shall be surfaced with a minimum depth of 4-in of crushed stone.

3.2 MAINTENANCE AND INSPECTIONS

- A. Inspections
1. The CONTRACTOR shall make a visual inspection of all erosion and sedimentation control devices once per week and promptly after every rainstorm. If such inspection reveals that additional measures are needed to prevent movement of sediment to offsite areas, promptly install additional devices as needed. Sediment controls in need of maintenance shall be repaired promptly.
- B. Device Maintenance
1. Sediment Fences
 - a. Remove accumulated sediment once it builds up to 1/2 of the height of the fabric.
 - b. Replace damaged fabric, or patch with a 2-ft minimum overlap.
 - c. Make other repairs as necessary to ensure that the fence is filtering all runoff directed to the fence.
 2. Filter Boxes
 - a. Replace crushed stone when it becomes saturated with silt.

3. Stone Filter Berm

- a. Muck out trapped silt from dewatering operations when it has built up to within 6-in of the top of the berm.
 - b. Replace crushed stone filter when saturated with silt.
4. Add crushed stone to access ways and staging area as necessary to maintain a firm surface free of ruts and mudholes.

3.3 TEMPORARY MULCHING

- A. Apply temporary mulch to areas where rough grading has been completed but final grading is not anticipated to begin within 30 days of the completion of rough grading.
- B. Straw mulch shall be applied at rate of 100 lbs/1000 sq ft and tackified with latex acrylic copolymer at a rate and diluted in a ratio per manufacturer's instructions.

3.4 EROSION CONTROL BLANKETS

- A. Erosion control blankets shall be installed in all seeded drainage swales and ditches as shown on the Drawings and as directed by the Project Manager and Engineer in accordance with manufacturer's instructions. The area to be covered shall be properly prepared, fertilized and seeded with permanent vegetation before the blanket is applied. When the blanket is unrolled, the netting shall be on top and the fibers in contact with the soil over the entire area. The blankets shall be applied in the direction of water flow and stapled. Blankets shall be placed a minimum of three rows (of 4-ft) wide (total approx. 12-ft width) within the drainage swale/ditch and stapled together in accordance with manufacturer's instructions. Side overlaps shall be 4-in minimum. The staples shall be made of wire, .091-in in diameter or greater, "U" shaped with legs 10-in in length and a 1-1/2-in crown. Commercial biodegradable stakes may also be used with prior approval by the Project Manager and Engineer. The staples shall be driven vertically into the ground, spaced approximately two linear feet apart, on each side, and one row in the center alternately spaced between each side. Upper and lower ends of the matting shall be buried to a depth of 4-in in a trench. Erosion stops shall be created every 25-ft by making a fold in the fabric and carrying the fold into a silt trench across the full width of the blanket. The bottom of the fold shall be 4-in below the ground surface. Staple on both sides of fold. Where the matting must be cut or more than one roll length is required in the swale, turn down upper end of downstream roll into a slit trench to a depth of 4-in. Overlap lower end of upstream roll 4-in past edge of downstream roll and staple.
 1. To ensure full contact with soil surface, roll matting with a roller weighing 100 lbs/ft of width perpendicular to flow direction after seeding, placing matting and

stapling. Thoroughly inspect channel after completion. Correct any areas where matting does not present a smooth surface in full contact with the soil below.

3.5 PERFORMANCE

- A. Should any of the temporary erosion and sediment control measures employed by the Contractor fail to produce results which comply with the requirements of the State of Florida or the Federal Government, Contractor shall immediately take whatever steps are necessary to correct the deficiency at his own expense.

3.6 REMOVAL AND FINAL CLEANUP

- A. Once the site has been fully stabilized against erosion, remove sediment control devices and all accumulated silt. Dispose of silt and waste materials in proper manner. Re-grade all areas disturbed during this process and stabilize against erosion with surfacing materials as indicated on the Drawings.

END OF SECTION

SECTION 02300 - EARTHWORK

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Soil Materials
- B. Execution
- C. Examination
- D. Preparation
- E. Project Conditions
- F. Excavation
- G. Placement and Compaction
- H. Frequency of Tests
- I. Finish / Final Grading
- J. Protection of Finished Work
- K. Layout and As-Built Survey

1.2 RELATED SECTIONS

- A. Section 01010 – Summary of Work
- B. Section 01025 - Measurement and Payment Procedures
- C. Section 01400 - Quality Requirements
- D. Section 01700 – Contract Closeout

1.3 REFERENCES

- A. AASHTO T180 - Standard Specification for Moisture-Density Relations of Soils using a 4.54-kg (10-lb) Rammer and a 457-mm (18-in) Drop.

- B. ASTM D1556 - Standard Test Method for Density of Soil in Place by the Sand-Cone Method.
- C. ASTM D1557 - Standard Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort (6,000 ft-lbf/ft³ (2,700 kN-m/m³)).
- D. ASTM D2922 - Standard Test Method for Density of Soil and Soil Aggregate in Place by Nuclear Methods (Shallow Depth).
- E. ASTM D3017 - Standard Test Method for Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth).

1.4 UNIT PRICE - MEASUREMENT AND PAYMENT

- A. Refer to Section 01025 - MEASUREMENT AND PAYMENT

Material that is excavated for the purpose of installing water mains and service connections, force mains, sanitary sewers and laterals or storm drainage piping and their associated public manholes and structures and then reused as bedding and/or backfill material are not subject to this UNIT PRICE - MEASUREMENT AND PAYMENT provision. This backfill material shall be considered as incidental to the item installation.

1.5 SUBMITTALS

- A. As specified in Part 2 below.

PART 2 PRODUCTS

2.1 SOIL MATERIALS

- A. All fill material shall be approved by the Project Manager and ENGINEER. CONTRACTOR shall notify the Project Manager and ENGINEER one (1) week in advance of providing imported material, shall provide one (1) cubic yard sample and the results of a signed and sealed proctor test for the material.
- B. Satisfactory soil materials are defined as those complying with ASTM D2487 soil classification groups GW, GP, GM, SM, SW, and SP.
- C. Unsatisfactory soil materials are defined as those complying with ASTM D2487 soil classification groups GC, SC, ML, MH, CL, CH, OL, OH, and PT.

- D. Coarse Aggregate shall conform to FDOT Specification 901 with the exception that slag or crushed slag shall not be used. Stone size shall be No. 57.
- E. Fine Aggregate shall conform to FDOT Specification 902.
- F. Sub-base, Backfill, and Fill Materials: Satisfactory soil materials free of clay, debris, waste, vegetation, rock or gravel larger than 2 inches in any dimension, and other deleterious matter.

2.2 ACCESSORIES

- A. Geotextile Fabric: Non-biodegradable, woven or non-woven depending of the application and as per FDOT specification Section 514 and 985.

PART 3 EXECUTION

3.1 FIELD QA/QC

- A. Verify that survey benchmark and intended elevations for the Work are as indicated.

3.2 PREPARATION

- A. Identify required lines, levels, contours, and datum.
- B. Locate, identify (stake and flag), and protect utilities that remain, from damage.
- C. Notify utility owner to remove and/or relocate utilities if required and not part of the project.
- D. Protect bench marks, survey control point, existing structures, fences, sidewalks, paving, and curbs from excavating equipment and vehicular traffic.

3.3 PROJECT CONDITIONS

- A. Site Information: Subsurface soil investigation report (if performed) will be made available for review. Data on indicated subsurface conditions is not intended as representative or a warranty of accuracy or continuity between soil borings. It is expressly understood that OWNER will not be responsible for interpretations or conclusions drawn there from by

CONTRACTOR. Data is made available only for convenience of CONTRACTOR.

- B. Additional test borings and other exploratory operations may be performed by CONTRACTOR, at the CONTRACTOR's option; however, no change in the Contract Sum will be authorized for such additional exploration.
- C. Existing Utilities: Locate existing underground utilities in areas of excavation work. If utilities are indicated to remain in place, provide adequate means of support and protection during earthwork operations.
- D. Should uncharted, or incorrectly charted, piping or other utilities be encountered during excavation, consult with Project Manager and utility owner (ex. Bell South, FPL, FPUC, Comcast) or Sunshine State One Call immediately for directions.
- E. Uncharted or incorrectly charted underground utilities that are discovered during construction shall be incorporated into the project As-Builts with vertical and horizontal coordinates.
- F. Cooperate with OWNER and utility companies in keeping respective services and facilities in operation. Repair damaged utilities to satisfaction of utility owner.
- G. Do not interrupt existing utility services except when permitted in writing by Project Manager and then only after acceptable temporary utility services have been provided.
- H. Use of Explosives: Use of explosives is not permitted.
- I. Protection of Persons and Property: Barricade open excavations occurring as part of this work and post with warning lights.
- J. Operate warning lights as recommended by authorities having jurisdiction.
- K. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earthwork operations.
- L. Perform excavation by hand within drip line of large trees to remain. Protect root systems from damage or dry out to the greatest extent possible. Maintain moist condition for root system and cover exposed roots with moistened burlap.

3.4 EXCAVATION

- A. Excavation is unclassified and includes excavation to subgrade elevation indicated, regardless of character of materials and obstructions encountered.

3.5 PLACEMENT AND COMPACTION

- A. Percentage of Maximum Density Requirements: Compact soil to not less than the following percentages of maximum density, in accordance with AASHTO T-180 specifications or ASTM D1557:
 - 1. Structures, (10' outside building lines) Building Slabs and Steps: Compact top 24 inches of subgrade and each layer of backfill or fill material to 98% of the modified proctor maximum dry density.
 - 2. Pavements: Compact top 12" of subgrade and each layer of backfill or fill material to 98% of the modified proctor maximum dry density.
 - 3. Lawn or Unpaved Areas: Compact top 6 inches of subgrade and each layer of backfill or fill material to 95% of the modified proctor maximum dry density.
 - 4. Walkways: Compact top 6 inches of subgrade and each layer of backfill or fill material to 95% of the modified proctor maximum dry density.

3.6 FREQUENCY OF TESTS

- A. Berms: Every 200 feet per lift.
- B. Swales: For areas that have been built-up and a swale cut-in every 200 feet; otherwise, density testing of swales cut-in to existing ground does not require density testing.
- C. Proof roll compacted fill surfaces under slabs-on-grade, pavers, paving, and other appurtenances as required.
- D. The CONTRACTOR is to "map" all density test results on the Record Drawings on each day when field tests are performed. CONTRACTOR's testing laboratory shall leave a copy of the day's density testing results on site.
- E. CONTRACTOR is to instruct their Testing Lab to copy the Project Manager on all Test Reports.

3.7 FINAL AND FINISH GRADING

- A. Final grading shall be performed and the grades shaped to match existing. Except as otherwise indicated or specified, finish grades shall be flush with the edges of existing paving, etc. Excess materials not utilized for final and finish grading shall be removed from the site and disposed of off site at suitable and appropriate disposal areas.
- B. Upon project completion all areas of the site limits and adjacent areas affected by the project shall be completely cleaned of all debris.

3.8 PROTECTION OF FINISHED WORK

- A. Reshape and re-compact fills subjected to vehicular traffic.
- B. Reconditioning Compacted Areas: Where completed compacted areas are disturbed by subsequent construction operations or adverse weather, scarify surface, reshape, and compact to required density prior to further construction.
- C. Settling: Where settling is measurable or observable at excavated areas during general project warranty period, remove surface (pavement, lawn, or other finish), add backfill material, compact, and replace surface treatment. Restore appearance, quality, and condition of surface or finish to match adjacent work, and eliminate evidence of restoration to greatest extent possible.

3.9 LAYOUT AND "AS BUILT" SURVEY

- A. Tolerances:
 - 1. Top surface of backfill for site clearing and general earthwork shall be plus or minus 0.10 foot from required elevations.
 - 2. Top surface of berms or other stormwater containment earthworks shall be plus 0.10, minus 0.00 foot of the required elevations.
- B. Layout for all construction improvements, paved and surface areas and other appurtenances to be constructed shall be performed by CONTRACTOR in strict accordance with drawings and work performed shall ensure true lines, angles, and elevations. All angles, lines, grades, and elevations shall be thoroughly checked by CONTRACTOR.

- C. Upon completion of placement of construction improvement, paved and surfaced areas, the CONTRACTOR shall provide OWNER and ENGINEER with a complete and accurate "As-Built" Survey. A surveyor registered in State of Florida shall perform "As-Built" Survey. "As-Built" Survey shall indicate exact horizontal and vertical location (relative to property lines and N.G.V.D.) of buildings, concrete and asphalt surfaces and all drainage features including lakes, detention areas, berms, embankments, and swales. All of the spot elevations shown on the paving and drainage plans shall be measured and the individual "As-Built" grades shall be included on the "As-Built" Survey.
- D. Additionally, where grading between any two elevations on the plan has not been constructed at a uniform slope, then sufficient "As-Built" information shall be included to provide a true representation of the constructed grading conditions. In addition to the information outlined above, the "As-Built" Survey shall include cross section elevations at 50-foot stations of all swales, lakes, roadways and drainage retention area (including banks, berms, bottom and transitions) constructed or improved. All elevations shown on the "As-Built" Survey shall be accurate to the nearest hundredth of a foot.

END OF SECTION

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SECTION 02320 - TRENCHING AND EXCAVATION

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Definitions
- B. Field Measurements
- C. Fill Materials
- D. Preparation
- E. Dewatering and Drainage
- F. Excavation
- G. OSHA Safety Compliance
- H. Field Quality Control
- I. Pavement Removal and Replacement

1.2 RELATED SECTIONS

- A. Section 01010 – Summary of Work
- B. Section 01025 - Measurement and Payment Procedures
- C. Section 01400 - Quality Requirements
- D. Section 02300 – Earthwork
- E. Section 02322 – Dewatering and Drainage
- F. Section 02324 - Backfill
- G. Section 02740 – Subgrade, Base Course and Asphalt Pavement

1.3 REFERENCES

- A. AASHTO T180 - Standard Specification for Moisture-Density Relations of Soils Using a 4.54-kg (10-lb) Rammer and a 457-mm (18-in) Drop

- B. ASTM C136 - Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates
- C. ASTM D1556 - Standard Test Method for Density of Soil in Place by the Sand-Cone Method
- D. ASTM D1557 - Standard Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort [6,000 ft-lbf/ft³ (2,700 kN-m/m³)]
- E. ASTM D2321 – Standard Practice for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications
- F. ASTM D2922 - Standard Test Method for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth)
- G. ASTM D3017 - Standard Test Method for Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth)

1.4 UNIT PRICE - MEASUREMENT AND PAYMENT

- A. Unit pricing will only be considered for special trenching requirements not associated with utility installations. If required and as approved by Project Manager, a Change Order will be issued to authorize payment to the CONTRACTOR for special trenching.

1.5 SUBMITTALS

Not used.

1.6 DEFINITIONS

- A. Excavation consists of removal of material encountered to subgrade elevations indicated and subsequent disposal or reuse of materials removed.
- B. Additional Excavation: If the ENGINEER believes that the existing soil at subgrade will not support the planned construction, the ENGINEER may order additional excavation and replacement of the unsuitable material with select material.
- C. Unauthorized excavation consists of removal of materials beyond indicated subgrade elevations or dimensions without specific direction of ENGINEER. Unauthorized excavation, as well as remedial work directed by ENGINEER, shall be at CONTRACTOR's expense.

Under footings, foundation bases, or retaining walls, fill unauthorized excavation by extending indicated bottom elevation of footing or base to excavation bottom, without altering required top elevation. Lean concrete fill may be used to bring elevations to proper position, when acceptable to ENGINEER.

In locations other than those above, backfill and compact unauthorized excavations as specified for authorized excavations of same classification, unless otherwise directed by ENGINEER.

- D. Subgrade: The undisturbed earth or the compacted soil layer immediately below granular subbase, drainage fill, or topsoil materials.
- E. Structure: Buildings, foundations, slabs, tanks, curbs, or other man-made stationary features occurring above or below ground surface.
- F. Utility: Any buried pipe, duct, conduit, cable or structure.

1.7 FIELD MEASUREMENTS

- A. Verify that survey benchmark, control points, and intended elevations for the Work are as shown on drawings.

PART 2 PRODUCTS

2.1 FILL MATERIALS

- A. Coarse Aggregate shall conform to FDOT Specification 901 with the exception that slag or crushed slag shall not be used. Stone size shall be No. 57.
- B. Fine Aggregate Type FDOT Specification for Road and Bridge Construction Section 902
- C. ASTM D2487 - Standard Classification of Soils for Engineering Purposes (Unified Soil Classification System) shall be used in the identification, classification and acceptance of fill materials.

- 2.2 Concrete: Lean concrete Class 1 conforming to Section 03300 CAST-IN-PLACE CONCRETE with a compressive strength of 2,500 psi, unless otherwise noted on the construction plans.

2.3 ACCESSORIES

- A. Geotextile Fabric: Non-biodegradable, non-woven or woven based on the application and per FDOT specification Section 514 and Section 985.

PART 3 EXECUTION

3.1 PROJECT CONDITIONS

- A. Site Information: Subsurface soils investigation report (if performed) has been included in the project bid package for information only. Data on indicated subsurface conditions is not intended as representative or a warranty of accuracy or continuity between soil borings. It is expressly understood that OWNER will not be responsible for interpretations or conclusions drawn by CONTRACTOR from the soils investigation report. Data is made available only for convenience of CONTRACTOR.
- B. Additional test borings and other exploratory operations may be performed by CONTRACTOR, at the CONTRACTOR's option; however, no change in the Contract Sum will be authorized for such additional exploration.
- C. Existing Utilities: Locate existing underground utilities in areas of excavation work. If utilities are indicated to remain in place, provide adequate means of support and protection during earthwork operations.
- D. Should uncharted, or incorrectly charted, piping or other utilities be encountered during excavation, consult with Project Manager and utility owner (ex. Bell South, FPL, FPUC, Comcast) or Sunshine State One Call immediately for directions.
- E. Uncharted or incorrectly charted underground utilities that are discovered during construction shall be incorporated into the project Record Drawings with vertical and horizontal coordinates.
- F. Cooperate with OWNER and utility companies in keeping respective services and facilities in operation. Repair damaged utilities to satisfaction of utility owner.
- G. Do not interrupt existing utility services except when permitted in writing by Project Manager and then only after acceptable temporary utility services have been provided.
- H. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earthwork operations.
- I. Use of explosives is not permitted.

3.2 PREPARATION

- A. Identify required lines, levels, contours, and datum locations.

- B. Protect plant life, lawns, rock outcropping and other features remaining as a portion of final landscaping.
- C. Protect benchmarks, existing structures, fences, sidewalks, paving, and curbs from excavating equipment and vehicular traffic.
- D. Maintain and protect above and below grade utilities that are to remain.
- E. Cut out soft areas of subgrade not capable of compaction in place. Backfill with approved materials as specified in Part 2 above.
- F. Dewatering, when and where required due to the groundwater elevation relative to the bottom of the excavation or subgrade (in the case of roadway construction) shall be performed in accordance with Section 02322 DEWATERING AND DRAINAGE.

3.3 EXCAVATION

- A. Prior to commencement of trenching and/or excavation, the CONTRACTOR shall physically locate all underground utilities as shown on the project construction drawings or as marked by Sunshine One Call or the underground utility owners. This information shall be provided to the Project Manager prior to trenching and excavation.
- B. Perform all excavation to depths indicated or as specified. During excavation, pile material suitable for backfilling in an orderly manner a sufficient distance from banks of trench to avoid overloading and to prevent slides or cave-ins. Unsuitable backfill material shall be identified and segregated from suitable backfill material and shall be removed from the project site by the CONTRACTOR at no expense to the OWNER.
- C. The bottom of the excavations shall be firm and dry and in all respects acceptable to the Project Manager and ENGINEER.
- D. Excavation and dewatering shall be accomplished by methods which preserve the undisturbed state of subgrade soils. The trench may be excavated by machinery to, or just below the designated subgrade, provided that material remaining in the bottom of the trench is no more than slightly disturbed. Subgrade soils which become soft, loose, "quick", or otherwise unsatisfactory as a result of inadequate excavation, dewatering or other construction methods shall be removed and replaced by screened gravel fill as required by the Project Manager and ENGINEER at the CONTRACTOR's expense.
- E. The length of open trench shall be related closely to the rate of pipe lay. Accurately grade bottom of excavations to provide uniform bearing and support for the item being installed on undisturbed soil at every point along its entire load

bearing sections, except for portions of pipe sections where it is necessary to excavate for bell holes and for proper sealing of pipe joints.

- F. Where pipe is to be laid directly on the trench bottom, final excavation at the bottom of the trench shall be performed manually, providing a flat bottom true to grade upon undisturbed or slightly disturbed material.
- G. Grade area to prevent surface water from flowing into trenches or other excavations, and remove any water accumulating therein by pumping or by other approved methods.
- H. Correct areas over excavated in accordance with Section 02300 EARTHWORK or Section 02324 BACKFILL.
- I. Where encountered in trench bed, rock shall be excavated to a depth of 1/4 of the pipe diameter below the bottom of the pipe but in no case less than 4 inches. All undercut excavations shall be backfilled and tamped with materials as specified in accordance with Section 02300 EARTHWORK or Section 02324 BACKFILL.
- J. Dig bell holes and depressions for joints after trench bottom has been graded and only of such length, depth, and width as required for properly making particular type of joint, so that pipe rests on prepared bottom for as nearly to its full length as practicable.
- K. Where wet or unstable soil that is incapable of properly supporting pipe, as determined by Project Manager and ENGINEER, is encountered in the bottom of trench, the trench bottom shall be excavated to a depth of at least two feet below the specified trench bottom. Place filter fabric in the bottom of the trench and support the filter fabric along the trench walls until the trench stabilization has been placed to the proper grade. The ends of the filter fabric shall be overlapped prior to placing the pipe.
- L. For Public Water Distribution Systems, Force Mains, Sanitary Sewers and Storm Drainage: Provide width of trench, at and below top of the pipe, with a clear space between barrel of pipe and trench wall as required by the pipe manufacturer recommendations. As a minimum, the distance between the pipe barrel and the trench wall shall not be less than 24-inches on both sides. This spacing does not apply to exfiltration trenches and the exfiltration trench width shall be as shown on the project construction drawings. The pipe shall rest firmly on undisturbed soil or pipe bedding material for as nearly to the full length of barrel as proper jointing operations will permit.
- M. Electrical Ducts or Cables: Provide trenches for cables or duct of a depth that will provide not less than 2 feet of cover below finished grade. Cut trenches for cables to an over depth of not less than 3 inches. Use select backfill material for not less than 3 inches bedding and 3 inches backfill over cable.

- N. Excavation for Appurtenances: Make sufficient excavation for manholes and similar structures to leave at least 18-inches of clearance between their outer surfaces and embankment or timber which may be used to hold and protect banks. Consider any over depth excavation below such appurtenances that has not been directed by Project Manager or ENGINEER as unauthorized and fill with sand, gravel, or concrete as directed by the Project Manager or ENGINEER and at expense of CONTRACTOR.
- O. Do not interfere with 45° bearing splay of foundations.
- P. Excavations shall not be left open overnight.

3.4 DISPOSAL OF MATERIALS

- A. Excavated material shall be stacked without excessive surcharge on the trench bank or obstructing free access to hydrants and gate valves. Inconvenience to traffic and adjacent property owners/users shall be avoided as much as possible. Excavated material shall be segregated for use in backfilling as specified below.
- B. It is expressly understood that no excavated material shall be removed from the site of the work or disposed of, except as directed by the Project Manager and ENGINEER. When removal of surplus materials has been approved by the Project Manager and ENGINEER, dispose of such surplus material in approved designated areas.
- C. Should conditions make it impracticable or unsafe to stack material adjacent to the trench, the material shall be hauled and stored at a location provided. When required, it shall be re-handled and used in backfilling the trench.

3.5 OSHA SAFETY COMPLIANCE

- A. Description: The use of trench box or other approved means to comply with the Florida Trench Safety Act (Chapter 90-96, Laws of Florida), and OSHA Trench Safety Standards, shall be used where excavation exceeds 5 feet in depth. CS/HB 3183 called for the OSHA revised excavation safety standards (29 C.F.R. S 1926.650, Subpart P) to be the safety standards for work under this section.
- B. Requirements: The Contract bid submitted by the CONTRACTOR who will perform such excavation shall include:
 - 1. A reference to the trench safety standards that will be in effect during the period of construction.
 - 2. Written assurance that such CONTRACTOR will comply with the applicable trench safety standards.

3. A unit price quotation on the appropriate line item identifying the cost of compliance (as established in the Summary of Bid Items).
4. Slope slides of excavations to comply with local codes, ordinances, and requirements of agencies having jurisdiction. Shore and brace where sloping is not possible because of space restrictions or stability of material excavated. Maintain sides and slopes of excavations in safe condition until completion of backfilling.

C. Execution by CONTRACTOR

1. The CONTRACTOR performing trench excavation shall, as a minimum, comply with the excavation safety standards, which are applicable to this project.
2. Adhere to any special shoring requirements, if any, of the State or other political subdivisions, which may be applicable to such a project.
3. The CONTRACTOR shall consider all geotechnical information, including his own site investigation, in his design of the trench safety system he will employ on the project. The CONTRACTOR shall submit his design to the Project Manager at the Pre-Construction Conference.
4. Trenches and excavations shall not be left open overnight without the written authorization of the Project Manager. All trenches and excavations within 6-feet of the edge of roadway shall be backfilled and properly compacted or trench-plated by the CONTRACTOR. In either case, the CONTRACTOR shall place type II lighted barricades and snow fence around the trench/excavation at the end of each working day.
5. Trenches or excavations that reduce the roadway or travel lane width shall be backfilled with suitable sub-grade material and road rock. If the temporary reinstatement is to be in place longer than 48 hours, the roadway shall backfilled and trench-plated by the CONTRACTOR. In either case, the CONTRACTOR shall place type II lighted barricades adjacent to the roadway impact area(s).

3.6 SHEETING AND BRACING

- A. The CONTRACTOR shall provide all trench and structural bracing, sheeting, or shoring necessary to construct and protect the excavation, existing utilities, structures and private property of all types and as required for the safety of the employees. Sheeting shall be removed during backfilling operations. Removal of shoring for structures shall be done in such a manner as not to disturb or mar finished masonry or concrete surfaces.

- B. When moveable trench bracing such as trench boxes, moveable sheeting, shoring or plates are used to support the sides of the trench, care shall be taken in placing and moving the boxes or supporting bracing to prevent movement of the pipe, or disturbance of the pipe bedding and backfill.
- C. When installing pipe, trench boxes, moveable sheeting, shoring or plates that extend below the mid diameter of the pipe shall be raised to the mid diameter of the pipe before they are moved forward or removed from the excavation. As trench boxes, moveable sheeting, shoring or plates are raised and moved, suitable backfill material shall be placed to fill any voids created and the backfill shall be re-compacted and density tested to provide and confirm uniform side support for the pipe. Refer to Section 02324 BACKFILL for additional information and requirements.
- D. The cost for use of trench boxes and/or steel sheeting will be included in the bid items for pipe and structures and shall include full compensation for driving, bracing and later removal of sheeting.
- E. All sheeting and bracing shall be carefully removed in such manner as not to endanger the construction of other structures, utilities, or property, whether public or private. All voids left after withdrawal of sheeting and/or bracing shall be immediately refilled with suitable backfill materials by ramming with tools especially adapted to that purpose. Compaction and density verification testing is required.

3.7 PROTECTION OR REMOVAL OF UTILITY LINES

- A. Prior to construction the CONTRACTOR shall locate for physical location, elevation and dimensions and adequately uncover existing utilities, (within the path of his proposed work), to determine possible conflicts. By starting underground constructions, the CONTRACTOR has agreed that they are fully responsible for any and all damages and/or delays that may arise from not having adequately locating the underground utilities. This applies to underground utilities that are shown on the project construction drawings and those that have been physically marked in the field by the various locating organizations or agencies.
- B. Information provided on the plans may be used as an approximate guide to assist the CONTRACTOR, however, the CONTRACTOR shall rely on actual field investigation to assure that all of the existing utilities are accurately located prior to commencement of his work.
- C. Existing structures reflect the best available information, but it shall be the CONTRACTOR's responsibility to acquaint him with all information and to avoid conflict with existing conditions. Protect all existing utility lines that are to be

retained, or utility line constructed during excavation operations, from damage during excavation and backfilling; if damaged, repair at CONTRACTOR's expense.

- D. Existing Utility Lines to be Retained: Repair damaged lines that are not shown on drawings, or locations of which are not known to CONTRACTOR in sufficient time to avoid further damage.
- E. Uncharted or incorrectly charted underground utilities that are discovered during construction shall be incorporated into the project As-Builts with vertical and horizontal coordinates.
- F. Prior to commencement of any excavation, the CONTRACTOR shall comply with Florida Statute 553.851 for the protection of underground gas lines and underground telecommunication lines.

3.8 BACKFILL

- A. Refer to Section 02324 BACKFILL for backfill, compaction and density testing requirements.

3.9 FIELD QUALITY CONTROL

- A. Section 01400 QUALITY REQUIREMENTS.
- B. Compaction testing will be performed in accordance with ASTM D1556 or AASHTO T180.
- C. If tests indicate Work does not meet specified requirements, remove Work, replace, compact, and retest. Refer to Section 01025 MEASUREMENT AND PAYMENT.
- D. Frequency of Density Tests: Refer to Section 02324 BACKFILL.

3.10 PROTECTION OF FINISHED WORK

- A. Maintain the elevations and contours of berms, ponds and embankments during construction.
- B. Reshape and re-compact fills subjected to vehicular traffic during construction.

3.11 PAVEMENT, REMOVAL, AND REPLACEMENT

- A. Removal: Where it is necessary to cut existing pavement, curbs, gutters, make saw cut with neat, parallel straight lines, at least 2 feet wider than trench width on

each side of trench; approved dust control measures shall be implemented by the CONTRACTOR when cutting roadways and curbs.

- B. Replacement: Replace pavement, curbs and gutters, and sidewalks to same cross section as original, except when otherwise detailed on the project construction drawings, using materials same as original construction. Replace no pavement until trench has been backfilled, compacted and accepted as specified herein.
- C. Temporary Surfaces: For temporary road surface, use temporary asphalt (preferred) or crushed stone (to be watered at least 3 times a day including weekends), as approved. One-way traffic must be maintained at all times and street must be fully opened to traffic as quickly as possible. The temporary surface or permanent pavement shall be placed no later than 2 days after the trench backfilling. Completely remove temporary materials and dispose when permanent pavement is replaced.

END OF SECTION

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SECTION 02322 - DEWATERING AND DRAINAGE

PART 1 GENERAL

1.1 STATUTORY REQUIREMENTS

- A. CONTRACTOR is responsible to obtain and pay for all permits required for temporary dewatering and drainage systems as required by the appropriate authorities having jurisdiction over the work.
- B. Original permits shall be prominently displayed on the site prior to constructing dewatering and drainage systems.

1.2 SCOPE OF WORK

- A. Furnish, install, operate, monitor, maintain and remove temporary dewatering and drainage systems as required and lower and maintain groundwater levels a minimum of 2 feet below sub-grades of excavations. Continuously maintain excavations free of water, regardless of source, and until backfilled to final grade. Prevent surface water runoff from entering or accumulating in excavations.
- B. Furnish the services of a licensed professional engineer registered in the State of Florida, to prepare dewatering and drainage system designs and submittals.
- C. Collect and properly dispose of all discharge water from dewatering and drainage systems in accordance with State and local requirements and permits. As a minimum, no discharge or run-off of groundwater or surface water that is contaminated with any petroleum products (gasoline, diesel fuel, oil, grease, hydraulic fluid, etc.) and/or sanitary waste shall be made to surface water systems such as lakes, rivers, streams, the Intracoastal Waterway or "on-site" retention ponds that secondarily discharge to these surface water systems.
- D. Repair damage caused by dewatering and drainage system operations.
- E. Remove temporary dewatering and drainage systems when no longer needed. Restore all disturbed areas.
- F. Furnish, install, monitor, maintain and remove groundwater observation wells (piezometers) as specified herein.]

1.3 RELATED SECTIONS

- A. The pre-design Geotechnical report is being provided for "reference only" and to provide the CONTRACTOR with the bore hole locations and general findings of

subsurface materials. Refer to Section 02320 TRENCHING AND EXCAVATION for additional clarification.

- B. Section 01010 – Summary of Work
- C. Section 01110 – Environmental Protection Procedures
- D. Section 01025 - Measurement and Payment
- E. Section 01400 - Quality Requirements
- F. Section 02300 – Earthwork
- G. Section 02320 – Trenching and Excavation
- H. Section 02324 - Backfill

1.4 UNIT PRICE – MEASUREMENT AND PAYMENT

- A. There is no unit pricing for this work and all on-site dewatering and drainage shall be considered to be incidental to the cost of the associated pay item(s).
- B. If identified in the Schedule of Bid Items, the cost of securing a General Water Use Permit from the South Florida Water Management District shall be reimbursed as an Allowance in accordance with Section 01025 MEASUREMENT AND PAYMENT.

1.5 SUBMITTALS

- A. Submit, in accordance with Section 01340 SHOP DRAWINGS, WORK DRAWINGS, AND SAMPLES the temporary dewatering and drainage system plan and design. At the discretion of the OWNER, dewatering and drainage system designs shall be prepared by a licensed professional engineer, registered in the State of Florida, having a minimum of 5 years of professional experience in the design and construction of dewatering and drainage systems. The submittal will be for authorization to make formal permit application to the South Florida Water Management District for the General Water Use Permit. The CONTRACTOR shall be responsible for adequacy and safety of construction means, methods and techniques.

1.6 DEFINITIONS

- A. Wellpoint: A dewatering system utilizing wellpoints to extract surrounding groundwater in the area of trenching/excavating in order to maintain the operation

in a dry condition for preparation of the trench bottom, for pipe laying, placement of bedding material and/or backfill, compaction and density testing.

- B. A dry excavation / trench: Shall be defined as the in situ soil moisture content is no more than two percentage points above the optimum moisture content for that general soil.

PART 2 PRODUCTS

2.1 Pump Drivers

- A. Noise levels emitted by diesel and/or gasoline pump drivers shall be controlled by the use of a “quiet-pack” muffler system or other suitable sound attenuation methods and shall not exceed 60 dB for daytime use and 55 dB for night time use at the nearest “receiving” property line. CONTRACTOR shall demonstrate, measure and record the dB levels at the time of initial set-up. The CONTRACTOR shall record dB levels weekly.

PART 3 EXECUTION

3.1 GENERAL

- A. Protection of Property - CONTRACTOR shall make an assessment for dewatering induced settlement and shall provide devices or systems, including but not limited to re-injection wells, infiltration trenches and cutoff walls, necessary to prevent damage to existing facilities, completed Work and adjacent facilities.
- B. Control surface water and groundwater such that excavation to final grade is made in the dry, and bearing soils are maintained undisturbed. Prevent softening, or instability of, or disturbance to, the sub-grade due to water seepage.
- C. Provide protection against flotation for all work.
- D. The impact of anticipated subsurface soil/water conditions shall be considered when selecting methods of excavation and temporary dewatering and drainage systems. Through the use of groundwater observation wells (piezometers), where groundwater levels are found not to be at least 2 feet below the proposed bottoms of excavations, a pumped dewatering system is required for pre-drainage of the soils prior to excavation and for maintenance of the lowered groundwater level until construction has been completed to such an extent that the foundation, structure, pipe, conduit, or fill will not be floated or otherwise damaged. Type of dewatering system, spacing of dewatering units and other details of the work are expected to vary with soil/water conditions at a particular location.

- E. Wellpoints shall not be set in such a way that undermines or jeopardizes paved areas; if the setting of wellpoints undermines or impacts paved areas, the impacted areas shall be removed and restored equal to or better than their original condition at the expense of the CONTRACTOR.
- F. Pipe and conduit shall not be installed in water or allowed to be submerged prior to backfilling. Pipe and conduit which becomes submerged shall be removed and the excavation dewatered and restored to proper conditions prior to reinstalling the pipe and conduit

3.2 SURFACE WATER CONTROL

- A. Control surface water runoff to prevent flow into excavations. Provide temporary measures such as dikes, ditches and sumps.

3.3 GROUNDWATER OBSERVATION WELLS (PIEZOMETERS)

- A. Groundwater observation wells (piezometers) shall be installed for monitoring groundwater levels before and during construction / installation of pipelines, foundations and structures that are below or just above the existing groundwater table. A minimum of one well for every 100 feet of pipeline and two wells at each foundation or structure in locations accepted by the ENGINEER. Observation wells shall be designed and installed in such a manner as to provide an accurate and reliable indication of the groundwater levels adjacent to the pipelines, foundations and structures.
- B. Each observation well shall be installed in a 2½ inch diameter bore hole extending at least 4-ft below the invert of the pipeline, foundation or structure. Backfill the annular space surrounding the intake and casing with filter sand especially processed for this purpose. Cap the top of the well to prevent infiltration of surface water.
- C. Maintain observation wells until pipelines, foundations and structures are backfilled. Observe and record daily the groundwater elevation in each well. Furnish measurements daily to the Project Manager. Periodically verify observation well accuracy by adding water to the well and recording the drop in level from the time the water was added. Redevelop plugged observation wells to maintain accuracy and reliability of groundwater level indication.
- D. Excavation work shall not be performed until the readings obtained from the observation wells indicate that the groundwater has been lowered at least 2 feet below the bottom of the sub-grade within the limits of excavation.

3.4 DISPOSAL OF DRAINAGE WATER

- A. All water discharged from temporary dewatering and drainage systems shall be disposed of in accordance with the sedimentation and control plans as specified in Section 01025 ENVIRONMENTAL PROTECTION PROCEDURES. Existing or new sanitary sewer systems shall not be used to dispose of drainage without written authorization from the Project Manager.
- B. Collect and properly dispose of all discharge water from dewatering and drainage systems in accordance with State and local requirements and permits. As a minimum, no discharge or run-off of groundwater or surface water that is contaminated with any petroleum products (gasoline, diesel fuel, oil, grease, hydraulic fluid, etc.) and/or sanitary waste shall be made to surface water systems such as lakes, rivers, streams, the Intracoastal Waterway or “on-site” retention ponds that secondarily discharge to these surface water systems.

3.5 DEWATERING

- A. All State and local permits associated with dewatering are the responsibility of the CONTRACTOR.
- B. Dewatering systems shall be designed to allow for localized variations in the depths of the excavations.
- C. Prevent surface water and subsurface or groundwater from flowing into excavations and from flooding project site and surrounding areas. All pumping and drainage shall be done with no damage to property or structures and without interference with the rights of the public, owners of private property, pedestrians and vehicular traffic.
- D. Do not allow water to accumulate in excavations. Remove water to prevent softening of foundation bottoms, undercutting footings, and soil changes detrimental to stability of sub-grades and foundations. Provide and maintain pumps, well points, sumps, suction and discharge lines, and other dewatering system components necessary to convey water away from excavations.
- E. Establish and maintain temporary drainage ditches and other diversions outside excavation limits to convey rainwater and water removed from excavations to collecting or runoff areas. Do not use trench excavations as temporary drainage ditches.
- F. Dewatering shall be accomplished well enough in advance of excavation to ensure that groundwater is already lowered prior to completing the final excavation to finish grade.

- G. Lower and maintain groundwater level a minimum of two (2) feet below bottom of excavation during placement and compaction of bedding material and foundation soils and during placement and compaction of fill and back-fill material.
- H. Excavations for foundations and structures shall be maintained in-the-dry for a minimum of 4 days after concrete placement. In no event shall water be allowed to enter an excavation and rise to cause unbalanced pressure on foundations and structures until the concrete or mortar has set at least 24 hours.
- I. Dewatering and drainage operations shall at all times be conducted in such a manner as to preserve the natural undisturbed bearing capacity of the sub-grade at the bottom of the excavation. If the sub-grade becomes disturbed for any reason, the unsuitable sub-grade material shall be removed and replaced with concrete, compacted granular fill, or other approved material to restore the bearing capacity of the sub-grade to its original undisturbed condition at no additional cost to the OWNER.

3.6 DAMAGE RESTORATION

- A. Damage restoration: The CONTRACTOR shall be responsible for any heaving, settlement and/or separation of pavement that results from the dewatering operations. A damage restoration/remediation plan will be required for review and authorization to proceed.

3.7 RESTORATION OF DEWATERING ACTIVITIES

- A. As the wellpoints are withdrawn, the locations of the voided areas shall immediately backfilled by jetting approved backfill material into the voids until they are completely filled. These restored wellpoint voids are subject to random density verification testing.

END OF SECTION

SECTION 02324 - BACKFILL

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Materials
- B. Execution
- C. Examination
- D. Preparation
- E. Bedding
- F. Backfilling
- G. Field Quality Control
- H. Compaction
- I. Frequency of Tests

1.2 RELATED SECTIONS

- A. Section 01025 - Price and Payment Procedures
- B. Section 01340 – Shop Drawings, Working Drawings and Samples
- C. Section 01400 - Quality Requirements
- D. Section 02060 - Aggregate
- E. Section 02300 – Earthwork
- F. Section 02320 – Trenching and Excavation
- G. Section 02322 – Dewatering and Drainage
- H. Section 02740 – Subgrade, Base Course and Asphalt

1.3 REFERENCES

- A. AASHTO T180 - Standard Specification for Moisture-Density Relations of Soils Using a 4.54-kg (10-lb) Rammer and a 457-mm (18-in) Drop.
- B. ASTM D1556 - Standard Test Method for Density of Soil in Place by the Sand-Cone Method.
- C. ASTM D1557 - Standard Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort (6,000 ft-lbf/ft³ (2,700 kN-m/m³)).
- D. ASTM D2922 - Standard Test Method for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).
- E. ASTM D3017 - Standard Test Method for Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth).

1.4 UNIT PRICE - MEASUREMENT AND PAYMENT

- A. Material that is excavated for the purpose of installing water mains and service connections, force mains, sanitary sewers and laterals or storm drainage piping and their associated public manholes and structures and then reused as bedding and/or backfill material are not subject to this UNIT PRICE - MEASUREMENT AND PAYMENT provision. The use of the in-situ material as backfill material shall be considered as incidental to the item installation.
- B. Fill Type – Fine Aggregate : By the cubic yard. Includes excavating existing subsoil, supplying fill materials, stockpiling, scarifying substrate surface, placing where required, and compacting.
- C. Structural Fill Type – Course Aggregate : By the cubic yard. Includes supplying fill material, stockpiling, scarifying substrate surface, placing where required, and compacting.
- D. Concrete (Flowable) Fill: For “areas”, by the cubic yard, and for grout filling of abandoned pipe, by the linear foot. Includes supplying materials, forming, mixing, and placing (and curing where required).

PART 2 PRODUCTS

2.1 FILL MATERIALS - GENERAL

- A. All fill material shall be approved by the Project Manager and ENGINEER. CONTRACTOR shall notify the Project Manager and Engineer one week in advance of providing imported material, shall provide a 1 cubic yard sample and the results of a signed and sealed proctor test and material classification report for the material to the Project Manager and ENGINEER.

Backfill

- B. Materials generated from the on-site excavations or imported from an off-site source may be utilized for backfill of pipeline and associated structure excavations provided the materials consist of relatively clean sands or reasonably well graded, relatively clean sand-gravel mixtures that are free of timber, roots, clods, construction demolition debris, rubbish, trash or other deleterious matter. The materials shall have a maximum size of 1 inch, have not more than 10 percent passing the US Standard No. 200 Sieve and contain not more than 2 percent (by weight) of organic matter.
- C. Satisfactory soil materials are defined as those complying with ASTM D2487 soil classification groups GW, GP, GM, SM, SW, and SP.
- D. Unsatisfactory soil materials are defined as those complying with ASTM D2487 soil classification groups GC, SC, ML, MH, CL, CH, OL, OH, and PT.
- E. Coarse Aggregate shall conform to FDOT Specification 901 with the exception that slag or crushed slag shall not be used. Stone size shall be No. 57.
- F. Fine Aggregate shall conform to FDOT Specification 902.
- G. Subbase, Backfill, and Fill Materials: Satisfactory soil materials free of clay, debris, waste, vegetation, rock or gravel larger than 2 inches in any dimension, and other deleterious matter.

2.2 ACCESSORIES

- A. Geotextile Fabric: Non-biodegradable, non-woven or woven, depending on the application as per FDOT Specification Section 514 and 985.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Inspect the area to be backfilled to assure that all preceding work activities have been completed and accepted, otherwise, the CONTRACTOR will be “at risk” until the preceding work has been accepted by the Project Manager.

3.2 DEFINITION OF BACKFILL ZONES

- A. Lowest Zone: The lowest zone is backfilled for deep undercuts up to within 6-inches of the bottom of the pipe.
- B. Bedding Zone: The zone above the lowest zone is the Bedding Zone. Usually it will be backfill which is the 6-inches, or the thickness identified on the project

Backfill

construction drawings, of soil below the bottom of the pipe. If the bedding zone has been constructed (vs. undisturbed in-situ material), the Bedding Zone shall be placed in lifts no greater than 6-inches (compacted thickness).

- C. Cover Zone: The next zone is backfill that is placed after the pipe has been laid and will be called the Cover Zone. This zone extends to 12-inches above the top of the pipe. The Cover Zone and the Bedding Zone are considered the Soil Envelope for the pipe. The Cover Zone shall be placed in lifts no greater than 6-inches (compacted thickness).
- D. Top Zone: The Top Zone extends from 12-inches above the top of the pipe to the base or final grade. The Top Zone shall be placed in lifts no greater than 12-inches (compacted thickness).

3.3 BACKFILL FOR PIPELINES

A. LOWEST ZONE

- 1. When over-excavation is required due to unforeseen site conditions backfill of the over-cut shall have a minimum thickness of 6-inches and shall be manually or mechanically tamped to simulate comparable density to that of the native soils.

B. BEDDING ZONE

- 1. Excavate pipe trench in accordance with Section 02320 TRENCHING AND EXCAVATION for work of this Section. Hand trim excavation for accurate placement of pipe to elevations indicated.
- 2. If a trench box is used for the installation of the piping, it shall be raised to an elevation even with the top of the pipe before the Bedding Zone materials are placed. Once the trench-box has been moved upward, forward or removed from the excavation, the voids created by this action shall receive supplemental backfill material and re-compacted to 98% of modified proctor where applicable.
- 3. If required, bedding material shall be placed to provide uniform support along the bottom of the pipe and to place and maintain the pipe at the proper elevation. The initial layer of bedding placed to receive the pipe shall be brought to the grade and dimensions indicated on the project construction drawings. All bedding shall extend the full width of the trench bottom. The pipe shall be placed and brought to grade by tamping the bedding material or by removal of the excess amount of the bedding material under the pipe. Adjustment to grade line shall be made by scrapping away or filling with bedding material. Wedging or blocking up

Backfill

of pipe is not permitted. Applying pressure to the top of the pipe, such as with a backhoe bucket, to lower the pipe to the proper elevation or grade shall not be permitted.

4. Were wet or unstable soil that is incapable of properly supporting pipe, as determined by Project Manager and ENGINEER, is encountered in the bottom of trench, the trench bottom shall be excavated to a depth of at least two feet below the specified trench bottom. Place filter fabric in the bottom of the trench and support the filter fabric along the trench walls until the over-excavation has been backfilled, in two (2) 1-foot lifts (as applicable based on the backfill material; structural backfill or FDOT rock). The ends of the filter fabric shall be overlapped prior to placing the pipe.

C. COVER ZONE

1. Haunching: Initial backfill/haunching material shall be carefully placed by hand until one third of the pipe diameter has been covered. The CONTRACTOR shall use non-mechanical means to tamp the backfill/haunching material to form unified initial support for the pipe for each lift.
2. After haunching of the pipe, carefully and evenly backfill trenches on all sides with suitable backfill materials and thoroughly and carefully tamped each lift until the backfill material reaches the same elevation as the top of the pipe.
3. If a trench box is used for the installation of the piping, it shall be raised to an elevation even with the top of the pipe before the Cover Zone backfill materials are placed. Once the trench-box has been moved upward, forward or removed from the excavation, the voids created by this action shall receive supplemental backfill material and re-compacted to 98% of modified proctor.
4. To prevent longitudinal movement of the pipe, dumping backfill material into the trench and then spreading will not be permitted until approved material has been placed and compacted to a level 1-foot over the pipe.

D. TOP ZONE

1. For the remaining lifts of backfill, the material shall be placed in 12-inch lifts and compacted. Compact each layer to a density of 98% of modified proctor in paved areas and 95% of modified proctor in landscaped and open areas.

Backfill

2. For all non-metallic pipeline installations, detection tape shall be buried 4 to 10-inches beneath the ground surface directly over the top of the utility. Should detection tape need to be installed deeper, the CONTRACTOR shall provide 3-inch wide tape. In no case shall detection tape be buried greater than 20-inches from the finished grade surface. Detection tape shall be appropriately identified based on the specific utility installation.

3.4 FOR STRUCTURES:

- A. All structures shall be marked and numbered with gradient lines, by the CONTRACTOR, to indicate the required lift thickness.
- B. Carefully backfill around all sides in a continuous and progressive manner in lifts no greater than 6-inches (compacted thickness) with excavated materials approved for backfilling, free from large clods of earth and stones and compact to 98% of modified proctor in all areas.
- C. For the sides of the structure where there is pipe penetration, the compacted backfill shall be brought up to a point where the pipe, at the correct invert elevation, is resting on compacted backfill. A bell-hole, extending no further than 1-foot from the structure, may be left around the penetration point for mudding-up around the pipe.

3.5 GENERAL BACKFILL

- A. All backfill operations shall be done in the dry. The dry condition shall be maintained during placement, compaction and density testing.
- B. As soon as practicable after the pipe has been laid and jointed, backfilling shall begin and thereafter be prosecuted expeditiously.
- C. Flooding of backfill (with potable water) will only be permitted when so directed in writing by the Project Manager.
- D. Reopen improperly backfilled trenches, or trenches where settlement occurs, to depth required for proper compaction, as determined by the ENGINEER, then refill and compact, with surface restored to required grade and compaction, mounded over and smoothed off.
- E. Backfill open trenches across roadways or other areas to be paved as specified above, backfill entire depth of trench in 6-inch layers, and compact each layer to a density of 98% of modified proctor, so that paving can proceed immediately after backfilling is completed.

- F. Grade ground to reasonable uniformity along all other portions of trenches and leave mounding over trenches in a uniform and neat condition, to the satisfaction of ENGINEER.
- G. Except as otherwise indicated, top of all piping and conduit to be 36" below finish grade (keeping project swale development in mind) unless incased in concrete. Concrete encasement to consist of a minimum of 4" thick concrete base slab placed prior to installation of piping or conduit and a minimum 4" thick concrete encasement (sides and top) placed after installation and testing of piping or conduit.
- H. Backfill excavations as promptly as work permits, but not until completion of the following:
 - 1. Acceptance of construction below finish grade including, where applicable, damp proofing, waterproofing, and perimeter insulation.
 - 2. Inspection, testing, approval, and recording locations of underground utilities have been performed and recorded.
 - 3. Removal of concrete formwork.
 - 4. Removal of trash and debris from excavation.
- I. Backfill areas to contours and elevations with approved materials.
- J. Systematically backfill to allow maximum time for natural settlement. Do not backfill over porous, wet or spongy subgrade surfaces.
- K. Place geotextile fabric over Class A-7 material existing prior to placing next lift of fill (if approved).
- L. Employ a placement method that does not disturb or damage other work.
- M. Maintain optimum moisture content of backfill materials to attain required compaction density.
- N. Backfill against supported foundation walls and concrete structures. Do not backfill against unsupported foundation walls.
- O. Backfill simultaneously on each side of unsupported foundation walls until supports are in place.
- P. Slope grade away from building minimum 2 inches in 10 ft, unless noted otherwise.

Backfill

- Q. Make gradual grade changes. Blend slope into level areas.
- R. Remove surplus backfill materials from site as directed by the Project Manager and/or ENGINEER.
- S. Leave fill material stockpile areas free of excess fill materials.
- T. TOLERANCES:
 - 1. Top surface of backfill for site clearing and general earthwork shall be plus or minus 0.10 foot from required elevations.
 - 2. Top surface of backfill for the creation of or improvements to berms or other stormwater containment earthworks shall be plus 0.10 foot, minus 0.00 foot from required elevations.

3.6 FIELD QUALITY CONTROL

- A. Section 01400 QUALITY REQUIREMENTS
- B. Compaction testing will be performed in accordance with ASTM D1556 or AASHTO T180 in locations as specified by the Project Manager or ENGINEER. Project Manager and/or ENGINEER are to select specific locations and lifts as well as witnessing of all compaction testing.
- C. If tests indicate Work does not meet specified requirements, remove Work, replace and retest. In general, the re-test locations shall be as specified in FDOT Standard Specification 125.

3.7 COMPACTION

- A. Percentage of Maximum Density Requirements: Compact soil to not less than the following percentages of maximum density, in accordance with AASHTO T-180 specifications or ASTM D1557:
 - 1. Structures, Building Slabs and Steps: 98% of the modified proctor.
 - 2. Pipe Bedding Zone and Cover Zone: 98% of the modified proctor.
 - 3. Driveway aprons, sidewalk sections that form part of a driveway apron, driveways and roadways: As a minimum, compact top 12" of subgrade and each layer of backfill or fill material to 98% of the modified proctor. Roadways may require special subgrade stabilization as specified in the project construction drawings.

Backfill

4. Lawn or Unpaved Areas: From 1-foot above the top of the pipe (Top Zone), 95% of the modified proctor; areas around structures shall be 98% of the modified proctor.
 5. Sidewalks and walkways: Compact top 12 inches of subgrade and each layer of backfill or fill material to 95% of the modified proctor.
- B. All subgrade shall be compacted and tested up to 6-inches from the edge of the pavement (asphalt or concrete). If for specific design reasons and the project construction drawings requires an area greater than 6-inches outside the edge of slab to be compacted and tested, then those more stringent requirements shall take precedence.
- C. Frequency of Tests:
1. Pipelines: In Public Right Of Way, swales and under sidewalks, every 100 feet per lift, for driveway aprons each lift, for road crossings each lift in three (3) locations, as directed by ENGINEER or Project Manager.
 2. In utility easements, every 200 feet per lift.
 3. Public Manholes and Structures: Each lift around structure; all sides shall be tested in random order. In addition, the final lift under pipe penetrations shall be tested.
 4. Berms: Every 200 feet per lift.
 5. Swales: For areas that have been built-up and a swale cut-in every 200 feet; otherwise, density testing of swales cut-in to existing ground does not require density testing.
- D. The CONTRACTOR's Test Lab is to "map" all density test results (pass and fail) on the Record Drawings on each day when field tests are performed. CONTRACTOR's Testing Lab shall leave a copy of the day's density testing results on site.
- E. CONTRACTOR is to instruct their Testing Lab to directly mail signed and sealed copies of all Test Reports (Procter, Density, Water Quality, etc.) to the Project Manager and ENGINEER on a weekly basis.

END OF SECTION

Backfill

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SECTION 02370 - EROSION CONTROL AND SLOPE PROTECTION

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 erosion control installation, as indicated on the drawings, as specified herein or both.

1.3 INTENT

- A. The main concern associated with erosion on a construction site is the movement of soil off the site and its impact on water quality. It is the OWNER's intent that the CONTRACTOR install and maintain sufficient erosion control practices to retain sediment within the boundaries of the site in addition to complying with regulatory authorities having jurisdiction and local erosion and sedimentation control laws and ordinances. All erosion control methods and devices used shall conform to the latest requirements imposed by federal, state and local authorities. The CONTRACTOR shall be responsible for repair of any damage caused and shall be financially responsible for any penalties imposed.
- B. If an erosion control drawing has been included in the drawings prepared by the ENGINEER, it shall be the CONTRACTOR's responsibility to review the drawing prior to implementation. If an erosion control drawing is not included in the project documents, the CONTRACTOR shall submit, for approval, a proposed sequence of operations and a compatible method of preventing erosion.
- C. The CONTRACTOR shall prepare and implement a Storm Water Pollution Prevention Plan (SWPPP) in accordance with FDEP document 62-621.300(4)(a).

1.4 SUMMARY

- A. Work under this section shall include but not be limited to, installation and maintenance of both temporary and permanent soil erosion control measures, slope protection and stabilization measures, protection of all surface water and property both on and off site. This work shall include all labor, materials, and equipment necessary to meet all applicable requirements and as specified in the contract documents.

1.5 REFERENCE STANDARDS

- A. All applicable standards and requirements of all regulatory authorities having jurisdiction, including local FDEP and soil conservation agencies.

1.6 QUALITY ASSURANCE

- A. Soil erosion and sediment control measures shall be implemented in accordance with the requirements and procedures outlined in this specification, contract drawings and documents, the state standards or guidelines for soil erosion and sediment control, and all regulatory authorities having jurisdiction. Where conflict between requirements exist, the more restrictive rules shall govern.
- B. The CONTRACTOR shall provide all temporary control measures shown on the drawings, or as directed by the OWNER, owner's representative, or soil conservation district for the duration of the contract. Erosion control drawings are intended to be a guide to address the stages of work shown. Additional erosion control measures not specified on the drawings may be necessary and shall be implemented to address intermediary stages of work and any conditions that may develop during construction at no cost to the OWNER.
- C. Temporary control provisions shall be coordinated with permanent erosion control features to the extent practical to assure economical, effective and continuous erosion control throughout the construction and post-construction period.
- D. Soil erosion and sediment control measures shall at all times be satisfactory to the owner's representative. Owner's representative will inform the CONTRACTOR of unsatisfactory construction procedures and operations if observed. If the unsatisfactory construction procedures and operations are not responded to and corrected within 48 hours, the owner's representative may suspend the performance of any or all other construction until the unsatisfactory condition has been corrected. Such suspension shall not be the basis of any claim by the CONTRACTOR for additional compensation nor for an extension of time to complete the work. Any complaints, fines, etc. relating to ineffective erosion control, shall be the sole responsibility of the CONTRACTOR.
- E. The CONTRACTOR shall inspect all soil erosion and sediment control measures at least at the beginning and end of each day to ascertain that all devices are functioning properly during construction. Maintenance of all soil erosion and sediment control measures on the project site shall be the responsibility of the CONTRACTOR until the project is 100% complete, and until the permanent soil erosion controls are established and in proper working condition.
- F. The CONTRACTOR shall protect adjacent properties and watercourses from soil erosion and sediment damage throughout construction.

1.7 SEQUENCE OF CONSTRUCTION

- A. The approved construction sequence, as permitted/approved shall be adhered to during the execution of work under this section. All soil erosion and sediment control measures shall be installed in accordance with the phasing sequence shown on the contract documents.

PART 2 PRODUCTS

2.1 MATERIALS

- A. CONTRACTOR shall provide all materials necessary to perform the work.
- B. Hold/gro as manufactured by Gulf States Paper, Tuscaloosa, Alabama or approved equal.

PART 3 EXECUTION

3.1 GENERAL REQUIREMENTS

- A. Review the soil erosion and sediment control drawings as they apply to current site conditions. Any deviation from the drawings must be submitted for approval to the ENGINEER in writing at least 72 hours prior to commencing that work.
- B. Notify county or municipal soil conservation district, in writing least 72 hours prior to initial land disturbance.
- C. All soil sediment and erosion control devices shall be in place prior to any earthwork construction, in their proper sequence, and maintained until permanent protection is established.
- D. The limit of the area of any earthwork operations in progress shall be commensurate with the CONTRACTOR's capability and progress in keeping the finished grading, mulching, seeding and other such permanent control measures current and in accordance with the accepted schedule for construction phasing. Should seasonal limitations make such coordination unrealistic, as determined by the owner's representative, temporary erosion control measures shall be provided immediately by the CONTRACTOR at no expense to the OWNER.
- E. Temporary erosion control measures shall be used to correct conditions which develop during construction that are needed prior to installation of permanent control features, or that are temporarily needed to control erosion that develops during normal construction practices, but are not associated with permanent control features on the project.
- F. The CONTRACTOR shall incorporate all permanent erosion control features into the project at the earliest practical time to minimize the need for temporary controls.

- G. A temporary construction entrance pad shall be installed and maintained at any point where construction vehicles enter a public right-of-way, street or parking area. The pad shall be used to eliminate mud from the construction area onto public right-of-way. The pad shall be constructed as shown on the drawings. Any mud or debris tracked on streets shall be cleaned up immediately.
- H. Any disturbed or stockpiled areas that will be left exposed more than 30 days, and not subject to construction traffic, shall immediately receive a temporary seeding. Mulch/straw shall be used if the season prevents the establishment of a temporary cover.
- I. Permanent vegetation shall be established as specified on all exposed areas within 10 days after final grading, unless otherwise directed by the OWNER and permitted by appropriate regulations. Mulch as necessary for seed protection and establishment. Lime and fertilize seedbed prior to permanent seeding.
- J. Cut slopes shall be permanently seeded and mulched as the excavation proceeds to the extent considered desirable and practical. Slopes that erode easily shall be temporarily seeded and mulched.
- K. All storm drainage outlets must be stabilized, as specified, before the discharge points become operational. Equip all inlets with inlet protection immediately upon construction.
- L. Discharge from de-watering operations for the excavated areas shall not be directed to surface waters without first properly removing the suspended sediment through filtration and/or settlement. The CONTRACTOR shall obtain any required permits associated with dewatering activities.
- M. The quantity of silt fence to be installed will be affected by the actual conditions that occur during the construction of the project. Silt fence shall be installed at locations shown on the drawings and any additional locations necessary for proper erosion control. The CONTRACTOR shall maintain the silt fence until the project is accepted and shall remove and dispose of the silt fence and silt accumulations.
- N. Soil erosion and sediment control shall include but not be limited to the approved measures. The CONTRACTOR shall be responsible for providing all additional measures that may be necessary to accomplish the intent of the drawings.
- O. Comply with all other requirements of authorities having jurisdiction.

3.2 SLOPE PROTECTION

- A. The soil and dunes, if applicable, shall be graded as called for on the drawings prior to installation. Seed and fertilizer shall be applied immediately before laying fabric.

- B. The hold/gro fabric shall be installed vertically to the slope starting from the top and running the length of the slope to the bottom. The fabric shall be overlapped a minimum of four (4) inches at all joints. The staples shall be located nine (9) inches apart along the edge and three (3) feet apart down the center. The staples shall be installed as the fabric is rolled out. Use heavy gauge staples. The fabric shall be draped over the dune, if applicable. Stretching over voids shall be avoided.
- C. When used for slope protection of sand dunes, the fabric shall be installed several days before the dune planting takes place. When planting cut an "x"-shaped opening in the fabric and insert the plant.
- D. The installer shall have a representative of the factory on site to inspect the installation.

3.3 MEASUREMENT AND PAYMENT

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

END OF SECTION

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SECTION 02486 – SEED, MULCH AND FERTILIZER

PART 1 - GENERAL

1.01 SUMMARY:

- A. The Work covered by this Section consists of furnishing all the necessary equipment, materials and labor associated with the establishment and maintenance of grass in all areas as specified herein and in the drawings. These include, but are not limited to seeding, mulching and fertilizing newly grassed areas and maintenance.

1.02 SUBMITTALS:

- A. Certificates:
 - 1. Seed and fertilizer shall be certified that they meet requirements of these specifications, stating botanical name, percentage by weight, percentage of purity, germination, and weed seed for each grass seed species.

1.03 WARRANTY:

- A. The MANUFACTURER shall warrant the EQUIPMENT, MATERIALS and PRODUCTS specified in this section against defective materials and workmanship with the MANUFACTURER’S standard warranty, but for no less than one year from the date of Substantial Completion.
- B. The CONTRACTOR shall warrant the WORK against defects for one year from the date of Substantial Completion.

PART 2 - MATERIALS:

2.01 GRASS SEED:

- A. Provide fresh, clean, new crop seed complying with tolerance for purity and germination established by Official Seed Analysts of North America and as required below.
- B. Seed shall be labeled according to the U.S. Department of Agriculture Federal Seed Act and shall be furnished in containers with tags showing seed mixture, purity, germination, weed content, name of seller, and date on which seed was tested.
 - 1. Seed Mixtures: Meet the following minimum weight of pure live seed per acre:

Seed Name	Pounds Pure Live Seed
Argentine Bahia	41
Bermudagrass	14
Brown Top Millet	21

NOTE: Pure live seed (PLS) is determined by multiplying the % pure seed by the % germination. Therefore, if the pure seed is 80% and the germination is 70% the

PLS is .80 X .70 or 56%. At 56% it would take 53.5 pounds to equal 30 pounds of PLS.

2. Moldy seed or seed that has been damaged in storage will not be accepted.
3. When seasonal conditions mandate, substitute a winter grass such as rye grass for the brown top millet.

2.02 FERTILIZER:

- A. Commercial fertilizer shall be Ammonium Nitrate (34-0-0) containing 34 percent nitrogen and 24 percent sulfur. Fertilizer containing phosphorus is not acceptable.
- B. Deliver to site in unopened, labeled bags or containers.

2.03 MULCH:

- A. Vegetative Anti-Erosion Mulch: Seed free, salt hay or straw of wheat, rye or oats, or of pangola, peanut, coastal Bermuda or Bahia grass hay.
- B. Only undeteriorated mulch that can readily be cut into the soil shall be used.
- C. Green mulch will not be accepted.

PART 3 - EXECUTION

3.01 SOIL PREPARATION:

- A. Any growth, rocks, or other obstructions which might interfere with tilling, seeding, or later maintenance operations shall be removed and disposed of properly. Remove stones over 2 inches in any dimension and sticks, roots, rubbish and other extraneous matter.
- B. Areas to be seeded are to be graded to a smooth, even surface with loose, uniformly fine texture. Roll and rake, remove ridges and fill depressions, to meet finish grades. Limit fine grading to areas which can be planted within immediate future.
- C. Moisten prepared areas before planting if soil is dry. Water thoroughly and allow surface to dry before planting.
- D. If prepared areas are eroded or otherwise disturbed after fine grading and prior to planting they shall be restored to specified condition prior to planting.
- E. Immediately upon completion of construction, grass shall be planted in all disturbed areas and as designated in the drawings. Method of planting shall be either hydroseeding or dry seeding.

3.02 FERTILIZING:

- A. Apply fertilizer in accordance with manufacturer's recommendations.

- B. Incorporate fertilizer into the soil to a depth of at least 2 inches by disking, harrowing or raking, except on slopes steeper than 2 horizontal to 1 vertical.

3.03 SEEDING:

- A. Do not use wet seed or seed that is moldy or otherwise damaged in transit or storage.
- B. Do not seed when wind velocity exceeds 5 miles per hour. Distribute seed evenly over entire area by sowing equal quantity in two directions at right angles to each other.
- C. Sow not less than a rate of 76 pounds of pure live seed per acre.
- D. Rake seed lightly into top 1/8-inch of soil, roll lightly, and water with fine spray.
- E. Methods of Application:
 - 1. Dry Seeding: Spreader or seeding machine.

3.04 MULCHING:

- A. Apply mulch covering to all seeded areas.
- B. Apply vegetative mulch to loose depth of 2 inches, by means of a mechanical spreader or other approved methods.
- C. Mulch material shall be cut into the soil so as to produce a loose-mulched thickness of three to four inches. The use of harrows will not be permitted.
- D. Immediately following the application of the mulch, water the seeded area in one watering, in sufficient amount to penetrate the seedbed to a minimum depth of 2 inches. Perform so as not to cause erosion or damage to the seeded surface.
- E. Protect seeded areas against hot, dry weather or drying winds by applying mulch not more than 24 hours after completion of seeding operations.

3.05 MAINTENANCE:

- A. Perform maintenance until 8 weeks after all areas have been seeded.
- B. Requirements:
 - 1. The CONTRACTOR shall water all newly grassed areas a minimum of once a week until satisfactory grass growth is attained.
 - 2. Repair any portion of the seeded surface which becomes gullied or otherwise damaged, or the seeding becomes damaged or destroyed.
 - 3. Replace mulch when washed or blown away.
- C. If, at the end of the 8-week maintenance period, a satisfactory stand of grass has not been produced, renovate and reseed the grass or unsatisfactory portions thereof immediately.

3.06 ACCEPTANCE OF GRASSING:

- A. When grassing work is substantially completed, including maintenance, the ENGINEER will, upon request, make an inspection to determine acceptability.
 - 1. Seeded areas may be inspected for acceptance in parts agreeable to the ENGINEER, provided work offered for inspection is complete, including maintenance.
- B. Replant rejected work and continue specified maintenance until reinspected by the ENGINEER and found to be acceptable.
 - 1. A satisfactory stand is defined as a grass or section of grass that has:
 - a. No bare spots larger than 3 square feet.
 - b. Not more than 5 percent of total area with bare spots larger than 6 inches.
 - c. Not more than 10 percent of total area with bare spots larger than 2 inches square.
 - 2. If the grassing is still unsatisfactory upon inspection of replanted area, the CONTRACTOR will sod those areas that are unacceptable. Acceptance of the sodded areas is dependent upon satisfactory coverage criteria established in Part 3.06.B.1.

END OF SECTION

SECTION 02513 - PUBLIC WATER DISTRIBUTION SYSTEMS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Submittals
- B. Products
- C. Installation Readiness
- D. Installation
- E. Connections to Existing Systems
- F. Cleaning and Testing
- G. PBC HD Clearance
- H. Restoration

1.2 RELATED SECTIONS

- A. Section 01025 - Measurement and Payment Procedures
- B. Section 01340 – Shop Drawings, Work Drawings, and Samples
- C. Section 01400 – Quality Requirements
- D. Section 01700 – Contract Closeout
- E. Section 02320 – Trenching and Excavation
- F. Section 02322 – Dewatering and Drainage
- G. Section 02324 - Backfill
- H. Section 02516 - Disinfection of Water Distribution Systems
- I. Section 02740 – Subgrade, Base Course and Asphalt
- J. Section 02960 – Restoration of Surface Improvements

K. Section 03300 – Cast-in-Place Concrete

1.3 REFERENCES

A. AWWA C600

1.4 UNIT PRICE - MEASUREMENT AND PAYMENT

A. Refer to Section 01025 MEASUREMENT AND PAYMENT.

When existing Right-Of-Way (ROW) irrigation must be disturbed due to pipeline installation or swale development, any existing irrigation lines shall be marked on the Contractors drawings prior to or at the time of temporary cutting-&-capping. The replacement of existing irrigation in the Public Right-Of-Way as a result of pipeline installation or swale development is NOT a pay item. Replacement of existing ROW irrigation (to match existing quality, quantity and size) shall be incidental to the Unit Price of the pipeline or swale development.

1.5 SUBMITTALS FOR REVIEW AND AUTHORIZATION TO PROCEED

A. Shop and manufacturer's drawings and catalog cut sheets for all pipe system components. Refer to Section 01340 – SHOP DRAWINGS, WORK DRAWINGS, AND SAMPLES.

B. Contractor shall prepare and submit to the Project Manager a Flushing, Pressure Testing and Disinfection Phasing Plan prior to the start of the pipe installation.

1.6 SUBMITTALS AT PROJECT CLOSEOUT

A. Refer to Section 01700 CONTRACT CLOSEOUT and 01720 PROJECT RECORD DOCUMENTS for requirements.

PART 2 PRODUCTS

2.1 All materials shall be per City of Lake Worth Approved Product List Manufacturers, or Approved Equal. Preferences are given to materials MADE IN THE UNITED STATES OF AMERICA, as well as, ductile iron fittings supplied by American Cast Iron Pipe Company from Brazil, Sigma Corporation from China, and Star-Pipe Products from the United States and China, and Tyler Union from the United States and China; and Electronic Marking System (EMS) full-range makers by 3M from Mexico.

2.2 DUCTILE IRON PIPE

A. For Aboveground Installation:

1. Ductile iron pipe for aerial canal crossings installations shall conform to ANSI A21.15 and be flanged. Thickness class shall be Class 350. Flanges shall conform to ANSI A21.15. All pipe supports, clamps and/or cradles shall have a minimum 1/4 inch neoprene liner between the pipe and support.

B. For Underground Installation:

1. In general, thickness class shall be Class 350. Ductile iron pipe shall conform to ANSI A21.51. Pipe shall have a wall thickness designed in compliance with ANSI 21.50, "American National Standard for the Thickness Design of Ductile Iron Pipe.
2. Joints shall be push-on rubber gaskets unless identified otherwise in the project construction drawings.
3. Restrained joints shall be as specified in 2.6, Restrained Mechanical Joints.

2.3 POLYVINYLCHORIDE (PVC) PIPE AND FITTINGS

- A. Pipe shall be unplasticized polyvinyl chloride (PVC) pipe with integral bell containing a locked-in ring and spigot joints 4-inch through 12-inch.
- B. Pipe shall be the requirements of AWWA C900 or C905 "Polyvinyl Chloride (PVC) Pressure Pipe", Class 150 and shall meet the requirements of SDR-18. PVC compound for pipe and fittings shall meet the requirements of ASTM D1784.
- C. Fittings shall be DIP of the appropriate and corresponding pressure rating as the main line pipe and as specified in 2.4, Ductile Iron Fittings.
- D. Restrained joints shall be as specified in 2.6, Restrained Mechanical Joints.

2.4 DUCTILE IRON FITTINGS

- A. Fittings for ductile iron pipe shall be manufactured of ductile iron shall conform to the requirements of ANSI A21.10 (AWWA C110) or ANSI A21.53 (AWWA C153).

Fittings shall be compatible with the pipe and designed for 350 psi working pressure. The lining and coating of the fittings shall be as specified for the pipe.

Joints for fittings 16-inches in diameter and under shall be mechanical joint, except above ground fittings shown on the drawings, shall be flanged. Joints for fittings 18-inches in diameter and above shall be restrained type in accordance with the schedule shown on the Standard Detail Drawing. Gaskets for the flanged joints shall be "Tourseal, TM" or approved equal.

B. Lining Pipe and Fittings:

1. DIP and fittings for water mains and reclaimed water mains shall be cement lined in accordance with ANSI A21.4 (AWWA C104).

C. Exterior Finish:

1. Potable Water and Reclaimed Water Mains: For aboveground installation, the exterior surfaces of pipe and fittings shall be painted **BRIGHT WHITE** for potable water systems and **PANTONE PURPLE** for reclaimed water systems with a coating system approved by the Engineer. A three (3)-coat system with a polyurethane topcoat is required.
2. For underground potable water systems, all pipe and pipe fittings installed under this project will be color coded or marked in accordance with subparagraph 62-555.320(21)(b) 3, F.A.C., using blue as the predominant color. Underground plastic pipe shall be solid-wall blue pipe, will have a co-extruded blue external skin, or will be white or black pipe with blue stripes incorporated into, or applied to, the pipe wall.
3. For underground reclaimed/reuse water systems, all pipe and pipe fittings installed under this project will be color coded or marked in accordance with subparagraph 62-555.320(21)(b) 3, F.A.C., using pantone purple as the predominant color. Underground plastic pipe for reclaimed/reuse water systems shall be solid-wall pantone purple pipe, will have a co-extruded pantone purple external skin, or will be white or black pipe with pantone purple stripes incorporated into, or applied to, the pipe wall.

Pipe striped during manufacturing of the pipe will have continuous stripes that run parallel to the axis of the pipe wall, that are located at no greater than 90-degree intervals around the pipe, and that will remain intact during and after installation of the pipe. If paint is used to stripe the pipe during the installation of the pipe, the paint will be applied in a continuous line that runs parallel to the axis of the pipe and that is located along the top of the pipe; for pipe with an internal diameter of 24 inches or greater, paint

will be applied in continuous lines along each side of the pipe as well as along the top of the pipe.

2.5 BALL CORPORATION STOP - UP TO 2 INCHES

- A. Brass body, teflon coated brass ball, rubber seats and stem seals, Tee stem pre-drilled for control rod, AWWA inlet threads end, compression transition outlet, with control rod, extension box and valve key. Teflon tape (minimum of two (2) wraps) shall be applied to the threads prior to installation.

2.6 RESTRAINED MECHANICAL JOINTS

- A. All pipe-to-pipe, branch connections, valves and all change of direction fittings shall be restrained with EBAA Iron MEGALUG products or approved equal. A second form of restraint, either thrust blocks or tie rods, may be required in certain cases as directed by the Project Manager and Engineer.
- B. All valves and change of direction fittings 16" diameter and larger shall have two (2) forms of restraint. The valve and fittings shall have mechanical joints with EBAA Iron MEGALUG products or approved equal, and either thrust blocks or tie rods. If tie-rods are approved, the tie-rods shall be in a "mid-span" configuration utilizing EBAA Iron products or approved equal.
- C. Any line terminated as a construction phase that is a known future extension, shall have a valve placed at the end, and restrained with EBAA Iron MEGALUG products or approved equal to the last two (2) pipe joints.
- D. Flex-Ring Restrained Joint Ductile Iron pipe supplied by American Cast Iron Pipe Company (ACIPCO) and TR Flex Restrained Joint Ductile Iron pipe supplied by U.S. Pipe & Foundry, LLC may be used as approved by the Project Manager and Engineer. Self restraining push-on gaskets are allowed for Jack & Bore applications only as approved by the Project Manager and Engineer.

2.7 WATER SERVICE

- A. The tapping saddle shall be a stainless steel double strap service saddle of the size required with an epoxy coated ductile iron body and AWWA threads. Neoprene gaskets shall be cemented in place.
- B. The corporation ball valve, "Y" Branch if necessary, compression by yoke curb stop(s), yoke bar, expansion nut, female iron pipe tail/outlet pieces, lock nuts, meter adapters, washers, and other fittings required to make a complete installation shall be brass as shown on the drawings and the project construction drawings, and as manufactured by the Ford Meter Box Co., or approved equal. Internal pipe and tube sleeves shall be stainless steel.

- C. Sleeves under minor highways, residential streets and rural roads may be PVC Sch. 80 as approved by Engineer and Project Manager.

2.8 POLYETHYLENE PIPE AND TUBE

- A. Materials used for the manufacture of polyethylene pipe and fittings shall be PE3408 high density polyethylene meeting cell classification 345434C or 345434E per ASTM D3350; and meeting Type III, Class B or Class C, Category 5, Grade P34 per ASTM D1248; shall be listed in the name of the pipe and fitting manufacturer in Plastic Pipe Institute TR-4, Recommended Hydrostatic Strengths and Design Stresses for Thermoplastic Pipe and Fittings Compounds, with a standard grade rating of 1600 psi at 73°F. The manufacturer shall certify that the materials used to manufacture pipe and fittings meet these requirements.
- B. Polyethylene pipe shall be manufactured in accordance with ASTM D3035, Polyethylene (PE) Plastic Pipe (DR-PR) Based on Controlled Outside Diameter and AWWA C906 and shall be so marked. Each production lot of pipe shall be tested for (from material or pipe) melt index, density, % carbon, (from pipe) dimensions and ring tensile strength.
- C. Polyethylene pipe (PE) shall be Drisco pipe 3408 1", 1½" & 2" or approved equal.
- D. All PE pipe shall be color coded to match the water system type; blue for potable water and pantone purple for reclaimed water.

2.9 SERVICE IDENTIFICATION STRIPES

- A. Refer to paragraph 2.4.C. above for color-coding requirements.

2.10 MISCELLANEOUS

- A. Electronic Marking System (EMS) full-range markers shall be by 3M. Full-range markers shall be blue for potable water and pantone purple for reclaimed water. The Contractor shall install the full-range markers in accordance with the manufacturer's and City's standards. The full-range markers shall be placed at the following locations:
 - 1. Fittings, bends, reducers, tees, crosses, deflections, valves, and air release valves (ARV).
- B. The installation of the full-range markers shall be field verified by the Project Manager and Engineer prior to the certification of the work.
- C. For the installation of the pipe segments and/or structures where moderate to significant root intrusion could be a factor, the Contractor shall furnish and install

BioBarrier (or approved equal) as a root barrier as directed by the Project Manager and Engineer. Furnishing and installing a root barrier is considered as an incidental cost.

PART 3 EXECUTION

3.1 INSTALLATION READINESS

- A. Prior to the start of underground excavations, Contractor shall examine the project construction drawings and have repair materials on site to effect repairs to all sizes of existing water mains, branch and/or service connections. Typical repair materials include, but are not limited to:
 - 1. Full encirclement repair clamps
 - 2. Fittings (DIP and brass)
 - 3. Poly tubing
 - 4. All-thread

3.2 EXAMINATION

- A. Verify that trench cut is ready to receive Work as required by this Section and excavations, dimensions, and elevations are as indicated on project construction drawings.

3.3 PREPARATION

- A. When the project drawings indicate, or when it is discovered during the course of the work, that the street or area's sanitary sewer main lines are in front of the properties (and that the new water mains will have to cross), the Contractor shall pothole each sewer lateral prior to beginning installation of the new water mains and provide the individual sewer lateral depths to the Project Manager and the proposed depth of the new water main before beginning water main installation.
- B. Cut pipe ends square, ream pipe and tube ends to full pipe diameter, and remove burrs.
- C. Remove scale and dirt on inside and outside before assembly.
- D. Prepare pipe connections to equipment with flanges or unions.

3.4 INSTALLATION

- A. Pipeline Installation:

1. All trenching and excavations associated with the water main and service lines shall conform to the requirements in Technical Specification 02320 – TRENCHING AND EXCAVATION.
2. Installation of potable water pipe and associated fittings shall be in accordance with current AWWA and NSF specifications, and manufacturer's requirements for their particular products. All mains shall have a 36" clear cover to finished grade (keeping in mind if there is a swale requirement) with pipe being as level as possible. Any variance will require approval by the Project Manager.

Changes in pipe alignment may be accomplished using appropriate fittings or through pipe deflection. Pipe deflection at the joint is allowed with ductile iron pipe only and shall not exceed 75% of the manufacturer's recommended maximum joint deflection.

3M full-range markers are required at all fittings and valves. Regardless of pipeline or pipeline component depth, the full-range markers shall be installed no deeper than 8 feet and shall be directly over the fitting or adjacent to the valve.

3. All pipe shall be laid in trenches having a dry and stable bottom. Backfill shall be free of boulders and debris and in accordance with Technical Specification 02324 - BACKFILL. Pipe shall be fully supported along its entire length. Sharp or rocky material encountered in the base shall be replaced with proper bedding. Pipe shall be laid on line and grade as designed.
4. All valves shall be placed according to project construction drawings unless relocation is approved by the Project Manager. **After installation, backfill and compaction and where applicable after asphaltting, all valves are to be exercised in the presence of the Project Manager and Engineer.** As-built drawings shall reflect the actual location of all mains, hydrants, services, and valves. All taps must be at least 18" from fitting or bell. Potable water main shall not be laid in fuel contaminated areas.
5. Clearance of 18" or one pipe diameter, whichever is greater, shall be maintained between all fittings (bells, valves, flanges, etc.).
6. All road crossings, pavement cuttings and restoration shall be in accordance with the requirements of the Owner or Palm Beach County (if project is located in their jurisdiction but within the Department's service area).

7. Generally, joints for ductile iron pipe shall be push-on or mechanical type designed in accordance with ANSI A21.11 (AWWA C111) or ANSI A21.53 (AWWA C153). Joint lubrication shall be as furnished by the manufacturer.

B. Valves

1. Valves shall generally be installed at intervals of no greater than 1,000 LF on transmission mains, at intervals of no greater than 700 LF on main distribution loops and feeders, and on all primary branches connected to these lines. In high-density areas, valves shall be installed to minimize the number of persons affected by a break.
2. In all instances, effectiveness of placement shall be primary criteria in determining valve location. Valves placed in curbs will not be accepted. For potable water, all valve boxes require lids be marked as "Water" and painted BLUE. For reclaimed/reuse water, all valve boxes require lids be marked "Reuse" and painted PANTONE PURPLE.

C. Fire Hydrants

1. Fire hydrants shall be installed with the center of the pumper nozzle approximately 18" – 24" above finished grade. Hydrants shall not be placed in sidewalks or traffic areas. It will be the responsibility of the Contractor to move hydrants placed in an unacceptable location and provide protection from traffic damage if necessary, upon the Project Manager's request.
2. Fire hydrant branches (from main to hydrant) shall not be less than 6" ID and be as short as possible to minimize any potential for potable water main stub with no flow. Long branch leads will require a second gate valve. Each branch shall be provided with a gate valve located as close as possible to the main.
3. Hydrants shall be located 5 feet to 10 feet from edge of pavement and no less than 6 feet from driveways with pumper discharge nozzle facing the roadway. Hydrants shall be located so as to minimize their vulnerability to traffic. At the direction of the Project Manager, for potential traffic protection, bollards may be required where minimum distances cannot be met.
4. Fire hydrants shall be placed in an accessible, unobstructed location with 5 feet clearance in all directions (except for protective bollards).

5. Fire hydrants shall be powder coated "Fire Engine" or "Safety" red in color. Valve box lids for fire hydrant or Siamese connections shall be painted RED.
6. Fire Hydrants shall be provided and installed in accordance with the project construction drawings. Newly installed fire hydrants, prior to being put into service, shall be clearly marked as being "OUT OF SERVICE" with signage.
7. For every ten (10) new fire hydrants installed, Contractor shall supply one (1) traffic repair kit and one (1) shoe repair kit and supplied by the fire hydrant manufacturer.

D. Corrosion Protection:

1. For protection against corrosive soils in those areas designated by the Engineer and Project Manager, ductile iron pipe and fittings shall additionally be enclosed in a polyethylene sheet or tube and each length joined with 2-inch wide polyethylene adhesive tape. The sheet or tube shall be made from polyethylene resin meeting the requirements of ASTM D1248 and shall be Type I, Class C, Category 5, Grade J-3 with minimum carbon black content of 2.5% and 8 mils thickness. The sheet or tube shall be in accordance with the provisions of ANSI A21.5 (AWWA C105). Methods shall be such as to minimize danger to the sheet also be used to repair tears or punctures.
2. Installation of polyethylene encasement shall be in accordance with ANSI A21.5.

E. Service Connections

1. Water service taps on the water main shall be spaced at a minimum distance of 18" apart. All service lines shall be installed in accordance with the details on the project construction drawings. All long-side service connections shall be sleeved. The sleeve is to be installed by jack & bore to avoid open-cuts across roadways for service connections. The minimum diameter of service connection taps shall be 3/4-inch for 1-inch service connections, 1 3/8-inch for 1 1/2-inch service connections and 1 3/4-inch for 2-inch service connections.
2. Service lines, between the corp stop and curb stop shall be one continuous line without any splices or fittings unless specifically authorized by the Project Manager and Engineer.

3. Services shall not exceed 100 feet to the meter. Services crossing under parking tracts shall have their meters placed prior to the crossing so that the Owner is not responsible for these lines.
4. In developments where the property line is not clearly defined (condominiums and commercial), the meter shall be placed in a readily accessible location.
5. Private services shall not cross potable water main. The Contractor shall coordinate the installation of private service lines with location of meters to deliver potable water to the correct multi-family dwelling unit or bay and shall identify each to the Project Manager.
6. Wet taps equal or larger than one half the pipe diameter require a stainless steel full contact saddle with flange and valve.

F. Connection to Existing System:

1. All connections to existing water main shall be made under the direct supervision of the Project Manager. Based on the existing pipe configuration and materials, the Contractor may be required to provide temporary restraints. All connections to existing water mains shall have double valves unless specifically authorized by the Project Manager. Valves on existing water mains shall be operated by Department personnel or under direct supervision by the Project Manager. Tapping sleeves and their valves shall be pressure tested at 150 psig for 1 hour prior to tapping (entire tapping sleeve shall be bubble tested with a soap solution during the pressure testing).
2. All pipe coupons from tapping sleeve tie-ins shall be saved, labeled and dated by the Contractor and transmitted to the Project Manager.
3. If service must be cut off to existing customers, the Project Manager must have fourteen (14) working days notice to make necessary arrangements. The Contractor shall prepare a Shutdown Request form in accordance with the directions given during the Pre-Construction Meeting.
4. The Contractor shall be ready to proceed with as much material pre-assembled as possible at the site to minimize the length of service interruption. The Project Manager will postpone a service cut-off if the Contractor is not ready to proceed on schedule. Such connections may be made at night to minimize effects. No customer should be without service for more than six (6) hours. Local chlorination, in compliance with ECR II, will be required for all pipe and fittings used to complete connections with potable water.

G. TESTING

Contractor shall prepare a Flushing, Pressure Test, Disinfection and Palm Beach County Health Department (PBC HD) Clearance Plan for review and authorization by the Project Manager prior to water main installation. The plan shall include a schematic that indicates swab locations, direction of flush, sample points and affected valves. The PBC HD Clearance requires the Contractor's Pressure Test Report, Disinfection Report, Lab Reports and As-Built drawings.

Reclaimed water mains and service connections shall be flushed and pressure tested (per the requirements below) but do NOT require disinfection or PBC HD Clearance.

1. Cleaning and Flushing:

- a. Upon completion of pipe installation, for any section, perform swabbing and cannon flushing in accordance with the Cleaning and Flushing Procedure detail shown on the project construction drawings. The Project Manager must observe the swab being inserted into the line **and** witness the cleaning and flushing process. The swab is to be one (1) pipe size diameter larger than the pipe being cleaned.

2. Pressure:

- a. Prior to conducting the official pressure test, to be witnessed by the Project Manager and Engineer, the Contractor shall conduct and document a preliminary pressure test meeting all of the following requirements.
- b. Potable water shall be supplied to the main and pumped to the minimum of 155 psi. The water main being tested shall be separated from the supply line or isolated by a double valve arrangement.
- c. The Contractor shall prepare a documented test report for each test identifying, date, time, weather, linear foot of pipe being tested, the piping segment tested (station to station), beginning test pressure and time, ending test pressure and time, amount of "make-up" water and a clear "pass / fail" statement. The test report shall be signed by the Contractor, Engineer and Project Manager. After test acceptance, Contractor shall provide copies of the test report to the Project Manager and Engineer and retain the original test report for inclusion in the Project Record Documents.

- d. Contractor shall provide all necessary equipment such as pumps, gages and water measuring tanks, and all necessary work required for pipe pressure and leakage tests. Make pressure and leakage tests between valves and/or connections for each section being tested, using procedure outlined in ANSI/AWWA C-600.
- e. Test lines at a minimum of 155 psi for no less than two (2) hours and test all fire lines at 200 psi for no less than one (1) hour in accordance with NFPA-24.
- f. Allowable leakage not to exceed value derived from following formula:

$$L = \frac{SD\sqrt{P}}{148,000}$$

- L = Allowable leakage (gallon per hour)
- S = Length of pipe (feet)
- D = Nominal diameter of pipe (inches)
- P = Average test pressure (PSIG)

- g. Conduct pressure tests with all valves servicing hydrants, services, etc., in open position.
- h. All potable water mains shall be pressure tested before bacteriological acceptability.
- i. The maximum length of line to be tested as one section will be 2,000 linear feet. The test shall be performed as determined in the current AWWA specification. The standard test duration is two (2) hours. The maximum quantity of water that must be supplied into the tested pipe to maintain pressure within 5 psi of the specified test pressure shall not exceed the applicable AWWA C-600 Standard.
- j. Bacteriological testing shall not begin until after the pressure test has been accepted by the Project Manager. Refer to Section 02516 DISINFECTION OF WATER DISTRIBUTION SYSTEM.

H. ABANDONMENT OF EXISTING WATER MAINS

- 1. Existing water mains shall be abandoned in accordance with the project drawings, including temporary restraints, cutting and capping with masonry

plugs or mechanical blind flanges, thrust blocks and grout filled (where required).

I. RESTORATION

1. Restoration shall be concurrent with the water main installation and shall be performed as required by Section 02960 RESTORATION OF SURFACE IMPROVEMENTS.

END OF SECTION

SECTION 02516 - DISINFECTION OF POTABLE WATER DISTRIBUTION SYSTEMS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Submittals
- B. Project Record Documents
- C. Products
- D. Execution
- E. Field Quality Control

1.2 RELATED SECTIONS

- A. Section 02513 – Public Water Distribution Systems

1.3 REFERENCES

- A. ANSI/AWWA C651 – AWWA Standard for Disinfecting Water Mains

1.4 UNIT PRICE – MEASUREMENT AND PAYMENT

- A. The cost of disinfecting the new water distribution system is considered to be incidental to the installation of the water main.

1.5 SUBMITTALS FOR REVIEW AND AUTHORIZATION TO PROCEED

- A. CONTRACTOR shall prepare and submit a Flushing, Pressure Testing, Disinfection and Palm Beach County Health Department (PBC HD) Clearance Plan to the Project Manager and ENGINEER for review and authorization prior to the start of pipeline installation.

1.6 PROJECT RECORD DOCUMENTS

- A. Disinfection Report from CONTRACTOR shall be signed and dated:
 - 1. Company Name.
 - 2. Type, form and quantity of disinfectant used.
 - 3. Diameters and lengths (in linear feet) of pipe being disinfected.

4. Date and time of disinfectant injection start and time of completion (continuous feed method).
5. Test locations (1 set for every 1,200 lf of pipe, 1 from every branch and 1 from the end of the line).
6. Initial and 24 hour disinfectant residuals (quantity in treated water) in ppm and/or mg/l for each outlet tested.
 - During the 24 hour disinfection process, CONTRACTOR shall operate all inline and branch valves and hydrants.
 - At the end of the 24 hour disinfection process the free chlorine residual shall not be less than 25 ppm or 25mg/l.
7. Date and time of flushing start and completion
8. Disinfectant residual after flushing in ppm for each outlet tested.
 - At the conclusion of the CONTRACTOR's disinfection and flushing process, the Total Chlorine (in ppm) shall be equal to that of the City's potable water system source point.

B. Bacteriological Report:

1. Date issued, project name, and testing laboratory name, address, and telephone number.
2. Time and date of water sample collection.
3. Name of person collecting samples
4. Sample point numbers and test locations.
5. Initial and 24 hour disinfectant residuals in ppm for each outlet tested.
6. Coliform bacteria test results for each outlet tested
7. Signed certification that water conforms, or fails to conform, to bacterial standards of the Palm Beach County Health Department.

C. Palm Beach County Health Department release

1.7 REGULATORY REQUIREMENTS

- A. Conform to applicable Palm Beach County Health Department rules or regulation for performing the work of this Section.

PART 2 PRODUCTS

2.1 Disinfectant:

- A. Liquid chlorine conforming to ANSI/AWWA B301 (100% available chlorine).
- B. Sodium hypochlorite conforming to ANSI/AWWA B300 (5% - 15% available chlorine).
- C. Calcium hypochlorite conforming to ANSI/AWWA B300 (65% available chlorine by weight).

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that piping system has been cleaned, inspected, and pressure tested.

3.2 EXECUTION

- A. Install, clean and flush the water distribution piping system in accordance with the project construction drawings. Refer to Section 02513 PUBLIC WATER DISTRIBUTION SYSTEMS.
- B. Pressure test the water distribution piping system in accordance with the project requirements. Refer to Section 02513 PUBLIC WATER DISTRIBUTION SYSTEMS.
- C. After successful pressure testing, provide and attach required equipment to perform the work of this Section.
- D. Mix (if applicable) and inject treatment disinfectant into piping system.
- E. Maintain disinfectant in system for 24 hours.
- F. Flush, circulate, and clean until required cleanliness is achieved; use municipal domestic water.
- G. Verify disinfection and record results on the Disinfection Report as specified in paragraph 1.6.A above.
- H. After receipt of the Palm Beach County Health Department system or partial system release and the service line transfer by the City are completed,

CONTRACTOR shall remove the temporary sample points and re-install permanent system devices in accordance with the project construction drawings.

3.3 FIELD QUALITY CONTROL

- A. The CONTRACTOR shall assure the accuracy of the disinfection testing and provide a copy of the CONTRACTOR's disinfection report to the Project Manager.

END OF SECTION

SECTION 02538 - CURED-IN-PLACE PIPE (CIPP) SANITARY SEWER REHABILITATION

PART 1 GENERAL

1.1 SCOPE

- A. The intent of this specification is to provide for the reconstruction of existing sewer lines by forming a new pipe within an existing deteriorated pipe, which has generally maintained its original shape. The cured-in-place-pipe (CIPP) shall provide flow capacity equal to or greater than 100% of the original pipe's flow capacity when new. The process is defined as the reconstruction of sewer lines by installation of a thermosetting resin impregnated flexible felt fiber tube, coated on one side with a thermoplastic, which is installed into the existing sewer line utilizing a water column. Curing is accomplished by circulating hot water throughout the length of the inverted tube to cure the thermosetting resin into a hard impermeable pipe with the thermoplastic coating on the inside surface of the new pipe. The pipe shall extend the full length of the original pipe and shall provide a structurally sound, joint-less, close fitting, and corrosion resistant cured-in-place pipe.

1.2 QUALIFICATION OF PRODUCTS AND INSTALLERS

- A. The OWNER will only approve experienced installers utilizing proven Commercially Acceptable sewer rehabilitation products. In order to be considered Commercially Acceptable, the Product and Installer must demonstrate compliance with the following requirements.
- B. Acceptable installers:
1. Insituform, 9001 NW 97th Terrace, Medley FL 33178
 2. Inliner Technologies, 1468 West Hospital Rd., Paoli, IN 47454-9215
 3. Layne Inliner LLC, 2531 Jewett Lane, Sanford FL 32771
 4. Altair Environmental Group, 710 South Milwee St., Longwood, FL 32750
 5. Approved alternate
- C. Documentation for products must be submitted for approval in accordance with: Section 01340, SHOP DRAWINGS, WORKING DRAWINGS and SAMPLES, Section 01630 SUBSTITUTIONS AND PRODUCT OPTIONS.
1. For a product to be acceptable, the product must be manufactured in a facility with a quality management program which is certified to ISO 9001:2000 standards. Proof of third party certification shall be required for approval. The product shall have been in service within the wastewater

collection system of the OWNER (or other city, town, or county within the United States of America) for a minimum of four (4) years.

2. For an alternate installer to be an approved alternate, the installer must have had at least four (4) years active experience in the commercial installation of the product.

1.3 UNIT PRICE - MEASUREMENT AND PAYMENT

- A. Refer to Section 01025 – MEASUREMENT AND PAYMENT PROCEDURES

PART 2 MATERIALS

2.1 RESIN

- A. The resin used shall be high-grade corrosion resistant polyester, vinylester or epoxy resin specifically designed for the cured-in-place pipe (CIPP) being installed. Only PREMIUM, NON-RECYCLED resin shall be used.
- B. The resin vendor must be able to confirm that the grade of resin used has been extensively tested for corrosion resistance and has met the minimum requirements of ASTM F1216, latest revision.
- C. The CONTRACTOR shall designate a wet-out facility and shall provide wet-out liner tubes from the designated facility only. Multiple facilities may not be used to supply wet-out liner tubes.
- D. The ENGINEER at his discretion shall have the right to inspect the designated wet-out facility and randomly draw samples of the resin used to wet-out the CIPP used under this contract.

2.2 TUBE

- A. The CIPP liner shall be a polyester, vinylester or epoxy vacuum impregnated flexible woven or non-woven tube. The tube shall be inverted into position by the means of hydrostatic head. The tube, once installed, shall be cured to form a hard impermeable pipe, by circulating hot water through the entire length of the tube. When cured, the liner shall extend over the designated length of the existing sewer in a continuous, tight fitting and watertight pipe-within-a-pipe.
- B. The minimum length shall be that deemed necessary by the ENGINEER to effectively span the pipelining distance of the necessary repair unless otherwise specified. The line lengths shall be verified in the field before impregnation of the tube with resin.

- B. The CONTRACTOR shall submit his price proposal based on the appropriate length, size, and existing pipe parameters designated in the Bid Item or Bid Proposal Section. The deterioration of sewers is an ongoing process. Should pre-construction inspections reveal the sewers to be in substantially different conditions than those in the design considerations, the CONTRACTOR shall request such changes in reconstruction liner thickness, supporting such requests with design data. The deviation, if approved, shall be reflected by the appropriate addition or reduction in the unit cost for that size as agreed to by the ENGINEER.

PART 3 EXECUTION

3.1 ACCESS TO MANHOLES AND ACCESS POINTS A. It shall be the responsibility of the OWNER to locate and designate all manhole access points open and accessible for the work, and provide rights of access to these points. If a street must be closed to traffic due to the orientation of the sewer, the OWNER shall institute the actions necessary to do this for the mutually agreed time period. The OWNER shall also provide free access to water hydrants for cleaning, inversion and other work items requiring water.

3.2 CLEANING AND PRE-TV INSPECTION

- A. Sewers shall be cleaned of all debris, roots and other materials that would block proper inversion of the cured-in-place-pipe. Utilizing high-pressure jet cleaning equipment, several passes are completed to assure all debris is removed from the pipe. If roots are present, root cutters or mechanical brushes are attached to the jet nozzle and are sent through the line to remove all root intrusions. The CONTRACTOR shall provide a site for disposal of materials removed from the lines at no cost to the OWNER.
- B. Sewers shall be CCTV inspected providing, both a video recording and log, which identifies all service connections and openings. Utilizing a color video inspection system with data recording capabilities, the entire pipe sections shall be recorded on DVD media.
- C. It shall be the responsibility of the CONTRACTOR to clear the line of obstructions such as solids and roots that will prevent the insertion of the CIPP. If pre-installation inspection reveals an obstruction such as a protruding service connection, dropped joint, or a collapse that will prevent the inversion process, that was not evident on the pre-bid video and it cannot be removed by conventional sewer cleaning equipment, then the CONTRACTOR shall make a point repair excavation to uncover and remove or repair the obstruction. Such excavation shall be approved in writing by the OWNER's representative prior

to the commencement of the work and shall be considered as a separate pay item.

- D. All active lateral connections shall be identified and measured. A 360° Pan-and-Tilt view camera shall be used to inspect the pipe traveling upstream. At each connection the operator will stop and turn the camera lens toward the lateral, thereby inspecting the first 8 to 12 inches of the connection. If there is still a doubt as to whether or not the connection is live, additional “dye and flush” tests shall be performed. It will be the responsibility of the OWNER’s representatives to review this process live or review the video tapes to verify and approve which laterals are to be reinstated. All laterals will be directly measured from the back wall (opposing wall) of the basis manhole, typically the downstream manhole.

3.3 BYPASS OF FLOW

- A. The CONTRACTOR shall bypass the sewerage around the sections of sewer to be lined. The bypass shall be made by plugging an existing upstream manhole if necessary and pumping the sewerage into the downstream manhole or adjacent system. The typical pump and bypass lines shall not be greater than 4” pump and pipe. Any bypass need requiring pump or pipe greater than 4” shall be paid for as a separate pay item.

3.4 RESIN IMPREGNATED OF CIPP TUBE

- A. The CONTRACTOR shall designate a location where the tube shall be impregnated or “wet out” with resin, using distribution rollers and a “single-source” vacuum to thoroughly saturate the tube’s felt fiber prior to installation. The impregnated tube shall be free of pinholes, resin voids and other defects. If the cured-in-place-pipe is impregnated at the manufacturing plant, it shall be delivered to the job site in a refrigerated truck and remain refrigerated prior to the installation to prevent premature curing.

3.5 INSTALLATION OF CIPP TUBE

- A. The impregnated tube shall be inverted through an existing manhole or other approved access until it has fully traversed the designated line length and the inversion face breaches the target manhole or termination point.
- B. Thermocouples shall be placed at the top, and if possible, the bottom interface of both ends of the liner and, if possible, at all intermediate manholes for monitoring the temperatures during the cure cycle.

- C. The cure cycle and cool down will be dictated with consideration of the actual field conditions and shall be per the manufacturer's recommendations. The curing temperatures shall be monitored at the boiler truck's water inlet and outlet lines. The temperature reading from the truck shall be compared to the thermocouples to ensure that sufficient heat is being supplied to the system.
- D. Once the pipe has reached exotherm, cool water shall be slowly introduced into the rehabilitated pipe. The water temperature shall be cooled inside of the pipe to below 100 degrees F. The cool down process will also be affected by actual field conditions, and may have to be modified in cases of severe weather conditions or below normal ground temperatures.
- E. Termination of the cured-in-place-pipe at the manhole is completed by trimming the inverted pipe end back within approximately 2 inches of the outlet connection.

3.6 TESTING

- A. Leakage testing shall be conducted by monitoring the water level in the down tube during the processing and cool down cycles prior to the reinstatement of laterals and shall be performed under the supervision of the OWNER's representative or inspector. The CONTRACTOR shall furnish all equipment and personnel necessary to conduct the test.

3.7 INTERNAL RECONNECTION OF LATERALS

- A. Lateral connections shall be reinstated robotically whereby a camera and robotic cutter are put into the newly rehabilitated line. Each lateral is identified by a dimple in the cured-in-place pipe or through pre-installation measurements. Initially, each lateral shall be relieved by cutting a 2 to 3 inch hole to ensure that no services will be interrupted and there will be minimal risk of backed up lines. Once this is accomplished, each lateral shall be fully reopened to 90% percent of its original size. The seal of the lined lateral connection to the sewer line shall be watertight and bonded by either a chemical or mechanical process. Contractor shall submit procedures and details for lining the laterals, connecting to the sewer line, time and duration of installation and by-pass.

3.8 FINAL INSPECTION

- A. Upon completion of installation, sewers shall be CCTV inspected, providing both a video recording and log which identifies all service connections and openings. The entire pipe sections rehabilitated shall be recorded on DVD media and presented to the OWNER.

END OF SECTION

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SECTION 02668 - VALVES AND APPURTENANCES

PART 1 GENERAL

1.1 PERFORMANCE

- A. Section generally defines Contractors responsibilities unless otherwise indicated, for the following:
 - 1. Gate Valves
 - 2. Butterfly Valves
 - 3. Air Release Valves
 - 4. Valve Boxes

1.2 RELATED SECTIONS

- A. All of Division 1.
- B. Section 02320 – Trenching and Excavation.
- C. Section 02324 – Backfill.
- D. Section 02513 – Public Water Distribution Systems

1.3 REFERENCES

- A. ANSI/AWWA C104/A21.4 (Latest Revision) - Cement mortar lining for ductile iron pipe and fittings for water and reclaimed water.
- B. ANSI/AWWA C110/A21.10 (Latest Revision) - Ductile iron and grey iron fittings 3 inch through 48 inch for water and other liquids.
- C. ANSI/AWWA C111/A21.11 (Latest Revision) - Rubber gasket joints for ductile iron and grey iron pressure pipe and fittings.
- D. ANSI/AWWA C600 (Latest Revision) - Installation of ductile iron water mains and appurtenances.
- E. ANSI/AWWA C153/A21.53 (Latest Revision) – Ductile Iron Compact Fittings for Water and Reclaimed Services.

PART 2 PRODUCTS

2.1 MATERIALS

All materials shall be per City of Lake Worth Approved Product List Manufacturers and as indicated below, or Approved Equal:

- A. Gate Valves:

1. Gate valves, unless otherwise specified or approved, shall be ductile iron body, resilient seat gate valves with mechanical joints conforming to the AWWA standard specifications for gate valves for ordinary water works service, designation C509, in so far as applicable.
2. Gate valves shall be as manufactured by Mueller, American or approved equal.
3. Buried gate valves shall be non-rising stem type with 2 inch square cast iron wrench nuts.
4. Face to face dimension shall conform to ANSI standard face to face and end to end dimensions of ferrous valves, (ANSI B16.10) for 125-pound cast-iron valves.
5. Hand wheels or chain wheels shall be turned counter clockwise to open the valves. Hand wheels shall be of ample size and shall have an arrow and the word "open" cast thereon to indicate the direction of opening.
6. Stuffing box follower bolts shall be of brass and the nuts shall be of bronze.
7. Where required, gate valves shall be provided with a box cast in a slab and a box cover.
8. Box cover opening shall be for valve stem and nut. Valve wrenches and extension stems shall be provided by the manufacturer to actuate the valves.

B. Butterfly Valves:

1. Butterfly valves for water working pressures up to 150 psi shall conform to ANSI/AWWA C504 – Rubber Seated Butterfly Valves, subject to the following requirements. Valves shall be of the size and class indicated and, unless otherwise shown, shall be short-bodied. Flanged valves for interior and exposed piping shall have ANSI 125-lb flanges. Valves for buried services shall have mechanical joint body design. Shaft seals shall be designed for use with standard split-V type packing, or other acceptable seal. The interior passage of butterfly valves shall not have any obstructions or stops. The seats shall be positively clamped or bonded into the disc or body of the valve, but cartridge-type seats which rely on a high coefficient of friction for retention shall not be acceptable
2. Manual Actuators: Unless otherwise indicated, all manually-actuated butterfly valves shall be equipped with a 2-inch square actuating nut. Screw-type (traveling nut) actuators will not be permitted for valves 30-inches in diameter and larger.
3. Worm Gear Actuators: Valves 30-inches and larger, as well as all submerged and buried valves, shall be equipped with worm-gear actuators, lubricated and sealed to prevent entry of dirt or water into the housing.
5. All exposed butterfly valves shall be installed with a means of removing

the complete valve assembly without dismantling the valve or operator.

C. Air Release Valves:

1. The air release valves shall be installed as shown on the drawings and shall be the automatic type.
2. Air release valves shall have a cast iron body, cover and baffle, stainless steel float, bronze water diffuser Buna-N or Viton seat and stainless steel trim.
3. Air release valves shall be provided with a vacuum check to prevent air from re-entering the line.
4. Air release valve fittings shall be threaded.
5. Air release valve manholes shall be precast concrete and shall conform to ASTM C478 and ASTM C-76, latest revision, Class II, Wall B, Type II Portland Cement, 4,000 psi. Steel reinforcing shall conform to ASTM A 185. Walls shall be 8" minimum. Manholes shall have a minimum 7 day cure time prior to delivery. Any visible reinforcing or honeycombing shall be cause for rejection. The base slab and first ring of the manhole shall be cast monolithically. The minimum diameter of the MH shall be 48" with a 22-1/4" frame and cover. The interior of the MH shall be coated with the high solids epoxy compound REZCLAD 125S in strict accordance with the manufacturer's instructions. The exterior of the MH shall be coated with two coats of an approved coal tar epoxy (Koppers 300-M or approved equal). The frame shall have a 30" opening. The cover shall be two piece and shall have the words "POTABLE WATER ARV", "RECLAIMED WATER ARV" or "FORCE MAIN ARV" (as appropriate) cast into it. Cover and frame shall be US Foundry & Mfg. Corp. Model # 690-AG-M or approved equal. For offset air release valves and/or tangential offset air/vacuum combination valves manholes, use 32" diameter safety ventilated hinged manhole cover by PAMREX or approved equal.

D. Valve Boxes:

1. All buried valves shall have cast iron two piece valve boxes with cast iron covers.
2. Valve boxes shall be provided with suitable heavy bonnets and will extend to an elevation at or slightly above the finished grade surface as directed by the Engineer.
3. The barrel shall be one or two piece, screw type, having a 5-1/4 inch shaft diameter.
4. Covers shall have "Water", "Reuse" or "Sewer" cast into the top and shall be painted the corresponding color (blue, pantone purple or green) for the pipe commodity that they are for.
5. All valves shall have actuating nuts extended to within six inches of the top of valve box cover.

PART 3 EXECUTION

NOT USED

END OF SECTION

SECTION 02730 - MILLING OF EXISTING ASPHALT PAVEMENT

PART 1 GENERAL

1.1 SCOPE

- A. The work specified in this Section consists of removing existing asphaltic concrete pavement by milling to improve the finished pavement, to lower the finished grade adjacent to existing curb prior to resurfacing, or to completely remove existing pavement.
- B. When milling to improve the finished pavement, an average depth of cut will be specified in the plans.
- C. Unless otherwise specified, the milled material becomes the property of the CONTRACTOR.

1.2 REFERENCES

- A. Florida Department of Transportation - Standard Specification for Road and Bridge Construction (Latest Edition). In the event of conflict of specification notation and FDOT, the ENGINEER shall identify the superior requirement.

PART 2 EQUIPMENT

2.1 MILLING MACHINE

- A. The milling machine shall be capable of maintaining a depth of cut and cross slope that will achieve the results specified in the plans and specifications. The overall length of the machine (out to out measurement excluding the conveyor) shall be a minimum of 18 feet. The minimum cutting width shall be six feet.
- B. The milling machine shall be equipped with a built-in automatic grade control system that can control the transverse slope and the longitudinal profile to produce the specified results.
- C. Any commercially manufactured milling machine meeting the above requirements will be approved to start the project. If it becomes evident after milling has started that the milling machine cannot consistently produce the specified results, the milling machine will be rejected for further use.
- D. When milling to lower the grade adjacent to existing curb or other areas where it impractical to use the above described equipment, the use of a smaller milling machine will be permitted.

- E. The milling machine shall be equipped with means to effectively limit the amount of dust escaping the removal operation. For complete pavement removal, the use of alternate removal and crushing equipment, in lieu of the equipment specified above, may be approved by the ENGINEER.

PART 3 EXECUTION

3.1 CONSTRUCTION

- A. When milling the existing pavement shall be removed to the average depth specified in the plans, in a manner that will restore the pavement surface to a uniform cross section and longitudinal profile. The ENGINEER may require the use of a string line to ensure maintaining the proper alignment.
- B. The CONTRACTOR may elect to make multiple cuts to achieve the required pavement configuration or depth of cut.
- C. The milling machine shall be operated to effectively minimize the amount of dust being emitted from the machine. Pre-wetting of the pavement may be required.
- D. If traffic is to be maintained on the milled surface prior to the placement of the new asphaltic concrete, the pattern of striations shall be such as to produce an acceptable riding surface.
- E. Prior to opening an area which has been milled to traffic, the pavement shall be thoroughly swept with a power broom or other approved equipment to remove to the greatest extent practicable, fine material which will dust under traffic. This operation shall be conducted in a manner so as to minimize the potential for creation of a traffic hazard and to minimize air pollution.
- F. Sweeping of the milled surface with a power broom will be required prior to placing asphaltic concrete.
- G. In urban and other sensitive areas where dust would cause a serious problem, the CONTRACTOR shall use a street sweeper (using water) or other equipment capable of removing and controlling dust. Approval of the use of such equipment is contingent upon its demonstrated ability to do the work.
- H. To prevent, to the greatest extent practicable, the infiltration of milled material into the storm sewer system when the milling operation is within the limits of and adjacent to a municipal curb and gutter or a closed drainage system, the sweeping

operation shall be performed immediately after the milling operations or as directly by the ENGINEER.

END OF SECTION

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SECTION 02740 - SUBGRADE, BASE COURSE AND ASPHALT

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Unit Price – Measurement and Payment
- B. Submittals
- C. Products
- D. Execution including examination, excavation, subgrades and base course
- E. Overlay Operations
- F. Stripping, RPMs and Roadway Signage
- G. Field Quality Control

1.2 RELATED SECTIONS

- A. Contract Documents, specifically the General Conditions For Construction, Section 01410 TESTING LABORATORY SERVICES
- B. Section 01025 – Price and Payment Procedures
- C. Section 01340 – Shop Drawings, Working Drawings and Samples
- D. Section 01400 – Quality Requirements
- E. Section 023122 – Dewatering and Drainage

1.3 REFERENCES

- A. The references to "Standard Specifications" shall mean the Florida Department of Transportation Standard Specifications cited above except for those paragraphs referring to Measurement and Payment.
- B. AASHTO M216 - Standard Specification for Lime for Soil Stabilization
- C. AI MS-2 - Mix Design Methods for Asphalt Concrete and Other Hot-Mix Types

- D. ASTM D946 - Standard Specification for Penetration-Graded Asphalt Cement for Use in Pavement Construction
- E. ASTM C977 - Standard Specification for Quicklime and Hydrated Lime for Soil Stabilization
- F. TAI - (The Asphalt Institute) - MS-8 Asphalt Paving Manual
- G. NLA (National Lime Association) Bulletin 326 - Lime Stabilization Construction Manual

1.4 UNIT PRICE - MEASUREMENT AND PAYMENT

- A. Refer to Section 01025 MEASUREMENT AND PAYMENT PROCEDURES

1.5 SUBMITTALS FOR REVIEW AND AUTHORIZATION TO PROCEED

- A. The job mix formula including the prime and tack coat, materials, and construction methods shall be submitted to the Engineer for approval before paving begins. Refer to Section 01340 SHOP DRAWINGS, WORKING DRAWINGS AND SAMPLES for additional requirements.

1.6 QUALITY ASSURANCE

- A. The Contractor will employ a testing laboratory to evaluate the materials delivered to and placed at the site.
- B. Certificates of material compliance, signed by material supplier and Contractor, may be submitted in lieu of material testing when acceptable to the ENGINEER and Project Manager.

1.7 PROJECT CONDITIONS

- A. Grade Control: Establish and maintain required lines and elevations.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Lime:
 - 1. Lime used as a stabilizing material: ASTM C207 Type N.

B. Limerock Base:

1. Limerock as stabilizing material or base coarse shall be to a compacted depth of at least 8 inches and shall consist of fossiliferous limestone of uniform quality, and shall not contain hard or flinty pieces that will prevent attainment of a smooth pavement surface free from pits and pockets. At the Contractor's option, either Ocala limerock or Miami Oolite limerock may be used, but only one type may be used on this Project.
2. Limerock shall be composed of not less than 70% of carbonates of calcium and magnesium, and not more than 3% of water-sensitive clay mineral.

C. Shell Base:

1. Shell as a stabilizing material or base course shall be to a compacted depth of at least 8 inches and shall be of mollusk family (i.e. oysters, mussels, clams, or cemented coquina). Steamed shell will not be permitted.
2. At least 50% (by weight) of the total material shall be retained on a No. 4 sieve. Not more than 7.5 % (by weight) of the total material passing the No. 200 sieve shall be removed by washing and the remainder shall consist of shell particles, chert and sand.

D. Prime/Tack Coat: The bituminous material to be used for prime/tack coats shall be either Cut-back Asphalt, Grade RC-70 or RC-250, or emulsified asphalt grades as specified in Section 300-2.1 of the "Standard Specifications" and approved by the Engineer. Materials shall conform to "Standard Specifications", Section 916 and the AASHTO requirements specified therein.

E. Asphaltic Concrete Surface Course:

1. Asphaltic concrete surface course Type S, S-I, S-II and S-III shall be composed of a mixture of aggregate, mineral filler and asphalt cement. Other types will be considered if not specified on the construction plans. Type should match adjacent existing pavement type if the Project requires restoration and not total resurfacing.
2. The job mix formula, size and percent of aggregates shall be as specified in the "Standard Specifications".

PART 3 EXECUTION

3.1 EXAMINATION

- A. Contractor must examine the site conditions and assure themselves that all proceeding construction activities are complete and the area is ready, as applicable, for stabilizing, application of base course and/or asphalt.
- B. Paver must examine the areas and conditions under which paving is to be installed. Notify the Contractor in writing of conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions have been corrected in a manner acceptable to the Paver.

3.2 EXCAVATION

- A. Excavation shall be as required for the subgrade and cross section as shown on the project construction drawings. All suitable materials removed from the excavation shall be used as far as practicable in the formation of embankments, subgrades, and shoulders, and in such other places as directed by the ENGINEER. No excavated material shall be wasted without permission and where necessary to waste such material, it shall be disposed of in the locations directed by the ENGINEER. Muck and other unsuitable material shall be removed and replaced with suitable material. All material used shall be free of stumps, roots, brush, sod, rubbish, rocks or other unsuitable material.

3.3 SUBGRADES

- A. Subgrade construction shall consist of bringing the bottom of excavations and top of embankments of the roadway, between the outer limits of the paving or base course, to a surface conforming to the grades, lines and cross sections shown on the drawings, of uniform density, ready to receive the base course. The entire subgrade in both cuts and fills shall be thoroughly plowed and mixed to a depth of at least 12 inches below grade.
- B. The limits of the roadbed included in the designation of subgrade shall be as shown in the profile shown on the project construction drawings. The lines and grades shall be established by the Contractor as shown on the drawings and shall be maintained by means of grade stakes placed in lines parallel to the centerline of the area to be paved and spaces so that string lines may be stretched between the stakes.
- C. At least 6 inches (loose measurement) of a suitable commercial stabilizing material shall be mixed into the subgrade for stabilization in accordance with the "Standard Specifications", Section 160 and 230. The Florida Bearing Value (FBV) shall be 75 pounds. Density tests will be paid for by CONTRACTOR except for additional tests requested by the Project Manager and/or ENGINEER. Refer to the Contract Documents, specifically the General Conditions For Construction, Section 01410 TESTING LABORATORY SERVICES for additional requirements.

- D. After the subgrade has been prepared, it shall be kept free from ruts, depressions and any damage resulting from the hauling or handling of tools and equipment.

3.4 BASE COURSE

A. Limerock or Shell:

- 1. Base material shall be dumped on the end of the preceding spread without dumping or hauling directly on the sub-grade. Equipment for spreading and grading shall be as specified in Section 200 and 250 of the "Standard Specifications". After the spreading is completed, the entire surface shall be scarified and then shaped to produce the required grade and cross section after compaction. Water shall be added as required to obtain the specified density.

- B. If, at any time, the subgrade material should become mixed with the base course material, the Contractor shall, without additional compensation, dig out and remove the mixture, reshape and compact the subgrade, and replace the materials removed with clean base material which shall be shaped and compacted as specified above.

- C. The completed base course shall be thoroughly cured before the prime coat or wearing surface is laid. The prime coat shall be applied only when the moisture content of the base does not exceed 90% of the optimum moisture for the base material. The Contractor shall maintain the base course to a true and satisfactory surface until the first lift of asphalt is laid.

- D. After completion of compaction, the surface of the base course shall be checked with a template cut to the required crown, and the thickness shall be checked by borings. Any surface irregularities in excess of 1/4 inch or any deficient thickness shall be corrected by scarifying and adding material after which the entire area shall be re-compacted and examined.

3.5 SURFACE PREPARATION

A. Overlay Operations

- 1. Mill all keyways and areas as shown on the project construction drawings.
- 2. Remove all loose material from existing asphalt surface immediately before applying prime coat.

3. Tack Coat: Apply at the rate of 0.02 to 0.08 gallon per sq. yd., over existing asphalt surface. Application of tack coat shall be immediately before overlay operations.

B. Roadway Construction

1. Proof roll prepared base course surface to check for unstable areas and areas requiring additional compaction.
2. Remove all loose material from compacted base surface immediately before applying prime coat.
3. Prime Coat: Apply at the rate of 0.35 to 0.40 gallon per sq. yd., over compacted base course. Apply material to penetrate and seal, but not flood, surface. Apply a light uniform cover of sand and allow to cure. Unless approved by the Project Manager, application of prime coat shall be within 48 hours of the asphaltting operations.

3.6 PLACING ASPHALT

A. General

1. Lay all asphalt, including leveling course, other than adjacent to curb and gutter or other true edges, by the string line method to obtain an accurate, uniform alignment of the pavement edge.

For overlay operations only, an alternative to the initial string line method would be to apply the asphalt overlay, survey and mark the roadway centerline, measure lane width on each side of centerline then string line and saw-cut the edge to match the existing in order to obtain an accurate, uniform alignment of the pavement edge. In no case shall the asphalt overlay material "overhang" the edge of the existing roadway.

2. Place asphalt mixture on clean prepared surface, spread and strike-off. Place inaccessible and small areas by hand. Place each course to required grade, cross-section and compacted thickness.
3. Follow "Standard Specification" Section 330 for general construction of the surface course as applicable to this project.

B. Joints:

1. Make joints between old and new pavements, or between successive days work, to ensure continuous bond between adjoining work.

2. Construct joints to have same texture, density and smoothness as other sections of asphalt concrete course. Clean contact surfaces and apply tack coat.
- C. Protection:
1. Immediately after placement, protect pavement from mechanical injury for sufficient time necessary or until surface temperature is less than 140°F.
 2. Erect barricades to protect paving from traffic until mixture has cooled and attained its maximum degree of hardness.

3.7 STRIPPING (TEMPORARY AND PERMANENT) RAISED PAVEMENT MARKINGS AND SIGNAGE

- A. Once the asphalt has been placed and has achieved its maximum degree of hardness, Contractor shall apply temporary STOP BARS and stripping as specified on the project construction drawings or in the applicable FDOT Index (9535 through 17356).
- B. Once 30 days has elapsed, after the final asphalt placement, permanent stripping and RPMs shall be applied as specified on the project construction drawings or in the applicable FDOT Index (9535 through 17356).
- C. Roadway signage shall be as specified on the project construction drawings or in the applicable FDOT Index. Street terminations shall be signed as specified in FCOT Index 17349

3.8 FIELD QUALITY CONTROL

- A. Section 01400 QUALITY REQUIREMENTS
- B. Compaction testing will be performed in accordance with ASTM D1556 or AASHTO T180 in locations as specified by the Project Manager or ENGINEER. Project Manager and/or ENGINEER are to select specific locations and lifts as well as witnessing of all compaction testing.
- C. If tests indicate Work does not meet specified requirements, remove Work, replace and retest. In general, the re-test locations shall be as specified in FDOT Standard Specification 125.
- D. Roadway Subgrade Compaction
 1. As a minimum, the top 12-inches of the roadway subgrade shall be compacted to 98% of the modified proctor. Some roadways may require

special subgrade stabilization, i.e., LBR 40 or as otherwise specified in the project construction drawings. When special subgrade stabilization is required by the project construction drawings, those requirements shall be superior to this specification requirement.

2. The frequency of density verification testing shall be 3 tests (usually edge of roadway – crown/center – edge of roadway) every 100 linear feet and 1 test for every 100 linear feet of curb.

E. Roadway Base Course Compaction

1. Compaction shall be by rolling with a combination of steel wheel and rubber tired rollers until 98% of the maximum density is reached as tested under AASHTO Method T-180. Compaction and finishing shall be in accord with single course base requirements of Paragraph 200-6 AND 250-7 of the "Standard Specifications".
2. The frequency of density verification testing shall be 3 tests (usually edge of roadway – crown/center – edge of roadway) every 100 linear feet and 1 test for every 100 linear feet of curb.

F. Asphalt Testing/Verification: Test the in-place asphalt courses for compliance with requirements for thickness and surface smoothness. Repair or remove and replace unacceptable paving as directed by ENGINEER.

G. Thickness: The compacted thickness of the base or surface courses shall be not less than that shown on the project construction drawings.

H. Surface Smoothness:

1. Test finished surface of each asphalt course for smoothness, using 15 foot straightedge applied parallel with the centerline of paved area and extended across all joints. Surfaces will not be acceptable if exceeding the following tolerances for smoothness.
 - a. Base Course Surface: 1/4 inch
 - b. Wear Course and Overlay Surface: 1/8 inch
2. Check surfaced areas at intervals as directed by the Engineer
3. Using the Contractors water truck or metered fire hydrant, Contractor shall flood the finished roadway to verify water coursing and flow line. Any ponding or “bird baths” will be cause for rejection.

END OF SECTION

SECTION 02761 - PAVEMENT MARKINGS AND CAR STOPS

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 and materials necessary to construct and install all pavement marking, striping and car stops in accordance with the plans and these specifications.

1.3 PROJECT CONDITIONS

- A. Pavement-Marking Paint: Proceed with pavement marking only on clean, dry surfaces and at a minimum ambient or surface temperature of 40 degrees F for oil base materials, 50 degrees F for water-based materials, and not exceeding 90 degrees F.
- B. Surface Preparation: The surface shall be clean and free of dirt, grease, oil, or other contaminants which could interfere with adhesion.

1.4 QUALITY ASSURANCE

- A. Perform all work in accordance with the requirements of local agencies.

PART 2 - PRODUCTS

2.1 Chlorinated rubber-alkyd type, as per Fed Spec. No. TT-P-115, Type III, or shall be Code T-1, conforming to Section 971-12.2 of the Florida Department of Transportation Standard Specifications.

- A. Paint shall be factory mixed, quick drying and non-bleeding type.
- B. Color shall be as per D.O.T. requirements.
- C. Striping, arrows, lane markers and stop bars shall be provided with paint containing reflective additive.

- 2.2 Thermoplastic paint shall conform to the applicable Technical Specifications (Section 711) of the Florida Department of Transportation Standards
- 2.3 Traffic paint shall conform to the applicable Technical Specifications (Section 710) of the Florida Department of Transportation Standards
- 2.4 Car stops shall be of the size and dimensions shown on the plans. Concrete for car stops shall have a minimum compressive strength of 2,500 psi.
- 2.5 Reflectors shall be in accordance with Florida Department of Transportation Standards.

PART 3 EXECUTION

3.1 TRAFFIC AND LANE MARKINGS

- A. Sweep dust and loose material from the sealed surface.
- B. Apply paint striping as indicated on the drawings, with suitable mechanical equipment to produce uniform straight edges.
 - 1. Apply in not less than (2) two coats as per manufacturer's recommended rates of applications.
- C. Protect pavement markings until completely dry in accordance with manufacturer's recommendations.

3.2 TEMPORARY PAVEMENT MARKINGS

- A. Temporary paint shall be applied in accordance with permanent pavement marking specifications. However, only 1 coat of paint shall be required to a clean, dry surface using template or a striping machine. The CONTRACTOR may also propose to utilize temporary/removable pavement marking tape, as approved by the OWNER.
- B. Markings shall be applied using butyl adhesive pads or paint to clean dry pavement surfaces which are free of cracking, checking, spalling, or failure of underlying base material.
- C. When required, removable marking tape or pavement marking paint shall be applied on clean dry surfaces at designated locations. Tape that has become damaged and is no longer serviceable shall be replaced without additional compensation.

- D. All temporary markings and striping shall be removed when no longer required. Any pavement area that has been determined to be damaged as a result of the removal operation shall be repaired at no cost to the OWNER.

3.3 PAVEMENT MARKING REMOVAL

- A. Existing pavement marking lines and symbols shall be removed as to not materially or structurally damage the surface or texture of the pavement. A motorized abrasive device shall be utilized to remove existing markings. The CONTRACTOR shall repair any damage to the pavement at no expense to the OWNER. The pavement surface shall be left in a condition that will not mislead or misdirect customers or motorists. Pavement marking removal within public rights of way shall be completed in accordance with the regulatory authority having jurisdiction and the specifications.

END OF SECTION

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SECTION 02960 - RESTORATION OF SURFACE IMPROVEMENTS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. The work includes the restoration of driveway aprons, mail boxes, grassed and sodded areas, trees and plants, roadways, sprinkler systems, sidewalks and any other improvements required as a result of the Work.
- B. Restoration of surface improvements shall be concurrent with the installation of the water main, reclaimed water main, force main, drainage improvements or sanitary sewer; the work includes swale development and improvements on both sides of the streets in the project area. Work includes re-grading, sodding, driveway apron reconstruction, replacement of pre-existing irrigation systems and all surface restoration including trench repair.
- C. This section includes furnishing equipment, labor and materials, and performing all necessary and incidental operations to perform the required Work.

1.2 RELATED SECTIONS

- A. Section 01025 – Measurement and Payment
- B. Section 01340 – Shop Drawings, Work Drawings, and Samples
- C. Section 01400 – Quality Requirements
- D. Section 02486 – Seed, Mulch and Fertilizer
- E. Section 02740 – Subgrade, Base Course and Asphalt
- F. Section 03300 – Cast-In-Place Concrete

1.3 REFERENCES

Not Used.

1.4 UNIT PRICE – MEASUREMENT AND PAYMENT

- A. Unless specifically called out in the Schedule of Bid Items, work under this Section shall be considered incidental to the Work as detailed in the related Sections.

When existing Right-Of-Way (ROW) irrigation must be disturbed due to pipeline installation or swale development, the existing lines shall be cut-&-capped during the construction/installation process. The replacement of existing irrigation in the Public ROW is NOT a pay item. Replacement of existing ROW irrigation shall be incidental to the Unit Price of the specific work item. Replacement material (pipe, fittings and sprinkler heads) shall be equal to or of a better quality, quantity and size than the pre-existing.

PART 2 PRODUCTS

2.1 Refer to the individual Sections identified above

PART 3 EXECUTION

3.1 RESTORATION ACTIVITIES

A. Areas affected by the Work shall be restored to a condition equal to or better than the condition existing before the commencement of the Work. Additionally the Contractor shall re-set/replace disturbed and/or damaged mailboxes (all mailboxes shall conform to the current requirements of the US Post Office) and the Contractor shall re-set or replace existing signage.

3.2 BUSH, PLANT, SHRUB AND/OR TREE REMOVAL AND REPLACEMENT CRITERIA

A. Bushes, plants, shrubs and/or trees that have been planted in the City, County or State ROW by the adjacent property owner and is in direct conflict with a proposed utility improvement that includes swales, green space, etc. shall be removed to allow for the installation of the project improvements and will not be replaced.

END OF SECTION

SECTION 03300 - CAST-IN-PLACE CONCRETE

PART 1 GENERAL

1.1 PURPOSE

- A. The purpose of this Section is to address concrete that is either mixed on site for thrust blocks, valve collars and other miscellaneous concrete and for concrete delivered to the site by an FDOT licensed Concrete Batch Plant for site placement for driveways, driveway aprons, curbs and gutters, sidewalks, minor equipment pads, light pole base, flagpole base, thrust blocks, manholes, miscellaneous structures and miscellaneous slabs on grade.

1.2 RELATED SECTIONS

- A. Section 01025 – Measurement and Payment
- B. Section 01340 – Shop Drawings, Work Drawings, and Samples
- C. Section 01400 – Quality Requirements

1.3 REFERENCES

- A. ACI 301 - Specifications for Structural Concrete
- B. ACI 305R - Hot Weather Concreting
- C. ACI 308 - Standard Practice for Curing Concrete
- D. ACI 347 - Recommended Practice for Concrete Formwork
- E. ASTM D1751 - Standard Specification for Preformed Expansion Joint Fillers for Concrete Paving and Structural Construction (Non-extruding and Resilient Bituminous Types)
- F. ASTM C33 - Standard Specification for Concrete Aggregates
- G. ASTM C94 – Standard Specification for Ready-mixed Concrete
- H. ASTM C150 - Standard Specification for Portland Cement
- I. ASTM C260 - Standard Specification for Air-Entraining Admixtures for Concrete

1.4 UNIT PRICE - MEASUREMENT AND PAYMENT

- A. Refer to Section 01025 MEASUREMENT AND PAYMENT PROCEDURES

1.5 SUBMITTALS FOR REVIEW AND AUTHORIZATION TO PROCEED

- A. The job mix formula, materials, and construction methods shall be submitted to the ENGINEER for approval before concrete begins. Refer to Section 01340 SHOP DRAWINGS, WORK DRAWINGS, AND SAMPLES.
- B. Project Record Documents
 - 1. Laboratory reports for compressive strength (7 day and 28 day), slump and air entrainment

PART 2 PRODUCTS

2.1 CONCRETE MATERIALS

- A. Cement: ASTM C150, Type I - Normal
- B. Fine and Coarse Aggregates: ASTM C33
- C. Water: Potable

2.2 FORM MATERIALS

- A. Form Materials: At the discretion of the CONTRACTOR

2.3 REINFORCEMENT

- A. Reinforcing Steel: ASTM A615, 60 ksi yield grade; deformed billet steel bars, unfinished or epoxy coated in accordance with ASTM A775 finish as called for on the plans.
- B. Stirrup Steel: ANSI/ASTM A82, unfinished or epoxy coated in accordance with ASTM A775 finish as called for on the plans.
- C. Welded Steel Wire Fabric: ASTM A497 Deformed Type; in coiled rolls; unfinished or epoxy coated in accordance with ASTM D884 Class A finish as called for on the plans.

2.4 ADMIXTURES

- A. Air Entrainment: ASTM C260

2.5 ACCESSORIES

- A. Bonding Agent: Polymer resin emulsion.
- B. Non-Shrink Grout: Premixed compound consisting of non-metallic aggregate, cement, water reducing and plasticizing agents; capable of developing minimum compressive strength of 2,400 psi in 48 hours, 7,000 psi in 28 days.

2.6 JOINT DEVICES AND FILLER MATERIALS

- A. Joint Filler Type A: ASTM D1751; Asphalt impregnated fiberboard or felt, 1/4 inch thick; tongue and groove profile.

2.7 CONCRETE MIX DESIGN

- A. Refer to FDOT Standard Specifications Section 347 for mix composition of the various types of concrete classes.
- B. Design mix to produce standard-weight concrete consisting of Portland cement, aggregate, air-entraining admixture and water to produce the following properties:
 1. Compressive Strength: 3000 psi, minimum at 28 days.
 2. Slump Range: 2" to 4"
 3. Air Content: 4% +/- 1.5%
 4. Minimum total cementitious content lb/yd³: 530
 5. Maximum water cement ratio lb/lb: 0.50

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify site conditions as shown on the contract drawings.
- B. Verify requirements for concrete cover over reinforcement.
- C. Verify compacted granular base is acceptable and ready to support concrete placement and imposed loads.

- D. Verify gradients and elevations of base are correct. Verify lines, levels and centers before proceeding with formwork. Ensure that dimensions agree with drawings.
- E. Verify that anchors, seats, plates, reinforcement and other items to be cast into concrete are accurately placed, positioned securely, and will not cause hardship in placing concrete.

3.2 PREPARATION

- A. Prepare previously placed concrete by cleaning with steel brush and applying bonding agent in accordance with manufacturer's instructions.
- B. In locations where agency jurisdictional requirements specify new concrete be doweled to existing work, or as shown on the drawings, the doweling shall be performed as follows: drill holes in existing concrete, remove dust and debris with compressed air, inject epoxy and insert steel dowels. For Curbs, sidewalks, driveways and other flatwork, provide a minimum of number 5 dowels at 18" o/c along the entire joint between new and existing concrete. Anchoring holes for all dowels shall be drilled at mid depth to provide a minimum penetration of 10" into the existing slab and 18" into the new slab. Brush full depth of each hole and remove dust with compressed air or rinse with water and allow to fully dry prior to epoxy/dowel placement into the existing slab.
- C. Set forms to required grades and lines, rigidly braced and secured. Install sufficient quantity of forms to allow continuous progress of work and so that forms can remain in place at least 24 hours after concrete placement.
- D. Check completed formwork for grade and alignment to the following tolerances:
 - 1. Top of forms not more than 1/8" in 10 feet deviation in alignment
 - 2. Vertical face on longitudinal axis, not more than 1/4" in 10 feet
- E. Clean forms after each use and coat with form release agent as often as required to ensure separation from concrete without damage.
- F. Assemble formwork to permit easy stripping and dismantling without damaging concrete.
- G. Place joint filler vertical in position, in straight lines to the full depth of the concrete. Secure to formwork during concrete placement.
- H. Place, support and secure reinforcement against displacement. Do not deviate from required position.

3.3 INSERTS, EMBEDDED PARTS, AND OPENINGS

- A. Provide formed openings where required for items to be embedded in passing through concrete work.
- B. Locate and set in place items, which will be cast directly into concrete.
- C. Coordinate with work of other sections in forming and placing openings, slots, recesses, sleeves, bolts, anchors, other inserts, and components of other Work.
- D. Install accessories in accordance with manufacturer's instructions, straight, level, and plumb. Ensure items are not disturbed during concrete placement.
- E. Provide temporary ports or openings in formwork where required to facilitate cleaning and inspection. Locate openings at bottom of forms to allow flushing water to drain.
- F. Close temporary openings with tight fitting panels, flush with inside face of forms, and neatly fitted so joints will not be apparent in exposed concrete surfaces.

3.4 QUALITY CONTROL

- A. Field inspection and testing will be performed in accordance with ACI 301.
- B. Provide free access to Work and cooperate with appointed firm.
- C. Tests of cement and aggregates may be performed to ensure conformance with specified requirements.
- D. Four (4) concrete test cylinders will be taken for every 75 or less cubic yards of each class of concrete placed or for each day concrete is placed.
 - 1. Compressive strength test reports are to be provided in a progressive manner as the testing laboratory generates them. CONTRACTOR shall instruct their subcontracted laboratory to send copies to the Project Manager.
- E. One additional test cylinder will be taken during cold weather concreting, cured on job site under same conditions as concrete it represents.
- F. One slump test will be taken, by the independent testing laboratory, for each set of test cylinders taken.

3.5 PLACING CONCRETE

- A. Place concrete in accordance with ACI 301, ACI 302 or ACI 318. CONCRETE SHALL BE CONSOLIDATED DURING THE PLACEMENT WITH THE USE OF APPROPRIATE VIBRATORY EQUIPMENT.
- B. Notify ENGINEER minimum 24 hours prior to commencement of operations.
- C. Ensure reinforcement, inserts, embedded parts, formed expansion and contraction joints, are not disturbed during concrete placement.
- D. Place joint filler in as shown on the plans. Set top to required elevations. Secure to resist movement by wet concrete.
- E. Install joint devices in accordance with manufacturer's instructions.
- F. Maintain records of concrete placement. Record date, location, quantity, air temperature, and test samples taken.
- G. Place concrete continuously between predetermined expansion, control, and construction joints.

3.6 JOINTS

- A. Make joints between old and new pavements, or between successive days work, to ensure continuous abutment between adjoining work.
- B. Construct joints to have same texture, density and smoothness as other sections of cement concrete course. Clean contact surfaces and install expansion joints prior to next day's installation.
- C. Weakened-Plane (Contraction) Joints: Provide weakened-plane joints, sectioning concrete into areas as shown on the drawings or every five linear feet for curbs. Construct weakened-plane joints for a depth equal to at least 1/4 concrete thickness, as follows:
 - 1. Sawed Joints: Form weakened-plane joints using powered saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut joints into hardened concrete as soon as surface will not be torn, abraded, or otherwise damaged by cutting action.
 - 2. Construction Joints: Place construction joints at end of all pours and at locations where placement operations are stopped for a period of more than 1/2 hour, except where such pours terminate at expansion joints.

- D. Expansion Joints: Provide premolded joint filler for expansion joints abutting concrete curbs, catch basins, manholes, inlets, structures, walks and other fixed objects, unless otherwise indicated.
- E. Extend joint fillers full-width and depth of joint, and not less than 1/2" or more than 1", and 1" below finished surface for joint sealer.

3.7 FINISHING

- A. After striking-off and consolidating concrete, smooth surface by screeding and floating. Use hand methods only where mechanical floating is not possible. Adjusting floating to compact surface and produce a uniform texture.
- B. After floating, test surface for trueness with a 10- foot straightedge. Distribute concrete as required to remove surface irregularities, and refloat repaired areas to provide a continuous smooth finish.
- C. Work edges of slabs, gutters, back top edge of curb, and formed joints with an edging tool, and round to 1/2" radius, unless otherwise indicated. Eliminate any tool marks on concrete surface.
- D. After completion of floating and when excess moisture or surface sheen has disappeared, complete surface finishing, as follows:
 - 1. Driveway aprons and Sidewalk Paving: Light broom, radius to 1/4-inch radius, and trowel joint edges. At the junction of sidewalks to roadway crossings, the sidewalks shall have a tactile surface treatment as specified in FDOT.
 - 2. Median Barrier: Light broom, radius to 3/4-inch radius, and trowel joint edges.
 - 3. Curbs and Gutters: Light broom.
 - 4. Direction of Texturing: Parallel to pavement direction.
 - 5. Inclined Vehicular Ramps: Broomed perpendicular to slope.
- E. Place curing compound on exposed concrete surfaces immediately after finishing. Apply in accordance with manufacturer's instructions.

3.8 FORM REMOVAL

- A. Forms shall not be removed before the expiration of the minimum number of days indicated below, except when specifically authorized. When conditions of the

work are such as to justify it, forms may be required to remain in place for longer periods.

1. Sidewalks, driveways, driveway aprons: 4 days
2. Walls & vertical faces: 7 days

3.9 PROTECTION

- A. Immediately after placement, protect pavement from premature drying, excessive hot or cold temperatures, mechanical injury and vandalism.
- B. Drill test cores where directed by the Project Manager, when necessary to determine magnitude of cracks or defective areas. Fill drilled core holes in satisfactory pavement areas with Portland cement concrete bonded to pavement with epoxy resin grout.
- C. Repair or replace broken or defective concrete, as directed by the Project Manager.
- D. Sweep concrete pavement and wash free of stains, discolorations, dirt and other foreign material just prior to Final Acceptance.

3.10 PATCHING

- A. Allow the Project Manager to inspect concrete surfaces immediately upon removal of forms.
- B. Excessive honeycomb or embedded debris in concrete is not acceptable.
- C. Patch imperfections as directed in accordance with ACI 301.

END OF SECTION

APPENDIX A

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Water Utilities Department
City of Lake Worth
301 College Street
Lake Worth, FL 33460

APPROVED PRODUCTS LIST

CERTIFICATION AND CONCURRENCY STATEMENT

Project Name: _____

Concurrency of Contractor: _____
Signature Date

Firm

Concurrency from the EOR
(Engineer of Record): _____
Signature Date

The execution of this document acknowledges that I (We), the above signed, have reviewed this Approved Products List (APL) in entirety, initialed all error corrections to the APL, and concur that the materials and products listed are acceptable and appropriate for the project noted above. As the engineer-of-record and/or contractor, I (We), the above signed, shall provide written notification to the City of Lake Worth for any material listed in the APL to which I object being implemented/ installed in the project noted above.

Individual product shop drawings will be required for all non-standard items. Products not listed in the APL, or APL listed products that defer in specification, shall be considered a non standard product.



Utilities Department
City of Lake Worth
301 College Street
Lake Worth, FL 33460

APPROVED PRODUCTS LIST

REVISED: July 9, 2015

Project Name: _____

Contractor: _____

Engineer: _____

APPROVED: _____
Signature Date

APPROVED AS NOTED: _____
Signature Date

*NOT APPROVED: _____
Signature Date

*Contractor to revise and resubmit by ____/____/____

WATER DISTRIBUTION

FIRE HYDRANTS:

- | | |
|---|--|
| <input type="checkbox"/> Mueller Super Centurion
A-423, 5 1/4" Plugged Drain | <input type="checkbox"/> American Darling
5 1/4" B-84-B-5 |
|---|--|

HYDRANT COATINGS:

Hydrants shall have a top coat of Tnemec Series 66 Yellow

BACKFLOW PREVENTION:

- BACKFLOW PREVENTORS (BFP)

- | | |
|---|---|
| <input type="checkbox"/> Watts
Model 009 | <input type="checkbox"/> Febco
805Y-BV |
|---|---|

- REDUCED PRESSURE ZONE (RPZ) DEVICE

Up to 2 1/2":

3" and up:

- | | |
|---|---|
| <input type="checkbox"/> Wilkins
975XL | <input type="checkbox"/> Wilkins
375XL |
|---|---|

WATER SERVICE FITTINGS:

- 1" CORPORATION STOPS

- | | | |
|--|--|--|
| <input type="checkbox"/> Mueller
P-25008N | <input type="checkbox"/> AY-McDonald
74701-22 | <input type="checkbox"/> Ford Meter
FB1000-4-NL |
|--|--|--|

- 2" CORPORATION STOPS

- | | | |
|--|--|--|
| <input type="checkbox"/> Mueller
P-25008N | <input type="checkbox"/> AY-McDonald
74701-22 | <input type="checkbox"/> Ford Meter
FB1000-7-NL |
|--|--|--|

- ANGLE METER VALVE (FOR U BRANCH)

5/8 x 3/4 x 3/4":

3/4":

- | | | |
|--|---|---|
| <input type="checkbox"/> Mueller
H-14265N | <input type="checkbox"/> AY-McDonald
74604B 3/4" | <input type="checkbox"/> Ford Meter
BA13-3-232W-NL |
|--|---|---|

- 1" ANGLE METER VALVE CURB STOP

5/8 x 3/4 x 1", 1":

1 x 3/4 x 3/4", 1":

- | | | |
|--|--|---|
| <input type="checkbox"/> Mueller
P-14258N | <input type="checkbox"/> AY-McDonald
74602B | <input type="checkbox"/> Ford Meter
BA13-342W-Q-NL |
| | | <input type="checkbox"/> Ford Meter
BA13-444W-Q-NL |

- 1" STRAIGHT METER VALVE CURB STOP

5/8 x 3/4 x 1", 1" 1 x 3/4 x 3/4", 1":

- | | | | | | |
|--------------------------|---------------------|--------------------------|--------------------------|--------------------------|---------------------------|
| <input type="checkbox"/> | Mueller
P-24350N | <input type="checkbox"/> | AY-McDonald
76100M-22 | <input type="checkbox"/> | Ford Meter
B43-342W-NL |
| | | | | <input type="checkbox"/> | Ford Meter
B43-444W-NL |

- 2" ANGLE METER VALVE CURB STOP

2" 2" Flanged

- | | | | | | |
|--------------------------|---------------------|--------------------------|--------------------------|--------------------------|-----------------------------|
| <input type="checkbox"/> | Mueller
P-24276N | <input type="checkbox"/> | AY-McDonald
74602B-22 | <input type="checkbox"/> | Ford Meter
BFA43-777W-NL |
|--------------------------|---------------------|--------------------------|--------------------------|--------------------------|-----------------------------|

- 3/4" – 2" SERVICE FITTINGS

- | | | | | | |
|--------------------------|---------------------|--------------------------|-------------------------|--------------------------|-------------------------|
| <input type="checkbox"/> | Mueller
P-15428N | <input type="checkbox"/> | AY-McDonald
74753-22 | <input type="checkbox"/> | Ford Meter
C84-XX-NL |
| <input type="checkbox"/> | Mueller
P-15451N | <input type="checkbox"/> | AY-McDonald
74754-22 | <input type="checkbox"/> | Ford Meter
C14-XX-NL |
| <input type="checkbox"/> | Mueller
P-15403N | <input type="checkbox"/> | AY-McDonald
74758-22 | <input type="checkbox"/> | Ford Meter
C44-XX-NL |

- DUAL WATER SERVICE U BRANCH

1 X 3/4 X 6.5": 1 X 3/4 X 6.5":

- | | | | | | |
|--------------------------|---------------------|--------------------------|-----------------------|--------------------------|----------------------------|
| <input type="checkbox"/> | Mueller
P-15363N | <input type="checkbox"/> | AY-McDonald
708U2M | <input type="checkbox"/> | Ford Meter
U48-43-65-NL |
| | | <input type="checkbox"/> | AY-McDonald
708UFM | <input type="checkbox"/> | Ford Meter
U18-43-65-NL |

- METER COUPLING

5/8 X 3/4 X 3/4": 3/4 X 3/4 X 2 1/2":

- | | | | | | |
|--------------------------|--------------------|--------------------------|----------------------|--------------------------|----------------------------|
| <input type="checkbox"/> | Mueller
H-10890 | <input type="checkbox"/> | AY-McDonald
74662 | <input type="checkbox"/> | Ford Meter
C38-23-25-NL |
|--------------------------|--------------------|--------------------------|----------------------|--------------------------|----------------------------|

1": 1 X 1 X 2.63":

- | | | | | | |
|--------------------------|--------------------|--------------------------|----------------------|--------------------------|----------------------------|
| <input type="checkbox"/> | Mueller
H-10890 | <input type="checkbox"/> | AY-McDonald
74662 | <input type="checkbox"/> | Ford Meter
C38-24-35-NL |
|--------------------------|--------------------|--------------------------|----------------------|--------------------------|----------------------------|

VALVES/ TAPS:

- GATE VALVES

3/4", 1", 1 1/2", 2", 2 1/2", 3":

Nibco
T-133

Nibco
T-136

4" to 16"

Resilient Seat and Bi Directional Flow Only
Max working Pressure of 200 psi; tested at 400 psi

Mueller

American
Darling

Clow

- BUTTERFLY VALVES

12" to 24"
150psi Rated

Mueller

American
Darling

Henry Pratt

Clow

- TAPPING VALVES

Resilient Wedge Type

Mueller

American
Darling

Clow

- TAPPING SLEEVES

4" to 24"

Mueller
H-615

10" to 24"

Mueller
H-616

4" to 12" and 16"

American Darling
2800C

- TAPPING CROSS

Mueller
H-715

SERVICE SADDLES:

- DOUBLE STRAP SERVICE SADDLE – CC THREADS

3/4", 1", 1 1/4", 1 1/2", 2":

JCM
402

JCM
404

1" and 2":

JCM
313

Ford Meter
202B

3/4", 1", 1 1/2", 2":

Ford Meter
F202

Ford Meter
FCD202

- DOUBLE STRAP TAPPING SADDLE – CC THREADS

3/4", 1", 1 1/4", 1 1/2", 2":

Mc Donald
3826

SERVICES:

- METER BOX

For 1 1/2" & 2" Meter:

Oldcastle Precast
N36 BOX
B36E Lid

For 3/4" or 1" Meter:

Oldcastle Carson
Heavywall 1118BCF
CDR 11" x 18" tier 15
With CI reader lid
#CO2111802D

- METER FLANGE

2" only:

Mc Donald
610F

Ford Meter
CF31-77-NL

WATER DISTRIBUTION PIPE MATERIALS:

- DUCTILE IRON PIPE (DIP)
Cement Line and Seal Coat

MANUFACTURER:

American Clow US Pipe McWayne Griffin

CLASS:

Class 52, sizes to be used on water mains: _____

Class 50, sizes to be used on water mains: _____

- POLYVINYL CHLORIDE (PVC)

MANUFACTURER: _____

CLASS:

PVC C-900, sizes to be used on water mains: _____ (4" to 12")

PVC C-905, sizes to be used on force mains: _____ (over 12")

- MECHANICAL JOINT RESTRAINT

Ebaa Iron
Mega Lug

Star Pipe Products
Series 3000 (DIP)

Star Pipe Products
Series 4000 (PVC)

Tyler Union
TUF Grip

- BELL JOINT RESTRAINT

Star Pipe Products
3100 Series (DIP)

Star Pipe Products
4100 Series (PVC 3"-12")

Star Pipe Products
4400 Series (PVC 14"-36")

- FLANGED ADAPTER

Star Pipe Products
Series 200

Star Pipe Products
Series 400

SEWER COLLECTION

MANHOLE LIDS

Low Traffic Areas:

- US Foundry No. 170 US Foundry No. 324

High Traffic Areas:

- Pamrex

VALVES

- AIR RELEASE VALVE (2") Val-Matic VM-48AS
- AIR/ VACUUM VALVE (2", 3") Val-Matic VM-301AS
- COMBINATION AIR VALVE (2" x 1"; 2" x 2"; 3" x 2") GA 959

TAPPING VALVES

Resilient Wedge Type

- Mueller American Darling Clow

RESILIENT SEAT VALVES

4" to 12"; Max working Pressure of 200 psi; tested at 400 psi

- Mueller American Darling Clow

PLUG VALVES

For force main installation after tapping valve
Working pressure 150 psi PRATT Clow

- VALVE BOX Tyler Union 6850 Series

LINING PRODUCTS

Manhole/ Wetwell Liners

For Existing Structures:

- Kerneos Sewpercoat Global Refratta

For New Structures:

- Agru Suregrip

SEWER PIPE MATERIALS

- DUCTILE IRON PIPE (DIP)
Cement Line and Seal Coat

MANUFACTURER:

American Clow US Pipe McWayne Griffin

CLASS:

Class 52, sizes to be used on force mains: 4" 8"

Class 52, sizes to be used on gravity mains: 4" 6"

Class 50, sizes to be used on force mains: _____ (over 8")

Class 50, sizes to be used on gravity mains: _____ (over 6")

- POLYVINYL CHLORIDE (PVC)

MANUFACTURER: _____

CLASS:

PVC C-900, sizes to be used on force mains: _____ (4" to 12")

PVC C-905, sizes to be used on force mains: _____ (over 12")

PVC SDR-35, sizes to be used on gravity mains: _____
Depth of pipe less than 6ft

PVC SDR-26, sizes to be used on gravity mains: _____
Depth of pipe greater than or equal to 6ft

- REINFORCED CONCRETE PIPE (RCP)

MANUFACTURER: _____

CLASS III, sizes to be used on gravity mains: _____ (12" to 144")

- MECHANICAL JOINT RESTRAINT

Ebaa Iron
Mega Lug