



# Infiltration Removal Lateral and Mainline Lining Program

Invitation for Bids # PSUT-20-08

General Information		
Project Cost Estimate	\$2,465,502 Annually for 3 Years	See Section 1.4
Project Timeline	This contract shall be for an initial three year period with two additional one-year renewal terms.	See Section 1.4
Evaluation of Proposals	Staff	See Section 1.7
Question Due Date	September 1, 2020	See Section 1.8
Proposals will be accepted until	2:00 p.m. on September 15, 2020	See Section 1.8
5% Proposal Security / Bid Bond	Required in the event that the proposal exceeds \$200,000	See Section 4.1
100% Payment and Performance Bonds	Required in the event that the proposal exceeds \$200,000	See Section 4.2
Grant or Federal Funding Information	Not Applicable	Not Applicable

THE CITY OF PEMBROKE PINES  
**PURCHASING DIVISION**  
**8300 SOUTH PALM DRIVE**  
**PEMBROKE PINES, FLORIDA 33025**  
**(954) 518-9020**



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- Attachment C: Proposer’s Qualifications Statement
- Attachment D: Sample Insurance Certificate
- Attachment E: Specimen Contract - Construction Agreement
- Attachment F: References Form
- Attachment G: Standard Release of Lien Form
- Attachment H: Contract Documents
- Appendix 1 – Work Area Map



## **SECTION 1 - INSTRUCTIONS**

### **1.1 NOTICE**

Notice is hereby given that the City Commission of the City of Pembroke Pines is seeking sealed proposals for:

#### **IFB # PSUT-20-08 Infiltration Removal Lateral and Mainline Lining Program**

Solicitations may be obtained from the City of Pembroke Pines website at <http://www.ppines.com/index.aspx?NID=667> and on the [www.BidSync.com](http://www.BidSync.com) website.

If you have any problems downloading the solicitation, please contact the BidSync Support line at 1-800-990-9339.

If additional information help is needed with downloading the solicitation package please contact the Purchasing Office at (954) 518-9020 or by email at [purchasing@ppines.com](mailto:purchasing@ppines.com). The Purchasing Office hours are between 7:00 a.m. - 6:00 p.m. on Monday through Thursday and is located at 8300 South Palm Drive, Pembroke Pines, Florida 33025.

The City requires all questions relating to the solicitation be entered through the "Ask a Question" option tab available on the BidSync website. Responses to the questions will be provided online at [www.bidsync.com](http://www.bidsync.com). Such request must be received by the "Question Due Date" stated in the solicitation. The issuance of a response via BidSync is considered an Addendum and shall be the only official method whereby such an interpretation or clarification will be made.

**Proposals will be accepted until 2:00 p.m., Tuesday, September 15, 2020.** Proposals must be **submitted electronically at [www.BidSync.com](http://www.BidSync.com)**. The sealed electronic proposals will be publicly opened at 2:30 p.m. by the City Clerk's Office, in the City Hall Administration Building, 4<sup>th</sup> Floor Conference Room located at 601 City Center Way, Pembroke Pines, Florida, 33025.

### **1.2 PURPOSE**

The City of Pembroke Pines is seeking proposals from qualified firms, hereinafter referred to as the Contractor, to rehabilitate Citywide sanitary sewer lines and laterals using the CIPP method, in accordance with the terms, conditions, and specifications contained in this solicitation.

The City has previously conducted inflow and infiltration analysis of the sanitary sewer system in this work area. Its goal is to line the vitrified clay main lines and laterals using CIPP technology.



### **1.3 SCOPE OF WORK**

Refer to Attachment H – Contract Documents

### **1.4 PROJECT COST ESTIMATE & TIMELINE**

Staff estimates this project to cost approximately \$2,465,502 annually, which does not include permit costs.

Please note the City will include a Permit Allowance for this project, **therefore proposers should not include permit costs in their total proposal price.**

This contract shall be for an initial three year per with two additional one-year renewal terms.

#### **1.4.1 PERMITS**

The City anticipates this project to require the following permits:

<b>Permit</b>	<b>Agency</b>	<b>Cost (or related method of calculation)</b>
Engineering	City of Pembroke Pines Engineering Department	4.9136% of construction costs

#### **1.4.2 PERMIT ALLOWANCE**

The City shall include a “Permit Allowance” for this project. The Contractor shall obtain all required permits to complete the work, however the City shall utilize the Permit Allowance to reimburse the contractor for the related permit, license, impact or inspection fees. Payments will be made to the contractor based on the actual cost of permits upon submission of paid permit receipts. The City shall not pay for other costs related to obtaining or securing permits.

The City shall determine the amount of the allowance at time of award. The allowance may be based on a specified percent of the proposed project amount and shall be established for the specific project being performed under the contract. This dollar amount shall be shown on the specific project purchase order as a distinct item from the vendor’s overall offer to determine the total potential dollar value of the contract. Any Permit Allowance funds that have not been utilized at the end of the project will remain with the City, if the City Permit fees exceed the allowance indicated, the City will reimburse the contractor the actual amount of City Permit Fees required for project completion.

### **1.5 PROPOSAL REQUIREMENTS**

The [www.bidsync.com](http://www.bidsync.com) website allows for vendors to complete, scan and upload their documents as part of the bidder’s submittal on the website. Prospective proposers interested



in responding to this solicitation are requested to provide all of the information listed in this section. Submittals that do not respond completely to all of requirements specified herein may be considered non-responsive and eliminated from the process. Brevity and clarity are encouraged.

### **1.5.1 Attachment A: Contact Information Form**

- a. Attached is contact information form (Attachment A) where the vendor will enter their contact information and complete the proposal checklist. The Contact information form shall be electronically signed by the contact person authorized to represent the contractor. This form must be completed and submitted through [www.bidsync.com](http://www.bidsync.com) as part of the bidder's submittal.
- b. The vendor must provide their pricing through the designated lines items listed on the BidSync website.
- c. Please note vendors should be registered on BidSync under the name of the organization that they are operating as and it should match the organization name on the documents that they are submitting and utilizing when responding to the solicitation.
- d. The contact information form should contain an electronic signature of the authorized representative of the Proposer along with the address and telephone number for communications regarding the Proposal.
- e. Proposals by corporations should be executed in the corporate name by the President or other corporate officer accompanied by evidence of authority to sign. The corporate address and state of incorporation must also be shown.
- f. Proposals by partnerships should be executed in the partnership name and signed by a partner whose title and the official address of the partnership must be shown.

### **1.5.2 Attachment B: Non-Collusive Affidavit**

### **1.5.3 Attachment C: Proposer's Qualifications Statement**

### **1.5.4 Attachment F: References Form**

- a. Complete **Attachment F: References Form**, preferably where the team was the same. References should be from the last five years and should be capable of explaining and confirming your firm's capacity to successfully complete the scope of work outlined herein. As part of the proposal evaluation process, the City may conduct an investigation of references, including a record check or consumer affairs complaints. Proposers' submission of a proposal constitutes acknowledgment of the process and consent to investigate. The City is the sole judge in determining Proposers qualifications.



### **1.5.5 Proposal Security (Bid Bond Form or Cashier's Check)**

- a. Each Proposal should be accompanied by a certified or cashier's check or by a Bid Bond made payable to the City of Pembroke Pines on an approved form, duly executed by the Proposer as principal and having as surety thereon a surety company acceptable to CITY and authorized to write such Bond under the laws of the State of Florida, in an amount not less than five percent (5%) of the amount of the base Proposal price.
- b. Contingency is not to be counted in the total amount the proposal security is based on.
- c. Proposers must submit a scanned copy of their bid security (bid bond form or cashier's check) with their bid submittal through BidSync.
- d. Proposers should also submit their original bid security (bid bond form or cashier's check) at time of the bid due date, or they may be deemed as non-responsive.
- e. The original Bid Bond or Cashier's Check should be in a sealed envelope, plainly marked "**BID SECURITY - IFB # PSUT-20-08 Infiltration Removal Lateral and Mainline Lining Program**" and sent to the City of Pembroke Pines, City Clerk's Office, 4th Floor, 601 City Center Way, Pembroke Pines, Florida, 33025.
- f. Please see SECTION 4 - SPECIAL TERMS & CONDITIONS of this RFP for additional information.

### **1.6 VENDOR REGISTRATION AND QUALIFICATION DOCUMENTS**

The City has implemented a new process that is intended to make the bidding process easier for vendors that bid on multiple City projects. This process will require vendors to complete and submit the following standard forms and documents at any time prior to bidding on a project. In addition, the vendors will be able to utilize these same forms without the need to re-fill and re-submit the forms each time they bid on a City project.

**Furthermore, please make sure to update this information on an as-needed basis so that all pertinent information is accurate, such as local business tax receipts, and any other relevant information.**

These forms will be found under the "Vendor Registration" group of "Qualifications" on the BidSync website for the City of Pembroke Pines. Please note that the BidSync website requires bidders to complete all of these qualifications prior to being able to submit questions on any bids, therefore, please make sure to complete this information as soon as possible.

The following documents can be completed prior to the bidding process through the BidSync website and do not need to be attached to your submittal as the BidSync website will automatically include it.



**1.6.1 Vendor Information Form****1.6.2 Form W-9 (Rev. October 2018)**

- a. Previously dated versions of this form will delay the processing of any payments to the selected vendor.

**1.6.3 Sworn Statement on Public Entity Crimes Form****1.6.4 Local Vendor Preference Certification**

- a. If claiming Local Pembroke Pines Vendor Preference, business must attach a current business tax receipt from the City of Pembroke Pines
- b. If claiming Local Broward County Vendor Preference, business must attach a current business tax receipt from Broward County or the city within Broward County where the business resides.
- c. The Local Vendor Preference Certification form must be completed by/for the proposer; the proposer **WILL NOT** qualify for Local Vendor Preference based on their sub-contractors' qualifications.

**1.6.5 Local Business Tax Receipts****1.6.6 Veteran Owned Small Business Preference Certification**

- a. If claiming Veteran Owned Small Business Preference Certification, business must attach the "Determination Letter" from the United States Department of Veteran Affairs Center for Verification and Evaluation notifying the business that they have been approved as a Veteran Owned Small Business (VOSB).
- b. The Veteran Owned Small Business Preference Certification form must be completed by/for the proposer; the proposer **WILL NOT** qualify for Veteran Owned Small Business Preference based on their sub-contractors' qualifications.

**1.6.7 Equal Benefits Certification Form****1.6.8 Vendor Drug-Free Workplace Certification Form****1.6.9 Scrutinized Company Certification****1.7 EVALUATION OF PROPOSALS & PROCESS OF SELECTION**

- A. Staff will evaluate all responsive proposals received from proposers who meet or exceed the bid requirements contained in the solicitation. Evaluations shall be based upon the information contained in the proposals as submitted.



B. Staff will make a recommendation to the City Commission for award of contract.

### **1.8 TENTATIVE SCHEDULE OF EVENTS**

<b>Event</b>	<b>Time &amp;/or Date</b>
Issuance of Solicitation (Posting Date)	<b>August 11, 2020</b>
Question Due Date	<b>September 1, 2020</b>
Anticipated Date of Issuance for the Addenda with Questions and Answers	<b>September 7, 2020</b>
Proposals will be accepted until	<b>2:00 p.m. on September 15, 2020</b>
Proposals will be opened at	<b>2:30 p.m. on September 15, 2020</b>
Evaluation of Proposals by Staff	<b>September 2020</b>
Recommendation of Contractor to City Commission award	<b>October 2020</b>
Issuance of Notice to Proceed	<b>October 2020 – November 2020</b>
Project Commencement	<b>Not later than 10 days after NTP</b>

### **1.9 SUBMISSION REQUIREMENTS**

Bids/proposals **must be submitted electronically** at [www.bidsync.com](http://www.bidsync.com) on or before 2:00 p.m. on September 15, 2020.

Please note vendors should be registered on BidSync under the name of the organization that they are operating as and it should match the organization name on the documents that they are submitting and utilizing when responding to the solicitation.

The vendor must provide their pricing through the designated lines items listed on the BidSync website. In addition, the vendor must complete any webforms on the BidSync website and provide any additional information requested throughout this solicitation. Any additional information requested in the solicitation should be scanned and uploaded. **Unless otherwise specified, the City requests for vendors to upload their documents as one (1) PDF document in the order that is outline in the bid package.**

The City recommends for proposers to submit their proposals as soon as they are ready to do so. Please allow ample time to submit your proposals on the BidSync website. Proposals may be modified or withdrawn prior to the deadline for submitting Proposals. BidSync Support is happy to help you with submitting your proposal and to ensure that you are submitting your proposals correctly, but we ask that you contact their support line at 1-800-990-9339 with ample time before the bid closing date and time.

**PLEASE DO NOT SUBMIT ANY PROPOSALS VIA MAIL, E-MAIL OR FAX.**

**CONTACT INFORMATION FORM**

IN ACCORDANCE WITH “PSUT-20-08” titled “**Infiltration Removal Lateral and Mainline Lining Program**” attached hereto as a part hereof, the undersigned submits the following:

**A) Contact Information**

The Contact information form shall be electronically signed by one duly authorized to do so, and in case signed by a deputy or subordinate, the principal's properly written authority to such deputy or subordinate must accompany the proposal. This form must be completed and submitted through [www.bidsync.com](http://www.bidsync.com) as part of the bidder's submittal. The vendor must provide their pricing through the designated lines items listed on the BidSync website.

**COMPANY INFORMATION:**

COMPANY: \_\_\_\_\_

STREET ADDRESS: \_\_\_\_\_

CITY, STATE &amp; ZIP CODE: \_\_\_\_\_

**PRIMARY CONTACT FOR THE PROJECT:**

NAME: \_\_\_\_\_ TITLE: \_\_\_\_\_

E-MAIL: \_\_\_\_\_

TELEPHONE: \_\_\_\_\_ FAX: \_\_\_\_\_

**AUTHORIZED APPROVER:**

NAME: \_\_\_\_\_ TITLE: \_\_\_\_\_

E-MAIL: \_\_\_\_\_

TELEPHONE: \_\_\_\_\_ FAX: \_\_\_\_\_

SIGNATURE: \_\_\_\_\_

**B) Proposal Checklist**

Did you make sure to submit the following items, as stated in section 1.5 “Proposal Requirements” of the bid package?

1. Attachment A - Contact Information Form	Yes_____
2. Attachment B - Non-Collusive Affidavit	Yes_____
3. Attachment C - Proposer’s Completed Qualification Statement	Yes_____
4. Attachment F - References Form	Yes_____
5. Proposal Security (Bid Bond Form or Cashier’s Check)	Yes_____

Did you make sure to update the following documents found under the “Vendor Registration” group of “Qualifications” on the BidSync website for the City of Pembroke Pines?

Vendor Information Form	Yes_____
Form W-9 (Rev. October 2018)	Yes_____
Sworn Statement on Public Entity Crimes Form	Yes_____
Local Vendor Preference Certification	Yes_____
Local Business Tax Receipts	Yes_____
Veteran Owned Small Business Preference Certification	Yes_____
Equal Benefits Certification Form	Yes_____
Vendor Drug-Free Workplace Certification Form	Yes_____
Scrutinized Company Certification	Yes_____



### **C) Sample Proposal Form**

*The following sample price proposal is for information only. The vendor must provide their pricing through the designated lines items listed on the BidSync website.*

Please note, the following quantities found in the Unit Price Bid Items is for year 1 of the original agreement. Yearly estimated quantities for year two (2) and three (3) of the original agreement will be determined at the end of each term.

Unit Price Bid Items						
ITEM	DESCRIPTION	QTY	U/M	PRICE	AMOUNT	MANUFACTURER
1	Mobilization	1	LS	Price to be Submitted Via BidSync	Price to be Submitted Via BidSync	
2	Mainline CIPP Lining	21,485	LF	Price to be Submitted Via BidSync	Price to be Submitted Via BidSync	
3	Install new clean-outs	456	EA	Price to be Submitted Via BidSync	Price to be Submitted Via BidSync	
4	CIPP Lateral Lining	456	EA	Price to be Submitted Via BidSync	Price to be Submitted Via BidSync	Submit Via BidSync
5	Lateral Repalcement	100	EA	Price to be Submitted Via BidSync	Price to be Submitted Via BidSync	
6	Manhole Rehabilitation (4' diameter)	1000	VF	Price to be Submitted Via BidSync	Price to be Submitted Via BidSync	
7	Chemical Grouting	500	Gallon	Price to be Submitted Via BidSync	Price to be Submitted Via BidSync	
Unit Price Schedule for Additive Work						

The following Unit Price Schedule are for work which may be added by the CITY. Unit Prices offered by the CONTRACTOR which are not comparable to prices offered by other contractors for similar work in South Florida will be rejected.

DESCRIPTION	QTY	U/M	PRICE	
8-inch Open Cut Point Repair < 4 feet deep	TBD	EA	Price to be Submitted Via BidSync	Price to be Submitted Via BidSync
8-inch Open Cut Point Repair 4 - 6 feet deep	TBD	EA	Price to be Submitted Via BidSync	Price to be Submitted Via BidSync
8-inch Open Cut Point Repair 6 - 8 feet deep	TBD	EA	Price to be Submitted Via BidSync	Price to be Submitted Via BidSync
8-inch Open Cut Point Repair 8 - 10 feet deep	TBD	EA	Price to be Submitted Via BidSync	Price to be Submitted Via BidSync
8-inch Open Cut Point Repair > 10 feet deep	TBD	EA	Price to be Submitted Via BidSync	Price to be Submitted Via BidSync



8-inch Point Repair using insert sleeve, 316L SS with EPDM rubber ASTM F3110 rated by Pipeline Renewal Technologies (Certified Installers Only).	TBD	EA	Price to be Submitted Via BidSync	Price to be Submitted Via BidSync
8-inch Point Repair using CIPP insert ASTM F1216 and F2599 rated by LMK Technologies, Infrastructure Repair Systems, Inc. or equal. (Certified Installers Only)	TBD	EA	Price to be Submitted Via BidSync	Price to be Submitted Via BidSync
<b>OWNER ALLOWANCES</b>				
Manhole concrete repairs in accordance with ACI standards	1	LS		\$20,000
Point repairs (method as directed by the CITY)	1	LS		\$125,000
Well point dewatering necessary with excessive infiltration	1	LS		\$50,000
TOTAL OWNER ALLOWANCES				\$195,000
<b>OWNER CONTINGENCY / PERMIT ALLOWANCE</b>				
Owner Contingency	7.5%			
Permit Allowance	5.0%			

# CITY OF PEMBROKE PINES

## Environmental Services Division

8300 South Palm Drive  
Pembroke Pines, FL 33025



## Contract Documents

Infiltration Removal  
Lateral and Mainline Lining Program

July 14, 2020

Contract Documents  
**City of Pembroke Pines**  
Infiltration Removal  
Lateral and Mainline Lining Program

July 14, 2020

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## SECTION 01000 - PROJECT DISCRIPTION

### PART 1 - GENERAL

#### 1.01 SPECIFICATION INCLUDES

- A. The CITY has previously conducted inflow and infiltration analysis of the sanitary sewer system in this work area. Its goal is to line the vitrified clay main lines and laterals using CIPP technology.
- B. The quantities in the bid sheet are an estimate of the number of linings, number of service repairs, feet of televising and cleaning, etc. for the project. This is a unit price contract so repairs will be based on the unit prices. The City reserves the right to have the CONTRACTOR perform the actual quantities at its discretion. CONTRACTOR will endeavor to minimize the costs to the CITY, while insuring that the appropriate repairs are made.

#### 1.02 CONTRACTOR USE OF SITE

- A. The CONTRACTOR shall limit his area of work to remain within those properties and easements as depicted in the CONTRACT DOCUMENTS or as approved in writing by the Owner.
- B. CONTRACTOR's use of lands other than those depicted in the Drawings shall require written approval from the land owner and be at the CONTRACTORs risk and cost.

#### 1.03 LOCATION OF WORK

- A. The work is located within portions of Pines Boulevard, SW 11<sup>th</sup> Street, SW 68<sup>th</sup> Ave. and Florida's Turnpike. Pembroke Pines, Florida.

### PART 2 - PRODUCTS (NOT USED)

### PART 3 - EXECUTION (NOT USED)

#### 3.01 DESCRIPTION OF WORK

The following is a general list of the work included. It is not intended to be complete. Consult the contract drawings and specifications for all contract requirements.

- A. This project involves the following generalized description of work:
  - 1. Some portions of the work may occur on private property which will require coordination between the CONTRACTOR, the CITY and the land owner.
  - 2. Rehabilitation of approximately 22,000 linear feet of sanitary sewer and 450 laterals using the CIPP method.

3. Lateral liners shall be 15 feet in length (minimum) and shall be full circumference type by BLD or LMK. No Substitutions Permitted.
4. CIPP mainlines will require hydrophilic end seals.
5. All manholes will receive rehabilitation including new benches as needed and interior repairs and coating with calcium aluminate.
6. Some mainlines in the work area have been previously lined.
7. Clean all the gravity sewer lines in area 6. Refer to Appendix One – Work Area Map,
8. Video tape the lines. Note: the CITY has had a portion of the area televised in 2019. Refer to Appendix One. Those television surveys will be made available to the successful Bidder.
9. Identify defects in the gravity sewer and the service lines.
10. Make a recommendation for repairs that require excavation (point repairs) or contain extensive roots or other defects that lining may need to be supplemented:
11. Make designated, approved repairs mainline and lateral lining.
12. Re-televiser pipes to verify work completion
13. The CONTRACTOR will be paid on a unit price basis.

#### 3.02 WORK SEQUENCE

- A. The CITY desires that the time between cleaning, televising and corrections will be minimized to minimize impact to customers.
- B. Work may need to be done at night.
- C. Refer to down time specifications.

#### 3.03 OWNER OCCUPANCY

- A. Cooperate with Owner to minimize conflict, and to facilitate Residences and Owner's operations.
- B. Schedule the Work to accommodate this requirement.

#### 3.04 WORK BY OTHERS

- A. The CONTRACTOR is advised that work by others may take place during the duration of the contract time. It shall be the CONTRACTOR's responsibility to coordinate and schedule all Work as not to delay or hinder his work or the work by others.

END OF SECTION

SECTION 01010 - CONTRACTOR SPECIAL CONDITIONS

PART 1 - GENERAL

1.01 SPECIFICATION INCLUDES

A. Demonstrating Work Experience

1. List of public utility clients in Florida where similar projects have been completed, including
  - a. Name,
  - b. Address,
  - c. Phone number and
  - d. Position of utility contact (a minimum of five);
  - e. The minimum value of work with one utility of \$1,000,000 or greater, is required).
  - f. Identify the work completed.
  - g. Length of mainline gravity sewers lines
  - h. Lateral repairs and lining. ASTM standards used for each
2. An example of the report provided to a public utility client as a result of performing the work
3. Five years of experience dealing with the specified products and examples of completed work. Note: CONTRACTOR must have performed a minimum of 500 lateral linings using the specified lateral lining system.
4. The CONTRACTOR's key personnel must hold a Pipeline Assessment Certification Program (PACP) certificate as issued by the National Association of Sewer Service Companies (NASSCO).

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

A. INVESTIGATION AND UTILITIES

1. CONTRACTOR shall have the sole responsibility of satisfying itself concerning the nature and location of the Work and the general and local conditions, and particularly, but without limitation, with respect to the following: those affecting transportation, access, disposal, handling and storage of materials; availability and quality of labor; water and electric power; availability and condition of roads; work area; living facilities; climatic conditions and seasons; physical conditions at

the work-site and the project area as a whole; topography and ground surface conditions; nature and quantity of the surface materials to be encountered; subsurface conditions; equipment and facilities needed preliminary to and during performance of the Work; and all other costs associated with such performance. The failure of CONTRACTOR to acquaint itself with any applicable conditions shall not relieve CONTRACTOR from any of its responsibilities to perform under the Contract Documents, nor shall it be considered the basis for any claim for additional time or compensation.

2. CONTRACTOR shall locate all existing roadways, railways, drainage facilities and utility services above, upon, or under the Project site, said roadways, railways, drainage facilities and utilities being referred to in this Sub-Section 2.2 as the "Utilities". CONTRACTOR shall contact the owners of all Utilities to determine the necessity for relocating or temporarily interrupting any Utilities during the construction of the Project. CONTRACTOR shall schedule and coordinate its Work around any such relocation or temporary service interruption. CONTRACTOR shall be responsible for properly shoring, supporting and protecting all Utilities at all times during the course of the Work.
3. The Contractor shall prepare a written notice to property owners adjacent to the project work site notifying them of the schedule of work affecting them and anticipated inconveniences they may expect. The notice shall meet the approval of the Engineer and be delivered to property owners at least 72 hours prior to construction adjacent to their property. This notice shall indicate the work to be performed, the time it will take to perform the work, and the time when the water service to the property owner will be disrupted.

### 3.02 BID QUANTITIES

- A. Quantities given in the Bid Schedule, while estimated from the best information available, are approximate only. Payment for unit price items shall be based on the actual number of units installed for the Work. Bids shall be compared on the basis of number of units stated in the Bid Schedule as set forth in the Bidding Documents. Said unit prices shall be multiplied by the bid quantities for the total Bid price. Any Bid not conforming to this requirement may be rejected. Special attention to all Bidders is called to this provision, for should conditions make it necessary or prudent to revise the unit quantities, the unit prices will be fixed for such increased or decreased quantities. Compensation for such additive or subtractive changes in the quantities shall be limited to the unit prices in the Bid.

### 3.03 PROGRESS PAYMENTS.

- A. Prior to submitting its first monthly Application for Payment, CONTRACTOR shall submit to CITY, for their review and approval, a draft of the CONTRACTOR's monthly Application for Payment. Each month the Application for Payment shall be updated, notarized and submitted to the ENGINEER.
- B. Prior to starting work, CONTRACTOR shall submit to CITY AND ENGINEER a complete list of all its proposed SUBCONTRACTORS and materialmen, showing the work and materials involved and the dollar amount of each proposed subcontract and purchase order. The first Application for Payment shall be submitted no earlier than thirty (30) days after the Commencement Date.
- C. If payment is requested on the basis of materials and equipment not incorporated into the Project, but delivered and suitably stored at the site or at another location agreed to by

the CITY in writing, the Application for Payment shall also be accompanied by a bill of sale, invoice or other documentation warranting that the CITY has received the materials and equipment free and clear of all liens, charges, security interests and encumbrances, together with evidence that the materials and equipment are covered by appropriate property insurance and other arrangements to protect CITY's interest therein, all of which shall be subject to the CITY's satisfaction.

#### 3.04 DAILY REPORTS AND MEETINGS.

- A. Unless waived in writing by CITY, CONTRACTOR shall complete and submit to ENGINEER on a weekly basis a daily log of the CONTRACTOR's work for the preceding week in a format approved by the ENGINEER and CITY. The daily log shall document all activities of CONTRACTOR at the Project site including, but not limited to, the following:
1. Weather conditions showing the high and low temperatures during work hours, the amount of precipitation received on the Project site, and any other weather conditions which adversely affect the Work;
  2. Soil conditions which adversely affect the Work;
  3. The hours of operation by CONTRACTOR's and SUBCONTRACTOR's personnel;
  4. The number of CONTRACTOR's and SUBCONTRACTOR's personnel present and working at the Project site, by subcontract and trade;
  5. All equipment present at the Project site, description of equipment use and designation of time equipment was used (specifically indicating any down time);
  6. Description of Work being performed at the Project site;
  7. Any unusual or special occurrences at the Project site;
  8. Materials received at the Project site;
  9. A list of all visitors to the Project site; and
  10. Any problems that might impact either the cost or quality of the Work or the time of performance.
  11. The daily log shall not constitute nor take the place of any notice required to be given by CONTRACTOR to CITY or ENGINEER pursuant to the Contract Documents.

END OF SECTION

## SECTION 01100 - GENERAL REQUIREMENTS

### PART 1 - GENERAL

#### 1.01 SPECIFICATION INCLUDES

This Section provides for miscellaneous provisions applicable to the WORK.

#### 1.02 REFERENCE STANDARDS

##### A. Standards, Specifications, Codes, Laws, and Regulations

1. Reference to standards, specifications, manuals, or codes of any technical society, organization, or association, or to Laws or Regulations, whether such reference be specific or by implication, shall mean the standard, specification, manual, code, or Laws or Regulations in effect at the time of opening of Bids (or on the Effective Date of the Agreement if there were no Bids), except as may be otherwise specifically stated in the CONTRACT DOCUMENTS
2. The CONTRACTOR shall comply with the applicable standards codes and specifications governing the CONTRACT DOCUMENTS whether City, County, State or Federal. The CONTRACTOR is obligated to notify the OWNER and Engineer of any deficiency contained in the CONTRACT DOCUMENTS immediately upon discovery. Where conflicts exist in such, the more stringent shall govern.

#### 1.03 DEFINED TERMS

##### A. Throughout the CONTRACT DOCUMENTS, the following definitions apply:

1. CONTRACTOR - The individual or entity with whom OWNER has entered into the Agreement.
2. CONTRACT DOCUMENTS - Those items so designated in the Agreement. Only printed or hard copies of the items listed in the Agreement are CONTRACT DOCUMENTS. Approved Shop DRAWINGS, other CONTRACTOR's submittals, and the reports and DRAWINGS of subsurface and physical conditions are not CONTRACT DOCUMENTS.
3. DRAWINGS - That part of the CONTRACT DOCUMENTS prepared or approved by Engineer which graphically shows the scope, extent, and character of the WORK to be performed by CONTRACTOR. Shop DRAWINGS and other CONTRACTOR submittals are not DRAWINGS as so defined.
4. ENGINEER – The Engineer of Record for the WORK.
5. GENERAL REQUIREMENTS - Sections of Division 1 of the Specifications. The General Requirements pertain to all sections of the Specifications.
6. LAWS AND REGULATIONS; Laws or Regulations - Any and all applicable laws, rules, regulations, ordinances, codes, and orders of any and all governmental bodies, agencies, authorities, and courts having jurisdiction.
7. OWNER - The City of Pembroke Pines (CITY)



8. PROJECT - The total construction of which the WORK to be performed under the CONTRACT DOCUMENTS may be the whole, or a part.
9. SHOP DRAWINGS - All DRAWINGS, diagrams, illustrations, schedules, and other data or information which are specifically prepared or assembled by or for CONTRACTOR and submitted by CONTRACTOR to illustrate some portion of the WORK.
10. SPECIFICATIONS - That part of the CONTRACT DOCUMENTS consisting of written requirements for materials, equipment, systems, standards and workmanship as applied to the WORK, and certain administrative requirements and procedural matters applicable thereto.
11. WORK - The entire construction or the various separately identifiable parts thereof required to be provided under the CONTRACT DOCUMENTS. WORK includes and is the result of performing or providing all labor, services, and documentation necessary to produce such construction, and furnishing, installing, and incorporating all materials and equipment into such construction, all as required by the Contract Documents.

#### 1.04 SAFETY

- A. The OWNER, nor the ENGINEER, shall not supervise, direct, or have control or authority over, nor be responsible for, CONTRACTOR's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of CONTRACTOR to comply with Laws and Regulations applicable to the performance of the WORK. OWNER will not be responsible for CONTRACTOR's failure to perform the WORK in accordance with the CONTRACT DOCUMENTS.
- B. CONTRACTOR shall be solely responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the WORK. CONTRACTOR shall take all necessary precautions for the safety of, and shall provide the necessary protection to prevent damage, injury or loss to:
  1. All persons on the Site or who may be affected by the WORK;
  2. All the Work and materials and equipment to be incorporated therein, whether in storage on or off the Site; and
  3. other property at the Site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures, utilities, and Underground Facilities not designated for removal, relocation, or replacement in the course of construction.
- C. CONTRACTOR shall comply with all applicable Laws and Regulations relating to the safety of persons or property, or to the protection of persons or property from damage, injury, or loss; and shall erect and maintain all necessary safeguards for such safety and protection. CONTRACTOR shall notify OWNERS of adjacent property and of Underground Facilities and other utility OWNERS when prosecution of the WORK may affect them, and shall cooperate with them in the protection, removal, relocation, and replacement of their property.

#### 1.05 APPLICABLE PERMITS AND LICENSES

- A. The CONTRACTOR shall abide by all permit conditions, whether, general, specific, limited or otherwise. A copy of all OWNER-obtained permits and licenses are attached

hereto and made a part of the CONTRACT DOCUMENTS.

## PART 2 - PRODUCTS (NOT USED)

## PART 3 - EXECUTION

### 3.01 PRE-CONSTRUCTION RESPONSIBILITIES

- A. Upon receipt of the Notice To Proceed, the CONTRACTOR shall arrange for a Pre-Construction meeting. The meeting shall be held with a minimum of one weeks' notice and shall include the ENGINEER, the OWNER and Representatives for all affected utility companies. The following list is offered for the convenience of the CONTRACTOR and is subject to change:

COMPANY	CONTACT	TELEPHONE NUMBER
AT&T Florida	Otis Keeve	(954) 723-2540
Broward County Traffic Engineering	Bret Henderson	(954) 847-2702
Copper Interconnect	Bret Henderson	(954) 847-2702
Fiber Optic Cable	Robert Blount	(954) 357-8242
Broward County Water & Wastewater	Eva Florian	(954) 831-0916
Comcast	Leonard Maxwell-Newbold	(954) 447-8405
FPL Distribution (Rdwy/Cnty/FDOT Dist. 4)	Byron Sample	(954) 321-2056
FPL Transmission	George Beck	(561) 904-3604
FPL Fibernet	Danny Haskett	(305) 552-2931
XO Communications	Tony Kowaleski	(305) 924-6761
Sunshine State One Call		(800) 432-4770
Broward Transit		(954) 357-8300

### 3.02 TEMPORARY UTILITIES

- A. The CONTRACTOR shall be responsible to arrange for and supply all temporary utilities including, but not limited to, water, sewer, drainage and electricity.
- B. The cost of temporary utilities shall be considered incidental to the cost of the WORK and is therefore included in the Bid.

### 3.03 HURRICANE PREPAREDNESS PLAN

- A. Should the performance of the WORK occur during Hurricane Season, within thirty days of the date of Notice to Proceed, the CONTRACTOR shall submit to the ENGINEER and OWNER a Hurricane Preparedness Plan. The plan should outline the necessary measures that the CONTRACTOR proposes to perform at no additional cost to the OWNER in case of a hurricane warning. The plan shall detail these measures with specific action items defining responsible personnel.

### 3.04 INCLEMENT WEATHER

- A. In the event of inclement weather, or whenever ENGINEER shall direct; CONTRACTOR

will cause Subcontractor's to protect carefully the WORK and materials against damage or injury from the weather. If, in the opinion of the ENGINEER, any portion of WORK or materials shall have been damaged or injured by reason of failure on the part of CONTRACTOR or any Subcontractor to so protect the WORK, such WORK and materials shall be removed and replaced at the expense of the CONTRACTOR.

### 3.05 PROTECTION OF WORK AND MATERIAL

- A. During the progress of the WORK and up to the date of final payment, the CONTRACTOR shall be solely responsible for the care and protection of all work and materials covered by the Contract.
- B. All work and materials shall be protected against damage, injury or loss from any cause whatsoever, and the CONTRACTOR shall make good any such damage or loss at his own expense.

### 3.06 CONTRACTOR USE OF PREMISES

- A. CONTRACTOR shall have limited use of the premises for construction operations, including limited use of the site. The CONTRACTOR's use of the premises is further limited to the OWNER's right to perform construction operations with its own forces or to employ separate CONTRACTORS on portions of the project.
- B. The CONTRACTOR shall be responsible for coordinating his daily activities in conjunction with any CONTRACTORS presently working within the vicinity of this project.
- C. Confine operations to areas within City property, rights-of-way and easements.
- D. Keep existing driveways and entrances serving the premises clear and available to the OWNER, Residents and the OWNER's employees at all times.
  - 1. Do not use these areas for parking or storage of materials.
  - 2. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on site.

### 3.07 DISPOSAL

- A. Do not dispose of any unsuitable fill, hazardous or organic material onsite. All such material shall be disposed of in a legal manner by the CONTRACTOR, the cost of which shall be included in the Bid.

### 3.08 ENVIRONMENTAL PROTECTION

- A. Provide protection, operate temporary facilities and conduct construction in ways and by methods that comply with environmental regulations, and minimize the possibility that air, waterways and subsoil might be contaminated or polluted, or that other undesirable effects might result.

### 3.09 ADJUSTMENT OF EXISTING UTILITIES

- A. The CONTRACTOR shall raise or lower all manholes, valve boxes, etc. to finished grade. The cost of these adjustments shall be considered incidental to the cost of the WORK and is therefore included in the Bid.

### 3.10 EXISTING IRRIGATION

- A. All existing irrigation systems within the area of the WORK shall be restored to original condition or better and adjusted to finished grade. The cost of repairs and/or adjustment to existing irrigation shall be considered incidental to the cost of the WORK and is therefore included in the Bid.

### 3.11 DEWATERING

- A. In accordance with SFWMD criteria contained in 40E-2.061 F.A.C., a dewatering permit is not required provided the following provisions are met:
  1. Maximum daily pumpage is less than 5 million gallons (MG) and a maximum total project pumpage of less than 100 MG over a one year period;
  2. All discharge shall remain on the project site;
  3. No dewatering shall occur to a depth below elevation 0.0 feet NGVD within 1,000 feet of saline water, except when dewatering water with a chloride concentration of greater than 1,000 milligrams per liter;
  4. No dewatering shall occur within 100 feet of a wastewater treatment plant rapid-rate land application system permitted under Part IV of Chapter 62-610, F.A.C.;
  5. No dewatering shall occur within 1,000 feet of a known landfill or contamination; and,
  6. No dewatering shall occur within 1,000 feet of a freshwater wetland unless dewatering activities are completed within 60 days.
  7. All dewatering operations are subject to the Permit Conditions in Section 5.0 of the SFWMD APPLICANT'S HANDBOOK FOR WATER USE PERMIT APPLICATIONS (07-16-2014), including responsibility for mitigating any harm that may occur as a result of the dewatering to existing legal uses, off-site land uses, or natural resources.
- B. The CONTRACTOR shall apply for a dewatering permit through the SFWMD if any of the above conditions cannot be met.

### 3.12 DEMOLITION

- A. Limits of demolition which may be shown in the CONTRACT DOCUMENTS are general in nature. Actual limits of demolition shall be as determined by the field conditions in conformance with the requirements of the WORK.
- B. All sidewalks within the limits of construction which are not ADA compliant (cross-slopes which exceed 2% and/or running slopes which exceed 5% and/or changes in level of ¼" or greater) shall be demolished and reconstructed to meet these requirements.
- C. When sidewalk tie-ins exist outside the limits of construction which are not ADA compliant, the CONTRACTOR shall replace those sections as directed by the OWNER.

END OF SECTION

## SECTION 01015 - CUTTING AND PATCHING

### PART 1 - GENERAL

#### 1.01 DESCRIPTION

- A. CONTRACTOR shall be responsible for all cutting, fitting and patching required to complete the WORK or to:
  - 1. Make its several parts fit together properly.
  - 2. Uncover portions of the WORK to provide for installation of ill-timed work.
  - 3. Remove and replace defective work.
  - 4. Remove and replace work not conforming to requirements of CONTRACT DOCUMENTS.
  - 5. Remove samples of installed work as specified for testing.
  - 6. Investigate subsurface conditions or utilities.

#### 1.02 SUBMITTALS

- A. Submit a written request to the ENGINEER in advance of executing any cutting or alteration which affects:
  - 1. Work of the OWNER or any separate CONTRACTOR.
  - 2. Structural value or integrity of any element of the Project.
  - 3. Integrity or effectiveness of weather-exposed or moisture-resistant elements or systems.
  - 4. Efficiency, operational life, maintenance or safety of operational elements.
  - 5. Visual qualities of sight-exposed elements.
- B. Request shall include:
  - 1. Identification of the Project.
  - 2. Description of affected work.
  - 3. The necessity for cutting, alteration or excavation.
  - 4. Effect on WORK of OWNER or any separate CONTRACTOR, or on structural or weatherproof integrity of Project.
  - 5. Description of proposed work:
    - a. Scope of cutting, patching, alteration, or excavation.

- b. Trades who will execute the work.
  - c. Products proposed to be used.
  - d. Extent of refinishing to be redone.
- 6. Alternatives to cutting and patching.
- 7. Cost proposal, when applicable.
- 8. Written permission of any separate CONTRACTOR whose work will be affected.
- C. Submit written notice to the ENGINEER designating the date and the time work will be uncovered.

## PART 2 - PRODUCTS

### 2.01 MATERIALS

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

## PART 3 - EXECUTION

### 3.01 INSPECTION

- A. Inspect existing conditions of Project, including elements subject to damage or to movement during cutting or patching.
- B. After uncovering work, inspect conditions affecting installation of Products, or performance of work.
- C. Report unsatisfactory or questionable conditions to the ENGINEER in writing; do not proceed with work until the ENGINEER has provided further instructions.

### 3.02 PREPARATION

- A. Provide adequate temporary support as necessary to assure structural value or integrity of affected portion of Work.
- B. Provide devices and methods to protect other portions of Project from damage.
- C. Provide protection from elements for that portion of the Project which may be exposed by cutting and patching work, and maintain excavations free from water.

### 3.03 PERFORMANCE

- A. Execute cutting and demolition by methods which will prevent damage to other work, and will provide proper surfaces to receive installation of repairs.
- B. Execute cutting methods which will prevent settlement or damage to other work.
- C. Employ original Installer or Fabricator to perform cutting and patching for:

1. Weather-exposed or moisture-resistant surfaces.
  2. Sight-exposed finished surfaces.
- D. Execute fitting and adjustment of products to provide a finished installation to comply with specified products, functions, tolerances and finishes.
- E. Restore work which has been cut or removed; install new products to provide completed Work in accord with requirements of CONTRACT DOCUMENTS.
- F. Fit work airtight to pipes, sleeves, ducts, conduit and other penetrations through surfaces.
- G. Refinish entire surfaces as necessary to provide an even finish to match adjacent finishes:
1. For continuous surfaces, refinish to nearest intersection.
  2. For an assembly, refinish entire unit.

END OF SECTION

SECTION 01020 - MODIFICATIONS TO EXISTING CONDITIONS

PART 1 - GENERAL

1.01 DESCRIPTION

- A. Furnish all labor, materials, equipment and incidentals required to modify, alter and convert existing structures as shown or specified and as required for the installation of new mechanical equipment, piping and appurtenances. Existing piping and equipment shall be removed, salvaged, abandoned or dismantled as necessary for the performance of the WORK.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 GENERAL

- A. The CONTRACTOR shall cut, repair, reuse, excavate, demolish or otherwise remove parts of the existing structures or appurtenances, as indicated on the DRAWINGS or specified herein or necessary for the performance of the WORK.
- B. The above work shall include the cutting of grooves and chases in existing masonry to permit the proper bonding of new masonry to old, repainting of existing masonry, the drilling of holes into bolts, or other appurtenances, and the cutting of holes in masonry for the installation of pipe, conduits, and other appurtenances. The work shall include all necessary cutting and bending of reinforcing steel, structural steel, or miscellaneous metal work found embedded in the existing structures.
- C. Blasting with explosives will not be permitted to complete any work under this Contract.
- D. Care shall be taken not to damage any part of existing buildings, foundations and exterior structures both below and above ground.
- E. No existing structure, equipment, or appurtenance shall be shifted, cut, removed, or otherwise altered except with the express approval of and to the extent approved by the ENGINEER.
- F. When removing materials or portions of existing structures and when making openings in walls and partitions, the CONTRACTOR shall take all precautions and use all necessary barriers and other protective devices so as not to damage the structures or contents by falling or flying debris and not to damage the structures from excavation or undermining of existing structural supports, beams, footings, columns or any structural member.
- G. Materials and equipment removed in the course of making alterations and additions shall remain the property of the OWNER, except that items not salvageable, as determined by the ENGINEER and the OWNER shall become the property of the CONTRACTOR to be disposed of by him off the site of the work at his own place of disposal. The CONTRACTOR shall assist the OWNER in loading and hauling of salvageable materials within the City limits of the project.
- H. All work of altering existing structures shall be done at such time and in such manner as



will comply with the approved time schedule. So far as possible before any part of the work is started, all tools, equipment, and materials shall be assembled and made ready so that the work can be completed without delay.

- I. All workmanship and new materials involved in constructing the alterations shall conform to the General Specifications for the classes of work insofar as such specifications are applicable.
- J. All cutting of existing masonry or other material to provide suitable bonding to new work shall be done in a manner to meet the requirements of the respective section of these specifications covering the new work. When not covered, the work shall be carried on in the manner and to extent directed by the ENGINEER.
- K. Where holes in existing masonry are required to be sealed, unless otherwise herein specified, they shall be sealed with cement mortar or concrete. The sides of the openings shall be provided with keyed joints and shall be suitably roughened to furnish a good bond and make a watertight joint. All loose or unsound material adjacent to the opening shall be removed and, if necessary, replaced with new material. The method of placing the mortar seal shall provide a suitable means of releasing entrapped air.
- L. Surfaces of seals visible in the completed work shall be made to match as nearly as possible the adjacent surfaces.
- M. Non-shrink grout shall be used for setting wall castings, sleeves, leveling pump bases, doweling anchors into existing concrete and elsewhere as shown.
- N. Operating equipment shall be thoroughly cleaned and then lubricated and greased for protection during prolonged storage.
- O. The CONTRACTOR shall provide flumes, hoses, piping, etc. to divert or provide suitable plugs, bulkheads or other means to hold back the flow of wastewater, water or other liquids, all as required in the performance of the work under this Contract.

### 3.02 SALVAGE

- A. Any existing equipment or material, including but not limited to, motors, electrical components or controls,, pipes, fittings, couplings, etc., which is removed or replaced as a result of construction under this project may be designated as salvage by the ENGINEER or OWNER, and, if so, shall be removed or excavated, if necessary, and delivered to the OWNER at a location directed by the OWNER. Any equipment or material not worthy of salvaging, as directed by the OWNER, shall be disposed of by the CONTRACTOR at a suitable location.

### 3.03 CONNECTING TO EXISTING PIPING AND EQUIPMENT

- A. The CONTRACTOR shall verify exact location, material, alignment, joint, etc. of existing piping and equipment prior to making the connections called out in the DRAWINGS. The verifications shall be performed with adequate time to correct any potential alignment or other problems prior to the actual time of connection.
- B. The CONTRACTOR shall dismantle and remove all existing equipment, piping and other appurtenances required, he shall cut existing pipelines for the purpose of making connections thereto. Anchor bolts for equipment and structural steel removed shall be cut off one inch below the concrete surface. Surface shall be finished as specified in Division 3.

- C. At the time that a new connection is made to an existing pipeline, additional new piping, extending to and including the most convenient new valve, shall be installed.
- D. Where necessary or required for the purpose of making connections, the CONTRACTOR shall cut existing pipe lines in a manner to provide an approved joint. Where required, he shall weld beads, flanges or provide Dresser Couplings, all as specified and required.

END OF SECTION

SECTION 01025 - MEASUREMENT AND PAYMENT-UNIT PRICE BID

PART 1 - GENERAL

1.01 DESCRIPTION

- A. This Section includes administrative and procedural requirements for determining Work completed under the unit price contract.
- B. 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 unless otherwise specified. The CITY or ENGINEER will witness all field measurements.
- C. The quantities stated in the Bid Proposal are approximate only and are intended to serve as a basis for the comparison of bids and to fix the approximate amount of the cost of the Project. The CITY does not expressly or impliedly agree that the actual amount of the work to be done in the performance of the contract will correspond with the quantities in the Bid Proposal; the amount of work to be done may be more or less than the said quantities and may be increased or decreased by the CITY as circumstances may require. The increase or decrease of any quantity shall not be regarded as grounds for an increase in the unit price or in the time allowed for the completion of the work, except as provided in the Contract Documents.

1.02 RELATED SECTIONS

- A. Section 02760 – Cured-in-Place Pipe (CIPP)
- B. Section 02761 – CIPP Chemical Grouting
- C. Section 02763 – CIPP Cleaning and Root Removal
- D. Section 02765 – CIPP Rehabilitation of Manholes
- E. Section 02770 – CIPP Lateral Lining
- F. Other Sections as applicable.

1.03 REFERENCE STANDARDS

- A. Refer to RELATED SECTIONS.

1.04 GENERAL REQUIREMENTS

- A. Prices shall include all costs required for the completed, in-place construction of the specified unit of work. This may include but not be limited to, materials and delivery; cost of installation; incidentals; labor including social security, insurance, and other required fringe benefits; workman's compensation insurance; bond premiums; rental of equipment and machinery; taxes; testing; surveys; incidental expenses; and supervision.
- B. Installation, acceptance and payment shall be in accordance with the REFERENCE STANDARDS.
- C. The Owner reserves the right to reject the Contractor's measurement of completed work

that involves use of established unit prices, and to have this Work measured by an independent surveyor acceptable to the Contractor at the Owner's expense.

- D. Contract Sum adjustments will be by a Contract Adjustment Letter on basis of the net accumulative change for each unit price category.
  - 1. Except as otherwise specified, unit prices shall apply to both deductive and additive variations of quantities.
  - 2. Lump sum and unit prices in the Agreement shall remain in effect until date of final completion of the entire Work.
- E. Partial payment for material and equipment properly stored on-site is not allowed.
- F. Abbreviations:
  - 1. Acre - AC
  - 2. Allowance - AL
  - 3. Cubic Yard - CY
  - 4. Each - EA
  - 5. Furnish and Install - F & I
  - 6. Gallons - GA
  - 7. Gross Mile - GM
  - 8. Linear Feet – LF
  - 9. Lump Sum - LS
  - 10. Million Gallons – MG
  - 11. Net Mile - NM
  - 12. Square Foot – SF
  - 13. Square Yard – SY
  - 14. Ton – TN
- G. Items with Bid form units of “EA” will be measured and paid at the unit price named in the Bid Form. Each unit price bid shall include, but not be limited to, all necessary or required labor, equipment, tools, and materials for traffic control, added sewer pipe cleaning and preparation of the existing sewer, including blocking or plugging incoming lines; removal, transportation and disposal of material generated by cleaning and preparation; television surveys, , pipe liner; cleaning; testing; cleanup; documentation and reporting; and all labor, materials and equipment required to provide a complete and acceptable liner installation.
- H. Items with Bid form units of “LF” will be measured and paid for at the unit price per foot. This item will be full compensation for all additional costs associated with the work. Each linear foot price bid shall include, but not be limited to, all necessary or required labor, equipment, tools, and materials for traffic control, added sewer pipe cleaning and preparation of the existing sewer, including blocking or plugging incoming lines; removal, transportation and disposal of material generated by cleaning and preparation; television surveys, unless specifically excluded; pipe liner; cleaning; testing; cleanup; documentation and reporting; and all labor, materials and equipment required to provide a complete and acceptable liner installation.

1.05 PROTECTION

- A. Where pavement, pipes, valves, appurtenances, trees, shrubbery, fences, other property or structures are in proximity to the WORK, adequate protection shall be provided. Such protection is considered incidental to construction and shall not be assigned to any pay item.

1.06 RESTORATION

- A. Where pavement, pipes, valves, structures, appurtenances, trees, shrubbery, fences, other property or structures not designated as pay items, have been damaged, removed or disturbed by the Contractor, whether deliberately or through failure to carry out the requirements of the Contract Documents, state laws, municipal ordinances or the specific direction of the Engineer, or through failure to employ usual and reasonable safeguards, such property and surface structures shall be replaced or repaired at the expense of the Contractor to a condition equal to that before work began within a time frame approved by the Engineer. Such restoration is considered incidental to construction and shall not be assigned to any pay item.

PART 2 - PRODUCTS

2.01 RECORD DRAWINGS

- A. The CONTRACTOR shall keep a set of record drawings for all improvements performed under this contract in accordance with these SPECIFICATIONS.
- B. Record Drawings shall be submitted with each pay request.
- C. The cost of Record Drawings shall be incidental to the individual improvement cost contained in the Bid.

PART 3 - EXECUTION

3.01 BID ITEM NO. 1 - MOBILIZATION

- A. Payment for mobilization, demobilization, insurance, bonds, license and other miscellaneous administrative costs, and all other costs to the Contractor not specifically identified in the costs of the WORK under the Contract will be made at the contract lump sum price bid for the item. No additional payment shall be made for transportation, communications, office maintenance, project signs, and other incidental work or services. No further payment shall be made for remobilization unless all of the work is suspended by the Engineer for a period in excess of three months and through no fault to the Contractor.
- B. The Contract Unit Price shall include compensation for all labor, materials, equipment and all other incidentals required to complete this item. Payment item for mobilization shall not exceed five percent (5%) of the contract price.

3.02 BID ITEM #2 - MAINLINE CIPP LINING

- A. Payment for the installation of Mainline CIPP Lining shall include full compensation for all labor, materials, and equipment setup, initial line cleaning, root removal, initial and final CCTV inspection, hydrophilic end seals, plugging and bypass pumping, hauling and

disposal, and traffic control required for the complete installation of cured in place pipe (CIPP) lining, in accordance with the SPECIFICATIONS.

- B. Measurement shall be along the center line of the pipe, from wall of manhole inlet to wall of manhole inlet.
- C. Payment shall be made on a per linear foot basis on a work order form in accordance with the SPECIFICATIONS as approved by the ENGINEER and OWNER.

**3.03 BID ITEM #3 – INSTALL NEW CLEAN-OUTS AT EACH LATERAL CONNECTION**

- A. Payment for the installation of new clean-outs at each lateral connection shall include full compensation for all labor, materials and equipment, bypass pumping and traffic control required to install one four-inch clean-out as directed by the City and in accordance with City Engineering Standards.
- B. Payment shall be made on a lump sum per each basis on a work order form as approved by the ENGINEER and OWNER.

**3.04 BID ITEM #4 – CIPP LATERAL LINING**

- A. Payment for the installation of CIPP Lateral Lining, 4 or 6-inch, shall include full compensation for all labor, materials, and equipment setup, initial lateral cleaning, initial and final CCTV inspection, root removal, plugging and bypass pumping, hauling and disposal, and traffic control required for the complete installation of cured in place pipe (CIPP) lining, in accordance with the SPECIFICATIONS.
- B. Payment shall be the same for either horizontal tee, tee-wye or vertical (stack, chimney) lateral configuration.
- C. Payment shall include lateral reinstatement and restoration for a complete leak free system.
- D. If clean-outs are required for the installation of the CIPP Lateral Lining, the cost of clean-out shall be included.
- E. Payment shall be made on a lump sum per each basis on a work order form as approved by the ENGINEER and OWNER.

**3.05 BID ITEM #5 – LATERAL REPLACEMENT**

- A. Payment for the installation of new laterals should the existing lateral be deemed unrepairable by the ENGINEER during the initial CCTV review shall include full compensation for all labor, materials and equipment, bypass pumping, hauling and disposal, and traffic control required to install one four-inch tee-wye lateral connection replacement in the existing vitrified clay mainline as directed by the CITY and in accordance with CITY Engineering Standards.
- B. Pay item shall be based on less than five feet of cover and include the necessary adapters for a cut-in tee-wye connection to the existing vitrified clay mainline prior to CIPP lining.
- C. Payment shall be made on a lump sum per each basis on a work order form as approved by the ENGINEER and OWNER.

3.06 BID ITEM #6 – MANHOLE REHABILITATION

- A. Payment for manhole rehabilitation shall include full compensation for all labor, preparation, materials, and equipment, setup, plugging, bypass pumping, hauling and disposal, and traffic control required for the complete rehabilitation in accordance with the SPECIFICATIONS.
- B. Repair and restoration of manhole benches shall be considered incidental to this bid item and shall be performed in accordance with CITY Engineering Standards.
- C. Concrete repairs which exceed the limits of repair allowed by the coating manufacturer shall be excluded from this pay item and be paid from an Owners Contingency Allowance.
- D. Payment shall be made on a per vertical foot basis on a work order form as approved by the ENGINEER and OWNER.

3.07 BID ITEM #7 – CHEMICAL GROUTING

- A. Payment for chemical grouting shall include full compensation for all labor, preparation, materials, and equipment, setup, plugging, bypass pumping, hauling and disposal, and traffic control required for the complete leak free chemical grouting in accordance with the SPECIFICATIONS.
- B. In cases of excessive infiltration, an external well point dewatering system may be employed to control active infiltration and paid from an Owners Contingency Allowance.
- C. Payment shall be made on a per gallon basis on a work order form as approved by the ENGINEER and OWNER.

END OF SECTION

## SECTION 01030 - REFERENCES

## PART 1 - GENERAL

## 1.01 DESCRIPTION

- A. Applicable Publications: Whenever in these specifications references are made to published specifications, codes, standards, or other requirements, it shall be understood that wherever no date is specified, only the latest specifications, standards, or requirements of the respective issuing agencies which have been published as of the date that the WORK is advertised for bids, shall apply; except to the extent that said standards or requirements may be in conflict with applicable laws, ordinances, or governing codes. No requirements set forth herein or shown on the DRAWINGS shall be waived because of any provision of, or omission from, said standards or requirements.
- B. Specialists, Assignments: In certain instances, specification text requires (or implies) that specific work is to be assigned to specialists or expert entities, who must be engaged for the performance of that work. Such assignments shall be recognized as special requirements over which the CONTRACTOR has no choice or option. These assignments shall not be interpreted so as to conflict with the enforcement of building codes and similar regulations governing the WORK; also they are not intended to interfere with local union jurisdiction settlements and similar conventions. Such assignments are intended to establish which party or entity involved in a specific unit of work is recognized as "expert" for the indicated construction processes or operations. The final responsibility for fulfillment of the entire set of contract requirements remains with the CONTRACTOR.

## 1.02 REFERENCE SPECIFICATIONS, CODES, AND STANDARDS

- A. Without limiting the generality of other requirements of the specifications, all work specified herein shall conform to or exceed the requirements of the REFERENCE SPECIFICATIONS, CODES AND STANDARD to the extent that the provisions of such documents are not in conflict with the requirements of these Specifications nor the applicable codes.
- B. References herein to "Building Code" or "Code" shall mean the Florida Building Code. The latest edition of the code as approved and used at the local agency having jurisdiction, shall apply to the WORK herein, including, all addenda, modifications, amendments, or other lawful changes thereto.
- C. Applicable Standard Specifications: The CONTRACTOR shall construct the Work specified herein in accordance with the requirements of the CONTRACT DOCUMENTS and the referenced portion of those referenced codes, standards, and specifications listed herein, and their referenced documents; except, that wherever references to "Standard Specifications" are made, the provisions therein for measurement and payment shall not apply.
- D. In case of conflicts between codes, reference standards, DRAWINGS and other CONTRACT DOCUMENTS, the most stringent requirements shall govern. All conflicts shall be brought to the attention of the ENGINEER for clarifications and directions prior to ordering or providing any materials or labor. The CONTRACTOR shall bid the most stringent requirements.
- E. References herein to "OSHA Regulations for Construction" shall mean Title 29, Part



1926, Construction Safety and Health Regulations, Code of Federal Regulations, including all changes and amendments thereto.

- F. References herein to "OSHA Standards" shall mean Title 29, Part 1910, Occupational Safety and Health Standards, Code of Federal Regulations (OSHA), including all changes and amendments thereto.

### 1.03 TRADE NAMES AND ALTERNATIVES

- A. For convenience in designation in the CONTRACT DOCUMENTS, materials to be incorporated in the WORK may be designated under a trade name or the name of a manufacturer and its catalog information. The use of alternative material which is equal in quality and of the required characteristics for the purpose intended will be permitted, subject to the following requirements:
1. The burden of proof as to the quality and suitability of such alternative equipment, products, or other materials shall be upon the CONTRACTOR.
  2. The ENGINEER will be the sole judge as to the comparative quality and suitability of such alternative equipment, products, or other materials and its decisions shall be final.
  3. Base Bid requirements outlined in the Supplement to Bid Form, shall supersede any language contained hereinafter.
- B. Whenever in the CONTRACT DOCUMENTS the name or the name and address of the manufacturer or distributor is given for a product or other material, or if any other source of a product or material is indicated therefore, such information is given for the convenience of the CONTRACTOR only, and no limit, restriction, or direction is indicated or intended thereby, nor is the accuracy or reliability of such information guaranteed. It shall be the responsibility of the CONTRACTOR to determine the accurate identity and location of any such manufacturer, distributor, or other source of any product or material called for in the CONTRACT DOCUMENTS.
- C. The CONTRACTOR may offer any material, process, or equipment which it considers equivalent to that indicated. Unless otherwise authorized in writing by the ENGINEER, the substantiation of offers of equivalency must be submitted within 30 days after execution of the Agreement. The CONTRACTOR, at its sole expense, shall furnish data concerning items it has offered as equivalent to those specified. The CONTRACTOR shall have the material as required by the ENGINEER to determine that the quality, strength, physical, chemical, or other characteristics, including durability, finish, efficiency, dimensions, service, and suitability are such that the items will fulfill its intended function. Installation and use of a substitute item shall not be made until accepted by the ENGINEER. If a substitute offered by the CONTRACTOR is found to be not equal to the specified material, the CONTRACTOR shall furnish and install the specified material.
- D. The CONTRACTOR'S attention is further directed to the requirement that failure to submit data substantiating a request for the substitution of an "or equal" item within said 30-day period after the execution of the Agreement, shall be deemed to mean that the CONTRACTOR intends to furnish one of the specific brand-named products named in the specification, and the CONTRACTOR does hereby waive all rights to offer or use substitute products in each such case. Wherever a proposed substitute product has not been submitted within said 30-day period, or wherever the submission of a proposed substitute product fails to meet the requirements of the specifications and an acceptable

resubmittal is not received by the ENGINEER within said 30-day period, the CONTRACTOR shall furnish only one of the products originally-named in the CONTRACT DOCUMENTS.

#### 1.04 ABBREVIATION

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

#### 1.05 ABBREVIATIONS AND ACRONYMS

- A. Abbreviations and acronyms contained in the CONTRACT DOCUMENTS may include, but not be limited to, the following:

AAMA	Architectural Aluminum Manufacturer's Association
AAR	Association of American Railroads
AASHTO	American Association of the State Highway and Transportation Officials
AATCC	American Association of Textile Chemists and Colorists
ACI	American Concrete Institute
ACPA	American Concrete Pipe Association
ACPPA	American Concrete Pressure Pipe Association
AFBMA	Anti-Friction Bearing Manufacturer's Association, Inc.
AGA	American Gas Association
AGC	Associated General CONTRACTORS
AGMA	American Gear Manufacturer's Association
AHAM	Association of Home Appliance Manufacturers
AI	The Asphalt Institute
AIA	American Institute of Architects
AISC	American Institute of Steel Construction
AISI	American Iron and Steel Institute
AITC	American Institute of Timber Construction
AMCA	Air Movement and Control Association
ANS	American Nuclear Society
ANSI	American National Standards Institute, Inc.
APA	American Plywood Association
API	American Petroleum Institute
APWA	American Public Works Association
AREA	American Railway Engineering Association
ASA	Acoustical Society of America
ASAE	American Society of Agricultural Engineers
ASCE	American Society of Civil Engineers
ASHRAE	American Society of Heating, Refrigerating, and Air-Conditioning Engineers
ASLE	American Society of Lubricating Engineers
ASME	American Society of Mechanical Engineers
ASPE	American Society of Plumbing Engineers
ASQC	American Society for Quality Control
ASSE	American Society of Sanitary Engineers
ASTM	American Society for Testing and Materials
AWPA	American Wood Preservers Association
AWPI	American Wood Preservers Institute
AWS	American Welding Society

AWWA	American Water Works Association
BBC	Basic Building Code, Building Officials and Code Administrators
International	
BHMA	Builders Hardware Manufacturers Association
CBM	Certified Ballast Manufacturers
CEMA	Conveyors Equipment Manufacturers Association
CGA	Compressed Gas Association
CLPCA	California Lathing and Plastering CONTRACTORS Association
CLFMI	Chain Link Fence Manufacturers Institute
CMA	Concrete Masonry Association
CRSI	Concrete Reinforcing Steel Institute
CSI	Construction Specifications Institute
DCDMA	Diamond Core Drill Manufacturers Association
DIPRA	Ductile Iron Pipe Research Association
EIA	Electronic Industries Association
ETL	Electrical Test Laboratories
HI	Hydraulic Institute
ICBO	International Conference of Building Officials
IEEE	Institute of Electrical and Electronic Engineers
IES	Illuminating Engineering Society
IME	Institute of Makers of Explosives
IP	Institute of Petroleum (London)
IPC	Institute of Printed Circuits
IPCEA	Insulated Power Cable Engineers Association
ISA	Instrument Society of America
ISO	International Organization for Standardization
ITE	Institute of Traffic Engineers
MBMA	Metal Building Manufacturers Association
MPTA	Mechanical Power Transmission Association
MTI	Marine Testing Institute
NAAM	National Association of Architectural Metal Manufacturers
NACE	National Association of Corrosion Engineers
NBS	National Bureau of Standards
NCCLS	National Committee for Clinical Laboratory Standards
NEC	National Electric Code
NEMA	National Electrical Manufacturers Association
NFPA	National Fire Protection Association
NFPA	National Forest Products Association
NGLI	National Grease Lubricating Institute
NMA	National Microfilm Association
NRCA	National Roofing CONTRACTORS Association
NWMA	National Woodwork Manufacturers Association
NWWA	National Water Well Association
OSHA	Occupational Safety and Health Administration
PCA	Portland Cement Association
PCI	Precast Concrete Institute
PDI	Plumbing and Drainage Institute
RIS	Redwood Inspection Service
RVIA	Recreational Vehicle Industry Association
RWMA	Resistance Welder Manufacturers Association
SAE	Society of Automotive Engineers
SAMA	Scientific Apparatus Makers Association
SBC	Southern Building Code Congress International, Inc. (SBCCI)
SIS	Swedish Standards Association
SJI	Steel Joist Institute
SMA	Screen Manufacturers Association

SPR	Simplified Practice Recommendation
SSBC	Southern Standard Building Code, Southern Building Code
Congress	
SSPC	Steel Structures Painting Council
SSPWC	Standard Specifications for Public Works Construction
TAPPI	Technical Association of the Pulp and Paper Industry
TFI	The Fertilizer Institute
UBC	Uniform Building Code
UL	Underwriters Laboratories, Inc.
USGS	United States Geological Survey
WCLIB	West Coast Lumber Inspection Bureau
WCRSI	Western Concrete Reinforcing Steel Institute
WIC	Woodwork Institute of California
WPCF	Water Pollution Control Federation
WRI	Wire Reinforcement Institute, Inc.
WWPA	Western Wood Products Association

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01200 - APPLICATIONS FOR PAYMENT

PART 1 - GENERAL

1.01 DESCRIPTION

- A. Submit Applications for Payment to the ENGINEER in accordance with the schedule established by Conditions of the Agreement between OWNER and CONTRACTOR and the CONTRACT DOCUMENTS.

1.02 FORMAT AND DATA REQUIRED

- A. Submit applications typed on forms provided by the OWNER (or forms provided by CONTRACTOR and agreed to by OWNER), Application for Payment, with itemized data typed on 8 1/2 inch x 14 inch white paper and continuation sheets.
- B. Payment forms shall show significant detail to substantiate request. Additional detail may be required by the ENGINEER.

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 summary of dollar values to agree with respective totals indicated on continuation sheets.
  - 3. Execute certification with signature of a responsible officer of Contract firm.
- B. Continuation Sheets:
  - 1. Fill in total list of 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 or products stored.
    - a. Round off values to nearest dollar, or as specified.
  - 3. List each Change Order Number, and description, as for an original component item or work.

1.04 SUBSTANTIATING DATA FOR PROGRESS PAYMENTS

- A. When the OWNER or the ENGINEER requires substantiating data, CONTRACTOR shall submit suitable information, with a cover letter identifying:
  - 1. Project
  - 2. Application number and date

3. Detailed list of enclosures
  4. For stored products:
    - a. Item number and identification as shown on application.
    - b. Description of specific material.
    - c. Copy of material invoice.
    - d. Address of location where item is stored
    - e. Photographs of item (if requested)
  - B. Submit one copy of data cover letter for each copy of application.
  - C. As a prerequisite for payment, CONTRACTOR is to submit the following:
    1. A "Surety Acknowledgment of Payment Request" letter showing amount of progress payment which the CONTRACTOR is requesting,
    2. Updated record DRAWINGS for review by the ENGINEER,
    3. Updated construction schedule for review by the ENGINEER,
    4. Construction photographs.
- 1.05 PREPARATION OF APPLICATION FOR FINAL PAYMENT
- A. Fill in Application form as specified for progress payments.
  - B. Provide FINAL COMPLETION documentation for the final statement of accounting.
  - C. Submit final record DRAWINGS.
- 1.06 SUBMITTAL PROCEDURE
- A. Submit Applications for Payment to the ENGINEER at the times stipulated in the Agreement.
  - B. Number: Five copies of each Application.
  - C. When the ENGINEER finds Application properly completed and correct, he will transmit certificate of payment to OWNER, with copy to CONTRACTOR.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

## SECTION 01210 - PROJECT MEETINGS

### PART 1 - GENERAL

#### 1.01 DESCRIPTION

- A. The CONTRACTOR shall schedule and administer preconstruction meetings, periodic progress meetings, and specially called meetings throughout the progress of work. The CONTRACTOR shall:
  - 1. Prepare agenda for meetings.
  - 2. Make physical arrangements for meetings.
  - 3. Preside at meetings.
  - 4. Record in writing the minutes; include significant proceedings and decisions and submit to ENGINEER for approval prior to distribution.
  - 5. Record the meeting with an audio recording device.
  - 6. Reproduce and distribute copies of minutes within five working days after each meeting:
    - a. To participants in the meeting.
    - b. To parties affected by decisions made at the meeting.
- B. Representatives of CONTRACTOR, subcontractors and suppliers attending meetings shall be qualified and authorized to act on behalf of the entity each represents.
- C. The CONTRACTOR shall attend meetings to assure that work is executed consistent with CONTRACT DOCUMENTS and construction schedules.

#### 1.02 PRECONSTRUCTION MEETING

- A. Schedule a preconstruction meeting no later than 15 days after date of Notice to Proceed.
- B. Location: A central site, convenient for all parties designated by the OWNER.
- C. Attendance:
  - 1. OWNER's Representative.
  - 2. ENGINEER and his Professional Consultants.
  - 3. Resident Project Representative.
  - 4. CONTRACTOR's Superintendent.
  - 5. Major Subcontractor's.
  - 6. Major Suppliers.

7. Utilities.
8. Others as appropriate.

D. Suggested Agenda:

1. Distribution and discussion of:
  - a. List of major subcontractors and suppliers.
  - b. Projected Construction Schedule.
2. Critical work sequencing/critical path scheduling.
3. Major equipment deliveries and priorities.
4. Project Coordination.
  - a. Designation of responsible personnel.
5. Procedures and processing of:
  - a. Field decisions.
  - b. Proposal requests.
  - c. Submittals.
  - d. Change Orders.
  - e. Applications for Payments.
6. Adequacy of Distribution of CONTRACT DOCUMENTS.
7. Procedures for maintaining Record Documents.
8. Use of Premises:
  - a. Office, Work and Storage Areas.
  - b. OWNER's Requirements.
9. Construction facilities, controls and construction aids.
10. Temporary Utilities.

1.03 PROGRESS MEETINGS

- A. Schedule regular periodic meetings. The progress meetings will be held as required by progress of the work or as required by the ENGINEER or the OWNER.
- B. Hold called meetings as required by progress of the work.
- C. Location of the meetings: Project field office of the CONTRACTOR or ENGINEER.
- D. Attendance:
  1. ENGINEER, and his professional consultants as needed.
  2. Subcontractor's as appropriate to the agenda.



3. Suppliers as appropriate to the agenda.
  4. Others as appropriate.
- E. Suggested Agenda:
1. Review, approval of minutes of previous meeting.
  2. Review of work progress since previous meeting.
  3. Field observations, problems and conflicts.
  4. Problems which impede Construction Schedule.
  5. Review of offsite fabrication, delivery schedule.
  6. Corrective measures and procedures to regain projected schedule.
  7. Revisions to Construction Schedule.
  8. Progress, schedule, during succeeding work period.
  9. Coordination of schedules.
  10. Review submittal schedules; expedite as required.
  11. Maintenance of quality standards.
  12. Pending changes and substitutions.
  13. Review proposed changes for:
    - a. Effect on Construction Schedule and on a completion date.
    - b. Effect on other contracts of the Project.
  14. Other business.
  15. Construction schedule.
  16. Critical/long lead items.
- F. The CONTRACTOR is to attend progress meetings and is to study previous meeting minutes and current agenda items, in order to be prepared to discuss pertinent topics such as deliveries of materials and equipment, progress of work, etc.
- G. The CONTRACTOR is to provide a current submittal log at each progress meeting.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

## SECTION 01220 - CONSTRUCTION SCHEDULES

### PART 1 - GENERAL

#### 1.01 DESCRIPTION

- A. Promptly after Award of the Contract and within ten days after the effective date of the Agreement, prepare and submit to the ENGINEER an estimated construction progress schedules for the work, with sub-schedules of related activities which are essential to its progress.
- B. Submit revised progress schedules on a monthly basis.
- C. No partial payments shall be approved by the ENGINEER until there is an approved up to date construction progress schedule on hand.
- D. The CONTRACTOR shall designate an authorized representative of his firm who shall be responsible for development and maintenance of the schedule and of progress and payment reports. This representative of the CONTRACTOR shall have direct project control and complete authority to act on behalf of the CONTRACTOR's schedule.

#### 1.02 FORM OF SCHEDULES

- A. Prepare schedules for submittal each month with pay request. The form of the schedule is to be Microsoft Project or approved equal. The Schedule is to indicate work completed to date and additions to or deletions from the schedule.
  - 1. Provide separate horizontal bar for each trade or operation within each structure or item.
  - 2. Horizontal time scale: In weeks from start of construction and identify the first work day of each month.
  - 3. Scale and spacing: To allow space for notations and future revisions.
- B. Format of listings: The chronological order of the start of each item of work for each structure.
- C. Identification of listings: By major specification section numbers as applicable and structure.

#### 1.03 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-week increment scale. Specifically list, but not limited to:
    - a. Receiving Materials
    - b. Pipeline Installations

- c. Testing
    - d. Restoration
    - e. Startup
    - f. Record DRAWINGS
    - g. Permit Close-out
    - h. Punch List
    - i. OWNER Activities, Including Inspections
  - 3. Show projected percentage of completion for each item, as of the first of each month.
  - 4. Show projected dollar cash flow requirements for each month of construction.
  - 5. Use of float suppression techniques such as preferential sequencing or logic, special lead/lag logic restraints, and extended activity times are prohibited, and use of float time disclosed or implied by use of alternate float-suppression techniques shall be shared to proportionate benefit of the OWNER and CONTRACTOR.
  - 6. Pursuant to above float-sharing requirement, no time extensions will be granted nor delay damages paid until a delay occurs which (i) impacts Project's critical path, (ii) consumes available float or contingency time, and (iii) extends work beyond contract completion date.
  - 7. If the CONTRACTOR provides an accepted schedule with an early completion date, the OWNER reserves the right to reduce the duration of the work to match the early completion date by issuing a deductive Change Order at no change in Contract Price.
  - B. Submittal Schedule for Shop DRAWINGS and Samples must include the following:
    - 1. The dates for CONTRACTOR's submittals.
    - 2. The date's submittals will be required for OWNER furnished products, if applicable.
    - 3. The dates approved submittals will be required from the ENGINEER.
  - C. A list of all long lead items (equipment, materials, etc.).
- 1.04 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.
- 1.05 SUBMISSIONS
- A. Submit initial schedules to the ENGINEER within 10 days after the effective date of the Agreement.
1. The ENGINEER will review schedules and return review copy within 21 days after receipt.
  2. If required, resubmit within 7 days after return of review copy.
- B. Submit a minimum of five (5) copies of revised monthly progress schedules with that month's application for payment.
- 1.06 DISTRIBUTION
- A. Distribute copies of reviewed schedules to:
1. OWNER (Two copies)
  2. ENGINEER (Two copies)
  3. Job Site File (One copy)
  4. Subcontractor's (As needed)
  5. Other Concerned Parties (As needed)
- B. Instruct recipients to report promptly to the CONTRACTOR, in writing, any problems anticipated by the projections shown in the schedule.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

## SECTION 01320 - SUBMITTALS

## PART 1 - GENERAL

## 1.01 DESCRIPTION

- A. The CONTRACTOR shall submit to the ENGINEER for review, such working DRAWINGS, shop DRAWINGS, test reports and data on materials and equipment (hereinafter in this article called data), and material samples (hereinafter in this article called samples) as are required for the proper control of work, including but not limited to those working DRAWINGS, shop DRAWINGS, data and samples for materials and equipment specified elsewhere in the Specifications and in the Contract DRAWINGS.
- B. The CONTRACTOR shall submit five (5) copies of shop DRAWINGS or other data to the ENGINEER.
- C. Within thirty (30) calendar days after the effective date of the Agreement, the CONTRACTOR shall submit to the ENGINEER a complete list of preliminary data for which Shop DRAWINGS are to be submitted. Included in this list shall be the names of all proposed manufacturers furnishing specific items. Review of this list by the ENGINEER 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.
- D. The CONTRACTOR is to maintain an accurate updated submittal log and will bring this log to each scheduled progress meeting with the OWNER and ENGINEER. This log should include the following items:
  - 1. Submittal-Description and Number assigned.
  - 2. Date to ENGINEER.
  - 3. Date returned to CONTRACTOR (from ENGINEER).
  - 4. Status of Submittal (Approved/Resubmit/Rejected).
  - 5. Date of Resubmittal and Return (as applicable).
  - 6. Date material released (for fabrication).
  - 7. Projected date of fabrication.
  - 8. Projected date of delivery to site.
  - 9. Status of O & M submittal.

## 1.02 CONTRACTOR'S RESPONSIBILITY

- A. It is the duty of the CONTRACTOR to check all DRAWINGS, data and samples prepared by or for him before submitting them to the ENGINEER for review. Each and every copy of the DRAWINGS and data shall bear CONTRACTOR's stamp will be returned to the CONTRACTOR for conformance with this requirement. Shop DRAWINGS shall indicate any deviations in the submittal from requirements of the CONTRACT DOCUMENTS.

- B. Determine and verify:
  - 1. Field measurements
  - 2. Field construction criteria
  - 3. Catalog numbers and similar data
  - 4. Conformance and Specifications
- C. The CONTRACTOR shall furnish the ENGINEER a schedule of Shop Drawing submittals fixing the respective dates for the submission of shop and working 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.
- D. Designate in the construction schedule, or in a separate coordinated schedule, the dates for submission and the dates that reviewed Shop DRAWINGS, Working DRAWINGS and Samples will be needed.
- E. The CONTRACTOR shall not begin any of the work covered by a drawing, data, or a sample returned for correction until a revision or correction thereof has been reviewed and returned to him, approved by the ENGINEER.
- F. The CONTRACTOR shall submit to the ENGINEER all shop DRAWINGS, working DRAWINGS and samples sufficiently in advance of construction requirements and shall account for ENGINEERs Shop Drawing review time accordingly.
- G. The CONTRACTOR shall submit two (2) copies of descriptive or product data submittals to complement shop DRAWINGS for the ENGINEER plus the number of copies which the CONTRACTOR requires. The ENGINEER will retain two (2) sets. All blueprint shop DRAWINGS shall be submitted with one (1) set of reproducible and four (4) sets of print. The ENGINEER will review the DRAWINGS and return to the CONTRACTOR the set of marked-up DRAWINGS with appropriate review comments.
- H. The CONTRACTOR shall be responsible for and bear all cost of damages which may result from the ordering of any material or from proceeding with any part of work prior to the review and Approval by ENGINEER of the necessary Shop DRAWINGS.

#### 1.03 ENGINEER'S REVIEW OF SHOP DRAWINGS

- A. The ENGINEER's review of DRAWINGS, data and samples submitted by the CONTRACTOR will cover only general conformity to the Specifications, external connections, and dimensions which affect the installation. The ENGINEER's review and exception if any, will not constitute an approval of dimensions, 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 ENGINEER, except as otherwise provided herein.

- C. If the DRAWINGS or schedule as submitted describe variations and/or show a departure from the Contract requirements which ENGINEERs finds to be in the interest of the OWNER and to be minor as not to involve a change in the Contract Price or time for performance, the ENGINEER may return the reviewed DRAWINGS without noting an exception.
- D. When reviewed by the ENGINEER, each of the Shop DRAWINGS will be identified as having received such review being so stamped and dated. Shop DRAWINGS stamped "REJECTED" and with required corrections shown will be returned to the CONTRACTOR for correction and resubmittal.
- E. Resubmittals will be handled in the same manner as the 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 ENGINEER on previous submissions. The CONTRACTOR shall make any corrections required by the ENGINEER.
- F. 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 ENGINEER.
- G. The ENGINEER will review one submittal and one re-submittal after which cost of review will be borne by the CONTRACTOR. The cost of engineering shall be equal to the ENGINEER's charges to the OWNER under the terms of the ENGINEER's agreement with the OWNER.
- H. When the Shop DRAWINGS have been completed to the satisfaction of the ENGINEER, the CONTRACTOR shall carry out the construction in accordance therewith and shall make no further changes therein except upon written instructions from the ENGINEER.
- I. No partial submittals will be reviewed. Submittals not complete will be returned to the CONTRACTOR, and will not be considered "Rejected" until resubmitted.
- J. The ENGINEER shall return Shop Drawing submittals to the CONTRACTOR within twenty-one (21) days calendar days from the date the ENGINEER receives them.

#### 1.04 SHOP DRAWINGS

- A. When used in the CONTRACT DOCUMENTS, the term "Shop DRAWINGS" shall be considered to mean CONTRACTOR's plans for material and equipment which become an integral part of the Project. These DRAWINGS shall be complete and detailed. Shop DRAWINGS 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 to required Shop DRAWINGS as defined above.
- B. DRAWINGS and schedules shall be checked and coordinated with work of all trades involved, before they are submitted for review by the ENGINEER and shall bear the CONTRACTOR's stamp of approval as evidence of such checking and coordination. DRAWINGS or schedules submitted without this stamp of approval shall be returned to the CONTRACTOR for resubmission.
- C. 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. Number and title of the drawing.
  2. Date of drawing or revision.
  3. Name of project building or facility.
  4. Name of CONTRACTOR and sub-contractor submitting drawing.
  5. Clear identification of contents and location of work.
  6. Specification title and number.
- D. If DRAWINGS show variations from Contract requirements because of standard shop practice or for other reasons, the CONTRACTOR shall describe such variations in his letter of transmittal. If acceptable, proper adjustment in the Contract shall be implemented where appropriate. If the CONTRACTOR fails to describe such variations he shall not be relieved of the responsibility for executing the work in accordance with the Contract, even though such DRAWINGS have been reviewed.
- E. 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.
- F. For all mechanical and electrical equipment furnished, the CONTRACTOR shall provide a list including the equipment name, address and telephone number of the manufacturer's representative and service company so that service and spare parts can be readily obtained. In addition, a maintenance and lubrication schedule for each piece of equipment shall be submitted along with each shop drawing submittal.
- G. All manufacturers or equipment supplier who proposes to furnish equipment or products under Divisions 11, 12, 13, 14, 15 and 16 shall submit an installation list to the ENGINEER along with the required shop DRAWINGS. The installation list shall include at least five installations where identical equipment has been installed and has been in operation for a period of at least five (5) years.
- H. Only the ENGINEER will utilize the color "red" in marking Shop Drawing submittals.
- I. Before final payment is made, the CONTRACTOR shall furnish to ENGINEER two (2) sets of record shop DRAWINGS all clearly revised, complete and up to date showing the permanent construction as actually made for all reinforcing and structural steel, miscellaneous metals, process and mechanical equipment, piping, electrical system and instrumentation system.
- 1.05 WORKING DRAWINGS
- A. When used in the CONTRACT DOCUMENTS, the term "working DRAWINGS" shall be considered to mean the CONTRACTOR's plans 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. Copies of working DRAWINGS as noted in subparagraph 1.06A above, shall be submitted to the ENGINEER where required by the CONTRACT DOCUMENTS or



requested by the ENGINEER, and shall be submitted at least thirty (30) calendar days (unless otherwise specified by the ENGINEER) in advance of their being required for work.

- C. Working DRAWINGS shall be signed by a Registered Professional Engineer, currently licensed to practice in the State of Florida and shall convey, or be accompanied by, calculation or other sufficient information to completely explain the structure, machine, or system described and its intended manner of use. Prior to commencing such work, working DRAWINGS must have been reviewed without specific exceptions by the ENGINEER, which review will be for general conformance and will not relieve the CONTRACTOR in any way from his responsibility with regard to the fulfillment of the terms of the Contract. The CONTRACTOR assumes all risks of error; the OWNER and ENGINEER shall have no responsibility therefore.

#### 1.06 SAMPLES

- A. The CONTRACTOR shall furnish, for the approval of the ENGINEER, samples required by the CONTRACT DOCUMENTS or requested by the ENGINEER. Samples shall be delivered to the ENGINEER 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 ENGINEER.
- 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 samples of each item shall be submitted.
- C. 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.)
- D. The CONTRACTOR shall prepare a transmittal letter in triplicate for each shipment of samples containing the information required in subparagraph 1.07B above. He shall enclose a copy of this letter with the shipment and send a copy of this letter to the ENGINEER. 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.
- E. Approved samples not destroyed in testing shall be sent to the ENGINEER 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 his expense, if so requested at time of submission.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01330 – SCHEDULE OF VALUES

PART 4 - GENERAL

4.01 DESCRIPTION

- A. Submit to the ENGINEER a Schedule of Values allocated to the various portions of the Work, within 10 days after the effective date of the Agreement.
- B. Upon request of the ENGINEER, support the values with data which will substantiate their correctness.
- C. Once approved, the Schedule of Values shall be used as the basis for the CONTRACTOR's Applications for Payment.

4.02 FORM AND CONTENT OF SCHEDULE OF VALUES

- A. Present schedule on an 8-1/2 inch x 11 inch white paper; CONTRACTOR's standard forms and automated printout will be considered for approval by the ENGINEER upon CONTRACTOR's request. Identify schedule with:
  - 1. Title of Project and location
  - 2. ENGINEER 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 to include individual equipment, piping, electrical, paving, of the Work (as required) in sufficient detail to serve as a basis for computing values for progress payments during construction and for additions and deletions to the Work.
- C. For the various portions of the Work:
  - 1. Each item shall include a directly proportional amount of the CONTRACTOR's overhead and profit.
- D. The sum of all values listed in the schedule shall equal the total Contract Sum.
- E. Schedules are subject to ENGINEER's approval wherein additional line item detail may be required.

PART 5 - PRODUCTS (NOT USED)

PART 6 - PRODUCTS (NOT USED)

END OF SECTION



SECTION 01350 - AUDIO/VIDEO PRE-CONSTRUCTION RECORD

PART 1 - GENERAL

1.01 DESCRIPTION

- A. The CONTRACTOR shall provide a continuous color video with audio of the entire project prior to construction.

1.02 SCHEDULE REQUIRED

- A. Video recordings shall not be made more than 30 days prior to construction. No construction shall begin prior to review and approval of the CD's by the ENGINEER and the OWNER. CD's not conforming to the Specifications shall be resubmitted at no additional charge.

1.03 PROFESSIONAL VIDEOGRAPHERS

- A. The CONTRACTOR shall engage the services of a professional videographer. The color audio-visual tapes shall be prepared by a responsible commercial firm known to be skilled and regularly engaged in the business of pre-construction color audio-visual documentation.

PART 2 - PRODUCTS

- A. The finished product shall be a bright, sharp, clear picture free of distortion and show in sufficient detail acceptable to the ENGINEER.
- B. The CONTRACTOR shall furnish to the ENGINEER and the OWNER two (2) copies each of the electronic file, which becomes a project record document.

PART 3 - EXECUTION

- A. The video recording shall show all surface features located within the construction zone. These features shall include, but not be limited to, roadways, sidewalks, outside of houses (front and sides), driveways, culverts, walls, fences and landscaping.
- B. Electronic storage media shall be labeled and identified by project title and project number.
- C. Where station numbering is used, coverage shall begin at the lowest station number and be continuous until the highest station number is reached. Otherwise, the entire length of the project shall be documented including each plan sheet.

END OF SECTION

SECTION 01360 – QUALITY CONTROL

PART 1 - GENERAL

1.01 DESCRIPTION

- A. This Section describes the CONTRACTORs minimum responsibilities in meeting the quality requirements of the CONTRACT DOCUMENTS.

1.02 OBSERVATION AT PLACE OF MANUFACTURE

- A. Unless otherwise specified, all products, materials, and time and equipment shall be subject to observation by the OWNER and the ENGINEER at the place of manufacture.
- B. The presence of the OWNER and/or the ENGINEER at the place of manufacture however, shall not relieve the CONTRACTOR of the responsibility for furnishing products, materials, and equipment which comply with all requirements of the CONTRACT DOCUMENTS. Compliance is a duty of the CONTRACTOR.
- C. The CONTRACTOR shall advise the OWNER and ENGINEER promptly upon placing orders for materials and equipment so that arrangements may be made, if desired, for observation before shipment from the place of manufacture.
- D. The ENGINEER may require the CONTRACTOR to provide statements or certificates from the manufacturers and fabricators that the materials and equipment provided by them are manufactured or fabricated in full accordance with the standard specifications for quality and workmanship indicated in the CONTRACTOR Documents. All costs of this testing and providing statements and certificates shall be a subsidiary obligation of the CONTRACTOR, and no extra charge to the OWNER shall be allowed on account of such testing and certification.

1.03 SAMPLING AND TESTING

- A. Unless otherwise specified, all sampling and testing shall be in accordance with the methods prescribed in the current standards of the ASTM, as applicable to the class and nature of the article or materials considered.
- B. The OWNER and the ENGINEER reserve the right to use any generally accepted system of sampling and testing which will insure the quality of the workmanship is in full accord with the CONTRACT DOCUMENTS.
- C. Any waiver by the OWNER or ENGINEER of any specific testing or other quality assurance measures, whether or not such waiver is accompanied by a guarantee of substantial performance as a relief from the specified testing or other quality assurance requirements as originally specified, and whether or not such guarantee is accompanied by a performance bond to assure execution of any necessary corrective or remedial Work, shall not be construed as a waiver of any requirements.
- D. The OWNER and ENGINEER reserve the right to make independent investigations and tests at any time
- E. Failure of any portion of the Work to meet any of the requirements of the Contract Document shall be reasonable cause for the OWNER or ENGINEER to require the removal or correction and reconstruction of any such Work at the cost of the

CONTRACTOR.

1.04 SITE INVESTIGATION AND CONTROL

- A. The CONTRACTOR shall verify all dimensions in the field and shall check field conditions continuously during construction. The CONTRACTOR shall be solely responsible for any inaccuracies built into the Work due to its failure to comply with this requirement.
- B. The CONTRACTOR shall inspect related and appurtenant work, and shall report in writing to the OWNER and ENGINEER any conditions that will prevent proper completion of the Work. Failure to report any such conditions shall constitute acceptance of all site conditions, and any required removal, repair, or replacement caused by unsuitable conditions shall be performed by the CONTRACTOR at its cost.

1.05 OBSERVATION AND TESTING

- A. The work or actions of the testing laboratory shall in no way relieve the CONTRACTOR of its obligations under the Contract. The laboratory testing work will include such observations and testing required by the OWNER or ENGINEER. The testing laboratory will have no authority to change the requirements of the CONTRACT DOCUMENTS, nor perform, accept or approve any of the CONTRACTOR's Work.
- B. The CONTRACTOR shall allow the OWNER and ENGINEER ample time and opportunity for field observation and testing materials and equipment to be used in the Work.
- C. The CONTRACTOR shall at all times furnish the OWNER and the ENGINEER facilities, including labor, and allow proper time for inspecting and testing materials, equipment, and workmanship.
- D. The CONTRACTOR must anticipate that possible delays may occur in the execution of its work due to the necessity of materials and equipment being inspected and accepted for use.
- E. The CONTRACTOR shall furnish, at its own expense, all samples of materials required by the OWNER or ENGINEER for testing, and shall make its own arrangements for providing water, electric power, or fuel for the various observations and tests of structures and equipment.

1.06 RIGHT OF REJECTION

- A. The OWNER and ENGINEER, shall have the right, at all times and places, to reject any articles or materials to be furnished hereunder which, in any respect, fail to meet the requirements of the Design Criteria Package, regardless of whether the defects in such articles or materials are detected at the point of manufacture or after completion of the Work at the site.
- B. If the OWNER or its representative, through an oversight or otherwise, has accepted materials or work which is defective or which is contrary to the CONTRACT DOCUMENTS, such materials, no matter in what stage or condition of manufacture, delivery, or erection, may be subsequently rejected.
- C. The CONTRACTOR shall promptly remove rejected articles or materials from the site of the Work after notification of rejection. All costs of removal and replacement of rejected articles or materials as specified herein shall be borne by the CONTRACTOR.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 BUOYANCY

- A. The CONTRACTOR shall be completely responsible for any tanks, pipelines, manholes, foundations or similar improvements that may become buoyant during the construction operations due to groundwater levels. Should there be any possibility of buoyancy, the CONTRACTOR shall take the necessary steps to prevent damage due to floating or flooding, and shall repair or replace said improvements at no additional cost.

3.02 DEVIATION FROM SPECIFICATIONS

- A. If any part of a submittal deviates from the plans and specifications, it is up to the CONTRACTOR to indicate such deviation—in writing—to the ENGINEER, for determination as to acceptance of the deviation. If no deviation is submitted, it is assumed that the CONTRACTOR has fully and completely followed the plans and specifications, and that any discrepancy discovered during construction shall be corrected completely at the expense of the CONTRACTOR.

3.03 AMERICANS WITH DISABILITIES ACT (ADA)

- A. The CONTRACTOR shall make every effort to ensure all concrete work including, but not limited to accessible sidewalks, routes, ramps and curb ramps is compliant with the ADA and Florida Building Code Accessibility.
- B. Prior to and during concrete placement, the CONTRACTOR shall verify the formwork for compliance. Any and all concrete work which is not compliant shall be removed and replaced at no cost to the OWNER.

END OF SECTION



SECTION 01370 – MATERIALS INSTALLATION AND TESTING

PART 1 - GENERAL

1.01 DESCRIPTION

- A. CONTRACTOR shall employ and pay for the services of an independent testing laboratory to perform materials and installation testing of the type and frequency specified in the CONTRACT DOCUMENTS including, but not limited to, Geotechnical Testing Services and concrete testing.
- B. Geotechnical Testing Services shall include, but not be limited to, periodic site inspections, soil proctor tests, soil classification tests and soil densities or compaction tests.
- C. The ENGINEER may, at any time, elect to have materials and equipment tested for conformity with the CONTRACT DOCUMENTS.
- D. CONTRACTOR shall include cost of testing in the Contract Price.
- E. Piping pressure test and bacteriological testing shall be in accordance with the applicable Section.

1.02 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

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 CONTRACTOR'S RESPONSIBILITIES

- A. Provide all testing required by the CONTRACT DOCUMENTS as well as laws, ordinances, rules, regulations, orders, or approvals of public authorities.
- B. Employment of the laboratory shall in no way relieve CONTRACTOR's obligations to perform the Work of the Contract.
- C. Cooperate with laboratory personnel, and provide access to Work and to Manufacturer's operations.
- D. Secure and deliver to the laboratory adequate quantities of representational samples of materials proposed to be used and which require testing.

- E. Provide to the laboratory the preliminary design mix proposed to be used for concrete and other materials mixes which require control by the testing laboratory.
- F. 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
- G. 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 OWNER for laboratory personnel and travel expenses incurred due to CONTRACTOR's negligence.
- H. Employ and pay for the services of the same or a separate, equally qualified independent testing laboratory to perform additional inspections, sampling, and testing required for the CONTRACTOR's convenience.
- I. If the OWNER requests tests in addition to those specified in the contract, and if the test results indicate the material or equipment complies with the CONTRACT DOCUMENTS, the OWNER shall pay for the cost of the testing laboratory. If the tests and any subsequent retests indicate the materials and equipment fail to meet the requirements of the CONTRACT DOCUMENTS, the CONTRACTOR may pay for the laboratory costs directly to the testing firm or the total of such costs shall be deducted from any payments due the CONTRACTOR.
- J. The CONTRACTOR shall pay costs for additional trips to the project by the agency when scheduled times for tests and inspections are canceled and agency is not notified sufficiently in advance of cancellation to avoid the trip.

END OF SECTION

## SECTION 01380 - CONTROL OF WORK

## PART 1 - GENERAL

## 1.01 DESCRIPTION

- A. The CONTRACTOR shall furnish personnel and equipment which will be efficient, appropriate and a quantity large enough to secure a satisfactory quality of work and a rate of progress which will insure the completion of the work within the time stipulated in the Proposal. If at any time such personnel appear to the ENGINEER to be inefficient, inappropriate or insufficient for securing the quality of work required or for producing the rate of progress aforesaid, he may order the CONTRACTOR to increase the efficiency, change the character or increase the personnel and equipment, and the CONTRACTOR shall conform to such order. Failure of the ENGINEER to give such order shall in no way relieve the CONTRACTOR of his obligations to secure the quality of the work and rate of progress required.

## 1.02 PIPE LOCATIONS

- A. Pipeline shall be located substantially as indicated on the DRAWINGS, but the ENGINEER reserves the right to make such modifications in locations as may be found desirable to avoid interference with existing structures or for other reasons.

## 1.03 OBSTRUCTIONS

- A. The attention of the CONTRACTOR is drawn to the fact that during digging at the Project site, the possibility exists of the CONTRACTOR encountering various water, sewer, gas, telephone, electrical, or other lines not shown on the DRAWINGS. The CONTRACTOR shall exercise extreme care before and during digging to locate and flag these lines so as to avoid damage to the existing lines. Should damage occur to an existing line, The CONTRACTOR shall repair the line at no cost to the OWNER.
- B. The CONTRACTOR shall protect all existing utilities and improvements not designated for removal and shall restore damaged or temporarily relocated utilities and improvements to a condition equal to or better than they were prior to such damage or temporary relocation, all in accordance with requirements of the CONTRACT DOCUMENTS.
- C. The CONTRACTOR shall verify the exact locations and depths of all utilities shown and the CONTRACTOR shall make exploratory excavations of all utilities that may interfere with the work. All such exploratory excavations shall be performed as soon as practicable after award of the contract and, in any event, a sufficient time in advance of construction to avoid possible delays to the CONTRACTOR's work. When such exploratory excavations show the utility location as shown to be in error, the CONTRACTOR shall so notify the ENGINEER.
- D. The number of exploratory excavations required shall be that number which is sufficient to determine the alignment and grade of the utility. Test pits shall be dug at the CONTRACTOR's expense, as directed.
- E. The CONTRACTOR shall protect all Underground Utilities and other improvements which may be impaired during construction operations. It shall be the CONTRACTOR's responsibility to ascertain the actual location of all existing utilities and other improvements that will be encountered in its construction operations, and to see that

such utilities or other improvements are adequately protected from damage due to such operations. The CONTRACTOR shall take all possible precautions for the protection of unforeseen utility lines to provide for uninterrupted service and to provide such special protection as may be necessary.

- F. In case it shall be necessary to move the property of any public utility or franchise holder, such utility company or franchise holder will, upon request of the CONTRACTOR, be notified by the OWNER to move such property within a specified reasonable time. When utility lines that are to be removed are encountered within the area of operations, the CONTRACTOR shall notify the ENGINEER a sufficient time in advance for the necessary measures to be taken to prevent interruption of service.
- G. Where the proper completion of the work requires the temporary or permanent removal and/or relocation of an existing utility or other improvement which is indicated, the CONTRACTOR shall remove and, without unnecessary delay, temporarily replace or relocate such utility or improvement in a manner satisfactory to the ENGINEER and the OWNER of the facility. In all cases of such temporary removal or relocation, restoration to former location shall be accomplished by the CONTRACTOR in a manner that will restore or replace the utility or improvement as nearly as possible to its former locations and to as good or better condition than found prior to removal.
- H. Existing utility lines that are indicated or the locations of which are made known to the CONTRACTOR prior to excavation and that are to be retained, and all utility lines that are constructed during excavation operations shall be protected from damage during excavation and backfilling and, if damaged, shall be immediately repaired or replaced by the CONTRACTOR at the CONTRACTOR's expense. Sewer laterals are included.
- I. All repairs to a damaged utility or improvement are subject to inspection and approval by an authorized representative of the utility or improvement OWNER before being concealed by backfill or other work.
- J. All power, telephone or the communication cable ducts, gas and water mains, irrigation lines, sewer lines, storm drain lines, poles, and overhead power and communication wires and any other cables encountered along the line of the work shall remain continuously in service during all the operations under the Contract, unless other arrangements satisfactory to the ENGINEER are made with the OWNER of said pipelines, duct, main, irrigation line, sewer, storm drain, pole, or wire or cable. The CONTRACTOR shall be responsible for and shall repair all damage due to its operations, and the provisions of this Section shall not be abated even in the event such damage occurs after backfilling or is not discovered until after completion of the backfilling.

#### 1.04 OPEN EXCAVATIONS

- A. All open excavations shall be adequately safeguarded by providing temporary barricades, caution signs, lights and other means to prevent accidents to persons, and damage to property. The CONTRACTOR shall, at his own expense, provide suitable and safe bridges and other crossings for accommodating travel by pedestrians and workmen. Bridges provided for access to private property during construction shall be removed when no longer required. The length of open trench will be controlled by the particular surrounding conditions, but shall always be confined to the limits prescribed by the ENGINEER. If the excavation becomes a hazard, or if it excessively restricts traffic at any point, the ENGINEER may require special construction procedures such as limiting the length of open trench or prohibiting stacking excavated material in the street, and requiring that the trenches shall not remain open overnight.
- B. The CONTRACTOR shall take precautions to prevent injury to the public due to open

trenches. All trenches, excavated material, equipment, or other obstacles which could be dangerous to the public shall be well lighted at night.

1.05 TEST PITS

- A. Test pits for the purpose of locating underground pipeline or structures in advance of the construction shall be excavated and backfilled by the CONTRACTOR at his cost at the direction of the ENGINEER. Test pits shall be backfilled immediately after their purpose has been satisfied and the surface restored and maintained in a manner satisfactory to the ENGINEER.

1.06 UTILITY CROSSINGS

- A. It is intended that wherever existing utilities such as service lines must be crossed, deflection of the pipe within recommended limits and cover shall be used to satisfactorily clear the obstruction unless otherwise indicated on the DRAWINGS. However, when in the opinion of the ENGINEER or the OWNER this procedure is not feasible he may direct the use of fittings.

1.07 SANITATION

- A. Toilet Facilities - Fixed or portable chemical toilets shall be provided wherever needed for the use of employees. Toilets at construction job sites shall conform to the requirements of Part 1926 of the OSHA Standards for Construction.
- B. Sanitary and Other Organic Wastes - The CONTRACTOR shall establish a regular daily collection of all sanitary and organic wastes. All wastes and refuse from sanitary facilities provided by the CONTRACTOR or organic material wastes from any other source related to the CONTRACTOR's operations shall be disposed of away from the site in a manner satisfactory to the ENGINEER and in accordance with all laws and regulations pertaining thereto.

1.08 RELOCATIONS

- A. The CONTRACTOR shall be responsible for the relocation of structures, including but not limited to light poles, signs, sign poles, fences, piping, conduits and drains that interfere with the positioning of the work as set out on the DRAWINGS. The cost of all such relocations shall be included in the bid for the project and shall not result in any additional cost to the OWNER.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 COOPERATION WITHIN THIS CONTRACT

- A. All firms or persons authorized to perform any work under this Contract shall cooperate with the General CONTRACTOR and his subcontractors or trades, and shall assist in incorporating the work of other trades where necessary or required.
- B. Cutting and patching, drilling and fitting shall be carried out where required by the trade or subcontractor having jurisdiction, unless otherwise indicated herein or directed by the ENGINEER.

3.02 PROTECTION OF CONSTRUCTION AND EQUIPMENT

- A. All newly constructed work shall be carefully protected from injury in any way. No wheeling or walking or placing of heavy loads on it shall be allowed and all portions injured shall be reconstructed by the CONTRACTOR at his own expense.
- B. Further, the CONTRACTOR shall take all necessary precaution to prevent damage to any structure due to water pressure during and after construction and until such structure is accepted and taken over by the OWNER.

3.03 PRIVATE LAND

- A. The CONTRACTOR shall not enter or occupy private land outside of easements, except by written permission of the land OWNER.

3.04 RESTORATION

- A. Temporary restoration shall be completed within five days of pipe installation. Temporary restoration shall include all driveways, sidewalks and roadways. They shall be swept clean and be maintained free of dirt and dust. All areas disturbed by the construction activities shall be restored to proper grade, cleaned up, including the removal of debris, trash, and deleterious materials. All construction materials, supplies, or equipment, including piles of debris shall be removed from the area. All temporarily restored areas shall be maintained by the CONTRACTOR. These areas shall be kept clean and neat, free of dust and dirt, until final restoration operations are completed. The CONTRACTOR is responsible to utilize dust abatement operations in the temporarily restored areas as required, to the satisfaction of the ENGINEER.
- B. Wherever sidewalks or private roads have been removed for purposes of construction, the CONTRACTOR shall place suitable temporary sidewalks or roadways promptly after backfilling and shall maintain them in satisfactory condition for the period of time fixed by the authorities having jurisdiction over the affected portions before proceeding with the final restoration or, if no such period of times is so fixed, the CONTRACTOR shall maintain said temporary sidewalks or roadways until the final restoration thereof has been made.
- C. Final restoration shall be completed within thirty days of pipe acceptance. Final restoration shall include the completion of all required pavement replacement of roadways, driveways, curbs, gutters, sidewalks and other existing improvements disturbed by the construction; final grading, placement of sod, pavement marking, etc., all complete and finished, acceptable to the ENGINEER.
- D. In order to obtain a satisfactory junction with adjacent surfaces, the CONTRACTOR shall saw cut back and trim the edge so as to provide a clean, sound, vertical joint before permanent replacement of an excavated or damaged portion of pavement. Damaged edges of pavement along excavations and elsewhere shall be trimmed back by saw cutting in straight lines. All pavement restoration and other facilities restoration shall be constructed to finish grades compatible with the adjacent undisturbed pavement.
- E. The CONTRACTOR shall test an installed section of pipeline within five calendar days from completion of the pipeline. A section of pipe is defined as a pipe section which can be isolated by valves for appurtenances is satisfactorily completed, the CONTRACTOR shall provide the ENGINEER with a "Schedule of Existing Facilities Restoration" which will be reviewed and be acceptable to the ENGINEER. The schedule shall show the existing facilities to be restored and schedule of beginning and completion dates for each

item of restoration. The work for completing the final restoration of existing facilities for a tested section of work shall be completed within 30 days of acceptance of the pipeline testing.

END OF SECTION

## SECTION 01390 - TEMPORARY UTILITIES

### PART 1 - GENERAL

#### 1.01 DESCRIPTION

- A. Furnish, install and maintain temporary utilities required for construction, remove on completion of work.
- B. Pay all fees associated with temporary utilities including water consumption charges.

#### 1.02 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.
- C. Comply with County Health Department and Environmental Regulations.

### PART 2 - PRODUCTS

#### 2.01 MATERIALS

- A. Materials may be new or used, but must be adequate in capacity for the required usage, must not create unsafe conditions, and must not violate requirements of applicable codes and standards.

#### 2.02 TEMPORARY ELECTRICITY AND LIGHTING

- A. Arrange with utility company, provide service required for power and lighting, and pay all costs for service and for power used in the construction, testing and trial operation prior to final acceptance of the work by the OWNER.
- B. Install circuit and branch wiring, with the area distribution boxes located so that power and lighting is available throughout the construction by the use of construction type power cords.
- C. Provide adequate artificial lighting for all areas of work when natural light is not adequate to work, and all areas accessible to the public.

#### 2.03 TEMPORARY WATER

- A. Arrange with the CITY to provider to provide water for construction purposes.
- B. Install branch piping with taps located so that water is available throughout the construction by the use of hoses.
- C. Install at each and every connection to the OWNER water supply a backflow preventer meeting the requirements of ANSI A40.6 and AWWA C511. CONTRACTOR shall be required to meter and pay for all water used.



2.04 TEMPORARY SANITARY FACILITIES

- A. Provide sanitary facilities in compliance with laws and regulations.
- B. Service, clean and maintain facilities and enclosures.

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.
- C. Restore permanent facilities used for temporary services to specified condition.

END OF SECTION

## SECTION 01400 - EXISTING UTILITIES

### PART 1 - GENERAL

#### 1.01 DESCRIPTION

- A. This Section provides for specifications related to construction in the vicinity of existing utilities.

#### 1.02 CONTRACTOR RESPONSIBILITIES

- A. The term existing utilities shall be deemed to refer to both publicly-owned and privately-owned utilities including, but not limited to, electric power and lighting, telephone, water, gas, storm drains, process lines, sanitary sewers and all appurtenant structures.
- B. Prior to underground construction, the CONTRACTOR is required by the Underground Facility Damage Prevention and Safety Act, Chapter 556 FS to contact Sunshine 811, for the location of underground utilities.
- C. Where existing utilities and structures are indicated in the CONTRACT DOCUMENTS, it shall be understood that all of the existing utilities and structures affecting the work may not be shown and that the locations of those shown are approximate only. It shall be the responsibility of the CONTRACTOR to ascertain the actual extent and exact location of existing utilities and structures. In every instance, the CONTRACTOR shall notify the proper authority having jurisdiction and obtain all necessary directions and approvals before performing any work in the vicinity of existing utilities.
- D. NOTIFICATION of utility OWNER
- E. Prior to any excavation in the vicinity of any existing underground facilities, including all water, sewer, storm drain, gas, petroleum products, or other pipelines; all buried electric power, communications, or television cables; all traffic signal and street lighting facilities; and all roadway and state highway rights-of-way the CONTRACTOR shall notify the respective authorities representing the OWNERS or agencies responsible for such facilities not less than three days nor more than seven days prior to excavation so that a representative may be present during such excavation.

### PART 2 - PRODUCTS (NOT USED)

### PART 3 - EXECUTION

#### 3.01 TEMPORARY CONNECTIONS

- A. The work shall be carried out in a manner to prevent disruption of existing services and to avoid damage to the existing utilities. Temporary connections shall be provided, as required, to insure no interruption of existing services. Any damage resulting from the work of this Contract shall be promptly repaired by the CONTRACTOR at his own expense in a manner approved by the ENGINEER and further subject to the requirements of any authority having jurisdiction. Where it is required by the authority having jurisdiction that they perform their own repairs or have them done by others, the CONTRACTOR shall be responsible for all costs thereof.

### 3.02 UTILITY SUPPORT

- A. Where excavations by the CONTRACTOR require any utility lines or appurtenant structures to be temporarily supported and otherwise protected during the construction work, such support and protection shall be provided by the CONTRACTOR. All such work shall be performed in a manner satisfactory to the CITY and the respective authority having jurisdiction over such work.

### 3.03 UTILITY CROSSINGS

- A. It is intended that wherever existing utilities such as water, chemical, electrical, or other service lines must be crossed, deflection of the pipe within limits recommended by the pipe manufacturer and the required minimum cover shall be used to satisfactorily clear the obstruction unless otherwise indicated on the DRAWINGS. However, when, in the opinion of the OWNER or ENGINEER, this procedure is not feasible the ENGINEER may direct the use of fittings for a utility crossing as detailed on the DRAWINGS. All existing utilities shall be potholed prior to construction of conflicting piping.

### 3.04 ADVANCE INVESTIGATIONS

- A. The CONTRACTOR shall be responsible for uncovering and exposing existing utilities sufficiently in advance of pipe laying operations to confirm elevation, size, and material and clearance separation. If, upon excavation, an existing utility is found to be in conflict with the proposed construction or be of a size or material different from what is shown on the plans, the CONTRACTOR shall immediately notify the ENGINEER, who will in turn prepare a recommendation. Failure of the CONTRACTOR to perform the advance investigation shall not relieve it of any claims for delay or damages.

### 3.05 UNFORESEEN UTILITIES

- A. The attention of the CONTRACTOR is drawn to the fact that during excavation, the possibility exists of encountering water, sewer, petroleum, gas, telephone, electrical, or other utilities not shown on the DRAWINGS. The CONTRACTOR is responsible for obtaining utility locations from the utility OWNERS or utility locating company. The CONTRACTOR shall exercise extreme care before and during digging to locate and flag these lines so as to avoid damage to the existing lines. Should damage occur to an existing line, the CONTRACTOR shall repair the line at the no cost to the OWNER.

### 3.06 CONNECTIONS TO EXISTING SYSTEMS

- A. The CONTRACTOR shall perform all work necessary to locate, excavate, and prepare for connections to the terminus of the existing mains all as shown on the DRAWINGS or where directed by the OWNER. The cost of this work and the cost for the actual connection to the existing mains shall be included in the bid price as a separate item and shall not result in any additional cost to the OWNER.

### 3.07 MAINTENANCE OF EXISTING STORM WATER FACILITIES OPERATION

- A. The CONTRACTOR shall take notice that existing storm water pump station is operated in the construction area. It is the responsibility of the CONTRACTOR to contact the OWNER's utility operator and ascertain the extent of any specific service area.
- B. The CONTRACTOR shall fully cooperate at all times with the OWNER in order to maintain the operation of the existing facilities with the least amount of interference and interruption possible. Continuous service, public health, and safety considerations shall

exceed all others and the CONTRACTOR's schedule, plans, and work shall at all times be subject to alteration and revision, if necessary, for the above considerations.

- C. The ENGINEER and OWNER reserve the right to require the CONTRACTOR to work 24 hours per day in all cases where, in their opinion, interference with operation of the system may result.
- D. In no case will the CONTRACTOR be permitted to interfere with the existing system until all materials, supplies, equipment, tools, and incidentals necessary to complete the interfering portion of the work are on the site, or a temporary by-pass system is effectively in place. All existing utilities shall be potholed prior to construction of conflicting piping.
- E. The CONTRACTOR shall provide emergency storm drainage pumping as specified in the CONTRACT DOCUMENTS.

### 3.08 RESTORATION OF PAVEMENT

- A. General: All paved areas including concrete, asphaltic concrete, berms cut or damaged during construction shall be replaced with similar materials and of equal thickness to match the existing adjacent undisturbed areas, except where specific resurfacing requirements have been called for in the CONTRACT DOCUMENTS. All pavements which are subject to partial removal shall be neatly saw-cut in straight lines.
- B. Temporary Resurfacing: Wherever required by the public authorities having jurisdiction, the CONTRACTOR shall place temporary surfacing promptly after backfilling and shall maintain such surfacing for the period of time fixed by said authorities before proceeding with the final restoration of improvements.
- C. Permanent Resurfacing: In order to obtain a satisfactory junction with adjacent surfaces, the CONTRACTOR shall saw-cut back and trim the edge so as to provide a clean, sound, vertical joint before permanent replacement of an excavated or damaged portion of pavement. Damaged edges of pavement along excavations and elsewhere shall be trimmed back by saw cutting in straight lines. All pavement restoration and other facilities restoration shall be constructed to finish grades compatible with adjacent undisturbed pavement.

END OF SECTION

## SECTION 01410 – PROTECTION OF EXISTING PROPERTY

## PART 1 - GENERAL

## 1.01 SPECIFICATION INCLUDES

- A. The CONTRACTOR shall be responsible for the preservation and protection of property adjacent to the work site against damage or injury as a result of his operations under this project. Any damage or injury occurring on account of any act, omission or neglect on the part of the CONTRACTOR shall be restored in a proper and satisfactory manner or replaced by and at the expense of the CONTRACTOR to an equal or superior condition than previously existed.
- B. In the event of any claims for damage or alleged damage to property as a result of work, the CONTRACTOR shall be responsible for all costs in connection with the settlement of or defense against such claims. Prior to commencement of work in the vicinity of property adjacent to the work site, the CONTRACTOR, at his own expense, shall take such surveys as may be necessary to establish the existing condition of the property. Before final payment can be made, the CONTRACTOR shall furnish satisfactory evidence that all claims for damage have been legally settled or sufficient funds to cover such claims have been placed in escrow, or that an adequate bond to cover such claims has been obtained.

## 1.02 BARRICADES, WARNING SIGNS AND LIGHTS

- A. In addition to the requirements of this Specification, the CONTRACTOR shall provide, erect and maintain as necessary, strong and suitable barricades, danger signs and warning lights for the preservation and protection of property adjacent to the work site. All barricades and obstructions along public roads shall be illuminated at night and all lights for this purpose shall be kept burning from sunset to sunrise.

## 1.03 TREES AND LANDSCAPING PROTECTION

- A. General: The CONTRACTOR shall exercise all necessary precautions so as not to damage or destroy any trees or landscaping in or near the project site, and shall not trim or remove any trees or landscaping unless such trees or landscaping have been approved for trimming or removal by the jurisdictional agency or OWNER. All existing trees or landscaping which are damaged during construction shall be replaced by the CONTRACTOR or a certified tree/landscaping company to the satisfaction of the OWNER.
- B. Replacement: The CONTRACTOR shall immediately notify the jurisdictional agency or OWNER if any tree or landscaping is damaged by the CONTRACTOR's operations. If, in the opinion of the jurisdictional agency or OWNER, the damage is such that replacement is necessary, the CONTRACTOR shall replace the tree or landscaping at its own expense. The tree or landscaping shall be of a like size and variety as the tree or landscaping damaged, or, if of a smaller size, the CONTRACTOR shall pay any compensatory payment.
- C. All permit fees associated with the removal and replacement of trees and landscaping damaged or destroyed shall be the responsibility of the CONTRACTOR.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

## SECTION 01420 - SECURITY

### PART 1 - GENERAL

#### 1.01 DESCRIPTION

- A. This Section provides for requirements of security, entry control, personnel identification and miscellaneous restrictions.

#### 1.02 SECURITY PROGRAM

- A. Protect Work, existing premises and OWNER's operations from theft, vandalism and unauthorized entry.
- B. Initiate program in coordination with OWNER's existing security system at job mobilization.
- C. Maintain program throughout construction period until OWNER occupancy as directed by ENGINEER.

#### 1.03 ENTRY CONTROL

- A. Restrict entrance of persons and vehicles into project site and existing facilities.
- B. Allow entrance only to authorized persons with proper identification.
- C. Maintain log of workmen and visitors, make available to OWNER on request.
- D. Coordinate access of OWNER's personnel to site in coordination with OWNER's security forces.

#### 1.04 PERSONNEL IDENTIFICATION

- A. All personnel shall wear clothing bearing the company information of which they are employed.
- B. Provide additional security as required by the OWNER.
- C. Become familiar with OWNER and ENGINEER representatives and restrict access to job site to these representatives.

### PART 2 - PRODUCTS (NOT USED)

### PART 3 - EXECUTION (NOT USED)

END OF SECTION

## SECTION 01430 – SITE ACCESS AND STORAGE

### PART 1 - GENERAL

This section provides general specifications for the CONTRACTOR's mobilization, de-mobilization, access to the site and limitations on storage or lay-down area.

#### 1.01 HIGHWAY LIMITATIONS

- A. The CONTRACTOR shall make his own investigation of the condition of available public and private roads and of clearances, restrictions, bridge load limits, and other limitations affecting transportation and ingress and egress to the site of the work.

#### 1.02 CONTRACTOR'S WORK AND STORAGE AREA

- A. Contractor's work and storage area plan shall be submitted for OWNERs approval no later than 30 days after NTP.
  - 1. OWNER approval of the work are and storage plan is required prior to commencement.
  - 2. The limits of the CONTRACTOR's staging area and other applicable restrictions shall be subject to the local municipality.
- B. The CONTRACTOR shall make his own arrangements and pay for any necessary off-site storage or shop areas necessary for the proper execution of the work.

### PART 2 - PRODUCTS (NOT USED)

### PART 3 - EXECUTION

#### 3.01 GENERAL

- A. The CONTRACTOR shall set up construction facilities in a neat and orderly manner within designated areas and shall confine operations to work and storage areas.

#### 3.02 RESTORATION

- A. All areas disturbed by the construction activities shall be restored to proper grade, cleaned up, including the removal of debris, trash, and deleterious materials.
- B. Temporary restoration shall include all driveways, sidewalks and roadways. They shall be swept clean and be maintained free of dirt and dust
- C. All construction materials, supplies, or equipment, including piles of debris shall be removed from the area.
- D. All temporarily restored areas shall be maintained by the CONTRACTOR. These areas shall be kept clean and neat, free of dust and dirt, until final restoration operations are completed.
- E. Temporary restoration shall be completed within five days of pipe installation or as



specified.

- F. The CONTRACTOR is responsible to utilize dust abatement operations in the temporarily restored areas as required, to the satisfaction of the ENGINEER.
- G. Final restoration shall be completed within thirty days of pipe acceptance. Final restoration shall include the completion of all required pavement replacement of roadways, driveways, curbs, gutters, sidewalks and other existing improvements disturbed by the construction; final grading, placement of sod, pavement marking, etc., all complete and finished, acceptable to the ENGINEER.
- H. In order to obtain a satisfactory junction with adjacent surfaces, the CONTRACTOR shall saw cut back and trim the edge so as to provide a clean, sound, vertical joint before permanent replacement of an excavated or damaged portion of pavement. Damaged edges of pavement along excavations and elsewhere shall be trimmed back by saw cutting in straight lines. All pavement restoration and other facilities restoration shall be constructed to finish grades compatible with the adjacent undisturbed pavement.

### 3.03 DEMOBILIZATION

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

END OF SECTION

## SECTION 01440 - TRAFFIC REGULATION

### PART 1 - GENERAL

#### 1.01 DESCRIPTION

- A. The Work to be performed under this section shall include furnishing all materials and labor necessary to regulate vehicular and pedestrian traffic.
- B. Provide, operate and maintain equipment, services and personnel, with traffic control and protective devices, as required to expedite vehicular traffic flow around the construction area.
- C. Remove temporary equipment and facilities when no longer required, restore grounds to original, or to specified conditions.

#### 1.02 REFERENCES

- A. The Work under this Contract shall be in strict accordance with the following codes and standards.
  - 1. The CITY
  - 2. Broward County Traffic Engineering Division
  - 3. Florida Department of Transportation Design Standards and Specifications
  - 4. OSHA Safety and Health Standards for Construction.
  - 5. Federal Highway Administration Manual of Uniform Traffic Control Devices for Streets and Highways (MUTCD)
  - 6. Federal Highway Administration Traffic Controls for Street and Highway Construction and Maintenance Operations

### PART 2 - PRODUCTS (NOT USED)

### PART 3 - EXECUTION

#### 3.01 MAINTENANCE OF TRAFFIC

- A. For the maintenance and protection of vehicular and pedestrian traffic in public or private streets and ways, the CONTRACTOR shall provide, place, and maintain all necessary barricades, traffic cones, warning signs, lights and other safety devices in accordance with the requirements of the "Manual of Uniform Traffic Control Devices, Part VI - Traffic Controls for Street and Highway Construction and Maintenance Operations," published by U.S. Department of Transportation, Federal Highway Administration (ANSI D6.1).
- B. The CONTRACTOR shall provide a Maintenance of Traffic Plan, prepared by a FDOT certified MOT CONTRACTOR. The plan, and subsequent revisions, must be approved by the Broward County or the Florida Department of Transportation as applicable.

- C. The CONTRACTOR shall take all necessary precautions for the protection of the work and the safety of the public. All barricades and obstructions shall be illuminated at night, and all lights shall be kept burning from sunset until sunrise. The CONTRACTOR shall station such guards or flaggers and shall conform to such special safety regulations relating to traffic control as may be required by the public authorities within their respective jurisdictions. All signs, signals, and barricades shall conform to the requirements of OSHA and Subpart G, Part 1926, of the OSHA Safety and Health Standards for Construction.
- D. The CONTRACTOR shall remove traffic control devices when no longer needed, shall repair all damage caused by installation of the devices, and shall remove post settings and backfill the resulting holes to match grade.

### 3.02 CORRECTIONS

- A. Upon notification by the OWNER either verbally or in writing, the CONTRACTOR shall correct any noted deficiencies within one hour.
- B. Inspection of all traffic control items shall be accomplished at least twice per day. One of these inspections shall be at the end of the work day or at night.

### 3.03 TRAFFIC AND VEHICULAR ACCESS:

- A. Emergency Vehicles: No single family residence, multi-family residence, apartment, commercial building or place of employment shall be without access to emergency vehicles for a period longer than three hours. The CONTRACTOR shall notify in writing the ENGINEER, the police, fire and other emergency departments and agencies when and where work is to be accomplished that will affect their operations at least two days in advance of such work.
- B. Commercial Properties: Access to commercial property shall not be blocked for a period of more than 30 minutes during the time such properties are open for business.
- C. Residential Property: Access to residential property shall not be blocked for a period of more than 4 hours.

### 3.04 ROAD CLOSURE

- A. No roads shall be blocked to traffic without adequate detour facilities for a period of more than 30 minutes or as directed by the governing authority.
- B. At least seven days prior to a proposed road closure, the CONTRACTOR shall submit to the City Engineer a complete traffic control plan. This plan shall include the following minimum information:
  - 1. Sketch of work site and all area roads, streets and mark driveways.
  - 2. Proposed detour route.
  - 3. All necessary traffic control devices to be used.
  - 4. Emergency CONTRACTOR contact person name and phone to be available 24 hours a day.
  - 5. Estimated times/dates of road closure.

3.05 FLAGMEN

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

3.06 FLARES AND LIGHTS

- A. Provide lights as required to clearly delineate traffic lanes and to guide traffic as required.
- B. Provide lights for use by flagmen in directing traffic.
- C. Provide illumination of critical traffic and parking areas as required.

3.07 CONSTRUCTION PARKING CONTROL

- A. Control vehicular parking to preclude interference with public traffic or parking, access by emergency vehicles, OWNER's operations, or construction operations.
- B. Monitor parking of construction personnel's private vehicles.
- C. Maintain free vehicular access to and through parking areas and driveways.
- D. Prohibit parking on or adjacent to access roads, or in non-designated areas.

END OF SECTION

## SECTION 01450 – PROJECT IDENTIFICATION SIGNS

### PART 1 - GENERAL

#### 1.01 SPECIFICATION INCLUDES

- A. Furnish, install and maintain one project identification sign.
- B. Remove sign upon completion of construction.
- C. Allow no other signs to be displayed without approval of OWNER.

#### 1.02 PROJECT IDENTIFICATION SIGN

- A. One painted or printed sign of size, design and lettering as shown on sample provided by OWNER.
  - 1. Locate as directed by OWNER.
  - 2. Colors as indicated.

#### 1.03 QUALITY ASSURANCE

- A. Provide one electronic proof for OWNER approval prior to release for printing or painting.

### PART 2 - PRODUCTS

#### 2.01 SIGN MATERIALS

- A. Structure and framing shall be pressure treated (2) 4"x4"x10' posts.
- B. Foundation shall be two eighty pound bags of concrete per post.
- C. Sign Surfaces shall be exterior grade plywood 8 feet wide by 4 feet high with a minimum thickness of 5/8 inch.
- D. Rough Hardware: Galvanized
- E. Finishes and painting shall be adequate to resist weathering and fading for scheduled construction period.

### PART 3 - EXECUTION

#### 3.01 PROJECT IDENTIFICATION SIGN

- A. Paint exposed surfaces of supports, framing and surface material; one coat of primer and one coat of exterior paint.
- B. Paint graphics in styles, sizes and colors selected.
- C. Lettering shall be as noted.

D. Logo shall be shown as directed by OWNER.

E. Background shall be white.

3.02 SIGN LOCATION

A. Sign shall be located within the right of way or in an area approved by the OWNER.

3.03 MAINTENANCE

A. Maintain sign and supports in a neat, clean condition; repair damages to structure, framing or sign.

B. Relocate sign as required by progress of the work.

3.04 REMOVAL

A. Remove sign, framing, supports and foundations at completion of project or at direction of the ENGINEER.

END OF SECTION

SECTION 01470 - MATERIAL AND EQUIPMENT

PART 1 - GENERAL

1.01 DESCRIPTION

- A. Material and equipment incorporated into the Work.
  - 1. Conform to applicable specifications and standards.
  - 2. Comply with size, make, and type and qualify specified, or as specifically approved in writing by the ENGINEER.
  - 3. Manufactured and Fabricated Products.
    - a. Design, fabricate, and assemble in accord with the best Engineering and shop practices.
    - b. Manufacture like part of duplicate units to standard sizes and gauges, to be interchangeable.
    - c. Two 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.
  - 4. Do not use material or equipment for any purpose other than that for which it is designed or is specified.

1.02 APPROVAL OF MATERIALS

- A. Only new materials and equipment shall be incorporated in the work. All materials and equipment furnished by the CONTRACTOR shall be subject to the inspection and approval of the ENGINEER. No material shall be delivered to the work without prior approval of the ENGINEER.
- B. Within 30 days after the effective date of the Agreement, the CONTRACTOR shall submit to the ENGINEER, data relating to materials and equipment he proposes to furnish for the work. Such data shall be in sufficient detail to enable the ENGINEER to identify the particular product and to form an opinion as to its conformity to the specifications. The data shall comply with Paragraph 1.06 of this Section.
- C. Facilities and labor for handling and inspection of all materials and equipment shall be furnished by the CONTRACTOR. If the ENGINEER requires, either prior to beginning or during progress of the work, the CONTRACTOR shall submit samples of materials for such special tests as may be necessary to demonstrate that they conform to the specifications. Such samples shall be furnished, stored, packed, and shipped as directed at the CONTRACTOR's expense. Except as otherwise noted, the OWNER will make arrangements for and pay for the tests.
- D. The CONTRACTOR shall submit data and samples sufficiently early to permit work. Any delay of approval resulting from the CONTRACTOR's failure to submit samples or data promptly shall not be used as a basis of claim against the OWNER or the ENGINEER.

- E. In order to demonstrate the proficiency of workmen or to facilitate the choice among several textures, types, finishes, and surfaces, the CONTRACTOR shall provide such samples of workmanship or finish as may be required.
- F. The materials and equipment used on the work shall correspond to the approved samples or other data.

#### 1.03 MANUFACTURER'S INSTRUCTIONS FOR INSTALLATION

- A. When CONTRACT DOCUMENTS require that installation of work shall comply with manufacturer's printed instruction, obtain, and distribute copies of such instructions to parties involved in the installation, including copies to the ENGINEER.
  - 1. Maintain one set of complete instructions at the job site during installation and until completion.
- B. Handle, install, connect, clean, condition, and adjust products in strict accord with such instructions and in conformity with specified requirements.
  - 1. Should job conditions or specified requirements conflict with manufacturer's instructions, consult with ENGINEER for further instructions.
  - 2. Do not proceed with work without clear instructions.
- C. Perform work in accord with manufacturer's instructions. Do not omit any preparatory step or installation procedure unless specifically modified or exempted by CONTRACT DOCUMENTS.

#### 1.04 TRANSPORTATION AND HANDLING

- A. Arrange deliveries of Products in accord with construction 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 upon delivery, inspect shipments to assure compliance with requirements of CONTRACT DOCUMENTS and approved submittals, and that Products are properly protected and undamaged.
- B. Provide equipment and personnel to handle Products by methods to prevent soiling or damage to Products or packaging.

#### 1.05 STORAGE AND PROTECTION

- A. The CONTRACTOR shall furnish a covered, weather-protected storage structure, providing a clean, dry, noncorrosive environment for all mechanical equipment, valves, electrical and instrumentation equipment, and special equipment to be incorporated into this project. Storage of equipment shall be performed to allow easy access and be in strict accordance with the "instructions for storage" of each equipment supplier and manufacturer including weather/humidity protection, connection of heaters, placing of storage lubricants in equipment, blocking, or skid storage, etc. Corroded, damaged, or deteriorated equipment and parts shall be replaced before acceptance of the project.
- B. 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, to 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. Cement, sand, and lime shall be stored under a roof, off the ground, 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 to minimize rusting. 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. Moving parts shall be rotated a minimum of once weekly to insure proper lubrications, and to avoid metal-to-metal "welding". Upon installation of the equipment, the CONTRACTOR shall start the equipment, at least half-load, once weekly, for an adequate period of time to insure that the equipment does not deteriorate from lack of use. All materials which, in the opinion of the ENGINEER, have become so damaged as to be unfit for the use intended or specified, shall be promptly removed from the site of the work, and the CONTRACTOR shall receive no compensation for the damaged material or its removal.
- F. Arrange storage in a manner to provide easy access for inspection. Make periodic inspections of stored Products to assure that Products are maintained under specific conditions, and free from damage or deterioration.
- G. CONTRACTOR shall be responsible for protection after installation by providing substantial coverings as necessary to protect installed products from damage from traffic and subsequent construction operations.
- H. The CONTRACTOR shall be responsible for all materials, equipment, and supplies sold and delivered to the OWNER under this Contract, until final inspection of the work and acceptance thereof by the OWNER. 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 OWNER.
- I. Should the CONTRACTOR fail to take proper action on storage and handling of equipment supplied under this Contract within seven days after written notice to do so has been given, the OWNER 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.

## 1.06 PRODUCT OPTIONS

### A. Products List

1. Within 30 days after the effective date of the Agreement, submit to the ENGINEER a complete list of major products proposed to be used, with the name of the manufacturer and the installing sub-contractor.

### B. CONTRACTOR's Options

1. For Products specified only by reference standard, select any product meeting that standard.
2. For Products specified by naming several products or manufacturers, select any one of the products or manufacturers named, which complies with the specifications.
3. For products specified by naming one or more Products or Manufacturers and an "or equal", the CONTRACTOR must submit a request for substitutions of any Product or Manufacturer not specifically named.
4. Do not submit proposed substitutions for products named as No Substitutions Permitted.

## 1.07 SPECIAL TOOLS

- A. Manufacturers of equipment and machinery shall furnish any special tools (including grease guns or other lubricating devices) required for normal adjustment, operations and maintenance, together with instructions for their use. The CONTRACTOR shall preserve and deliver to the OWNER these tools and instructions in good order no later than upon completion of the Contract.

## PART 2 - PRODUCTS (NOT USED)

### 2.01 FASTENERS

- A. All necessary bolts, anchor bolts, nuts, washers, plates and bolt sleeves shall be furnished by the CONTRACTOR. Bolts shall have suitable washers and, where so required, their nuts shall be hexagonal.
- B. All bolts, anchor bolts, nuts, washers, plates, and bolt sleeves shall be Type 316 stainless steel unless otherwise specifically indicated or specified.
- C. Unless otherwise specified, stud, tap, and machine bolts shall be of the best quality refined bar iron. Hexagonal nuts of the same quality of metal as the bolts shall be used.

### 2.02 LUBRICANTS

- A. During testing and prior to acceptance, the CONTRACTOR shall furnish all lubricants necessary for the proper lubrication of all equipment furnished under this Contract.

### 2.03 GREASE, OIL AND FUEL

- A. All grease, oil, and fuel required for testing of equipment shall be furnished with the

respective equipment. The OWNER shall be furnished with a year's supply of required lubricants including grease and oil of the type recommended by the manufacturer with each item of the equipment supplied under Division 11 through 16.

- 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 weeks of operation.

## 2.04 SPARE PARTS

- A. Spare parts for certain equipment provided under Division 11 through 16 have been specified in the pertinent sections of the Specifications. The CONTRACTOR shall collect and store all spare parts so required in an area to be designated by the ENGINEER. In addition, the CONTRACTOR shall furnish to the ENGINEER 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.

## PART 3 - EXECUTION

### 3.01 PROTECTION AGAINST ELECTROLYSIS

- A. Where dissimilar metals are used in conjunction with each other, suitable insulation shall be provided between adjoining surfaces so as to eliminate direct contact and any resultant electrolysis. The insulation shall be bituminous impregnated felt, heavy bituminous coatings, nonmetallic separators, nylon neoprene or other acceptable materials.

### 3.02 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.
  - 1. Equipment shall not be shipped until approved by the ENGINEER. The intent of this requirement is to reduce on-site storage time prior to installation and/or operation. Under no circumstances shall equipment be delivered to the site more than one month prior to installation without written authorization from the ENGINEER.
  - 2. 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 ENGINEER, until such time as the equipment is to be installed.
  - 3. All equipment shall be stored fully lubricated with oil, grease, etc. unless otherwise instructed by the manufacturer.
  - 4. Manufacturer's storage instructions shall be carefully studied by the CONTRACTOR and reviewed with the ENGINEER by him. These instructions shall be carefully followed and a written record of this kept by the CONTRACTOR.
  - 5. 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-load, once weekly for an adequate period of time to insure that the equipment does not deteriorate from lack of use.

6. 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 start up, at no extra cost to the OWNER.
7. 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.

END OF SECTION

## SECTION 01480 - SUBSTITUTIONS

### PART 1 - GENERAL

#### 1.01 DESCRIPTION

- A. Furnish and install products specified and named in their respective Specifications or on the DRAWINGS unless substitution is allowed by the requirements stated in this Section.
- B. For products specified only by reference standard, select product meeting that standard, by any manufacturer.
- C. For products specified by naming several products or manufacturers, select any one of those products and manufacturers names which complies with their respective Specifications.
- D. For products specified by naming only one or more products or manufacturers and stating "or equal", submit a request as for substitutions for any product or manufacturer which is not specifically named.
- E. Requests for any substitutions not submitted in accordance with the instructions herein will be denied.

#### 1.02 PRODUCTS LIST

- A. Within 30 days after award of Contract, submit to ENGINEER five 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 catalog designation.
  - 4. Manufacturer's data:
    - a. Reference standards.
    - b. Performance test data.

#### 1.03 SUBSTITUTION SUBMITTAL REQUIREMENTS – “OR APPROVED EQUAL”

- A. Within a period of 30 days after award of Contract, ENGINEER will consider formal requests from the CONTRACTOR for substitution of products in place of those specified.
- B. 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 CONTRACTOR.
- C. Submit a separate request for each substitution. Support each request with:

1. Complete data substantiating compliance of the proposed substitution with requirements stated in the CONTRACT DOCUMENTS:
    - 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.
- D. Substitute products shall not be ordered or installed without written acceptance of ENGINEER.
- E. ENGINEER will determine the acceptability of proposed substitutions.
- 1.04 SUBSTITUTIONS WILL NOT BE CONSIDERED FOR ACCEPTANCE WHEN:
- A. They are indicated or implied on Shop DRAWINGS or product data submittals without a formal request from CONTRACTOR.
  - B. The manufacture of the product substitution does not meet the Qualifications as stated in the specifications.
  - C. They are requested directly by a subcontractor or supplier.
  - D. No data is provided relating to changes in construction schedule.
  - E. There is any effect of substitution on separate contracts.
  - F. Changes are required in other work or products.
  - G. There is no accurate cost data comparing proposed substitution with product specified.
  - H. There are required license fees or royalties above and beyond the specified vendor.

- I. Availability of maintenance services, sources of replacement materials does not equal that provided by the specified vendor.
- J. Acceptance will require substantial revision of CONTRACT DOCUMENTS.

1.05 CONTRACTOR'S REPRESENTATION

- A. In making formal request for substitution CONTRACTOR represents that:
  - 1. He has investigated proposed product and has determined that it is equal to or superior in all respects to that specified.
  - 2. He will provide the same warranties or bonds for substitution as for product specified.
  - 3. He will coordinate installation of accepted substitution into the Work, and will make such changes as may be required for the Work to be complete in all respects.
  - 4. He waives claims for additional costs caused by substitution which may subsequently become apparent.
  - 5. Cost data is complete and includes related costs under his Contract, but not:
    - a. Costs under separate contracts.
    - b. ENGINEER's costs of redesign or revision of CONTRACT DOCUMENTS.

1.06 ENGINEER DUTIES

- A. Review CONTRACTOR's requests for substitutions in accordance the Shop Drawing review requirements.
- B. Notify CONTRACTOR, in writing, of decision to accept or reject requested substitution.

1.07 SUBSTITUTION SUBMITTAL REQUIREMENTS – “NO SUBSTITUTIONS PERMITTED”

- A. CONTRACTOR may not request a substitute item or vendor/manufacturer for which the specifications indicate “No Substitutions Permitted “.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

## SECTION 01500 - CLEANING

### PART 1 - GENERAL

#### 1.01 DESCRIPTION

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

#### 1.02 DISPOSAL REQUIREMENTS

- A. Conduct cleaning and disposal operations to comply with applicable 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. The CONTRACTOR shall keep the area of the work and other areas utilized or impacted by construction in a neat and clean condition, free from any accumulation of rubbish. The CONTRACTOR shall dispose of all rubbish and waste materials of any nature occurring at the work site, and shall establish regular intervals of collection and disposal of such materials and waste. The CONTRACTOR shall also keep its haul roads free from dirt, rubbish, and unnecessary obstructions resulting from its operations.
- B. Disposal of all rubbish and surplus materials shall be off the site of construction in accordance with local codes and ordinances governing locations and methods of disposal, and in conformance with all applicable safety laws, and to the particular requirements of Part 1926 of the OSHA Safety and Health Standards for Construction.
- C. Provide on-site containers for the collection of waste materials, debris and rubbish as required.

#### 3.02 DUST ABATEMENT

- A. The CONTRACTOR shall furnish all labor, equipment, and means required and shall carry out effective measures wherever and as often as necessary to prevent its operation from producing dust in amounts damaging to property, cultivated vegetation, or domestic



animals, or causing a nuisance to persons living in or occupying buildings in the vicinity. Means for the control of dust shall include, but not be limited to, sweeping and water trucks. The CONTRACTOR shall be responsible for any damage resulting from any dust originating from its operations. The dust abatement measures shall be continued until the CONTRACTOR is relieved of further responsibility by the ENGINEER.

### 3.03 FINAL CLEANING

- A. Remove temporary protection and facilities installed for protection of the Work during construction.
- B. Comply with regulations of authorities having jurisdiction and safety standards for cleaning. Do not burn waste materials. Do not bury debris or excess materials on the OWNER's property. Do not discharge volatile, harmful or dangerous materials into drainage systems. Remove waste materials from the site and dispose of in a lawful manner.
- C. Where extra materials of value remaining after completion of associated Work have become the OWNER's property, arrange for disposition of these materials as directed.

END OF SECTION

SECTION 01720 - PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.01 DESCRIPTION

- A. This Section includes the requirements for maintaining, recording and submitting Project Record Documents including, but not limited to,
  - 1. Record DRAWINGS or As-Built DRAWINGS
  - 2. Record Specifications and other CONTRACT DOCUMENTS
  - 3. Record Samples, Shop DRAWINGS or Record Product Data

1.02 MAINTENANCE OF DOCUMENTS AND SAMPLES

- A. Maintain at the site for the OWNER and ENGINEERs review one record copy of:
  - 1. DRAWINGS
  - 2. Specifications
  - 3. Addenda
  - 4. Change Orders and other Modifications to the Contract
  - 5. ENGINEER's Field Orders or Written Instructions
  - 6. Approved Shop DRAWINGS, Working DRAWINGS, and Samples
  - 7. Field Test Reports
  - 8. Construction Photographs
- B. Store Record Documents in the CONTRACTOR's field office apart from documents used for construction.
- C. File Record Documents in accordance with the CSI format number system utilized in the CONTRACT DOCUMENTS.
- D. Maintain Record Documents in a clean, dry, legible condition and in good order. Do not use Record Documents for construction purposes.
- E. Make Record Documents available at all times for inspection by the ENGINEER.
- F. As a prerequisite for monthly progress payments, the CONTRACTOR is to exhibit the currently updated Record Documents for review by the ENGINEER and the OWNER.

1.03 RECORDING

- A. Record DRAWINGS:

1. Maintain a clean, undamaged set of prints of Contract DRAWINGS to serve as the project Record DRAWINGS.
  2. Label each sheet "RECORD DRAWING" in neat large printed letters with red erasable pencil; use other colors to distinguish between variations in separate categories of the Work.
  3. The Record DRAWINGS shall be presented at the same scale as the Contract DRAWINGS.
  4. The Record DRAWINGS shall correctly and accurately show all changes from the Contract DRAWINGS made during construction.
  5. All information shall be verified and certified by an independent Professional Surveyor and Mapper registered in the State of Florida.
  6. All vertical information shall be provided in the datum indicated in the Contract DRAWINGS.
  7. Horizontal and vertical locations referenced to base-line or permanent surface improvements.
  8. Mark whichever drawing is most capable of showing conditions fully and accurately; where Shop DRAWINGS are used, record a cross reference at the corresponding location on the Record DRAWINGS.
  9. Give particular attention to concealed elements that would be difficult to measure and record at a later date.
  10. Mark new information that was not shown on Contract DRAWINGS or Shop DRAWINGS.
  11. Note related Change Order numbers where applicable.
  12. Organize Record Drawing sheets into manageable sets, bind with durable paper cover sheets, and print suitable titles, dates and other identification on the cover of each set.
  13. Do not use Record DRAWINGS for construction purposes.
  14. Record information concurrently with construction progress.
- B. The Record DRAWINGS shall be neat and legible including the following:
1. Above ground piping and equipment:
    - a. All equipment locations, dimensions and elevations as indicated in the Contract DRAWINGS.
    - b. All building and tank locations, dimensions and elevations as indicated in the Contract DRAWINGS.
    - c. All above ground piping size, material, class, lengths, dimensions, and elevations as indicated in the Contract DRAWINGS.

- d. Horizontal locations of piping, fittings, valves and appurtenances.
  - e. Elevations of the top of pipe, fittings, valves and appurtenances.as indicated in the Contract DRAWINGS and at 50' maximum increments
  - f. All changes from the original design.
- 2. Underground pressure pipe including potable water mains sanitary sewer force mains, drainage force mains and the like:
  - a. All piping size, material, class, lengths, dimensions, bury depth and elevations as indicated in the Contract DRAWINGS.
  - b. Horizontal locations of piping, fittings, valves and appurtenances.
  - c. Elevations of the top of pipe, fittings, valves and appurtenances.
  - d. Elevations as indicated in the Contract DRAWINGS and at 50' maximum increments
  - e. Lengths of restrained pipe.
  - f. Water service locations.
  - g. Meter sizes.
  - h. All changes from the original design.
- 3. Gravity sanitary sewer:
  - a. All piping size, material, class, lengths, slopes, dimensions and elevations as indicated in the Contract DRAWINGS.
  - b. Horizontal locations of manholes.
  - c. Rim, invert, and size of all manholes.
  - d. Service terminal end locations.
  - e. Wet well construction including diameter, bottom, invert and float elevations.
  - f. All changes to piping from the original design.
- 4. Stormwater Drainage:
  - a. All piping size, material, class, lengths, dimensions and elevations as indicated in the Contract DRAWINGS.
  - b. Horizontal locations of manholes and catch basins.
  - c. Rim, invert, bottom elevations and size of all manholes and catch basins.
  - d. All surface elevations indicated on the Contract DRAWINGS including, but not limited to, swales, berms, yards, sidewalks, and the like.

- e. Horizontal location and elevation of all storm water retention or detention areas.
  - f. All changes from the original design.
5. Limerock base:
- a. Upon completion of all underground utilities and limerock base, and before placement of asphalt, provide the following for ENGINEER review:
    - 1) Finished limerock base elevations taken at the location of finished asphalt elevations as indicated in the Contract DRAWINGS.
    - 2) Additional elevations as required by the ENGINEER, including, but not limited to:
      - (a) Finished limerock base at centerline, edge of median and edge of pavement.
      - (b) Back of sidewalk or right of way.
      - (c) Bottom of swale or flow line of gutter.
      - (d) Top of curb.
      - (e) High points, low points and grade breaks.
      - (f) Intersections.
6. Electrical, instrumentation and controls
- a. Horizontal location of all electrical equipment and control cabinetry.
  - b. Elevations of the bottom of all electrical and control panels.
  - c. Horizontal location and elevation of all conduits including conduit size, route and wire size.
  - d. Horizontal location of all light poles and junction boxes.
7. Miscellaneous:
- a. Horizontal location and elevation of all concrete slabs.
  - b. Horizontal location, size and material of all fencing.
  - c. Location size and material of all existing utilities whether indicated on the Contract DRAWINGS or not.
  - d. Location of internal utilities and appurtenances concealed in the construction, referenced to visible and accessible features of the structure.
  - e. Depths of various elements of foundation in relation to finish first floor datum.
  - f. Field changes of dimensions and details.
  - g. Details not on original contract DRAWINGS.
- C. Record Specifications: Maintain one complete copy of the Project Manual, including addenda, and one copy of other written construction documents such as Change Orders and modifications issued in printed form during construction.

1. Mark these documents to show substantial variations in actual Work performed in comparison with the text of the Specifications and modifications.
  2. Give particular attention to substitutions, selection of options and similar information on elements that are concealed or cannot otherwise be readily discerned later by direct observation.
  3. Note related record drawing information and Product Data.
  4. Manufacturer, trade name, catalog number, and supplier of each product and item of equipment actually installed.
  5. Changes made by field order or by Change Order.
- D. Record Product Data (Shop DRAWINGS): Maintain one copy of each Product Data submittal.
1. Mark these documents to show significant variations in actual Work performed in comparison with information submitted. Include variations in products delivered to the site, and from the manufacturer's installation instructions and recommendations.
  2. Give particular attention to concealed products and portions of the work which cannot otherwise be readily discerned later by direct observation.
  3. Note related Change Orders and mark-up of record DRAWINGS and Specifications.
- E. Record Sample Submitted: Immediately prior to the date or dates of Substantial Completion, the CONTRACTOR will meet at the site with the ENGINEER and the OWNER to determine which of the submitted Samples that have been maintained during progress of the Work are to be transmitted to the OWNER for record purposes. Comply with delivery to the OWNER's Sample storage area.
- F. Miscellaneous Record Submittals: Refer to other Specification Sections for requirements of miscellaneous record-keeping and submittals in connection with actual performance of the Work.
- 1.04 SUBMITTAL
- A. Project Record Documents, demonstrating construction progress, shall be submitted with each Application for Payment.
- B. Interim Project Record DRAWINGS shall be submitted at significant project milestones including:
1. Construction of wet well or other structures.
  2. Construction of catch basins, manholes, pipes and appurtenances.
  3. As required by the ENGINEER.
- C. Project Record Documents, demonstrating construction completion shall be submitted with the balance of Closeout documents at the conclusion of construction including:

1. Three sets of signed and sealed sets of prints.
  2. One compact disc copy of record DRAWINGS in Autocad format.
- D. Accompany submittals 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

## SECTION 01740 - WARRANTIES

### PART 1 - GENERAL

#### 1.01 SPECIFICATION INCLUDES

- A. Compile warranties and bonds as specified in the CONTRACT DOCUMENTS.
- B. Co-execute submittals when so specified.
- C. Review submittals to verify compliance with CONTRACT DOCUMENTS.
- D. Submit to the ENGINEER for review and transmittal to OWNER.

#### 1.02 SUBMITTAL REQUIREMENTS

- A. Assemble warranties, bond, 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 or 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 OWNER'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 x 11 inches, punch sheets for standard 3-post binder
  - 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-post (3) binder, with durable and cleanable plastic covers and maximum post width of 2 inches.

#### 1.04 WARRANTY SUBMITTAL REQUIREMENTS

- A. For all equipment, submit a one-year warranty from the equipment manufacturer, unless otherwise specified. The manufacturer's warranty period shall be concurrent with the CONTRACTOR's for one year commencing at the time of acceptance by the OWNER.
- B. The CONTRACTOR shall be responsible for obtaining certificates for equipment warranty for all major equipment and which has a 1 HP motor or which lists for more than \$1,000. The ENGINEER 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-year warranty commencing at the time of OWNER acceptance, 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-year (2) warranty from the manufacturer shall not relieve the CONTRACTOR of the one-year warranty starting at the time of OWNER acceptance of the equipment.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01750 - CONTRACT CLOSEOUT

PART 1 - GENERAL

1.01 DESCRIPTION

- A. Administrative and procedural requirements for project closeout.
  - 1. Inspection procedures.
  - 2. Project Record Document submittal.
  - 3. Final cleaning.
- B. Warranty and bond submittal.
- C. Closeout submittals, warranties and bonds required for specific products of work.

1.02 SUBSTANTIAL COMPLETION

- A. Before requesting inspection for certification of Substantial Completion, complete the following. List exceptions in the request.
  - 1. If 100 percent completion cannot be shown, include a list of incomplete items, the value of incomplete construction, and reasons the Work is not complete.
  - 2. Advise OWNER of pending insurance change-over requirements.
  - 3. Submit specific warranties, workmanship bonds, maintenance agreements, final certifications and similar documents.
  - 4. Obtain and submit releases enabling the OWNER unrestricted use of the Work and access to services and utilities; include occupancy permits, operating certificates and similar releases.
  - 5. Submit record DRAWINGS, maintenance manuals, and similar final record information.
  - 6. Complete start-up testing of systems, and instruction of the OWNER's operating and maintenance personnel. Discontinue or change over and remove temporary facilities from the site, along with construction tools, mock-ups, and similar elements.
- B. When the CONTRACTOR considers the Work to be substantially complete, he shall submit a written notice to the ENGINEER that the Work, or designated portion of the Work, is complete and ready for inspection.
- C. Within a reasonable time of receipt of a request for inspection, the ENGINEER will either proceed with inspection or advise the CONTRACTOR of unfulfilled requirements. When the ENGINEER and OWNER concur that the Work, or designated portion of the Work, is substantially complete, the ENGINEER will prepare the Certificate of Substantial Completion following inspection.

- D. Should the ENGINEER determine that the Work is not substantially complete, he will advise the CONTRACTOR of construction that must be completed or corrected before the certificate will be issued.
  - 1. The ENGINEER will repeat inspection when requested and assured that the Work has been substantially completed.
  - 2. Results of the completed inspection will form the basis of requirements for final acceptance.

### 1.03 FINAL COMPLETION

- A. When CONTRACTOR considers the Work to be complete, he shall submit written certification to the ENGINEER that the Work is completed and ready for final inspection. Include the following:
  - 1. Submit the final payment request with releases and supporting documentation not previously submitted and accepted. Include certificates of insurance for products and completed operations where required.
  - 2. Submit an updated final statement, accounting for final additional changes to the Contract Sum.
  - 3. Submit a certified copy of the ENGINEER's final inspection list of items to be completed or corrected, stating that each item has been completed or otherwise resolved for acceptance, the list has been endorsed and dated by the ENGINEER.
  - 4. Submit final meter readings for utilities, a measured record of stored fuel, and similar data as of the date of Substantial Completion, or when the OWNER took possession of and responsibility for corresponding elements of the Work.
  - 5. Submit consent of surety to final payment.
  - 6. Submit evidence of final, continuing insurance coverage complying with insurance requirements.
  - 7. Submit final record documents.
- B. The ENGINEER will inspect the Work upon receipt of notice that the Work, including inspection list items from earlier inspections, has been completed, except items whose completion has been delayed because of circumstances acceptable to the ENGINEER.
  - 1. Upon completion of inspection, the ENGINEER will prepare a certificate of final acceptance, or advise the CONTRACTOR of Work that is incomplete, or of obligations that have not been fulfilled but are required for final acceptance.
  - 2. If necessary, re-inspection process will be repeated.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

END OF SECTION

## SECTION 02760 – MAINLINE CURED-IN-PLACE PIPE (CIPP) LINING

### PART 1 - GENERAL

#### 1.01 SPECIFICATION INCLUDES

- A. It is the intent of these SPECIFICATIONS to provide for the reconstruction of pipelines and conduits by the installation of a resin-impregnated flexible tube which is formed to the original conduit by use of a hydrostatic head. The resin is cured using hot water under hydrostatic pressure within the tube. The Cured-In-Place Pipe (CIPP) will be continuous and tight fitting.
- B. The finished pipe in place shall be fabricated from materials which when cured will be chemically resistant to withstand internal exposure to domestic sewage.
- C. An end-seal shall be provided at the liner/manhole interphase on both ends of each segment of lined mainline.
- D. Point repairs shall be performed as required at the direction of the ENGINEER.
- E. All manholes shall be rehabilitated according to these SPECIFICATIONS.
- F. Chemical grouting shall be on an as-needed basis as directed by the ENGINEER and in accordance with these SPECIFICATIONS.
- G. Portions of the WORK may take place on private property.
- H. The WORK specified shall include all labor, materials, accessories, equipment and tools necessary to install and test cured-in-place pipe lining in main lines.

#### 1.02 REFERENCE STANDARDS

- A. ASTM F1216 - Rehabilitation of Existing Pipelines and Conduits by the Inversion and Curing of a Resin-Impregnated Tube.

#### 1.03 SUBMITTALS

- A. The CONTRACTOR shall submit shop drawings and other information to the ENGINEER for review in accordance with these SPECIFICATIONS, Including the following:
  - 1. Details on all proposed lining materials and resins including the name of resin supplier and liner fabric supplier and Manufacturer's or Assembler's certification that the liner materials are in compliance with these Specifications, and the codes and standards

referenced herein.

2. Certification showing that the proposed installers are currently licensed by the manufacturer to install the products referenced in this Specification.
3. The Contractor shall submit resumes of all project managers' superintendents, foreman and crew proposed to be on this project in accordance with the bid form. Key personnel, including project managers, superintendents and foreman must have at least five (5) years collective experience each to be considered.
4. Manufacture's or assembler's guidelines for storage procedures and temperature control, handling and inserting the liner, curing requirements and details, service connection methods, and trimming and finishing.
5. Manufacture's or assembler's guidelines for minimum and maximum pressures, temperatures, and time duration to be used during liner inversion, cure, pressure relief and cool down.
6. Data on Contractor's monitoring equipment to be used during curing: type and tolerance of temperature gages and thermocouples.
7. Manufacture's or Assembler's guidelines for factory and/or field (whichever applies) wet out procedures including: volume of resin per unit of liner, roller gap setting, mixing ratios and procedures for resin and catalyst/hardener, shelf life of resin, pot life of resin, and required wet out procedure to ensure full saturation.
8. An emergency response plan to be followed in the event of a sewage spill or back-up.
9. Structural calculations per ASTM F1216, Appendix X.1 for fully deteriorated gravity pipe signed and sealed by a Florida Registered Engineer.

#### 1.04 PRODUCT AND INSTALLER QUALIFICATIONS

- A. Products seeking approval must meet all of the following criteria to be deemed commercially acceptable. For a product to be considered commercially proven, a minimum of 1,000,000 linear feet of manhole-to-manhole line sections successfully installed in wastewater collection system i in the U.S. must be documented to the satisfaction of the CITY to assure commercial viability. In addition, at least 500,000 linear feet of the product shall have been in successful service within the State of Florida for a minimum of five years.
- B. The installer and installer's personnel must be certified by the product manufacturer for the installation of his product and must have had at least five (5) years active experience in the installation of the product in Florida. In addition, the installer must have successfully installed a minimum quantity of material as stated above.
- C. The installer must own and operate a permanent facility to impregnate the CIPP tubes (wet-out facility) within the State of Florida. All CIPP liners used on this project shall be impregnated at this facility only. No pre-impregnated CIPP products will be accepted from a third-party vendor. The facility shall be open to inspection by the ENGINEER prior to the Notice to Proceed.

- D. Certified material testing data must be provided by an independent testing company demonstrating conformance to ASTM 1216 Table 1, both initial and long term, as well as chemical resistance properties in Appendix X2.
- E. The manufacturer of the resin, the manufacturer of the liner and installer shall operate under a quality management system which is third-party certified to ISO 9001. Proof of certification shall be required for approval.
- F. The installer must provide resumes of key personnel including the project manager, superintendent and technicians demonstrating a minimum of five (5) years active experience in the installation of the specified product in high groundwater conditions.
- G. The CONTRACTOR's key personnel must hold a Pipeline Assessment Certification Program (PACP) certificate as issued by the National Association of Sewer Service Companies (NASSCO).

## PART 2 - PRODUCTS

### 2.01 CIPP TUBE

- A. The sewn tube shall consist of one or more layers of flexible needled felt or absorbent non-woven felt fabric and meet the requirements of ASTM F1216, Section 5. The tube shall be constructed to withstand installation pressures, have sufficient strength to bridge missing pipe, and stretch to fit irregular pipe sections.
- B. The sewn tube shall consist of one or more layers of absorbent non-woven felt fabric and meet the requirements of ASTM F1216 or ASTM F1743, Section 5. The tube shall be constructed to withstand installation pressures, have sufficient strength to bridge missing pipe, and stretch to fit irregular pipe sections.
- C. The wetout tube shall have a uniform thickness that when compressed at installation pressures will meet or exceed the Design thickness.
- D. The tube shall be sewn to a size that when installed will tightly fit the internal circumference and length of the original pipe. Allowance should be made for circumferential stretching during inversion. Overlapped layers of felt in longitudinal seams that cause lumps in the final product shall not be utilized.
- E. The outside layer of the tube (before wetout) shall be coated with an impermeable, flexible membrane that will contain the resin and facilitate monitoring of resin saturation during the resin impregnation (wetout) procedure.
- F. The tube shall be homogeneous across the entire wall thickness containing no intermediate or encapsulated elastomeric layers. No material shall be included in the tube that may cause delamination in the cured CIPP. No dry or unsaturated layers shall

be evident.

- G. The wall color of the interior pipe surface of CIPP after installation shall be a light reflective color so that a clear detailed examination with closed circuit television inspection equipment may be made.
- H. Seams in the tube shall be stronger than the unseamed felt.
- I. The outside of the tube shall be marked for distance at regular intervals along its entire length, not to exceed 5 ft. Such markings shall include the Manufacturers name or identifying symbol. The tubes must be manufactured in the USA.

## 2.02 CIPP RESIN

- A. Resin - The resin system shall be polyester that when properly cured within the tube composite meets the requirements of ASTM F1216. The resin shall produce CIPP which will comply with the structural and chemical resistance requirements of these SPECIFICATIONS and ASTM D3681.

## 2.03 STRUCTURAL REQUIREMENTS

- A. The CIPP shall be designed as per ASTM F1216, fully deteriorated gravity pipe conditions and shall a nominal thickness not less than the following:

<b>Inside Diameter of Original Pipe (inches)</b>	<b>Nominal CIPP Thickness (mm)</b>
8	6
10	6
12	7.5
15	9

- B. The CIPP design shall assume no bonding to the original pipe wall.
- C. The CONTRACTOR must have performed long-term testing for flexural creep of the CIPP pipe material installed by his company. Such testing results are to be used to determine the Long-term, time dependent flexural modulus to be utilized in the product design. This is a performance test of the materials (tube and resin) and general workmanship of the installation and curing. A percentage of the instantaneous flexural modulus value (as measured by ASTM D-790 testing) will be used in design calculations for external buckling. The percentage, or the long-term creep retention value utilized, will be verified by this testing. Values in excess of 50% will not be applied unless substantiated by qualified third party test data. The materials utilized for the contracted project shall be of a quality equal to or better than the materials used in the long-term test with respect to the initial flexural modulus used in design.
- D. The layers of the cured CIPP shall be uniformly bonded. It shall not be possible to separate any two layers with a probe or point of a knife blade so that the layers separate



cleanly or the probe or knife blade moves freely between the layers. If separation of the layers occur during testing of field samples, new samples will be cut from the work. Any reoccurrence may cause rejection of the work.

- E. The cured pipe material (CIPP) shall conform to the structural properties, as listed below:

<b>MINIMUM PHYSICAL PROPERTIES</b>		
<b>Property</b>	<b>Test Method</b>	<b>Cured Composite (min)</b>
Modulus of Elasticity	ASTM D-790 (initial)	250,000 psi
Flexural Stress	ASTM D-790	4,500 psi

- F. The required structural CIPP wall thickness shall be based at a minimum, on the physical properties described above and in accordance with the design equations in the appendix of ASTM F 1216, and the following design parameters:

Design Safety Factor	2.0
Retention Factor for Long-Term Flexural Modulus to be used in Design <i>(as determined by Long-Term tests described in paragraph 2.02.B)</i>	50 %
Ovality*	2 %
Groundwater Depth = Pipe Depth (above invert)*	ft.
Soil Depth (above crown)*	ft.
Soil Modulus	700 psi
Soil Density	120 pcf
Live Load	Two H20 passing trucks
Design Condition	Fully deteriorated
<i>*Denotes information which can be provided here or in inspection video tapes or project construction plans. Multiple line segments may require a table of values.</i>	

- G. Any layers of the tube that are not saturated with resin prior to insertion into the existing pipe shall not be included in the structural CIPP wall thickness computation.
- H. The lining manufacturer shall submit to the ENGINEER for review complete design calculations for the liner, signed and sealed by a Professional ENGINEER registered in the State of Florida and certified by the manufacturer as to the compliance of his materials to the values used in the calculations. A safety factor of 2 shall be applied in the design calculation. The host pipe shall be considered fully deteriorated. The liner shall be designed to withstand a live load equivalent to two H-20 passing trucks plus all pertinent dead loads, hydrostatic pressure and grout pressure (if any). For design purposes, the water table shall be considered at grade elevation. The liner shall be designed in accordance with ASTM F 1216. The buckling analysis shall account for the combination of dead load, live load, hydrostatic pressure and grout pressure (if any). The liner side support shall be considered as if provided by soil pressure against the liner. The existing pipe shall not be considered as providing any structural support. Modulus of soil reaction shall be 700, corresponding to a moderate degree of compaction of bedding and a fine-grained soil as shown in AWWA Manual M45, Fiberglass Pipe Design.
- I. Because of the nature of the calculations and constants utilized, the minimum liner

thicknesses shall be 5 percent greater than the amount specified.

- J. As part of the design calculation submittal, the liner manufacturer shall submit a tabulation of time versus temperature. This tabulation shall show the lengths of time that exposed portions of the liner will endure without self-initiated cure or other deterioration beginning. This tabulation shall be at five degree Fahrenheit increments ranging from 70 degrees F to 100 degrees F. The manufacturer shall also submit his analysis of the progressive effects of such "pre-cure" on the insertion and cured properties of the liner. This information shall be submitted in a timely fashion prior to the preconstruction conference so that the ENGINEER may set procedures for dealing with such an instance caused by construction delays. The minimum liner thicknesses are for materials with characteristics as shown.
- K. Liner shall be neither accepted nor installed until design calculations are acceptable to the ENGINEER.
- L. Testing Requirements
  - 1. The CIPP shall meet the chemical resistance requirements of ASTM F1216, Appendix X2. CIPP samples for testing shall be of tube and resin system similar to that proposed for actual construction. It is required that CIPP samples with and without plastic coating meet these chemical testing requirements.
  - 2. Hydraulic Capacity - Overall, the hydraulic profile shall be maintained as large as possible. The CIPP shall have a minimum of the full flow capacity of the original pipe before rehabilitation. Calculated capacities may be derived using a commonly accepted roughness coefficient for the existing pipe material taking into consideration its age and condition.
  - 3. CIPP Field Samples - When requested by the CITY, the CONTRACTOR shall submit test results from field installations in the USA of the same resin system and tube materials as proposed for the actual installation. These test results must verify that the CIPP physical properties specified in Section 2.2.4 have been achieved in previous field applications.
  - 4. CIPP samples shall be prepared and physical properties tested in accordance with ASTM F1216 or ASTM F1743, Section 8, using either method proposed. The flexural properties must meet or exceed the values listed in Table 1 of the applicable ASTM.
  - 5. Wall thickness of samples shall be determined as described in paragraph 8.1.6 of ASTM F1743. The minimum wall thickness at any point shall not be less than 87.5% of the design thickness as calculated in these SPECIFICATIONS.
  - 6. Visual inspection of the CIPP shall be in accordance with ASTM F1743, Section 8.6.
  - 7. CIPP mainline may require leakage testing in accordance with ASTM F-1216 paragraph 8.2.

## 2.04 END SEALS

- A. An end-seal shall be provided at the liner/manhole interphase on both ends of each segment of lined mainline.
  - 1. End seals may one of the following:
    - a. Full circumference, seamless molded hydrophilic material by LMK Insignia.
    - b. Full circumference, seamless molded hydrophilic material by Perma-Liner Industries, Inc.
    - c. Full circumference, 316L stainless steel with EPDM gasket by Pipeline Renewal Technologies Quick Lock end caps ASTM F3310 rated.
    - d. No substitutions permitted.

## PART 3 - EXECUTION

### 3.01 UTILITY ACCESS

- A. The Contractor may have free access to fire hydrants for cleaning, inversion and other work items requiring water at no cost. However, a hydrant meter and backflow assembly must be installed by the Contractor at each location. The City shall provide the hydrant meter and backflow assembly.
- B. The Contractor may have free access to all manholes in the City WORK area. The Contractor shall coordinate work with the OWNER and Engineer for mutually agreed upon time periods to minimize impact to the public.
  - 1. Some manholes may be in the rear yards of private property. The CONTRACTOR shall work with the CITY to gain access to private property. The CONTRACTOR shall minimize impacts to private property and be required to fully restore all impacts.
- C. It shall be the responsibility of the contractor to locate and designate all manhole access points, verify that they are open and accessible for the Work, and arrange access to these points. The CONTRACTOR shall notify the ENGINEER and the CITY of access points that cannot be opened due to obstruction by permanent structures.

### 3.02 MAINTENANCE OF TRAFFIC

- A. The contractor shall be responsible for all Maintenance of Traffic (MOT) requirements. On CITY streets, the CONTRACTOR shall provide MOT devices as necessary to comply with regulatory requirements. On State roads, the Contractor and shall provide MOT plans obtain the required FDOT permits. The Contractor shall be required to modify any MOT deemed necessary by the ENGINEER OR THE CITY.

- B. All MOT plans shall be prepared by a Certified MOT contractor.

### 3.03 CLEANING/SURFACE PREPARATION

- A. It shall be the responsibility of the CONTRACTOR to clean the pipeline with a high-pressure water jet and to remove all internal debris out of the pipeline in accordance with these SPECIFICATIONS.

### 3.04 BYPASS SEWAGE FLOW CONTROL

- A. The Contractor shall provide for the flow of sewage around the section or sections of sewer mainlines and laterals designated for repair. The pump and bypass lines shall be of adequate capacity and size to handle the flow. The Engineer may require a detail of the bypass plan to be submitted. If the CIPP liner installation fails, the Contractor shall be responsible for operating the bypass pumping equipment for the additional time required until the installation can be completed.
- B. The Contractor shall be responsible for any sewage back-up into residences, streets or yards including clean-up, fines, legal, engineering and administrative costs.
- C. The Contractor shall indemnify and hold harmless the ENGINEER and the CITY for any fines or third-party claims for personal or property damage arising out of a sewage spill or overflow as a result activities on this project.

### 3.05 PUBLIC NOTIFICATION

- A. The Contractor shall make every effort to maintain service usage throughout the duration of the project. In the event that a residential lateral will be out of service, the maximum amount of time of no service shall be 8 hours for any property served by the sewer. Commercial and multi-family laterals will require full service without interruption unless approved by the Engineer. A public notification program shall be implemented, and shall as a minimum, require the Contractor to be responsible for contacting each home or business connected to the sanitary sewer and informing them of the work to be conducted and when the sewer will be off-line. The Contractor shall also provide the following:
- B. Written notice to be delivered to each home or business the day prior to the beginning of work being conducted on the section, and a local telephone number of the Contractor they can call to discuss the project or any problem which could arise.
- C. Personal contact with any home or business, which cannot be reconnected within the time stated in the written notice.

### 3.06 INSPECTION

- A. A pre-installation video inspection shall be performed on each sewer mainline and lateral and shall be performed by experienced personnel trained in locating breaks, obstacles

and service connections by close circuit television using a pan and tilt camera. The interior of the mainline and lateral shall be carefully inspected to determine the location of any conditions which may prevent proper installation. If pre-installation inspection reveals an obstruction such as a protruding service connection, dropped joint, conflicting utility or a collapse that will prevent the inversion process or that cannot be removed by conventional sewer cleaning equipment, then the Contractor shall make a point repair excavation to uncover, remove and repair the obstructed section. Such excavation shall be approved in writing by the Engineer prior to the commencement of the work and shall be considered as a separate pay item based on the unit price schedule contained in the bid form. The video tape and suitable log shall be given to the Engineers representative.

### 3.07 SEWER REPAIRS

- A. Any protruding pieces of concrete, dropped joints or broken pipe shall be subjected to point repairs, so that the pipe is left in a clean smooth condition in all respects ready for lining.
- B. If conditions such as broken pipe and major blockages are found that will prevent proper cleaning, or where additional damage would result if cleaning is attempted or continued, the CONTRACTOR, with the concurrence of the ENGINEER, shall perform the necessary point repair(s), and then complete the cleaning.

### 3.08 CHEMICAL GROUTING

- A. Chemical grouting shall be on an as-needed basis as directed by the ENGINEER and in accordance with these SPECIFICATIONS.

### 3.09 INSTALLATION

- A. The prepared pipe shall be available for inspection and be acceptable to the ENGINEER for cleanliness and smoothness before the CONTRACTOR begins to line the pipe.
- B. The Contractor shall measure the inside diameter of each mainline to be lined prior to manufacture of each tube segment.
- C. Temperature gauges shall be placed inside the tube at the beginning, middle and end of each segment to monitor the temperatures during the cure cycle. Any CIPP segment which does not maintain the minimum temperatures in accordance with the manufacturer's recommendations throughout the curing process, as monitored by the gauges, may be rejected.
- D. The CONTRACTOR shall immediately notify the ENGINEER of any construction delays taking place during the insertion operation. Such delays shall possibly require sampling and testing by an independent laboratory of portions of the cured liner at the ENGINEER's discretion. The cost of such test shall be borne by the CONTRACTOR and no extra compensation will be allowed. Any failure of sample tests or a lack of immediate notification of delay shall be automatic cause for rejection of that part of the work at the ENGINEER's discretion.

- E. The CONTRACTOR shall designate a location where the tube will be vacuum impregnated prior to installation. The CONTRACTOR shall allow the CITY to inspect the materials and the "wet-out" procedure.
- F. The Contractor shall be responsible for confirming the locations of all branch service connections prior to installing and curing the CIPP.
- G. All resin shall be contained to ensure no public property or persons are exposed to the liquid resin.
- H. Curing shall be accomplished by utilizing hot water under hydrostatic pressure in accordance with the manufacturer's recommended cure schedule. The use of steam for curing will not be allowed.
- I. Initial cure shall be deemed complete when the exposed portions of the tube appear to be hard and sound and the temperature sensor indicates that the temperature is of a magnitude to realize an exotherm. The cure period shall be of a duration recommended by the resin manufacturer and may require continuous recirculation of the water to maintain the temperature.
- J. Resin Impregnation: The quantity of resin used for tube impregnation shall be sufficient to fill the volume of air voids in the tube with additional allowances for polymerization shrinkage and the loss of resin through cracks and irregularities in the original pipe wall. A vacuum impregnation process shall be used. To insure thorough resin saturation throughout the length of the felt tube, the point of vacuum shall be no further than 25 feet from the point of initial resin introduction. After vacuum in the tube is established, a vacuum point shall be no further than 75 feet from the leading edge of the resin. The leading edge of the resin slug shall be as near to perpendicular as possible. A roller system shall be used to uniformly distribute the resin throughout the tube. If the Installer uses an alternate method of resin impregnation, the method must produce the same results. Any alternate resin impregnation method must be proven.
- K. Temperature gauges shall be placed inside the tube at the invert level of each end to monitor the temperatures during the cure cycle.
- L. Curing shall be accomplished by utilizing hot water under hydrostatic pressure in accordance with the manufacturer's recommended cure schedule.
- M. Cooldown: The CONTRACTOR shall cool the hardened pipe to a temperature below 100 F before relieving the hydrostatic head. Cooldown may be accomplished by the introduction of cool water into the inversion standpipe to replace water being pumped out of the manhole.
- N. The finished product shall be continuous over the length of pipe reconstructed and be free from dry spots, delamination and lifts. The installer shall document the placement of the liner by internal video inspection with the camera being inserted from the lateral pipe down to the mainline pipe.

- O. Pipe entries and exists shall be smooth, free of irregularities, and watertight. No visible leaks shall be present.

### 3.10 REINSTATEMENT OF BRANCH CONNECTIONS

- A. It is the intent of these Specifications that branch connections to buildings be reopened without excavation, utilizing a remote controlled cutting device, monitored by a video TV camera. The Contractor shall certify he has a minimum of 2 complete working cutters plus spare key components on the site before each inversion. Unless otherwise directed by the Engineer all laterals will be reinstated. No additional payment will be made for excavations for the purpose of reopening connections and the Contractor will be responsible for all costs and liability associated with such excavation and restoration work.
- B. The Contractor shall locate the service connections from inside the lined pipe, cut a hole matching the connection diameter, free from burrs, loose or abraded material, hanging fibers or projections, and with a neat, smooth and crack-free edge. The hole shall be 95 percent minimum and 100 percent maximum of the original service connection diameter. The invert of the service connection shall match the bottom of the reinstated service opening.
- C. Reconnection of service shall be within four hours after liner insertion. The Contractor shall initially reopen each connection in an expeditious manner with a less than a full size opening to release wastewater temporarily stored in the service lateral. The Contractor shall then complete reconnection of all service a within 24 hours. The Contractor shall immediately reopen any missed connections and repair any hole drilled in error. Faulty cuts shall be repaired by methods approved by the Engineer.z
- D. After the pipe has been cured in place, the CONTRACTOR shall reconnect the existing service connections. This shall be done from the interior of the pipeline without excavation using a robotic cutter. Where holes are cut through the liner, they shall be neat and smooth in order to prevent blockage at the service connections. Cut-in service connections shall be opened to a minimum of 95 percent of the flow capacity of the building sewer. Cuts shall be wire-brushed to remove jagged edges. All coupons shall be recovered at the downstream manhole and removed. The CONTRACTOR shall stop all visible leaks, including at service connections as required. All reinstated service lateral connections (between the liner and the existing pipe) shall be grouted. The reinstatement of the service connections shall be a separate pay item. The CONTRACTOR should not reactivate any line sections until accepted by the ENGINEER.
- E. No additional payment will be made for excavations for the purpose of reopening connections and the CONTRACTOR will be responsible for all costs and liability associated with such excavation and restoration work.

### 3.11 TIME OF CONSTRUCTION:

- A. Construction schedules will be submitted and approved by the ENGINEER. At no time will any service lateral remain inoperative for more than an eight (8)-hour period. Any service that will be out of service for more than eight (8) hours will be temporarily by-passed into a mainline sanitary sewer. This will be done at the CONTRACTOR's expense.

3.12 ACCEPTANCE

- A. The finished liner shall be continuous over the entire length of the installation. The liner shall be free from visual defects, damage, deflection, holes, delamination, uncured resin, and the like. There shall be no visible infiltration through the liner or from behind the liner at manholes and service connections. Cut-ins and attachments at service connections shall be neat and smooth.

3.13 CLEANUP

- A. After the liner installation has been completed and accepted, the CONTRACTOR shall cleanup the entire project area and return the ground cover to the original or better condition. All excess material and debris not incorporated into the permanent installation shall be disposed of by the CONTRACTOR.

3.14 CLOSED CIRCUIT TELEVISION (CCTV) SURVEY

- A. Television survey, including Preconstruction Surveys, Post Construction Survey, and Warranty Survey, is required for all cured-in-place lining, including main lines and service laterals.
- B. No work shall start until the CONTRACTOR has been notified to proceed after review of the initial television survey by the ENGINEER.
- C. A post installation video survey inspection of the CIPP shall be performed on each pipe segment. Variations in line and grade may be inherent because of the conditions of the original piping. No infiltration of groundwater should be observed. All service connections should be accounted for and unobstructed.
- D. A warranty video survey shall be performed on each pipe segment 12 months from CITY acceptance.

3.15 PUBLIC NOTIFICATION

- A. The CONTRACTOR shall make every effort to maintain service usage throughout the duration of the project. In the event that a service will be out of service, the maximum amount of time of no service shall be 8 hours for any property served by the sewer. A public notification program shall be implemented, and shall as a minimum, require the CONTRACTOR to be responsible for contacting each home or business connected to the sanitary sewer and informing them of the work to be conducted, and when the sewer will be off-line. The CONTRACTOR shall also provide the following:
  - 1. Personal contact with any home or business which cannot be reconnected within
- B. Written notice to be delivered to each home or business the day prior to the beginning of work being conducted on the section, and a local telephone number of the CONTRACTOR they can call to discuss the project or any problems which could arise.



the time stated in the written notice.

3.16 SAFETY

- A. The Contractor shall take satisfactory precautions to protect the sewer segments and appurtenances from damage that might be inflicted upon them by the lining operations. Any damage caused to the sewer segment or other public or private property as a result of the lining operations shall be repaired at the Contractors expense.

3.17 WARRANTY

- A. The manufacturer warrants the liner to be free from defects in raw materials for one year from the date of acceptance. During the warranty period, any defects which affect the integrity or strength of the pipe shall be repaired at the CONTRACTOR's expense in a manner mutually agreed by the CITY and the CONTRACTOR.

END OF SECTION

## SECTION 02761 – CHEMICAL GROUTING

### PART 1 - GENERAL

#### 1.01 SPECIFICATION INCLUDES

- A. The following types of chemical injection grouting may be utilized as required in cases of excessive infiltration as judged by the ENGINEER during the pre-installation video.
  - 1. Sealing sewer mainlines, lateral-main connections and laterals.
  - 2. Sealing sewer mainline joints.
  - 3. Placement of grout curtain around the manhole exterior via drilled access points in the manhole wall.
- B. To ensure proper installation, curing of the CIPP, and a defect-free liner, any active infiltration, shall be controlled using an approved chemical grout in accordance with manufacturer recommendations.
- C. Where internal grouting may not be a viable option, the Engineer may authorize, at the City's option, an external well point dewatering system to be employed to control active infiltration under extra work performed by the Contractor or City forces.

#### 1.02 REFERENCE STANDARDS

- A. ASTM F2304 Standard Practice for Sealing of Sewers Using Chemical Grouting
- B. ASTM F2454 Standard Practice for Sealing Lateral Connections and lines from the mainline Sewer Systems by the Lateral Packer Method, Using Chemical

#### 1.03 GROUTING MINIMUM QUALIFICATIONS

Installers must be certified by the material manufacture and have a minimum of five (5) years experience shall be considered. Installers must provide manufacturer certificate and reference list to be considered.

#### 1.04 SUBMITTALS

- A. Pump calibration information, field sealing records, certification of pressure sensing/monitoring equipment, current documentation of Contractor's compliance with product manufacturer's Safe Operating Practices Procedures (SOPP) as approved by the U.S. EPA.
- B. Submit proof of chemical supplier's product liability insurance.

#### 1.05 SAFETY

- A. The Contractor shall be solely responsible for safety during the performance of all WORK. Take satisfactory precautions to protect the main and lateral pipes from damage that might be inflicted upon them by the use of grouting equipment. Any damage inflicted upon a pipe or other public or private property as a result of the Contractor's grouting operations, regardless of the grouting method used and regardless of any other circumstance which may contribute to the damage, shall be repaired at no cost to the Owner. Do not enter into any sewer segment where hazardous conditions may exist until such time as the source of those conditions is identified and eliminated by the Contractor.

Perform all work in accordance with the latest OSHA confined space entry regulations. Coordinate the work with local fire, police and emergency rescue units.

- B. The CONTRACTOR shall reserves the right to deem what is "safe" to grout.

## PART 2 - PRODUCTS

### 2.01 MATERIALS

- A. Deliver materials to job site in undamaged, unopened containers bearing manufacturer's original labels. Materials used as chemical grout shall be transported, stored, and placed in a manner prescribed by manufacturer of those materials, as detailed in published data provided by manufacturer.
- B. Grout used shall be Avanti AV-100 acrylamide or equal. Contractor shall provide a chemical sealant solution containing principal chemical sealant constituent, Initiator (trigger) and catalyst specifically recommended for the purpose of sealing leaks in sanitary sewer lines and manholes.
- C. Chemical sealant constituent, initiator (trigger) and catalyst shall be compatible when mixed. Solution shall have ability to tolerate dilution and react in moving water. After final reaction, it shall be a stiff, impermeable, yet flexible gel.
- D. The grout proportions shall be such that dilute aqueous solutions – when properly catalyzed – will form stiff gels. Grout shall make true solution at concentrations as high as three pounds per gallon of water. Solutions shall have ability to accept dilution by groundwater of at least 50% by volume, without significantly changing sealing ability of the gel when at rest or in motion. Solutions shall gel in a predetermined time when exposed to normal groundwater pH ranges, and be capable of formula adjustments to compensate for changing conditions.
- E. Final reaction shall produce a continuous, irreversible, impermeable stiff gel at chemical concentrations as low as 0.4 lbs per gallon of water that is able to break away from the joint sealing packer when the packer is deflated. Gel shall not be rigid or brittle. Gel shall have negligible corrosion rate on mild steel plates.

### 2.02 EQUIPMENT

- A. Provide equipment consisting of closed-circuit television systems, necessary chemical sealant containers/tanks, pumps, regulators, valves, hoses, etc. and joint sealing packers for appropriate sizes of pipe designated to receive chemical grouting. The packer shall be cylindrical and have a diameter less than the pipe size. The packer shall be constructed in a manner to allow restricted amounts of sewage to flow and shall be pneumatically operated. Hydraulically or mechanically expanded devices shall not be permitted.
- B. To test the accuracy, integrity, and performance capabilities of sealing equipment units, perform a demonstration test in a test cylinder constructed so that a minimum of two known leak sizes can be simulated. Provide test cylinders and pressure gauges. Perform the demonstration test for each chemical sealing unit prior to beginning work. This test will establish test equipment performance capability in relationship to test criteria and ensure that there is no leakage of the test medium from the system or other equipment defects that could affect joint testing results. Tests may be required at any other time during joint testing work if the Owner suspects testing equipment is not functioning properly. All testing costs shall be borne by the Contractor.

## PART 3 - EXECUTION

## 3.01 INSTALLATION

- A. A two-component chemical grout sealant is pressure injected through the lateral packer into the isolated void. The grout material is then forced into the soil through leaking joints and pipe defects. The pumping rate and reaction or gel time of 20 seconds is acceptable when using a low void packer.
- B. The pump capacity must be sufficient to initially fill up the isolated void before the gelling of the two component grout. After filling up the isolated void, the pumping rate should be adjusted to bring up and maintain back pressure of 8 psi into the isolated void at the mainline level. When the time for a drop of pressure of 8 psi to 6 psi exceeds 20 seconds without pumping, the sealing is considered successful. However, when the effective quantity of grout pumped exceeds one gallon per foot of sealing distance plus 3 gallons, it should be suspected that there are unseen cavities or honeycomb structures outside of the pipe. The applicator shall try to build grout dams by repetitively pumping and curing the grout until the area is dammed off and the refusal pressure of 8 psi is obtained.
- C. To avoid plugging the crevices from the inside, the pump stroke interval shall be shorter than the gel time.
- D. Effective Volume of Grout – To ensure a proper amount of grout is being pumped into the joint, the volume of the void space of the packer shall be subtracted from the total volume of grout pumped at the joint. The effective volume of grout is the total volume pumped less the void volume of the packer chamber. The volume of the packer chamber is measured in the above ground lateral and the pipe connection set by simulating the actual sealing, using water only, and measuring the quantity of water necessary to fill up the void area
- E. If the total volume of gel is less than or equal to the void space of the packer, no gel has been injected into the joint.
- F. The “gel” time shall be 10 seconds longer than the time required by the pumps to fill the inside packer void and at no time shall the “gel” time be less than 20 seconds, unless approved by the engineer. This applies to both low-void and high-void packers.
- G. Extraneous grout material which may come in contact with the CIPP liner shall be compatible with the resin system utilized.
- H. Extreme caution should be taken during leak sealing (pressure grouting) operations in order to avoid damaging the already weakened pipe.
- I. Excessive pumping of grout which might block a service lateral shall be avoided.
- J. Any main or service laterals blocked by the grouting operation shall be cleared immediately by the Contractor. Host pipe damage caused by improper use of grouting equipment or operator error shall be repaired at the Contractor's expense.

## 3.02 POST-GROUTING INSPECTION

- A. The grouted pipe segment shall be inspected by using CCTV. Television inspection of the liner shall be in accordance with Section 330131. No infiltration of groundwater shall be observed. Should infiltration be observed, re-grout the pipe segment at no cost to the Owner.

- B. The finished grouted segment shall be free from visual defects such as foreign inclusions, excessive grout in the pipe that would cause partial blocking. Any foreign material and excessive grout in the pipe segment shall be removed by the Contractor at no cost to the Owner.

### 3.03 WARRANTY

The contractor shall warrant the installation for one year from OWNER acceptance.

END OF SECTION

SECTION 02763 - PREPARATORY CLEANING AND ROOT REMOVAL

PART 1 - GENERAL

1.01 SPECIFICATION INCLUDES

- A. This Section covers the preparatory cleaning of sewer lines and manholes as needed prior to the internal survey of the sewer lines by closed-circuit television. It also covers the preparatory cleaning and root removal of sewer lines and the cleaning of manholes prior to rehabilitation. The CONTRACTOR shall furnish all necessary material, labor, equipment and services required for cleaning the specific sewer lines.
- B. Cleaning of sewer lines shall remove all dirt, grease, rocks tuberculation, sand and other foreign materials from the mainlines and laterals in accordance with ASTM F1216.
- C. This specification is not intended to cover all cleaning methods. The CONTRACTOR shall utilize all necessary methods of cleaning. No additional cost shall be entertained for alternate cleaning methods which may be required.

PART 2 - PRODUCTS

2.01 HIGH-VELOCITY JET (HYDRO-CLEANING) EQUIPMENT.

- A. All high-velocity sewer cleaning equipment shall be constructed for ease and safety of operation. The equipment shall have a selection of two or more high-velocity nozzles. The nozzles shall be capable of producing a scouring action from 15 to 45 degrees in all size lines designated to be cleaned. Equipment shall also include a high-velocity gun for washing and scouring manhole walls and floor. The gun shall be capable of producing flows from a fine spray to a solid stream. The equipment shall carry its own water tank, auxiliary engines, pumps, and hydraulically driven hose reel.

2.02 MECHANICALLY POWERED EQUIPMENT.

- A. Bucket machines shall be in pairs with sufficient power to perform the work in an efficient manner. Machines shall be belt operated or have an overload device. Machines with direct drive that could cause damage to the pipe will not be allowed. A power rodding machine shall be either a sectional or continuous rod type capable of holding a minimum of 750 feet of rod. The rod shall be specifically heat-treated steel. To insure safe operation, the machine shall be fully enclosed and have an automatic safety clutch or relief valve.

2.03 HYDRAULICALLY PROPELLED EQUIPMENT.

- A. The equipment used shall be of a movable dam type and be constructed in such a way that a portion of the dam may be collapsed at any time during the cleaning operation to protect against flooding of the sewer. The movable dam shall be equal in diameter to the pipe being cleaned and shall provide a flexible scraper around the outer periphery to insure removal of grease. If sewer cleaning balls or other equipment which cannot be collapsed is used, special precautions to prevent flooding of the sewers and public or private property shall be taken.

## PART 3 - EXECUTION

### 3.01 GENERAL

- A. The designated sewer sections shall be cleaned using hydraulically propelled, high-velocity jet, or mechanically powered equipment. The equipment shall dislodge, transport and remove all sludge, mud, sand, gravel, rocks, bricks, grease, roots, sticks, and all other debris from the interior of the sewer pipe and manholes. The equipment and methods selected shall be based on the conditions of lines and manholes at the time the work commences and shall be satisfactory to the ENGINEER. If cleaning of an entire section cannot be successfully performed from one manhole, the equipment shall be set up on the other manhole and cleaning again attempted. If, again, successful cleaning cannot be performed, or the equipment fails to traverse the entire manhole section, the cleaning effort shall be stopped and sufficient inspection performed so that the ENGINEER can be notified of the reason for inability to continue. CITY and the ENGINEER, in consult with CONTRACTOR, will identify a solution.

### 3.02 CLEANING PRECAUTIONS

- A. During all cleaning and preparation operations all necessary precautions shall be taken to protect the sewer from damage. During these operations, precautions shall also be taken to ensure that no damage is caused to public or private property adjacent to or served by the sewer or its branches.
- B. Satisfactory precautions shall be taken in the use of cleaning equipment. When hydraulically propelled cleaning tools (which depend upon water pressure to provide their cleaning force) or tools which retard the flow in the sewer line are used, precautions shall be taken to ensure that the water pressure created does not damage or cause flooding of public or private property being served by the sewer. When possible, the flow of sewage in the sewer shall be utilized to provide the necessary pressure for hydraulic cleaning devices. When additional water from fire hydrants is necessary to avoid delay in normal work procedures, the water shall be conserved and not used unnecessarily. No fire hydrant shall be obstructed in case of a fire in the area served by the hydrant.

### 3.03 SEWER LINE CLEANING.

- A. The intent of sewer line cleaning is to remove foreign materials from the lines and restore the sewer to a minimum of 95% of the original carrying capacity or as required for proper seating of internal pipe joint sealing packers or performance of other specified work. It is recognized that there are some conditions such as broken pipe and major blockages that prevent cleaning from being accomplished or where additional damage would result if cleaning were attempted or continued. Should such conditions be encountered, the CONTRACTOR will not be required to clean those specific sewer sections. If, in the course of normal cleaning operations, damage does result from preexisting and unforeseen conditions such as broken pipe, the CONTRACTOR will not be held responsible.

### 3.04 MANHOLE CLEANING GENERAL

- A. All concrete and masonry surfaces must be cleaned prior to repair. Grease, laitance, loose bricks, mortar, unsound concrete, and other materials must be completely removed. Water blasting (minimum 1,200 psi) utilizing proper nozzles shall be the primary method of cleaning; however, other methods such as wet or dry sandblasting, acid wash, concrete cleaners, degreasers or mechanical means may be required to properly clean the surface. Surfaces on which these methods are used shall be

thoroughly rinsed, scrubbed, and neutralized to remove cleaning agents and their reactant products.

### 3.05 CLEANING AND PREPARATION FOR CEMENTITIOUS LINER REHABILITATION

- A. The manhole or chamber surface shall be clean, structurally sound and free from oil, grease, loose mortar, paints, protective coatings, efflorescence, laitance and airing compounds. The conditions of the manhole or chamber may require the use of an environmentally safe degreasing compound; if so, the surface shall be thoroughly rinsed to eliminate any residue.
  - 1. All cleaning shall be in accordance with the cementitious liner product manufacturers requirements.
- B. Place covers over invert to prevent extraneous material from entering the sewer lines.
- C. All foreign material shall be removed from the manhole wall and bench using a high pressure water spray (minimum 4,000 psi). Loose and protruding brick, mortar, and concrete shall be removed using a mason's hammer, chisel and/or scraper. Fill any large voids with quick setting patching material.
- D. If the 4,000 psi high water pressure water spray is not successful in removing all grease and contaminants, then a chemical wash shall be used to clean and degrease the interior of the manhole or chamber. The entire structure shall be thoroughly water- and/or sand-blasted to remove any loose or deteriorated material. The CONTRACTOR shall clean all accumulations of debris, such as dirt and grease, loose mortar, bricks and concrete, and dispose or properly. Care shall be taken to prevent any loose material from entering outlet sewer lines by inserting a 2-inch or smaller mesh protective screen into the manhole's outlet.
- E. Any existing manhole steps shall be removed prior to sealing (waterproofing) the structure walls, and installing liners.

### 3.06 MATERIAL REMOVAL

- A. All sludge, dirt, sand, rocks, grease, roots, and other solid or semisolid material resulting from the cleaning operation shall be removed at the downstream manhole of the section being cleaned. Passing material from manhole section to manhole section, which could cause line stoppages, accumulations of sand in wet wells, or damage pumping equipment, shall not be permitted.
- B. Under no circumstances shall sludge or other debris removed during these operations be dumped or spilled into the streets, ditches, storm drains or other sanitary sewers. The CONTRACTOR shall remove from the site and properly dispose of all solids or semi-solids recovered during the cleaning operation. The CONTRACTOR shall obtain permits and make arrangements as required to properly dispose of solids.
- C. The CONTRACTOR shall keep his haul route and work area(s) neat and clean and reasonably free of odor, and shall bear all responsibility for the cleanup of any spill which occurs during the transport of cleaning/surface preparation by-products and the cleanup of any such material which is authorized by or pursuant to this Contract and in accord with applicable law and regulations. The CONTRACTOR shall immediately cleanup any such spill, or waste. If the CONTRACTOR fails to cleanup such spill, or waste immediately, the CITY shall have the right to cleanup or arrange for its cleanup and may charge to the CONTRACTOR all costs, including administrative costs and overhead,



incurred by the CITY in connection with such cleanup. The CITY may also charge to the CONTRACTOR any costs 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 SUBCONTRACTOR's and other CONTRACTOR's.

- D. The general requirements for vehicles hauling such waste materials are as follows: Transport vehicles must be of type(s) approved for this application by the political jurisdictions involved. General requirements are that the vehicles have watertight bodies, that they be properly equipped and fitted with seals and covers to prohibit material spillage or drainage, and that they be cleaned as often as is necessary to prevent deposit of material on roadways. Vehicles must be loaded within legal weight limits and operated safely within all traffic and speed regulations.
- E. 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.

### 3.07 DISPOSAL OF MATERIALS

- A. All solids or semisolids resulting from the cleaning operations shall be removed from the site and disposed of by the CONTRACTOR in a legal and sanitary manner as approved by appropriate authorities, at the CONTRACTOR's cost. Copies of records of all disposal shall be furnished to the CITY, indicating disposal site, date, amount and a brief description of material disposed. All materials shall be removed from the site no less often than at the end of each workday. Under no circumstances will the CONTRACTOR be allowed to accumulate debris, etc., on the site of work beyond the stated time, except in totally enclosed containers and as acceptable to the ENGINEER.

### 3.08 ROOT REMOVAL

- A. Roots shall be removed in the designated sections of pipe and manholes where root intrusion is indicated.
- B. Special attention should be exercised during the cleaning operation to assure almost complete removal of roots from the joints. Any roots which could prevent the traveling of the packer or could prevent the proper application of chemical sealants or could prevent the proper seating and application of cured-in-place, fold-and-formed or sectional cured-in-place liners, shall be removed.
- C. Procedures may include the use of mechanical equipment such as rodding machines, bucket machines and winches using root cutters and porcupines, and equipment such as high-velocity jet cleaners. When roots may not be removed by these means, the ENGINEER may specify a point repair.
- D. When specifically directed, chemical root treatment shall be used before the root removal operation, in accordance with these SPECIFICATIONS. CONTRACTOR shall capture and remove all roots from the line.
- E. CHEMICAL ROOT TREATMENT
  - 1. To aid in the removal of roots, manhole sections that have root intrusion shall be treated with an acceptable herbicide when specifically directed. The application of the herbicide to the roots shall be done in accordance with the manufacturer's

recommendations and specifications in such a manner to preclude damage to surrounding vegetation. Any damaged vegetation so designated by the ENGINEER shall be replaced by the CONTRACTOR at no additional cost to the CITY. All safety precautions as recommended by the manufacturer shall be adhered to concerning handling and application of the herbicide.

2. Chemical Root Inhibitor shall be Dichlobenil (2-6-dichlorobenzonitrile): Norosac 50W or equal.
3. Add root inhibitor to the chemical grout mixture at a safe level of concentration having the ability to remain active within the grout for a minimum of 12 months.
4. Mix root inhibitor with the grout according to the instructions of the grout manufacturer and in the specified quantities as recommended by the grout manufacturer.
5. Grouting will take place after root removal in accordance with these SPECIFICATIONS.

### 3.09 ACCEPTANCE OF CLEANING OPERATION

- A. Acceptance of sewer line cleaning shall be made upon the successful completion of the television survey and shall be to the satisfaction of the ENGINEER. If television survey shows the cleaning to be unsatisfactory, the CONTRACTOR shall be required to re-clean and re-inspect the sewer line until the cleaning is shown to be satisfactory. In areas where television survey is not performed, the ENGINEER may require the CONTRACTOR to pull a double squeegee (with each squeegee the same diameter as the sewer) through each manhole section as evidence of adequate cleaning. If internal sealing is to follow the television survey, particular attention should be given to the adequacy of the cleaning to ensure that proper seating of the sealing packer can be achieved.
- B. In addition, on all those lines which have sags or dips, to an extent that the television camera lens becomes submerged for three (3) or more feet during the television inspection, the CONTRACTOR shall pull double squeegee and/or sponges through the line in order to remove the water from those dips or sags, or draft the water by means of high-velocity jet cleaners. Water removal shall be performed until the television camera lens will no longer be submerged. This requirement may be waived by the ENGINEER if the water in which the camera lens is submerged, is clear enough to allow the identification of pipe defects, cracks, holes and location of service taps.

END OF SECTION

## SECTION 02765 - REHABILITATION OF MANHOLES

### PART 1 - GENERAL

#### 1.01 SPECIFICATION INCLUDES

- A. It is the intent of this specification to provide for the reconstruction of sanitary sewer manholes using a cementitious material coating designed for the installation in municipal wastewater manholes by the "dry-gunite" application method.
- B. All manhole benches are to be repaired in accordance with CITY standards.
- C. All manhole concrete spalling and exposed rebar shall be repaired in accordance with ACI standards.

#### 1.02 REFERENCE STANDARDS

- A. ACI 506 – Specifications for Materials, Proportioning, and Application of Shotcrete.

#### 1.03 MINIMUM QUALIFICATIONS

Installers must be certified by the material manufacture and have a minimum of five (5) years experience shall be considered. Installers must provide manufacturer certificate and reference list to be considered.

#### 1.04 SUBMITTALS

- A. Manufactures product data sheet.
- B. Installers certification and references.

### PART 2 - PRODUCTS

#### 2.01 MATERIALS

- A. Material shall provide high-strength, corrosion-resistant protection against corrosion caused by hydrogen sulfide (H<sub>2</sub>S) found in wastewater environments.
- B. Material shall be resistant to hydrostatic pressure up to ten (10) feet once full thickness and cure is reached.
- C. Material shall reach a minimum of 6000 PSI compressive strength at seven (7) days per ASTM C109.
- D. Material shall contain 100% pure calcium aluminate both cement and manufactured aggregates.
- E. Material shall be SewperCoat as manufactured by Kemeous, Inc. or engineers approved equal.

## PART 3 - EXECUTION

### 3.01 INSTALLATION

- A. Manhole benches are to be rebuilt prior to application of material in accordance with the CITY standards.
- B. Inspect manhole walls for any necessary concrete repair such as cracking, spalling and exposed rebar.
  - 1. Should concrete repair requirements exceed the limits of repair allowed by the coating manufacturer, notify ENGINEER and CITY and repair in accordance with ACI standards prior to application of coating after receiving approval.
- C. Liners ends shall be sealed to per these SPECIFICATIONS.
- D. Surface preparation shall be performed in accordance with applicable industry standards to include sandblasting and high pressure water to remove all deleterious or loose material to the satisfaction of the Engineer and in accordance with the Manufacturers specifications.
- E. Mixing, water ratio, curing, etc. shall be performed in accordance with manufacturers' recommendations.
- F. Apply material using dry gunite equipment and in accordance with manufacturers' recommendations.
- G. The dry thickness shall be ½ inch, minimum.

### 3.02 WARRANTY

The manufacture shall warranty each manhole structure from the date of Owner acceptance for a period of ten (10) years.

END OF SECTION

## SECTION 02770 – CIPP LATERAL LINING

## PART 1 - GENERAL

## 1.01 SPECIFICATION INCLUDES

- A. The work specified in this section consists of providing for the reconstruction of a particular mainline section and the adjacent 4 or 6" lateral sewer pipe using a Cured-In-Place-Pipe (CIPP) without excavation while providing a structural one piece leak free connection at the interface of the mainline and lateral pipelines.
- B. The CIPP Lateral Lining shall be 15 feet in length as measured from the centerline of the sewer mainline towards the property and shall include standard wye and vertical (stack, chimney) configurations.
- C. The reconstruction will be accomplished using a non-woven fabric tube of particular length and a thermoset resin with physical and chemical properties in accordance with ASTM F1216. The lateral tube within a translucent inversion bladder is vacuum impregnated with the resin then placed inside a protective carrying device. The mainline liner that is physically attached to the lateral tube is affixed around a rigid launching device. The launching device and protective carrying device are winched into the existing sewer. When the launching device is properly positioned at the lateral connection, the mainline liner is inflated and the resin saturated tube is inverted up through the lateral pipe, using air or water pressure, by the action of the inversion bladder. Once the tube/resin composite is cured, the inversion bladder and launching/carrying devices are removed.

## PART 2 - PRODUCTS

- A. General - The finished liner shall be fabricated from material as specified in this section which when cured will be resistant to the corrosive effects of the raw sewage and hydrogen sulfide.
- B. Liner Sizing - The liner shall be fabricated to a size that when installed will neatly fit the internal circumference of the conduit to be repaired as specified by the CITY.
- C. Liner Material - The liner shall be one piece and will consist of a lateral portion and the mainline portion with one or more layers of flexible needled felt or an equivalent non-woven material. The liner will be continuous in length and the wall thickness shall be uniform. No overlapping sections shall be allowed in the circumference or the length of the lateral liner. The tube will be capable of conforming to offset joints, bells, and disfigured pipe sections. The mainline liner will be flat with one end overlapping the second end and sized accordingly to create a circular lining equal to the diameter of the mainline pipe. The resin will be polyester or vinyl ester or epoxy, with proper catalysts as designed for the specific application. The CIPP shall provide a smooth bore interior. Both the lateral pipe and the main connection shall have a design report documenting the design criteria, fully deteriorated pipe section for the lateral and partially deteriorated for the main (if the main has already been lined), relative to the hydrostatic pressures, depth of soil cover, and type of soil. The mainline sectional liner shall be a full-circumference 16-inch long CIPP liner integrally manufactured to the lateral liner providing a seamless connection between the mainline pipe liner and the lateral liner. Installation will be accomplished remotely using air or water for inversion and curing. The cured pipe repair system shall be watertight and shall conform to the existing pipe and eliminate any

leakage or connection to the outside of the host pipe/service.

- D. The composite of the materials above will, upon installation inside the host pipe, exceed the minimum test standards specified by the American Society for Testing Methods, shall assume no bonding to the original host pipe and meet or exceed the following:

Physical Characteristics	Test Procedure	Minimum Value
Flexural Strength	ASTM D790	4,500 psi
Flexural Modulus	ASTM D790	250,000 psi
Long Term Modulus	Reduction for Creep	50%
Design Considerations	Criteria	
Tube Design	ASTM F 1216 or F2561	Appendix X1
Hydrostatic Buckling	ASTM F 1216 or F2561	Appendix X1

E. Liner Design

1. The minimum required structural CIPP wall thickness shall be based on the physical properties described above and in accordance with the design equations in the appendix of ASTM F 1216, and the following design parameters:

Design Safety Factor	2.0
Retention Factor for Long-Term Flexural Modulus to be used in Design	50 %
Ovality*	2 %
Groundwater Depth = Pipe Depth (above invert)*	ft.
Soil Depth (above crown)*	ft.
Soil Modulus	700 psi
Soil Density	120 pcf
Live Load	One H20 passing truck
Design Condition (lateral pipe)	Fully deteriorated
Design Condition (main pipe) Lined Main Pipe	Partially deteriorated
Design Condition (main pipe) Unlined Main Pipe	Fully deteriorated
<i>*Denotes information which can be provided here or in inspection video tapes or project construction plans. Multiple line segments may require a table of values.</i>	

Note: There are two conditions that require design calculation in accordance with ASTM F1216. 1) Lateral piping. 2) The connection in the main, lined or unlined main.

2. The lining manufacturer shall submit to the CITY for review complete design calculations for the liner, both main connection and lateral pipe designs, signed and sealed by a Professional ENGINEER registered in the State of Florida and certified by the manufacturer as to the compliance of his materials to the values used in the calculations. A safety factor of 2 shall be applied in the design calculation. The lateral host pipe shall be considered fully deteriorated, the previously lined main pipe shall be considered partially deteriorated. The liner shall be designed to withstand a live load equivalent to one H-20 passing truck plus all pertinent dead loads, hydrostatic pressure and grout pressure (if any). For design purposes, the water table shall be considered at grade elevation. The liner shall be designed in accordance with ASTM F 1216. The buckling analysis shall account for the combination of dead load, live load, hydrostatic pressure and grout pressure (if any). The liner side support shall be considered as if provided by soil pressure against the liner. The existing lateral pipe shall not be considered as providing any structural support. If the main pipe has been lined a partially deteriorated condition is to be used for the design of the main.

Hydrostatic loads must be considered in three existing pipe conditions 1) mainline design, for previously lined mains and 2) unlined mains as well as 3) the lateral pipe design for unlined pipe. Modulus of soil reaction shall be 700, corresponding to a moderate degree of compaction of bedding and a fine-grained soil as shown in AWWA Manual M45, Fiberglass Pipe Design.

3. Liner shall be neither accepted nor installed until design calculations are acceptable to the CITY for the three existing pipe conditions.
- F. Approved products shall be full circumference type as manufactured by:
1. BLD "Service Connection Seal + Lateral" of BLD Services, LLC or
  2. LMK Pipe Renewal Full Circumference Lateral Liner in accordance with ASTM F2561
  3. No substitutions permitted.

### PART 3 - EXECUTION

#### 3.01 CLEANING SEWER LINES

Prior to any lining of a pipe, it shall be the responsibility of the CONTRACTOR to remove internal deposits from the pipeline in accordance with these SPECIFICATIONS. Both mainline and lateral line shall be cleaned.

#### 3.02 TELEVISION SURVEY

- A. Television survey shall be performed in accordance with these SPECIFICATIONS including Preconstruction and Post Construction Surveys to verify the connections have been properly made.
- B. The interior of the pipeline shall be carefully surveyed to determine the locations and extent of any structural failures. The location of any conditions which may prevent proper installation of lining materials into the pipelines shall be noted so that these conditions can be corrected. A video and suitable log shall be kept and a copy turned over to the CITY.
- C. No work shall start until the CONTRACTOR has been notified to proceed after review of the television survey by the ENGINEER.

#### 3.03 FLOW BYPASSING

- A. CONTRACTOR shall notify all the residents affected by this construction at least 24 hours prior to any service disruption affecting their service connection. The mainline sewer shall be kept in operation at all times during the rehabilitation of lateral lines. Bypassing as outlined in the following section is permitted.
- B. The CONTRACTOR, when required, shall provide for the transfer of flow, through or around section or sections of pipe that are to be repaired. The proposed bypassing system shall be acceptable in advance by the CITY. The acceptance of the bypassing system in advance by the CITY shall in no way relieve the CONTRACTOR of his responsibility and/or public liability. The flow bypassing shall be done in accordance with these SPECIFICATIONS.

### 3.04 LINER INSTALLATION

- A. The tube is inspected for tears and frayed sections. The tube, in good condition, will be vacuum impregnated with the thermostat resin. The resin will be introduced into the tube creating a slug of resin at the beginning of the tube. A calibration roller will assist the resin slug to move throughout the tube. All air in the tube shall be removed by vacuum allowing the resin to thoroughly impregnate the tube. All resin shall be contained to ensure no public property or persons are exposed to the liquid resin. The mainline liner will be saturated upon a wet-out platform. The resin impregnated sample (wick), shall be retained by the installer to provide verification of the curing process taking place in the host pipe.
- B. The saturated tube along with the inversion bladder will be inserted into the carrying device. The mainline liner is affixed on the launching device. Both the launching and carrying device is pulled into the pipe using a cable winch. The pull is complete when the open port of the launching device is aligned with the interface of the service connection and mainline pipe. The resin saturated lateral tube is completely protected during the pull. No resin shall be lost by contact with manhole walls or the pipe during the pull. The resin saturated mainline liner is supported upon the rigid launcher that is elevated above the pipe invert by means of rotating skid system. The mainline liner should not be contaminated or diluted by exposure to dirt, debris, or water during the pull.
- C. The installer shall document the placement of the liner by internal video inspection with the camera being inserted from the lateral pipe down to the mainline pipe.
- D. The mainline liner is expanded against the mainline pipe and lateral tube is inverted out of the launcher/carrying device by controlled air or water pressure. The installer shall be capable of viewing the lateral liner contacting the lateral pipe from the beginning to the end of the repair. The mainline liner and the lateral tube are held tightly in place against the wall of the host pipe by controlled pressure until the cure is complete.
- E. When the curing process is complete, the pressure will be released. The inversion bladder and launching device shall be removed from the host pipe with the winch. No barriers, coatings, or any material other than the cured tube/resin composite, specifically designed for desirable physical and chemical resistance properties, should ever be left in the host pipe. Any materials used in the installation other than the cured tube/resin composite are to be removed from the pipe by the installer.
- F. After the pipe liner has been formed, the Contractor shall internally reconnect the existing service connections. The Contractor shall be responsible to confirm the active laterals prior to reconnection. In the case of non-man entry pipes, reconnection shall be performed from the interior of the pipeline by means of the television camera and a cutting device that re-establishes them to not less than 100 percent diameter. All reinstated services shall be cut neat and smooth and shall be wire brushed and smoothed to prevent collection of solids and potential blockages at service connections.

### 3.05 LATERAL SEAL TEST

- A. At the direction of the Engineer, the contractor shall pressure test the lateral connection seal. The Contractor shall position a bladder packer over the lateral opening and inflate the inversion tube to isolate the lateral. The bladder shall be pressurized to four (4) PSI plus 0.5 PSI for each foot of groundwater above the sewer invert. Maximum pressure shall be nine (9) PSI. Once the required pressure has been achieved, the air supply shall be disconnected and the time required for the void pressure to drop 0.5 PSI shall be



recorded. If the pressure drops more than 0.5 PSI in less than ten (10) seconds, the lateral shall be re-grouted and retested.

END OF SECTION

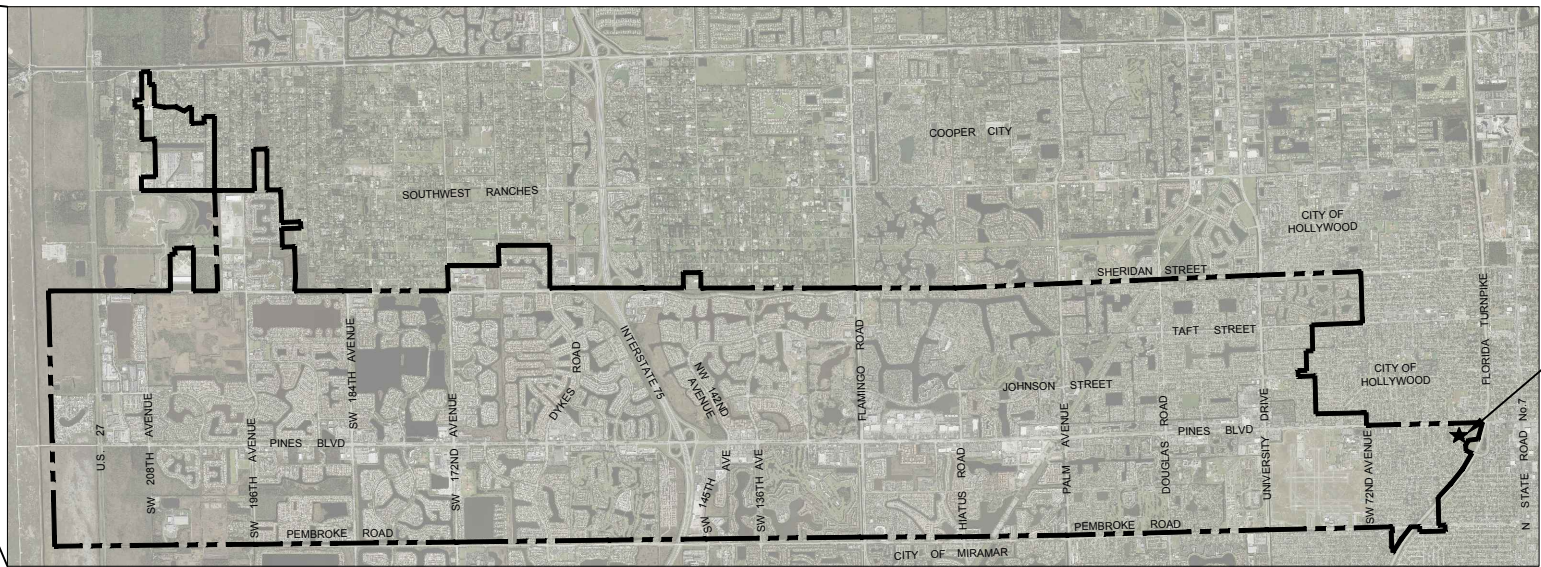
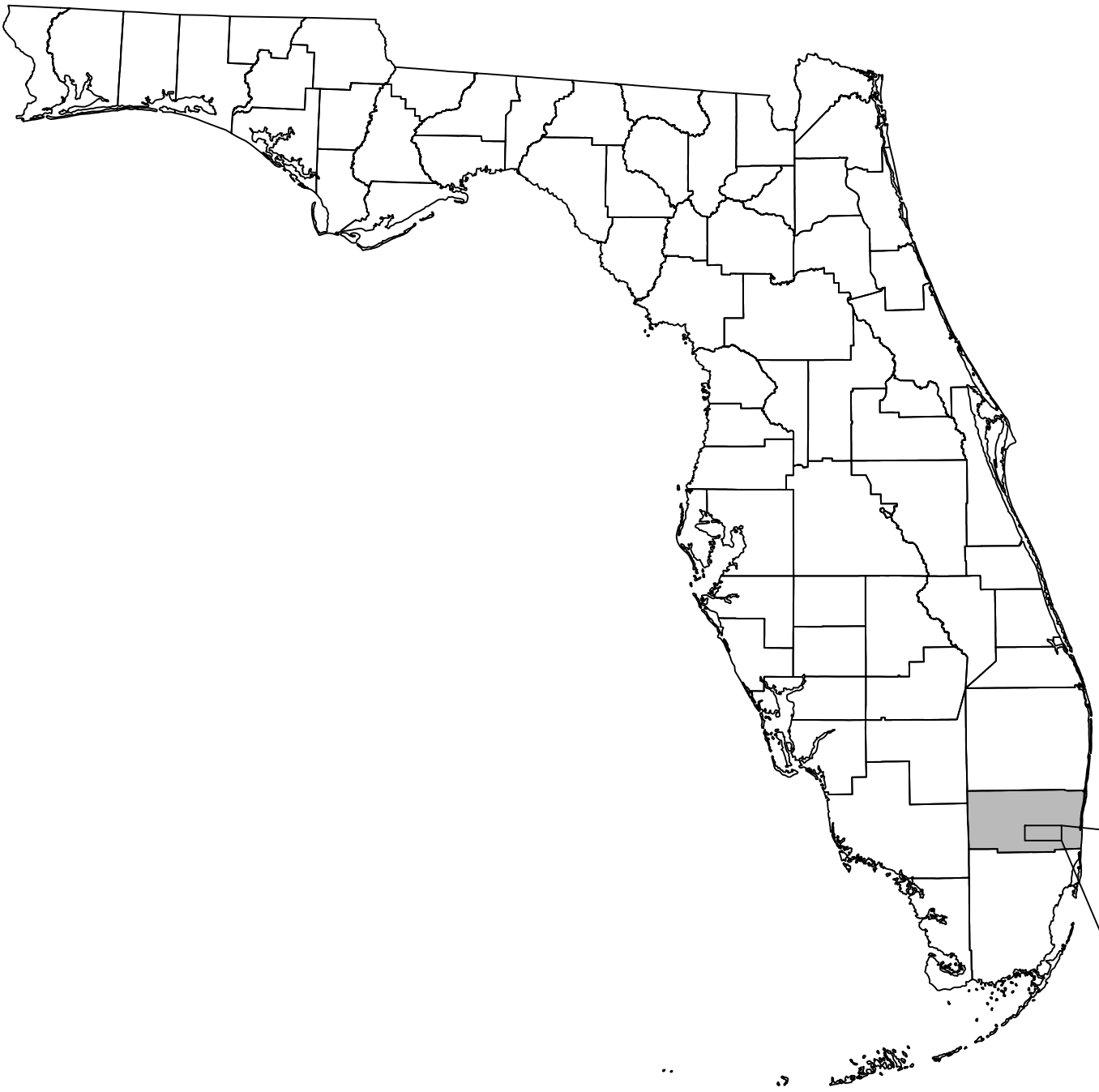
APPENDIX ONE – WORK AREA MAP



City of Pembroke Pines  
Infiltration Removal Area 6  
Lateral and Mainline Lining Program  
Appendix One - Work Area Map

GENERAL NOTES:

- 1. Sewer lines shown in black were televised in 2019.
- 2. Sewer lines shown dashed in black were previously lined.
- 3. Pump Station No.6 (PS No.6) force main is shown in green and is excluded.



Vicinity Map

