

# **CITY OF HOLLYWOOD**



**F-4708-22-OT**

**UTILITY REPLACEMENT ALONG NORTH 26TH AVENUE  
(PHASE 1)**

**CONTRACT BOOK**

Prepared by:

**PURCHASING SERVICES DIVISION**

2600 Hollywood Blvd.  
PO Box 229045  
Hollywood, FL 33022

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**CITY OF HOLLYWOOD  
DEPARTMENT OF PUBLIC UTILITIES  
CONTRACT DOCUMENTS AND SPECIFICATIONS**

**For:**

**WATER MAIN REPLACEMENT PROGRAM PROJECT No.16-5133**

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**SUBMIT THIS COMPLETE PACKAGE AND ONE COPY WITH YOUR BID**



CITY OF  
HOLLYWOOD  
DEPARTMENT  
OF PUBLIC  
UTILITIES  
ENGINEERING AND CONSTRUCTION SERVICES DIVISION (ECSD)

SECTION 00030  
NOTICE TO BIDDERS

PROJECT NAME: **WATER MAIN REPLACEMENT PROJECT FOR N. 26<sup>TH</sup> AVENUE  
(PHASE 1)**

**BID NUMBER: F-4708-22-OT**

NOTICE IS HEREBY GIVEN that the City Commission of the City of Hollywood, Florida, is advertising for sealed bids which shall be submitted to the City Clerk's Office (City Hall, 2600 Hollywood Blvd., Hollywood, Florida 33022-9045, Suite 221), until 3:00 p.m., local time, **February 15, 2022**. The bids will be opened and read publicly in the City's Procurement Services Division, 2600 Hollywood Blvd., Suite 303, P.O. Box 229045, Hollywood, Florida 33022-9045.

Project Scope: The work performed includes site and civil work associated with the construction of the water main replacement project for the boundaries of TAFT STREET TO SHERIDAN STREET AND BETWEEN NORTH 26TH AVENUE TO INTERSTATE 95 (NORTH 28TH AVENUE).

A **Mandatory** pre-bid meeting will be held on **January 19, 2022 at 10:00 a.m.** The meeting will be held via WebEx (see information below).

**Join from the meeting link**

<https://cohfl.webex.com/cohfl/j.php?MTID=md0219b6fb559133aa5638dfc9831e590>

**Join by meeting number**

Meeting number (access code): 2631 098 4359

Meeting password: 8MspGSma8p3

**Tap to join from a mobile device (attendees only)**

+1-408-418-9388,,26310984359## United States Toll

**Join by phone**

+1-408-418-9388 United States Toll

Global call-in numbers | Toll-free calling restrictions

**Join from a video system or application**

Dial 26310984359@cohfl.webex.com

You can also dial 173.243.2.68 and enter your meeting number.

**Join using Microsoft Lync or Microsoft Skype for Business**

Dial 26310984359.cohfl@lync.webex.com

If you are a host, [click here](#) to view host information.

Need help? Go to <https://help.webex.com>

A **Voluntary** site visit will be held on **January 19, 2022 at 2 p.m.** The meeting location for this visit will be at the intersection of **Scott Street and North 26<sup>th</sup> Avenue, Hollywood, FL .**

The Bid Package and Contract documents can be downloaded at: [www.bidsync.com](http://www.bidsync.com). For information concerning procedures for responding to this Bid, contact the Procurement Services Division Otis J. Thomas, Senior Purchasing Agent via email at [othomas@hollywoodfl.org](mailto:othomas@hollywoodfl.org) or by phone at (954) 921-3224, or Steve Stewart, Assistant Director, Financial Services for Procurement (Chief Procurement Officer) via email at [sstewart@hollywoodfl.org](mailto:sstewart@hollywoodfl.org) or by phone at 954-921-3628, or his designee. Such contact is to be for clarification purposes only. It is preferred that all other questions be submitted in writing via [bidsync.com](http://bidsync.com). Deadline for questions is **February 8, 2022 at 5 p.m. local time.**

Each bid must be accompanied by a Bid Security in an amount no less than ten percent (10%) of the bid amount. Said security shall be in the form of a Certified Check or Cashier's Check on a solvent National or State Bank, or a bid bond executed by the Bidder and a qualified Surety, satisfactory and payable to the City of Hollywood, Florida.

A Cone of Silence is in effect with respect to this bid. The Cone of Silence prohibits certain communications between potential vendors and the City. For further information, please refer to Section 30.15(E) of the City's Code of Ordinances.

The City of Hollywood is strongly committed to ensuring the participation of local Hollywood vendors in the procurement of goods and services. For additional information about the City's Local Preference Ordinance, visit [www.hollywoodfl.org](http://www.hollywoodfl.org).

**It will be the Bidder's sole responsibility to hand-deliver or mail his/her proposal to the City Clerk's Office at City Hall on or before the closing hour and date for the receipt of bids as noted above.**

The City Commission reserves the right to reject any or all bids, to waive informalities and to accept or reject all or any part of any bid, as they may deem to be in the best interest of the City of Hollywood, Florida.

Dated this 12<sup>th</sup> Day of January 2022  
CITY OF HOLLYWOOD, FLORIDA

Otis J. Thomas, Senior Purchasing Agent  
Procurement Services Division

## SECTION 00100

### INSTRUCTIONS TO BIDDERS

#### 1. PREPARATION OF BIDS:

Bids must be submitted on the separate and enclosed **BIDDING PACKAGE** forms, which shall be completed **by typewriter** or legibly handwritten in ink. The Bid price of each item on the form must be stated in words and numerals; in case of a conflict, words will take precedence. Where unit prices and extended totals are required, unit prices take precedence. Likewise, discrepancies between the indicated sum of any column of figures and the correct sum thereof will be resolved in favor of the correct sum.

If the Bid is made by an individual, he must sign his name therein and state his address. If the Bid is made by a firm or partnership, its name and address must be stated, as well as the name and address of each member of the firm or partnership. Bids by corporations must be signed by an authorized corporate officer (accompanied by evidence of authority to sign) and the corporate seal must be affixed and attested by the Secretary or an Assistant Secretary of the corporation. The corporate address and state of incorporation shall be shown below the signature. When the state of incorporation is other than Florida, proof of registry with Florida must be attached.

#### 2. RECEIPT AND OPENING OF BIDS:

The **Bid Package** consisting of the Bid, Bid Proposal Form, Bid Bond, Trench Safety Form, all requested information as specified within and list of Subcontractors and/or material suppliers shall be completed, signed and sealed as required and must be delivered or mailed to the City Clerk of Hollywood, Florida, by the time and date specified in the Notice to Bidders and shall be properly identified on the face thereof.

Bids will be publicly opened and immediately read aloud at the time and place designated in the Notice to Bidders. No Bid will be considered which is not based upon the Drawings and Specifications, or which contains any letter or written memorandum qualifying the same, or which is not properly made out and signed in writing by the Bidder.

#### 3. PRE-BID MEETING:

A **Mandatory** Pre-bid meeting will be held on **January 19 at 10:00 a.m.** This meeting will be held via WebEx. All Contractors planning to submit a bid are **required** to attend the meeting.

A **Voluntary** Site visit will be held on **January 19 at 2:00 p.m.** The meeting location for this visit will be at the intersection of **Scott Street and North 26th Avenue, Hollywood, FL**

#### 4. CONTRACT DOCUMENTS:

The Contract Documents give the location and description of the work to be done under this Contract and estimated quantities of each item of work for which Bids are invited, the time in which the work must be completed, the amount of the Bid Guaranty, if any, and the date, time and place of the receipt and opening of the Bids.

## **5. EXAMINATION OF CONTRACT DOCUMENTS AND SITE:**

The Bidder is required to carefully examine the site of the work and the Contract Documents for the work contemplated. It will be assumed that the Bidder has investigated and is fully informed as to the requirements of the Contract Documents, laws, ordinances, codes and any other factors which may affect the performance of the work. Failure to be so informed will not relieve a successful Bidder of his obligation to furnish all material, equipment and labor necessary to carry out the provision of the Contract Documents and to complete the contemplated work for the consideration set forth in his Bid.

## **6. DIMENSIONS, QUANTITIES AND SUBSURFACE INFORMATION:**

Dimensions, quantities and subsurface information supplied by the City are in no way warranted to indicate true amounts or conditions. Bidders/Contractors shall neither plead misunderstanding or deception, nor make claims against the City if the actual amounts, conditions or dimensions do not conform to those stated. Any "Outside" reports made available by the Engineer are neither guaranteed as to accuracy or completeness, nor a part of the Contract Documents.

## **7. ADDENDA - CHANGES WHILE BIDDING:**

During the Bidding period, Bidders may be furnished addenda or bulletins for additions or alterations to the Plans or Specifications which shall be included in the work covered by the Proposal.

Any prospective Bidder in doubt as to the meaning of any part of the Drawings, Specifications or other Contract Documents may submit a written request to the Engineer for an interpretation. The Bidder submitting the request will be responsible for its prompt delivery. Any interpretation of the documents will be made by an addendum and a copy of such addendum will be mailed or delivered to each prospective Bidder who has received a set of documents. The City will not be responsible for any other explanations or interpretations of the proposed documents. Each prospective bidder must submit their questions or inquiries via [www.bidsync.com](http://www.bidsync.com).

## **8. BID GUARANTY:**

A Bid Guaranty in the form of a Cashier's Check, Certified Check or Bid Bond executed by the Bidder and a qualified Surety in the amount of **10%** of the Bid is required for this project in accordance with the Notice to Bidders.

## **9. TRENCH SAFETY FORM:**

The Trench Safety Form included in the Bid Documents must be completed and signed. Noncompliance with this requirement may invalidate the bid.

## **10. QUALIFICATIONS AND DISQUALIFICATIONS OF BIDDERS:**

The Contract will be awarded only to the responsive and responsible bidder, who in the opinion of the Engineer and Procurement Division, is fully qualified to undertake the work and is in compliance with the City's Local Preference Criteria (when applicable). The City reserves the right before awarding the Contract to require a bidder to submit such evidence of his qualifications as it may deem necessary and may consider any available evidence of his financial status, technical

qualifications and other qualifications and abilities.

Bidders shall submit proof, along with their bid, that their firm has successfully completed comparable projects meeting the following criteria:

- A. The Bidder shall have successfully completed a minimum of one (1) project demonstrating experience with water main projects having a total construction value of greater than \$20 million and three (3) projects demonstrating experience with water main projects having a total construction (for each project) of greater than \$10 million. These projects shall have been performed within the past ten (10) years from the date of the Invitation to Bid.
- B. The Bidder's proposed project manager shall have successfully completed a minimum of two (2) projects demonstrating project management experience with water main projects having a total construction value (for each project) of greater than \$10 million. These projects shall have been performed within the past ten (10) years from the date of the Invitation to Bid.

The Bidder or Bidder's Electrical Subcontractor Lead Electrician shall have successfully completed a minimum of two (2) projects demonstrating experience with medium or high voltage power supply systems, including transformers and switchgear. These projects shall have been performed within the past ten (10) years from the date of the Invitation to Bid

Any one of the following causes, among others, may be considered as sufficient justification to disqualify a bidder and reject his or her bid:

- C. Submission of more than one bid for the same work by an individual, firm, partnership or corporation under the same or different names.
- D. Evidence of collusion.
- E. Previous participation in collusive bidding on work for the City of Hollywood, Florida.
- F. Submission of an unbalanced bid in which the prices bid for some items are out of proportion to the prices bid for other items.
- G. Lack of competency. The Bidder shall provide proof that their past experience can demonstrate similar complexity and size compared to this contract. The Engineer may declare any bidder ineligible, at any time during the process or receiving bids or awarding the contract, if developments arise which, in his opinion, adversely affects the bidder's responsibility. The Bidder will be given an opportunity, by the engineer, to present additional evidence before final action is taken.
- H. Lack of responsibility as shown by past work judged by the Engineer from the standpoint of workmanship and progress.
- I. Non-compliance with the City's Local Preference (when applicable).



- J. Uncompleted work for which the Bidder is committed by Contract, which is in the judgment of the Engineer, might hinder or prevent the prompt completion of work under this Contract.
- K. Being in arrears on any existing Contracts with the City, or any taxes, licenses or other monies due the City; in litigation with the City or having defaulted on a previous contract with the City.

#### **11. LIFE AND WITHDRAWAL OF BID:**

All Bids shall remain open for 90 days after the day of the Bid opening, however, the Engineer may, at his sole discretion, release any Bid and return the Bid Guaranty prior to that date. Any Bid may be modified or withdrawn prior to the time scheduled for the opening of Bids.

#### **12. REJECTION OF IRREGULAR BIDS:**

Bids will be considered irregular and may be rejected if they show omissions, alterations of form, additions not called for, conditions, limitations, unauthorized alternate Bids or other irregularities of any kind.

#### **14. BIDDING ERRORS:**

If after the opening of bids, a Bidder claims an error and requests to be relieved of the Award, or the Engineer believes that an error may have been made then, the Bidder shall present his work sheets and supplier quotations to the Engineer for verification. This information shall be presented on the same day as the bid opening or if the opening is in the afternoon then on the following business day. When the Engineer has suspected an error and requires the documents, Bidder's failure to produce them within the time specified shall make the Bidder non-responsive and thereby eligible for disqualification. Award may then be made to the next lowest responsive, responsible Bidder, or the work may be re-advertised or it may be performed by City forces, as the Commission desires.

#### **15. AWARD OF CONTRACT:**

The City Commission reserves the right to reject any or all Bids, or any part of any Bid, to waive any informality in any Bid, or to re-advertise for all or any part of the work contemplated. If Bids are found to be acceptable by the City Commission, written notice of award will be given to the lowest responsive, responsible Bidder.

#### **16. EXECUTION OF CONTRACT:**

The Bidder to whom the Contract is awarded shall, within ten days of the date of award, execute and deliver three (3) copies of the following to the Engineer.

- A. The Contract
- B. Performance and Payment Bond
- C. Evidence of required Insurance
- D. Proof of authority to execute the Contract

- E. Proof of authority to execute the Bond on behalf of the Awardee
- F. List of Subcontractors, estimated Contract Value for each and proof that such subcontractors possess all required Federal, State, County and/or municipality licenses, including but not limited to certified of competency and occupational license.

The above documents must be furnished, executed and delivered before the Contract will be executed by the City. The Contract shall not be binding upon the City until it has been executed by the City and a copy of such fully executed Contract is delivered to the Contractor.

**16. FAILURE TO EXECUTE CONTRACT, BID GUARANTY FORFEITED:**

Should the Bidder to whom the Contract has been awarded refuse or fail to complete the requirements of Article 15 above within ten (10) days after Notice of Award, the additional time in days (including weekends) required to CORRECTLY complete the documents will be deducted, in equal amount, from the Contract Time, or the City may elect to revoke the Award. In the same manner as Article 13, the Bid Guaranty of any Bidder failing to execute the awarded Contract shall be retained by the City and the Contract awarded as the Commission desires.

**17. GUARANTY OF FAITHFUL PERFORMANCE AND PAYMENT:**

A Performance Bond and a Payment Bond each equal to 100 percent of the total Bid will be required of the Awardee. The Bond must be written through a company licensed to do business in the State of Florida and be rated at least "A", Class X, in the latest edition of "Best's Key Rating Guide", published by A.M. Best Company. As per Florida Statute Section 255.05, the Contractor shall be required to record the payment and performance bonds in the public records of Broward County.

**18. INSURANCE:**

Bidder must satisfy all insurance requirements as set forth in the Supplementary and General Conditions.

**The insurance policy shall not contain any exceptions that would exclude coverage for risks that can be directly or reasonably related to the scope of goods or services in this bid/proposal. A violation of this requirement at any time during the term, or any extension thereof shall be grounds for the immediate termination of any contract entered in to pursuant to this bid/proposal. In order to show that this requirement has been met, along with an insurance declaration sheet demonstrating the existence of a valid policy of insurance meeting the requirements of this bid/proposal, the successful proposer must submit a signed statement from insurance agency of record that the full policy contains no such exception.**

**19. QUALIFICATIONS:**

At the time of submission of the bid, Bidder must possess, and be able to provide City, any and all required Federal, State, County and/or municipal licenses, including but not limited to certificates of competency and occupational licenses. Moreover, upon receipt of the Award of the Contract, Bidder must provide proof of valid licensing for all subcontractors and/or material suppliers hired by the Contractor as set forth in Article 16 above.

When the Bidder is a Joint Venture, in order to satisfy the construction licensing requirements one member of a Joint Venture must hold a valid state certificate as well as the appropriate county and city license. The Contractor shall be held responsible for assurance that all subcontractors and/or material suppliers hired by the Contractor have the appropriate state certificate and licenses.

**20. PERMITS:**

The Contractor and Subcontractors must obtain and pay for the fees associated with the Permits required for all work covered under this Contract as well as any other permit required by any other regulatory agency, except as noted on the Drawings to be obtained by the Engineer.

The Contractor shall also be responsible to call for all inspections associated with the issued permits.

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## SECTION 00200



### **NOTICE OF IMPOSITION OF CONE OF SILENCE**

On January 12<sup>th</sup>, 2022, the City of Hollywood, Florida Department of Procurement Services Division issued the following:

#### **Bid #F-4708-22-OT: WATER MAIN REPLACEMENT PROJECT FOR N. 26<sup>TH</sup> AVENUE (PHASE 1)**

Project Scope: The work performed includes site and civil work associated with the construction of the water main replacement project for the boundaries of TAFT STREET TO SHERIDAN STREET AND BETWEEN NORTH 26TH AVENUE TO INTERSTATE 95 (NORTH 28TH AVENUE).

Pursuant to Section 30.15(F) of the Code of Ordinances, a Cone of Silence has been imposed on the items set forth above. The Cone of Silence will continue until the City awards or approves a contract, votes to reject all bids or responses, or otherwise takes action which ends the solicitation. If the City Commission refers the item back to the City Manager and staff for further review, the Cone of Silence shall remain in effect until an award is made, a contract is approved, or the City Commission takes any other action which ends the solicitation.

cc: City Commission Office  
City Manager  
City Clerk (sunshine board)  
Affected department(s)/office(s)

- END OF SECTION -

**ORIGINAL**

**BID PACKAGE**

**FOR**

**F-4708-22-OT**

**UTILITY REPLACEMENT ALONG NORTH 26TH AVENUE (PHASE 1)**

**SUBMITTED BY:** Man-Con Incorporated

**January 2022**

SECTION 00300

PROPOSAL

TO THE MAYOR AND COMMISSIONERS  
CITY OF HOLLYWOOD, FLORIDA

SUBMITTED Man-Con Incorporated

Dear Mayor and Commissioners:

The undersigned, as BIDDER, hereby declares that the only person or persons interested in the Proposal as principal or principals is or are named herein and that no other person than herein mentioned has any interest in this Proposal or in the Contract to be entered into; that this Proposal is made without connection with any other person, company or parties making a Bid or Proposal; and that it is in all respects fair and in good faith without collusion or fraud.

The BIDDER further declares that he has examined the site of the Work and informed himself fully in regard to all conditions pertaining to the place where the Work is to be done; that he has examined the Drawings and Specifications for the Work and contractual documents relative thereto, including the Notice to Bidders, Instructions to Bidders, Proposal Bid Form, Form of Bid Bond, Form of Contract and Form of Performance Bond, General, Supplementary and Technical Specifications, Addenda, Drawings, and Local Preference Program, Exhibit A, and has read all of the Provisions furnished prior to the opening of bids; and that he has satisfied himself relative to the work to be performed.

The undersigned BIDDER has not divulged to, discussed or compared his bid with other bidders and has not colluded with any other BIDDER of parties to this bid whatever.

If this Proposal is accepted, the undersigned BIDDER proposes and agrees to enter into and execute the Contract with the City of Hollywood, Florida, in the form of Contract specified; of which this Proposal, Instructions to Bidders, General Specifications, Supplementary Conditions and Drawings shall be made a part for the performance of Work described therein; to furnish the necessary bond equal to one hundred (100) percent of the total Contract base bid, the said bond being in the form of a Cash Bond or Surety Bond prepared on the applicable approved bond form furnished by the CITY; to furnish all necessary materials, equipment, machinery, tools, apparatus, transportation, supervision, labor and all means necessary to construct and complete the work specified in the Proposal and Contract and called for in the Drawings and in the manner specified; to commence Work on the effective date established in the "Notice to Proceed" from the ENGINEER; and to substantially complete all Contract Work for Phase 1 within 214 days with final completion within 244 days and all Contract Work for Phase 2 within 734 days with final completion within 818 days, and stated in the "Notice to Proceed" or pay liquidated damages for each calendar day in excess thereof, or such actual and consequential damages as may result therefrom, and to abide by the Local Preference Ordinance.

The BIDDER acknowledges receipt of the following addenda:

No. <u>1</u>	Dated <u>1/12/22 &amp; 2/7/22</u>
No. _____	Dated _____
No. _____	Dated _____

And the undersigned agrees that in case of failure on his part to execute the said Contract and the Bond within ten (10) days after being presented with the prescribed Contract forms, the check or Bid Bond accompanying his bid, and the money payable thereon, shall be paid into the funds of the City of Hollywood, Florida, otherwise, the check or Bid Bond accompanying this Proposal shall be returned to the undersigned.

Attached hereto is a certified check on the

\_\_\_\_\_ Bank of \_\_\_\_\_

or approved Bid Bond for the sum of

10% of the Bid Amount Dollars (\$) according to the conditions under the Instructions to Bidders and provisions therein.

NOTE: If a Bidder is a corporation, the legal name of the corporation shall be set forth below, together with signature(s) of the officer or officers authorized to sign Contracts on behalf of the corporation and corporate seal; if Bidder is a partnership, the true name of the firm shall be set forth below with the signature(s) of the partner or partners authorized to sign Contracts in behalf of the partnership; and if the Bidder is an individual, his signature shall be placed below; if a partnership, the names of the general partners.

WHEN THE BIDDER IS AN INDIVIDUAL:

\_\_\_\_\_  
(Signature of Individual)

\_\_\_\_\_  
(Printed Name of Individual)

\_\_\_\_\_  
(Address)

\*\*\*\*\*

WHEN THE BIDDER IS A SOLE PROPRIETORSHIP OR OPERATES UNDER A TRADE NAME:

\_\_\_\_\_  
(Name of Firm)

\_\_\_\_\_  
(Address)

\_\_\_\_\_  
(Signature of Individual) (SEAL)

\*\*\*\*\*

WHEN THE BIDDER IS A PARTNERSHIP:

\_\_\_\_\_  
(Name of Firm) A Partnership

\_\_\_\_\_  
(Address)

By: \_\_\_\_\_  
(SEAL)  
(Partner)

Name and Address of all Partners:

\_\_\_\_\_  
\_\_\_\_\_

\*\*\*\*\*

WHEN THE BIDDER IS A JOINT VENTURE:

\_\_\_\_\_  
(Correct Name of Corporation)

By: \_\_\_\_\_  
(SEAL)  
(Address)

\_\_\_\_\_  
(Official Title)

As Joint Venture  
(Corporate Seal)

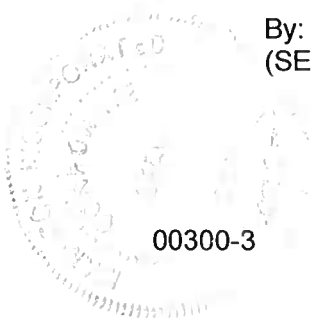
Organized under the laws of the State of \_\_\_\_\_, and authorized by the law to make this bid and perform all Work and furnish materials and equipment required under the Contract Documents.

\*\*\*\*\*

WHEN THE BIDDER IS A CORPORATION:

Man-Con Incorporated  
\_\_\_\_\_  
(Correct Name of Corporation)

By:   
(SEAL) Anthony Mancini



00300-3



Vice President

(Official Title)

3460 SW 11th Street  
Deerfield Beach, FL 33442

(Address of Corporation)

Organized under the laws of the State of Florida, and authorized by the law to make this bid and perform all Work and furnish materials and equipment required under the Contract Documents.

CERTIFIED COPY OF RESOLUTION OF BOARD OF DIRECTORS

Man-Con Incorporated

(Name of Corporation)

RESOLVED that Anthony Mancini

(Person Authorized to Sign)

Vice President of

(Title) (Name of Corporation)

be authorized to sign and submit the Bid or Proposal of this corporation for the following project:

**CITY OF HOLLYWOOD**

**WATER MAIN REPLACEMENT PROJECT FOR N. 26<sup>TH</sup> AVENUE (PHASE 1)**

**Bid No.: F-4708-22-OT**

The foregoing is a true and correct copy of the Resolution adopted by

Man-Con Incorporated

(Name of Corporation)

at a meeting of its Board of

Directors held on the 7th day of February, 2022.

By: 

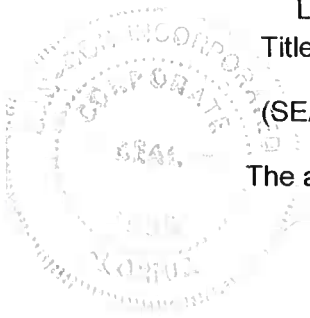
Luke Mancini

Title: Secretary

(SEAL)

The above Resolution MUST BE COMPLETED if the Bidder is a Corporation.

- END OF SECTION -



## SECTION 00301

CITY OF HOLLYWOOD  
DEPARTMENT OF PUBLIC UTILITIES  
ENGINEERING and CONSTRUCTION SERVICES DIVISION

**PROPOSAL BID FORM**

Project No.: 16-5133

Project Name: **WATER MAIN REPLACEMENT  
PROJECT FOR N. 26<sup>TH</sup> AVENUE (PHASE 1)**

If this Proposal is accepted, the undersigned Bidder agrees to complete all work under this contract within **240** calendar days following the issuance of the Notice to Proceed. **UNIT PRICE PREVAILS OVER TOTAL PRICE.** All entries on this form must be typed or written in block form in ink. Quantities provided are for information purposes. Full descriptions of the pay items are provided in Section 01025, "Basis of Payment".

**BASE BID:****Water Main Replacement Construction Costs**

<u>No.</u>	<u>Description</u>	<u>Qty</u>	<u>Unit</u>	<u>Unit Price</u>	<u>Total</u>
1	Fire Hydrant Assemblies and Connections	10	EA	17,024.00	170,240.00
2	Fire Hydrant Removal and Delivery to CITY Property	10	EA	3,438.00	34,380.00
3	PVC C-900/C-905 Water Mains and D.I. Fittings				
a.	2" Diameter Piping (within city roads)	50	LF	141.10	7,055.00
b.	4" Diameter Piping (within city roads)	1,800	LF	97.90	176,220.00
c.	6" Diameter Piping (within city roads)	120	LF	122.10	14,652.00
d.	8" Diameter Piping (within city roads)	3,900	LF	146.10	569,790.00
4	8" D.I. Water Main (Taft Street)	70	LF	190.10	13,307.00
5	D.I. Reducers				
a.	8" x 4" Diameter	1	EA	726.00	726.00
b.	8" x 6" Diameter	6	EA	805.00	4,830.00
6	D.I. Tees				
a.	8" x 4" Diameter	8	EA	1,127.00	9,016.00
b.	8" x 6" Diameter	3	EA	1,277.00	3,831.00
c.	8" x 8" Diameter	4	EA	1,292.00	5,168.00
7	8"x8" D.I. Crosses	1	EA	1,780.00	1,780.00

8	D.I. Bends				
a.	4-inch 45° Bends	17	EA	1,920.00	32,640.00
b.	6-inch 45° Bends	19	EA	2,433.00	46,227.00
c.	8-inch 45° Bends	34	EA	2,334.00	79,356.00
d.	2-inch 11.25° Bends	2	EA	2,406.00	4,812.00
e.	4-inch 90° Bends	1	EA	1,965.00	1,965.00
9	D.I. Gate Valves				
a.	4-inch Diameter	8	EA	2,012.00	16,096.00
b.	6-inch Diameter	4	EA	2,458.00	9,832.00
c.	8-inch Diameter	10	EA	2,870.00	28,700.00
10	Transition Coupling				
a.	8" Transition Coupling	1	EA	9,110.00	9,110.00
b.	6" Transition Coupling	10	EA	9,210.00	92,100.00
11	Flexible Connection to Existing 2-inch WM	9	EA	2,857.00	25,713.00
12	Cutting, Capping, and Abandonment of Existing 2-inch Water Mains	1	LS	11,411.00	11,411.00
13	Cutting, Grouting, and Abandonment of Existing 4-inch, 6-inch, and 8-inch Water Mains	1	LS	46,140.00	46,140.00
<b>Water Main Replacement Construction Sub-Total</b>					<b>1,415,097.00</b>

#### Water Meter and Water Service Construction Costs

14	Water Service Lines From New Water Main To Existing Water Meters				
a.	1-inch Diameter	42	EA	2,529.00	106,218.00
b.	2-Inch Diameter	5	EA	4,910.00	24,550.00
<b>Water Meter and Water Service Construction Sub-Total</b>					<b>130,768.00</b>

#### Storm Drainage Construction Costs

15	4' Dia. Drainage Manhole w/USF 420 Ring and C Cover 4' - 6' depth	2	EA	5,668.00	11,336.00
16	4' Dia. Drainage Manhole w/USF 420 Ring and C Cover 6' - 8' depth	5	EA	9,992.00	49,960.00

17	4' Dia. Drainage Manhole w/USF 420 Ring and C Cover 8' - 10' depth	2	EA	<u>11,685.00</u>	<u>23,370.00</u>
18	5' Dia. Drainage Manhole w/USF 420 Ring and C Cover 4' - 6' depth	1	EA	<u>6,436.00</u>	<u>6,436.00</u>
19	5' Dia. Drainage Manhole w/USF 420 Ring and C Cover 8' - 10' depth	8	EA	<u>12,334.00</u>	<u>98,672.00</u>
20	FDOT Type "C" Catch Basin w/Cast iron Grate (Index 443-002)	13	EA	<u>5,008.00</u>	<u>65,104.00</u>
21	4' Dia. Catch Basin w/USF 4180-6172	2	EA	<u>6,754.00</u>	<u>13,508.00</u>
22	Replace Exist. Struct. EX-01 with 5' Dia. Catch Basin w/4122-6172 Frame-Grate, including reconnections	1	LS	<u>11,558.00</u>	<u>11,558.00</u>
23	Skimmer (PRB) (FDOT Index 443-002)	19	EA	<u>2,606.00</u>	<u>49,514.00</u>
24	6" In-Line Storm Drainage Check Valve (Procured by COH)	1	EA	<u>3,693.00</u>	<u>3,693.00</u>
25	12" In-Line Storm Drainage Check Valve (Procured by COH)	1	EA	<u>4,683.00</u>	<u>4,683.00</u>
26	24" In-Line Storm Drainage Check Valve (Procured by COH)	1	EA	<u>6,528.00</u>	<u>6,528.00</u>
27	6" Solid Corrugated Drainage Pipe and Couplings/ Connectors	30	LF	<u>108.00</u>	<u>3,240.00</u>
28	12" Solid Corrugated Drainage Pipe and Couplings/ Connectors	50	LF	<u>124.00</u>	<u>6,200.00</u>
29	15" Solid Corrugated Drainage Pipe and Couplings/ Connectors	290	LF	<u>128.00</u>	<u>37,120.00</u>
30	18" Solid Corrugated Drainage Pipe and Couplings/ Connectors	920	LF	<u>120.00</u>	<u>110,400.00</u>
31	French Drain, including 18" Perforated Corrugated PVC Pipe and Couplings as Shown on Drawings	2,221	LF	<u>214.00</u>	<u>475,294.00</u>
32	Cut Exist. 24" Storm Sewer and Reconnect to Prop. Manhole SD-01 w/24" Solid Corrugated PVC and Couplings as Needed (Manhole SD-01 paid under separate pay item)	1	LS	<u>5,985.00</u>	<u>5,985.00</u>

33	Cut Exist. 15" Storm Sewer and Reconnect to Prop. Manhole SD-02 w/15" Solid Corrugated PVC and Couplings as Needed (Manhole SD-02 paid under separate pay item)	1	LS	3,706.00	3,706.00
34	Core-drill Wall of Exist. Structure to Prepare for Connection of 12" Solid Corrugated PVC (EX-06 and EX-07)	2	EA	3,798.00	7,596.00
35	Core-drill Wall of Exist. Structure to Prepare for Connection of 15" Solid Corrugated PVC (EX-02 and EX-03)	2	EA	3,967.00	7,934.00
36	Core-drill Wall of Exist. Structure to Prepare for Connection of 18" Solid Corrugated PVC (EX-05)	2	EA	4,895.00	9,790.00
37	Remove Exist. 6" Storm Sewer Connected to South Invert of Exist. Structure EX-09, Mortar-seal Exist. Pipe Opening, and Core-drill South Wall to Prepare for Connection of Prop. 6" Solid Corrugated PVC at Invert Shown on Drawings	1	LS	2,865.00	2,865.00
38	Remove Exist. 6" Storm Sewer Connected to North Invert of Exist. Structure EX-08 to Prepare for Connection of Prop. 6" Solid Corrugated PVC at Same Invert	1	LS	2,865.00	2,865.00
<b>Storm Drainage Construction Costs Sub-Total</b>					<b>1,017,357.00</b>

#### Storm Drainage Allowance Items

39	Replace Exist. Struct. with FDOT Type C Catch Basin w/Cast Iron Grate per FDOT Index 425-052. Reconnect to Exist. Pipe of Varying Diameters w/Prop. Solid Corrugated PVC Pipe and Couplings as Needed (EX-02, EX-07 and EX-09)	3	EA	6,443.00	19,329.00
40	Replace Exist. Struct. w/4' Dia. Catch Basin 4' - 6' deep w/USF Frame-Grate 4122-6172 or 4180-6172. Cut Exist. Pipe and Reconnect w/New Pipe and Couplings as Needed. (EX-03 and EX-04)	2	EA	7,253.00	14,506.00

41	Replace Exist. Struct. w/5' Dia. Catch Basin 4' - 6' deep w/USF Frame-Grate 4122-6172 or 4180-6172. Cut Exist. Pipe and Reconnect w/New Pipe and Couplings as Needed. (EX-05 and EX-06)	2	EA	<u>7,729.00</u>	<u>15,458.00</u>
42	Replace Exist. 24-inch Storm Sewer w/24-inch Solid Corrugated PVC Pipe and Couplings adjacent to SD-01	1	LS	<u>4,854.00</u>	<u>4,854.00</u>
43	Remove Section of Existing 6" Storm Sewer Connected to North Invert of Struct. EX-09 and Replace with 6" Solid Corrugated PVC Pipe and Couplings to Accommodate In-line Check Valve Installation	1	LS	<u>4,449.00</u>	<u>4,449.00</u>
44	Remove Section of Existing 12" Storm Sewer Connected to North Invert of Struct. EX-04 and Replace with 12" Solid Corrugated PVC Pipe and Couplings to Accommodate In-line Check Valve Installation	1	LS	<u>4,516.00</u>	<u>4,516.00</u>
45	Remove Section of Existing 24" Storm Sewer Connected to North Invert of Struct. EX-01 and Replace with 24" Solid Corrugated PVC Pipe and Couplings to Accommodate In-line Check Valve Installation	1	LS	<u>4,854.00</u>	<u>4,854.00</u>
46	Relocate 30± LF of Exist. 6" CI/DI Watermain Pipe and Fittings as Shown on Drawings to Accommodate Prop. Drainage Installation Btw. STA 49+81 and 50+09 of Sherman St.	1	LS	<u>16,434.00</u>	<u>16,434.00</u>
47	Furnish and Install Sleeves for Proposed Service Lines and Existing Service Lines to Remain 2-inch Diameter and Smaller that Cross Proposed French Drain in Accordance with Detail on Sheet SD-206 and FDOT Specifications.	45	EA	<u>1,572.00</u>	<u>70,740.00</u>
48	Furnish and Install Sleeves for Proposed Service Lines and Existing Service Lines to Remain Larger than 2-inch Diameter that Cross Proposed French Drain in Accordance with Detail on Sheet SD-206 and FDOT Specifications.	45	EA	<u>10.00</u>	<u>450.00</u>

49	Adjust Proposed Drainage Structure Tops due to Unforeseen Field Conditions in Accordance with FDOT Standard Index 425-001 as Modified on Sheet SD-206.	25	EA	<u>30.00</u>	<u>750.00</u>
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**Storm Drainage Allowance Items Sub-Total**

156,340.00

**City Roads Restoration Construction Costs**

50	Milling of Asphaltic Course to 1-inch Nominal Thickness within Liberty, Thomas, and Sherman Streets' ROW	5,900	SY	<u>4.00</u>	<u>23,600.00</u>
51	2-inch Thick (SP9.5) Asphaltic Concrete Structural Course for Trench Restoration within City ROW (all impacted streets)	9,400	LF	<u>45.60</u>	<u>428,640.00</u>
52	Roadway Patches for Large Damaged Areas (2" Asphalt)	600	SY	<u>44.33</u>	<u>26,598.00</u>
53	Resurfacing of Side Streets	5,900	SY	<u>11.15</u>	<u>65,785.00</u>
54	Existing Concrete Pavement, Brick Pavers and/or other specialty paving removed during re-routing of water services within private properties	100	SY	<u>163.00</u>	<u>16,300.00</u>
55	Temporary Striping for N 26th Avenue and Side Streets Except Liberty, Sherman, and Thomas	1	LS	<u>9,253.00</u>	<u>9,253.00</u>
56	Protective Concrete Slab over DI Piping on Taft Street	1	LS	<u>11,270.00</u>	<u>11,270.00</u>
57	Speed Humps	1	EA	<u>6,075.00</u>	<u>6,075.00</u>
<b>City Roads Restoration Construction Sub-Total</b>					<u>587,521.00</u>

**General**

58	Mobilization / Gen. Requirements	1	LS	<u>88,500.00</u>	<u>88,500.00</u>
59	Demobilization / Gen. Requirements	1	LS	<u>58,900.00</u>	<u>58,900.00</u>
60	Consideration for Indemnification	1	LS	<u>\$10.00</u>	<u>10.00</u>
61	Maintenance of Traffic, Including Design and	1	LS	<u>\$100,000.00</u>	<u>100,000.00</u>

	Permitting				
62	Permit, Licenses, Fees, and Materials Testing Allowance	1	LS	<u>\$50,000.00</u>	<u>50,000.00</u>
	<b>General Sub-Total</b>				<u>297,410.00</u>
63	Miscellaneous Work Allowance/Contingency	1	LS	<u>\$433,000.00</u>	<u>433,000.00</u>
64	Unforeseen Utility Locates or Break Repair (besides water main work)	60	HR	<u>954.00</u>	<u>57,240.00</u>
	<b>BASE BID TOTAL FOR COMPLETE PROJECT:</b>				<u><u>4,094,733.00</u></u>

Four Million Ninety Four Thousand Seven Hundred Thirty Three and Zero Cents

**BASE BID TOTAL IN WRITING**

Man-Con Incorporated

**NAME OF BIDDER**

**NOTES:**

1. **SUBSTANTIAL COMPLETION TIME AND PROJECT CLOSEOUT TIME FOR THE CONTRACT SHALL BE AS DEFINED IN THE PROJECT SCHEDULE IN THE SUPPLEMENTARY GENERAL CONDITIONS (SGC'S).**

- END OF SECTION -



SECTION 00410

APPROVED BID BOND

(Construction)

STATE OF FLORIDA

KNOW ALL MEN BY THESE PRESENTS:

That we Man-Con Incorporated, as Principal, and Westfield Insurance Company, as

Surety, are held and firmly bound unto the City of Hollywood in the sum of \_\_\_\_\_

Ten Percent of Amount Bid Dollars (\$ 10% of Amount Bid ) lawful money

of the United States, amounting to 10% of the total Bid Price, for the payment of said sum, we bind ourselves, our heirs, executors, administrators, and successors, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH, that whereas the principal has submitted the accompanying bid, dated \_\_\_\_\_ February 15th 20<sup>22</sup> for

**WATER MAIN REPLACEMENT PROJECT FOR N. 26<sup>TH</sup> AVENUE (PHASE 1)**  
**Bid No.: F-4708-22-OT**

NOW, THEREFORE, if the principal shall not withdraw said bid within 90 days after date of the same and shall within ten days after the prescribed forms are presented to him for signature, enter into a written contract with the CITY, in accordance with the bid as accepted, and give bond with good and sufficient surety or sureties, and provide the necessary Insurance Certificates as may be required for the faithful performance and proper fulfillment of such Contract, then this obligation shall be null and void.

Approved Bid Bond

In the event of the withdrawal of said bid within the specified period, or the failure to enter into such contract and give such bond and insurance within the specified time, the principal and the surety shall pay to the City of Hollywood the difference between the amount specified in said bid and such larger amount for which the City of Hollywood may in good faith contract with another party to perform the work and/or supply the materials covered by said bid.

IN WITNESS WHEREOF, the above bound parties have executed this statement under their several seals this 15th \_\_\_\_\_ day of February, 2022 \_\_\_\_\_, ~~XX~~ the name and corporate seal of each corporate party being hereto affixed and these presents duly signed by its undersigned representative, pursuant to authority of its governing body.

WHEN THE PRINCIPAL IS AN INDIVIDUAL:

Signed, sealed and delivered in the presence of:

\_\_\_\_\_  
Witness

\_\_\_\_\_  
Signature of Individual

\_\_\_\_\_  
Address

\_\_\_\_\_

\_\_\_\_\_  
Printed Name of Individual

\_\_\_\_\_  
Witness

\_\_\_\_\_  
Address

\_\_\_\_\_

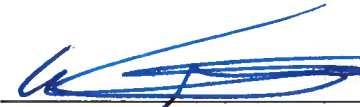
WHEN THE PRINCIPAL IS A CORPORATION:

Attest:

Secretary   
Luke Mancini

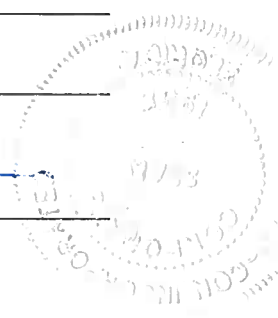
Man-Con Incorporated  
Name of Corporation

3460 SW 11th Street,  
Business Address  
Deerfield Beach, FL 33442

By:   
(Affix Corporate Seal)

Anthony Mancini  
Printed Name

Vice President  
Official Title



CERTIFICATE AS TO CORPORATE PRINCIPAL

I, Luke Mancini, certify that I am the secretary of the Corporation named as Principal in the attached bond; that Anthony Mancini who signed the said bond on behalf of the Principal, was then Vice President of said Corporation; that I know his signature, and his signature thereto is genuine and that said bond was duly signed, sealed and attested for and on behalf of said Corporation by authority of its governing body.

 (SEAL)  
Secretary Luke Mancini




TO BE EXECUTED BY CORPORATE SURETY:

Attest:

  
Secretary

Westfield Insurance Company  
Corporate Surety  
P.O. Box 5001, Westfield Center,  
Business Address  
OH, 44251

BY:   
(Affix Corporate Seal)

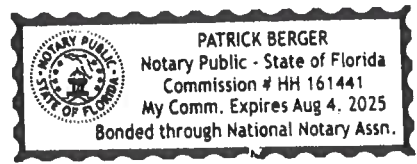
Angelo G. Zervos  
Attorney-in-Fact  
Zervos Group, Inc.  
Name of Local Agency  
4443 Lyons Road, Suite D-212,  
Business Address  
Coconut Creek, FL 33073

STATE OF FLORIDA

Before me, a Notary Public, duly commissioned, qualified and acting, personally appeared, Angelo G. Zervos to me well known, who being by me first duly sworn upon oath says that he is the attorney-in-fact for the Westfield Insurance Company and that the has been authorized by Westfield Insurance Company to execute the forgoing bond on behalf of the CONTRACTOR named therein in favor of the City of Hollywood, Florida. Subscribed and sworn to before me this 15th day of February, 2022

  
Notary Public, State of Florida

My Commission Expires: 8/4/2025



- END OF SECTION -

THIS POWER OF ATTORNEY SUPERCEDES ANY PREVIOUS POWER BEARING THIS SAME POWER # AND ISSUED PRIOR TO 12/14/18, FOR ANY PERSON OR PERSONS NAMED BELOW.

POWER NO. 2141882 09

General  
Power  
of Attorney

**Westfield Insurance Co.**  
**Westfield National Insurance Co.**  
**Ohio Farmers Insurance Co.**

Westfield Center, Ohio

CERTIFIED COPY

Know All Men by These Presents, That WESTFIELD INSURANCE COMPANY, WESTFIELD NATIONAL INSURANCE COMPANY and OHIO FARMERS INSURANCE COMPANY, corporations, hereinafter referred to individually as a "Company" and collectively as "Companies," duly organized and existing under the laws of the State of Ohio, and having its principal office in Westfield Center, Medina County, Ohio, do by these presents make, constitute and appoint  
**GUS E. ZERVOS, ANGELO G. ZERVOS, DONALD W. BURDEN, STEPHEN M. ZERVOS, MICHAEL G. ZERVOS, JOINTLY OR SEVERALLY**

of SOUTHFIELD and State of MI its true and lawful Attorney(s)-in-Fact, with full power and authority hereby conferred in its name, place and stead, to execute, acknowledge and deliver any and all bonds, recognizances, undertakings, or other instruments or contracts of suretyship.

**LIMITATION: THIS POWER OF ATTORNEY CANNOT BE USED TO EXECUTE NOTE GUARANTEE, MORTGAGE DEFICIENCY, MORTGAGE GUARANTEE, OR BANK DEPOSITORY BONDS.**

and to bind any of the Companies thereby as fully and to the same extent as if such bonds were signed by the President, sealed with the corporate seal of the applicable Company and duly attested by its Secretary, hereby ratifying and confirming all that the said Attorney(s)-in-Fact may do in the premises. Said appointment is made under and by authority of the following resolution adopted by the Board of Directors of each of the WESTFIELD INSURANCE COMPANY, WESTFIELD NATIONAL INSURANCE COMPANY and OHIO FARMERS INSURANCE COMPANY:

"Be It Resolved, that the President, any Senior Executive, any Secretary or any Fidelity & Surety Operations Executive or other Executive shall be and is hereby vested with full power and authority to appoint any one or more suitable persons as Attorney(s)-in-Fact to represent and act for and on behalf of the Company subject to the following provisions:

*The Attorney-in-Fact* may be given full power and authority for and in the name of and on behalf of the Company, to execute, acknowledge and deliver, any and all bonds, recognizances, contracts, agreements of indemnity and other conditional or obligatory undertakings and any and all notices and documents canceling or terminating the Company's liability thereunder, and any such instruments so executed by any such Attorney-in-Fact shall be as binding upon the Company as if signed by the President and sealed and attested by the Corporate Secretary."

"Be It Further Resolved, that the signature of any such designated person and the seal of the Company heretofore or hereafter affixed to any power of attorney or any certificate relating thereto by facsimile, and any power of attorney or certificate bearing facsimile signatures or facsimile seal shall be valid and binding upon the Company with respect to any bond or undertaking to which it is attached." (Each adopted at a meeting held on February 8, 2000).

In Witness Whereof, WESTFIELD INSURANCE COMPANY, WESTFIELD NATIONAL INSURANCE COMPANY and OHIO FARMERS INSURANCE COMPANY have caused these presents to be signed by their National Surety Leader and Senior Executive and their corporate seals to be hereto affixed this 14th day of DECEMBER A.D., 2018 .

Corporate  
Seals  
Affixed



WESTFIELD INSURANCE COMPANY  
WESTFIELD NATIONAL INSURANCE COMPANY  
OHIO FARMERS INSURANCE COMPANY

*Dennis P. Baus*

By: **Dennis P. Baus, National Surety Leader and Senior Executive**

State of Ohio  
County of Medina ss.:

On this 14th day of DECEMBER A.D., 2018 , before me personally came **Dennis P. Baus** to me known, who, being by me duly sworn, did depose and say, that he resides in **Wooster, Ohio**; that he is **National Surety Leader and Senior Executive** of WESTFIELD INSURANCE COMPANY, WESTFIELD NATIONAL INSURANCE COMPANY and OHIO FARMERS INSURANCE COMPANY, the companies described in and which executed the above instrument; that he knows the seals of said Companies; that the seals affixed to said instrument are such corporate seals; that they were so affixed by order of the Boards of Directors of said Companies; and that he signed his name thereto by like order.

Notarial  
Seal  
Affixed



*David A. Kotnik*

**David A. Kotnik, Attorney at Law, Notary Public**  
My Commission Does Not Expire (Sec. 147.03 Ohio Revised Code)

State of Ohio  
County of Medina ss.:

I, **Frank A. Carrino**, Secretary of WESTFIELD INSURANCE COMPANY, WESTFIELD NATIONAL INSURANCE COMPANY and OHIO FARMERS INSURANCE COMPANY, do hereby certify that the above and foregoing is a true and correct copy of a Power of Attorney, executed by said Companies, which is still in full force and effect; and furthermore, the resolutions of the Boards of Directors, set out in the Power of Attorney are in full force and effect.

In Witness Whereof, I have hereunto set my hand and affixed the seals of said Companies at Westfield Center, Ohio, this 15th day of February A.D., 2022.



*Frank A. Carrino* Secretary  
**Frank A. Carrino, Secretary**

SECTION 00420

INFORMATION REQUIRED FROM BIDDERS

GENERAL INFORMATION

The Bidder shall furnish the following information. Failure to comply with this requirement may cause its rejection. Additional sheets shall be attached as required.

1. Contractor's Name/Address: Man-Con Incorporated  
3460 SW 11th Street, Deerfield Beach, FL 33442  
\_\_\_\_\_
2. Contractor's Telephone Number: 954-427-0230  
and e-mail address: Anthony@mancon.ws
3. Contractor's License (attach copy): CGC1526881 See attached  
Primary Classification: General Contractor  
Broward County License Number (attach copy): See attached.
4. Number of years as a Contractor in construction work of the type involved in this  
Contract: 37 years  
\_\_\_\_\_
5. List the names and titles of all officers of Contractor's firm:  
Jeffrey Mancini, President  
Anthony Mancini, Vice President  
Luke Mancini, Secretary  
CAroline Mancini, Director
6. Name of person who inspected site or proposed work for your firm:  
Name: Jeffrey Mancini  
Date of Inspection: 1/22/22
7. What is the last project of this nature you have completed?  
Seminole Tribe of Florida - Seminole Park  
\_\_\_\_\_
8. Have you ever failed to complete work awarded to you; if so, where and why?  
No.  
\_\_\_\_\_  
\_\_\_\_\_

9. Name three individuals or corporations for which you have performed work and to which you refer:

Pat MacGregor - Broward County 954-831-0904 pamacgregor@broward.org

Patrick Gibney - Craven, Thompson & Associates 954-739-6400 pgibney@craventhompson.com

Aaron Cutler- Mathews Consulting 561-655-6175 x 7714 acutler@baxterwoodman.com

10. List the following information concerning all contracts on hand as of the date of submission of this proposal (in case of co-venture, list the information for all coventures).

Name of Project	City	Total Contract Value	Contracted Date of Completion	% Completion to Date
District 2 Sample Road 12 Inches Water Main Aerial Crossing	Lighthouse Point	\$328,155.30	4/1/22	0%
Parkside Water Main Replacement Project	Hollywood	\$10,424,457.40	2/1/23	80%
Utility Analysis Zone 362 and 363 Water Service Transfer	Miramar	\$2,288,419.62	5/1/22	75%
Alleyway Improvements Plan	Hollywood	\$895,069.12	5/31/22	95%

(Continue list on inset sheet, if necessary)

11. What equipment do you own that is available for the work?

See the attached equipment list.

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12. What equipment will you purchase for the proposed work?

None

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**NOTE:**

If requested by CITY, the Bidder shall furnish a notarized financial statement, references and other information, sufficiently comprehensive to permit an appraisal of its current financial condition.





### All Contracts on Hand (Continued)

Name of Project	City	Total Contract Value	Contracted Date of Completion	% Completion to Date
Palm Club Septic to Sewer Project	Lauderdale by the Sea	\$3,130,291.50	5/14/22	75%
Sanitary Sewer Collection System for District 2 Septic Tank Elimination Area 2-F	Pompano Beach	\$2,570,829.63	1/31/23	10%



LIST OF SUBCONTRACTORS

The Bidder shall list below the name and address of each Subcontractor who will perform work under this Contract in excess of one-half percent of the total bid price, and shall also list the portion of the work which will be done by such Subcontractor. After the opening of Proposals, changes or substitutions will be allowed with written approval of the City of Hollywood. Subcontractors must be properly licensed and hold a valid Hollywood Certificate of Competency.

	<b>Work to be Performed</b>	<b>Subcontractor's Name / Address</b>
1.	<u>Milling &amp; Paving</u>	<u>Atlantic Southern Paving</u>
		<u>6301 W Sunrise Blvd, Sunrise, FL 33313</u>
2.		
3.		
3.	<u>Survey &amp; As Builts</u>	<u>Compass Point Surveyors</u>
4.		<u>3350 NW 22nd Terrace #1200,</u>
		<u>Pompano Beach, FL 33069</u>
5.		
5.	<u>Material Supply</u>	<u>Core &amp; Main</u>
6.		<u>4310 NW 10th Ave, Oakland Park, FL 33309</u>
6.		
7.		
7.		
8.		
8.		
9.		
9.		
10.		
10.		

NOTE: Attach additional sheets if required.

- END OF SECTION -

SECTION 00435

LOCAL PREFERENCE

(EXHIBIT "A")

Pursuant to §38.50 of the City of Hollywood *Code of Ordinances*, the City shall grant a preference to local Hollywood vendors if their initial bid is within 5% of the bid of the lowest responsive bidder that is a non-local Hollywood vendor. The preference shall allow the local Hollywood vendor to submit a second and final offer, which must be at least 1% less than the bid of the lowest responsive responsive non-local Hollywood vendor to be awarded. The local Hollywood vendor shall have the burden of demonstrating that it maintains a permanent place of business with full-time employees within the City limits and has done so for a minimum of one (1) year prior to the date of issuance of a bid or proposal solicitation within Hollywood, Florida. All supporting documentation (e.g. City of Hollywood valid local business tax receipt) for local preference eligibility must be received with the bid package prior to the bid opening date and time.

SECTION 00495

TRENCH SAFETY FORM

This form must be completed and signed by the Bidder.

Failure to complete this form may result in the bid being declared non-responsive.

Bidder acknowledges that the Florida Trench Safety Act, Section 553.60 et. seq., which became effective October 1, 1990, shall be in effect during the period of construction of the project. The Bidder by signing and submitting the bid is, in writing, assuring that it will perform any trench excavation in accordance with applicable trench safety standards. The Bidder further identifies the following separate item of cost of compliance with the applicable trench safety standards as well as the method of compliance:

Method of Compliance

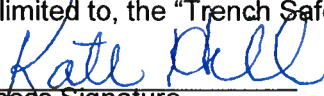
Cost

Sloping

Total \$ 17,500.00


Bidder acknowledges that this cost is included in the applicable items of the Proposal and in the Grand Total Bid Price. Failure to complete the above will result in the bid being declared non-responsive.

The Bidder is, and the Owner and Engineer are not, responsible to review or assess Bidder's safety precautions, programs or costs, or the means, methods, techniques or technique adequacy, reasonableness of cost, sequences or procedures of any safety precaution, program or cost, including but not limited to, compliance with any and all requirements of Florida Statute Section 553.60 et. seq. cited as the "Trench Safety Act". Bidder is, and the owner and Engineer are not, responsible to determine if any safety related standards apply to the project, including but not limited to, the "Trench Safety Act".

  
Witness Signature

Kate Hill  
Witness Printed Name  
3460 SW 11th Street  
Deerfield Beach, FL 33442  
Witness Address

2/15/22  
Date

  
Contractor's Signature

Anthony Mancini  
Printed Name  
Vice President  
Title

2/15/22  
Date

- END OF SECTION -



# QUALIFICATIONS OF BIDDER

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**Broward County Office:**  
3460 S.W. 11<sup>th</sup> Street  
Deerfield Beach, Florida 33442  
Office: 954-427-0230 Fax: 954-427-8133

**Palm Beach County Office:**  
3020 Fairlane Farms Road  
Suite 1, Wellington, Florida 33414  
Office: 954-427-0230 Fax: 954-427-8133

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**INCORPORATED**

**Project Construction - Reference**

**PROJECT NAME:** Location: Pompano Beach , W. Copans Rd, NE 35th Ct  
**MAN CON JOB #:** North County Neighborhood Improvement Project Bid Pack 15  
299

**OWNER:** Broward County Water & Wastewater Services  
**Contact:** Pat MacGregor, P.E.  
**Address** 2555 West Copans Road  
Pompano Beach, FL 33069

**PH #** 954-831-0904  
**FX #** 954-831-0798  
**Email** pamacgregor@broward.org

**Duration:** 790 **Total Days** **Start** 5/10/2011  
**Schedule Compliance:** yes **Finish** 8/25/2013

**Cost:** **Original** \$ 9.760 million **Final** \$10,375,412.44  
**Budget Compliance:** Yes, owner desired changes.

**Project Description:**

Installation of 4,155 LF of Exfiltration Trench  
Installation of 30,975 LF of Sanitary Sewer in deep dewatering trenches with connection of  
approximately 600 existing residences to new system. 9800 LF of drainage piping and structures,  
desilting of the existing drainage pipe and structures. 1,227 LF of new 8" Ductile Iron Water Main  
with appurtenances and new water service connections to residences. Grout / abandonment of the  
existing water main, new force main and lift station.  
Removal and disposal of existing concrete sidewalks and asphalt pavement, installation of new  
concrete sidewalks and asphalt pavement, installation of new concrete sidewalk, type "F" curb and gutter,  
restoration of driveway approaches, and existing roadways subgrade, base and asphalt pavement.. .  
Signage and reconstruction of pavement markings.  
Tree relocations, new tree installations and landscape features, swale grading and sodding, existing  
irrigation system restorations and new irrigation system installation for landscaped median.

All work performed within the Broward County Right of Way.

Work performed within the Leisureville residential neighborhood.

General Superintendent: Jeffrey J. Mancini  
Superintendent: Kevin Rutherford Project  
Manager: Michael F. Iacobelli



**INCORPORATED**

**Project Construction - Reference**

<b>PROJECT NAME:</b>	Avenue O & H Neighborhood Infrastructure Improvements	
	<b>SECTION H</b>	<b>SECTION O</b>
<b>MAN CON JOB #:</b>	344	
<b>OWNER:</b>	City of Riviera Beach	City of Riviera Beach
<b>Contact:</b>	Suzanne Dombrowski, P.E.,	Rick Labinsky, P.E.
<b>Address</b>	ENV SP - Chen Moore and Associates 500 Australian Ave. South, Suite 850 West Palm Beach, FL 33401	600 W. Blue Heron Blvd., Suite 140 Riviera Beach, FL 33404

<b>PH #</b>	561-746-6900 Ext. 1035	407-492-3712
<b>FX #</b>		
<b>Email</b>	<a href="mailto:SDombrowski@chenmoore.com">SDombrowski@chenmoore.com</a>	<a href="mailto:Rmlabinsky@gmail.com">Rmlabinsky@gmail.com</a>

<b>Duration:</b>	450	Total Days	390	Total Days
<b>Start</b>	May 1, 2018		March 26, 2018	
<b>Finish</b>	October 2, 2019		March 11, 2019	

	<b>SECTION H</b>	<b>SECTION O</b>
<b>Original Cost</b>	\$ 7,919,040.34	\$ 8,925,606.20
<b>Final Cost</b>	\$ 8,840,460.71	\$ 9,316,257.10

**\$ 18,156,717.81**

**Project Description:**

<b>SECTION H</b>	<b>SECTION O</b>
Complete ROW Replacement of Paved Surface	Complete ROW Replacement of Paved Surface
All Concrete Sidewalk and Driveway Aprons,	All Concrete Sidewalk and Driveway Aprons
6,791' RCP Drainage Installation Sizes 15" - 60" Diameter	8,586' RCP Drainage Installation Sizes 15" - 48"
1,144 LF Remove & Replace Existing Sanitary Sewer Pipe	1,400 LF R&R Existing Cast Iron Force Main Pipe
12,708 LF Furnish & Install and DIP Main Pipe, Incl Rem.	12,000 LF F&I and DIP Main Pipe, Incl Rem.
Asbestos and Grout Abandonment	Asbestos and Grout Abandonment
Water Service relocation from rear to front of property.	Water Service relocation from rear to front
6,761' Re-Line Ex. Sanitary Sewer	7,327' Re-Line Ex. Sanitary Sewer & 93 EA SL's
50 LF 6' x 7' Box Culvert FDOT Index 289	Re-line 780' of up to 48" RCP Storm Drain
	182 Drainage Structures

**Man-Con Incorporated Key Employee's for this project:**

Jeffrey J. Mancini, General Superintendent
Kevin Rutherford, Utilities Superintendent
Michael F. Iacobelli, Senior Project Manager
Anthony Mancini, Project Manager
C. Eric Moulton, Restoration Superintendent



**INCORPORATED**

**Project Construction - Reference**

**PROJECT NAME:** Utility Analysis Zone 122

**MAN CON JOB #:** 347

**OWNER:** Broward County Water and Wastewater Services

**Contact:** Luz Sanchez, Project Manager

**Address** 2555 W Copans Rd

Pompano Beach, FL 33069

**PH #** 954-831-0971

**FX #**

**Email** [Lusanchez@broward.org](mailto:Lusanchez@broward.org)

**Duration:** 607 **Total Days** **Start** 03/2019

**Schedule Compliance:** Yes **Finish** 3/2020

**Cost:** **Original** \$13,369,728.55 **Final** \$14,466,032.93

**Budget Compliance:** Yes

**Project Description:**

Construct 27,630 LF of 4", 6", 8", 10", 12", & 16" Water Main and appurtenances including abandonment of existing mains and 2" water services

Construct 16,666 LF of 8", 10", 12" & 14" Sanitary Sewer Main and appurtenances including abandonment or removal of existing mains, laterals, new lift station, demo & removal of two ex lift stations, 1,600 LF of force main, CIPP lining of existing sanitary sewer, rehabilitation of existing sanitary sewer manholes.

Horizontal Directional Drill installation of 8" & 12" Water Mains and Force Main crossing existing canals and under Oakland Park Blvd.

Complete roadway re-construction and realignment throughout existing multifamily development.

Tree removal and replacement and replacement of all disturbed sod and landscape.

**Key Project Personnel:**

Jeffrey J. Mancini, General Superintendent

Anthony J. Mancini, Project Manager

Michael Iacobelli, Senior Project Manager

Kevin Rutherford, Project Superintendent

C. Eric Moulton, Restoration Superintendent





**INCORPORATED**

**Project Construction - Reference**

**PROJECT NAME:** Seminole Park Site Development

**MAN CON JOB #:** 349

**OWNER:** Seminole Tribe of Florida

**Contact:** James Rabideau

**Address** 6300 Sterling Road

Hollywood, FL 33024

**PH #** 561-248-4098

**FX #** \_\_\_\_\_

**Email** [James.Rabideau@jacobs.com](mailto:James.Rabideau@jacobs.com)

<b>Duration:</b>	<u>426</u>	<b>Total Days</b>		<b>Start</b>	<u>11/2019</u>
<b>Schedule Compliance:</b>		<u>Yes</u>		<b>Finish</b>	<u>12/2020</u>

<b>Cost:</b>	<b>Original</b>	<u>\$10,574,677.60</u>	<b>Final</b>	<u>\$10,900,000.00</u>
<b>Budget Compliance:</b>		<u>Yes</u>		

**Project Description:**

Project Site Development including 53,200 CY of Mass Excavation, 124,800 CY of Embankment from On-site and Imported Materials, 18,300 SY of Asphalt Paving, 22,000 SY of 8" Limerock Base, 23,900 SY of LBR 40 Stabilized Subgrade, 6,680 SY of Concrete Sidewalk, Irrigation and Vegetative Restoration.

Utility Installation of 6,556 LF of 12"-48" RCP and HDPE Drainage Pipe, 64 drainage structures, 5,280 LF of 8" C-900 Water Main, 1,455 LF of 12" C-900 Water Main, 76 Single Water Services, 1,191 LF of 8" SDR26 Sanitary Sewer Main, 3,354 LF of 10" SDR26 Sanitary Sewer Main, 19 Sanitary Sewer Manholes, 76 Sewer Lateral Services.

**Man-Con Incorporated Key Employee's for this project:**

Jeffrey J. Mancini, General Superintendent

Anthony J. Mancini, Project Manager

Michael Iacobelli, Senior Project Manager

Kevin Rutherford, Project Superintendent

C. Eric Moulton, Restoration Superintendent





ENGINEERING CONTRACTORS

Key Personnel and Their Role

Jeffrey Mancini - President

Michael F. Iacobelli - Senior Project Manager

Anthony Mancini - Vice President / Secretary

Luke Mancini – General Superintendent / Secretary

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Palm Beach County Office:  
3020 Fairlane Farms Road  
Suite 1, Wellington, Florida 33414

## JEFFREY MANCINI



**PRESIDENT**  
Jeffm@mancon.ws

Incorporated in the State of Florida in 1985, Man-Con Inc. has completed more than 400 sizeable construction projects throughout Broward, Palm Beach, and Miami-Dade counties. Founded by Guy and Jeff Mancini, Man-Con Inc. is a second-generation underground utility company. Mr. Mancini works closely with the team of highly experienced project managers and superintendents daily. Under his leadership, Man-Con Inc. has developed a reputation for its high standards of workmanship and outstanding level of performance.

**EXPERIENCE:**

**PRESIDENT**  
MAN-CON INCORPORATED | 2018 TO CURRENT

**VICE PRESIDENT/GENERAL CONSTRUCTION SUPERINTENDENT**  
MAN-CON INCORPORATED | 1983 - 2018

Responsible for management and oversight of all field operations including, but not limited to, water main, sewage force main, gravity sewer, storm drain, earthwork, and highway and heavy construction.

**VICE PRESIDENT/ASSISTANT SECRETARY**  
RIC-MAIN INTERNATIONAL | 1983 - 1985

In charge of all field operations for highway construction, heavy construction, and underground utility construction.

**FOREMAN/SUPERINTENDENT**  
RIC-MAIN INTERNATIONAL | 1980 - 1983

Responsible for all field operations for highway construction, heavy construction, and underground utilities.

**FOREMAN**  
RIC-MAIN INTERNATIONAL | 1977

In charge of various underground utility pipeline projects in southeast Michigan.

**OPERATOR/LABORER**  
RIC-MAIN INTERNATIONAL | 1975 - 1977

Part-time heavy equipment operator and laborer on numerous underground utility pipeline projects in southeast Michigan.

**CLIENT REFERENCE'S**

- Pat MacGregor  
Broward County WWS  
Phone: (954) 831-0904  
Email: [pmacgregor@broward.org](mailto:pmacgregor@broward.org)
- Aaron Cutler  
Mathews Consulting  
Phone: (561)655-6175  
Email: [Acutler@baxterwoodman.com](mailto:Acutler@baxterwoodman.com)

### Notable Projects:

#### Watermain replacement Project | Town of Highland Beach | Project Manager

- Construct 7,000 LF of Water Main
- Install Aerial Crossing over Intracoastal
- 200 new Water Services

#### Avenue H East & West Roadway Improvements | City of Riviera Beach | Project Manager

- Reconstruction of 8,000 LF of Roadway
- Install Drainage Structures and over 5,000 LF of RCP Drainage Pipe
- 5,500 LF of DIP Watermain
- Grout and Abandon existing Pipe
- Reline 5,055 LF of 8" VCP sewer pipe and bypass

#### Pines Village Water Main Improvements – Phase I | City of Pembroke Pines | Project Manager

- Installation of Approximately 20,000 LF of 6", 8" & 12" Water Mains, Including Asphalt Trench Repairs
- 9,929 LF Abandonment of Existing Water Main
- 191 EA Water Services
- 365 EA Rear to Front Meter Relocations

#### Utility Analysis Zone 122 | Broward County Water and Wastewater Services | Project Manager

- Construct 27,630 LF of 4", 6", 8", 10", 12", and 16" Water Main and Appurtenances including Abandonment of existing Mains and 2" Water Services
- Construct 16,666 LF of 8", 10", 12" and 14" Sanitary Sewer Main and Appurtenances including Abandonment or Removal of Existing Mains, New Lift Station, Demo and Removal of two existing lift stations, 1,600 LF of Force Main, CIPP lining of existing Sanitary Sewer, Rehabilitation of existing Sanitary Sewer Manholes.
- Horizontal Directional Drill Installation of 8" and 12" Water Mains and Force Mains crossing existing Canals and under Oakland Park Blvd.
- Complete Roadway Re-Construction and Realignment throughout existing Multifamily Development
- Tree Removal and Replacement of all disturbed Sod and Landscape

## MICHAEL IACOBELLI



**SENIOR PROJECT MANAGER**  
Mikei@mancon.ws

Mr. Iacobelli has been employed by Man Con, Inc. as our Senior Project Manager for the past 20 years and possesses extensive knowledge of utility and road construction in South Florida. The extent of his utility and roadway construction experience spans forty-three years and includes all construction techniques including open-cut, horizontal directional drill, micro-tunneling, TBM tunneling, poured-in-place underground concrete structures and asphalt paving in South Florida, New York, Michigan, Indiana, Florida Keys and the Bahamas.

#### EXPERIENCE

##### SENIOR PROJECT MANAGER/SENIOR ESTIMATOR MAN-CON INCORPORATED | 2000 TO CURRENT

Responsible for work procurement including negotiated and municipal bid projects. Lead management team on all Florida projects. Actively manage project administration, contract negotiation and management of subcontractors, oversee scheduling and materials procurement. Led management of \$4MM of disaster recovery related work and \$176 MM in aggregate workload since 2000.

##### PROJECT MANAGER

##### FELIX EQUITIES, INC. | 1998 - 2000

Led management team for construction of \$19.9 MM Concourse "A" Apron and Utility Corridor project at Miami International Airport. Project included installation of jet fuel pipelines, water mains, sewage force mains, concrete encased electrical communication duct banks, and paving of airport grounds. Managed minority participation mandated by contract at 22% of total work value.

##### SECRETARY/TREASURER

##### COASTAL UTILITIES | 1994 - 1998

Partner in corporation. Work included installing water, sewer, drainage, and road projects, serving municipalities and private developers. Merged Michigan with Florida operations to expand operations in the south Florida market.

##### PRESIDENT

##### ICAOBELLI UNDERGROUND CONTR. CORP. | 1986 - 1994

##### VICE PRESIDENT

##### ICAOBELLI CONSTRUCTION | 1980 - 1986

##### FOREMAN/SUPERINTENDENT

##### ICAOBELLI CONSTRUCTION | 1973 - 1980

#### EDUCATION:

##### BACHELOR OF SCIENCE:

CONSTRUCTION ENGINEERING - LAWRENCE TECHNOLOGICAL UNIVERSITY | 1981

#### CLIENT REFERENCE'S

- Mike Hagerty, P.E., LEED AP  
Broward County WWS  
Phone: (954) 831-3217  
Email: [mhagerty@broward.org](mailto:mhagerty@broward.org)
- Aaron Cutler, Vice President of Construction  
Baxter & Woodman  
Phone: (561)655-6175  
Email: [Acutler@baxterwoodman.com](mailto:Acutler@baxterwoodman.com)

#### Notable Projects:

##### Central Seacrest Corridor Utility Improvements | City of Boynton Beach | Project Manager

- Storm Water System Upgrade including 5,210 LF of Exfiltration Trench
- 8" DI Water Main Replacement 26,933 LF
- 66,823 SY of Pavement Overlay
- 14,355 SY of Driveway Apron Restoration
- 264 Rear to Front Transfers and Connection

##### Avenue "O" Neighborhood Infrastructure Improvements | City of Riviera Beach | Project Manager

- 6,791 LF RCP Drainage Installation Sizes 15" - 16" DI
- 1,144 LF Remove and Replace Existing Sanitary Sewer Pipe
- 12,708 LF Furnish and Install DIP Main Pipe, Including Remove Asbestos and Grout Abandonment
- 6,761 LF Re-line Existing Sanitary Sewer
- Water Service Relocation from Rear to Front of Properties
- Complete Right of Way to Right of Way Replacement of Paved Surface, Demo and Re-Construct all Concrete Sidewalk and Driveway Aprons

##### Hillsboro Pines Neighborhood Project | Broward County | Project Manager

- Install 12,641 LF of Sanitary Sewer Pipe
- Install 4,000 LF of Reclaimed Water Line
- Install 10,500 LF of RCP Storm Drainage
- Landscape and Roadway Reconstruction

##### Utility Analysis Zone 122 | Broward County Water and Wastewater Services | Project Manager

- Construct 27,630 LF of 4", 6", 8", 10", 12", and 16" Water Main and Appurtenances including Abandonment of existing Mains and 2" Water Services
- Construct 16,666 LF of 8", 10", 12" and 14" Sanitary Sewer Main and Appurtenances including Abandonment or Removal of Existing Mains, New Lift Station, Demo and Removal of two existing lift stations, 1,600 LF of Force Main, CIPP lining of existing Sanitary Sewer, Rehabilitation of existing Sanitary Sewer Manholes.
- Horizontal Directional Drill Installation of 8" and 12" Water Mains and Force Mains crossing existing Canals and under Oakland Park Blvd.
- Complete Roadway Re-Construction and Realignment throughout existing Multifamily Development
- Tree Removal and Replacement of all disturbed Sod and Landscape

#### Main Office:

3460 S.W. 11<sup>th</sup> Street  
Deerfield Beach, Florida 33442  
O: 954-427-0230  
F: 954-427-8133

#### Palm Beach County Office:

3020 Fairlane Farms Road  
Suite 1, Wellington, Florida  
33414



## ANTHONY MANCINI



**VICE PRESIDENT**  
AnthonyM@mancon.ws

Anthony has been a crucial member of the Man Con Inc team since 2005 when he worked as a foreman at the start of his career until 2011 when he took a break on work to focus on his education while attending Florida Atlantic University. At which point he returned to the Man Con team as a project manager and has proved himself as one of the go people in the organization and currently serves as the Vice President of Man Con Inc. Anthony brings with him a wealth of knowledge in multiple areas of utility and heavy civil in both the public and private sectors where he has been actively involved with construction operations for the past 15 years. Which have included multi design-build projects, Directional Drilling Operations, Lining of Existing Utilities, Open and Deep Cut utility installation, roadway and hardscape paving operations.

### **EXPERIENCE:**

#### **VICE PRESIDENT**

**MAN-CON INCORPORATED | DEC 2017 TO CURRENT**

#### **PROJECT MANAGER**

**MAN-CON INCORPORATED | DEC 2013 - DEC 2017**

Responsible for the Projects and overall performance including all aspects from project award to project close out.

**HALVORSEN HOLDINGS | DEC 2011 - DEC 2013**

Acquisitions, Dispositions, Construction Management of Commercial Real Estate.

#### **FOREMAN**

**MAN-CON INCORPORATED | DEC 2005 - DEC 2011**

Worked on multiple sanitary sewers, water, drainage, and road building projects in South Florida and gained experience in all aspects of construction from project start-up through final restoration.

### **EDUCATION:**

**BACHELOR of BUSINESS ADMINISTRATION:**

**FINANCE - FLORIDA ATLANTIC UNIVERSITY | 2013**

### **CLIENT REFERENCE'S**

- Mike Hagerty, P.E., LEED AP  
Broward County WWS  
Phone: (954) 831-3217  
Email: [mhagerty@broward.org](mailto:mhagerty@broward.org)
- Aaron Cutler, Vice President of Construction  
Baxter & Woodman  
Phone: (561)655-6175  
Email: [Acutler@baxterwoodman.com](mailto:Acutler@baxterwoodman.com)

### **Notable Projects:**

#### **Central Seacrest Corridor Utility Improvements | City of Boynton Beach | Project Manager**

- Storm Water System Upgrade including 5,210 LF of Exfiltration Trench
- 8" DI Water Main Replacement 26,933 LF
- 66,823 SY of Pavement Overlay
- 14,355 SY of Driveway Apron Restoration
- 264 Rear to Front Transfers and Connection

#### **Avenue "O" Neighborhood Infrastructure Improvements | City of Riviera Beach | Project Manager**

- 6,791 LF RCP Drainage Installation Sizes 15" – 16" DI
- 1,144 LF Remove and Replace Existing Sanitary Sewer Pipe
- 12,708 LF Furnish and Install DIP Main Pipe, Including Remove Asbestos and Grout Abandonment
- 6,761 LF Re-line Existing Sanitary Sewer
- Water Service Relocation from Rear to Front of Properties
- Complete Right of Way to Right of Way Replacement of Paved Surface, Demo and Re-Construct all Concrete Sidewalk and Driveway Aprons

#### **Pines Village Water Main Improvements – Phase I | City of Pembroke Pines | Project Manager**

- Installation of Approximately 20,000 LF of 6", 8" & 12" Water Mains, Including Asphalt Trench Repairs
- 9,929 LF Abandonment of Existing Water Main
- 191 EA Water Services
- 365 EA Rear to Front Meter Relocations

#### **Utility Analysis Zone 122 | Broward County Water and Wastewater Services | Project Manager**

- Construct 27,630 LF of 4", 6", 8", 10", 12", and 16" Water Main and Appurtenances including Abandonment of existing Mains and 2" Water Services
- Construct 16,666 LF of 8", 10", 12" and 14" Sanitary Sewer Main and Appurtenances including Abandonment or Removal of Existing Mains, New Lift Station, Demo and Removal of two existing lift stations, 1,600 LF of Force Main, CIPP lining of existing Sanitary Sewer, Rehabilitation of existing Sanitary Sewer Manholes.
- Horizontal Directional Drill Installation of 8" and 12" Water Mains and Force Mains crossing existing Canals and under Oakland Park Blvd.
- Complete Roadway Re-Construction and Realignment throughout existing Multifamily Development
- Tree Removal and Replacement of all disturbed Sod and Landscape

### **Main Office:**

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Deerfield Beach, Florida 33442  
O: 954-427-0230  
F: 954-427-8133

### **Palm Beach County Office:**

3020 Fairlane Farms Road  
Suite 1, Wellington, Florida  
33414

## LUKE MANCINI



**GENERAL SUPERINTENDENT**  
Lukem@mancon.ws

### **EXPERIENCE:**

**GENERAL SUPERINTENDENT**  
MAN-CON INCORPORATED | 2018 - PRESENT

**SUPERINTENDENT**  
MAN-CON INCORPORATED | 2016 - 2018  
*Superintendent*

**FOREMAN**  
MAN-CON INCORPORATED | 2014 - 2016  
Worked on multiple sewer, water, drainage, and road building projects in south Florida and gained experience in all aspects of construction from project start-up through final restorations.

**SITE SUPERVISOR**  
LOXWELL, INC. | 2011 - 2012

**ASSISTANT PROPERTY MANAGER**  
WELLINGTON LAND DEVELOPMENT | 2010 - 2012

**EDUCATION:**  
**BACHELOR of BUSINESS ADMINISTRATION:**  
**FINANCE - FLORIDA ATLANTIC UNIVERSITY | 2015**

**LICENSES / CERTIFICATIONS:**  
OSHA Basic Rigging Training Certification

OSHA CPR & First Aid Certification

OSHA Confined Space Entry Training Certification

OSHA Competent Person Training Certification

### **CLIENT REFERENCE'S**

- Pat MacGregor  
Broward County WWS  
Phone: (954) 831-0904  
Email: [pmacgregor@broward.org](mailto:pmacgregor@broward.org)
- Aaron Cutler  
Mathews Consulting  
Phone: (561)655-6175  
Email: [Acutler@baxterwoodman.com](mailto:Acutler@baxterwoodman.com)

### **Notable Projects:**

**Hillsboro Pines Neighborhood Project | Broward County | Project Manager**

- Install 12,641 LF of Sanitary Sewer Pipe
- Install 4,000 LF of Reclaimed Water Line
- Install 10,500 LF of RCP Storm Drainage
- Landscape and Roadway Reconstruction

**Pines Village Water Main Improvements – Phase I | City of Pembroke Pines | Project Manager**

- Installation of Approximately 20,000 LF of 6", 8" & 12" Water Mains, Including Asphalt Trench Repairs
- 9,929 LF Abandonment of Existing Water Main
- 191 EA Water Services
- 365 EA Rear to Front Meter Relocations

**Watermain Replacement Project | Town of Highland Beach | Project Manager**

- Construct 7,000 LF of Water Main
- Install Aerial Crossing over Intracoastal
- 200 new Water Services

**Avenue "O" Neighborhood Infrastructure Improvements | City of Riviera Beach | Project Manager**

- 6,791 LF RCP Drainage Installation Sizes 15" – 16" DI
- 1,144 LF Remove and Replace Existing Sanitary Sewer Pipe
- 12,708 LF Furnish and Install DIP Main Pipe, Including Remove Asbestos and Grout Abandonment
- 6,761 LF Re-line Existing Sanitary Sewer
- Water Service Relocation from Rear to Front of Properties
- Complete Right of Way to Right of Way Replacement of Paved Surface, Demo and Re-Construct all Concrete Sidewalk and Driveway Aprons

**Avenue H East & West Roadway Improvements | City of Riviera Beach | Project Manager**

- Reconstruction of 8,000 LF of Roadway
- Install Drainage Structures and over 5,000 LF of RCP Drainage Pipe
- 5,500 LF of DIP Watermain
- Grout and Abandon existing Pipe
- Reline 5,055 LF of 8" VCP sewer pipe and bypass



**Bid Alerts**

**Addendum acceptance required**  
City of Hollywood, Florida, FL  
REQUIRES THAT ALL  
ADDENDUMS BE ACCEPTED in  
order to finalize an offer on this  
bid. [Review addendums](#)

**Bid #F-4708-22-OT - UTILITY  
REPLACEMENT ALONG NORTH 26TH  
AVENUE (PHASE 1)**



City of Hollywood, Florida, FL

Time left: 26 days, 22 hrs

Bid started: Jan 12, 2022 4:31:59 PM EST

Bid ends: Feb 15, 2022 3:00:00 PM EST

Pre-bid conference: **Mandatory**

Bid packet generation in process

[Remove from My bids](#)

[Details](#)

[Documents](#)

[Q&A](#)

[Pre-bid conference](#)

[Vendor ads](#)

[Planholder's list](#)

**Bid #F-4708-22-OT - UTILITY REPLACEMENT ALONG NORTH 26TH AVENUE  
(PHASE 1)**

IFB

Select the documents you want to view:

- [W-9](#) [download] Pending acceptance
- [CQH WM Phase 1 BID SET 12-17 reduced 4.pdf](#) [download] Viewed
- [Specifications Set 1-12 2.pdf](#) [download] Viewed

[Select all](#) [Deselect all](#)

= Included in Bid Packet

= Excluded from Bid Packet

[Generate zip file](#)

To generate a zip file, select the document(s) you want from the list above and click "Generate zip file"

Bid packet is a .pdf file that includes all documents and bid details, including line items

[Send to Print Vendor](#)

To send documents to a Print Vendor, select the document(s) you want from the list above and click "Send to Print Vendor"

Fill out the qualifications for this agency. [Click here](#)

Addendum # 1 - made on Jan 12, 2022 4:59:17 PM EST

Removed Documents: F-4708-22-OT Bid Draft.pdf

New Documents: Specifications Set 1-12 2.pdf



**How do I respond to a paper response bid?**

Instructions may vary. Ask the bid [contact\(s\)](#) for this agency's process.

Questions? Contact a BidSync representative: 800-990-9339 or email: [support@bidsync.com](mailto:support@bidsync.com)

CONNECT WITH US

(<https://www.facebook.com/PeriscopeHoldings>)

(<https://twitter.com/PeriscopeHldgs>)

(<https://www.linkedin.com/company/periscope-holdings>)

Anthony Mancini

# CITY OF HOLLYWOOD, FLORIDA

---

DEPARTMENT OF PUBLIC UTILITIES  
ENGINEERING AND CONSTRUCTION SERVICES DIVISION  
P. O. Box 229045 · HOLLYWOOD, FL 33022-9045 · PHONE: 954-921-3930 · FAX: 954-921-3937

## UTILITY REPLACEMENT ALONG N. 26<sup>TH</sup> AVENUE

### Addendum 1

Date: February 7, 2022

Bid Number: F-4708-22-OT

ALL BIDDERS BE ADVISED OF THE FOLLOWING CHANGES TO THE ABOVE REFERENCED PROJECT AS LISTED BELOW:

This addendum is issued as part of the Bidding Documents for the above-described project. The changes incorporated in this addendum shall be considered as a part of the documents and shall supersede, amend, add to, clarify, or subtract from those conditions shown in the original documents. The bidder shall coordinate all modifications herein with all trades and disciplines related to the work. The Bidder shall acknowledge receipt of this addendum on the Bid Form by addendum number and date. Failure to do so may subject Bidder to disqualification.

#### Item 1: Updated Bid Form Items

The following bid items were updated as a part this addendum. Section 00301 Proposal Bid Form and Section 01025 Basis of Payment have been updated and can be found in the attachments to this document in Item 7.

Bid Item 47: Furnishing and installation of sleeves for 2-inch diameter proposed and existing service lines was added (45 EA).

Bid Item 48: Furnishing and installation of sleeves for proposed and existing service lines larger than 2-inch diameter was added (45 EA).

Bid Item 49: Adjust proposed drainage structure tops due to unforeseen conditions was added (25 EA).

Bid Item 56: This item was previously listed in the Section 00301 Proposal Bid Form, but not Section 01025 Basis of Payment. This has now been added to the Basis of Payment.

Bid Item 57: Furnishing and installation of speed humps was added (1 EA).

X   
Anthony Mancini

**Item 2: Request for Information**

Specification Section 01010 – Summary of Work was updated to include Part 1.09 Request for Information (RFI). Refer to the updated Specification in Item 7.

**Item 3: Section 01200**

Specification Section 01200 – Project Meetings was updated to include the correct section number at the bottom of the page. Refer to the updated Specification in Item 7.

**Item 4: Construction Signs**

Specification Section 01500 – Construction Considerations was updated to include Part 1.19 Construction Signs. Refer to the updated Specification in Item 7.

**Item 5: Storage Area and Written Permission Before Proceeding**

Specification Section 01520 – Maintenance of Facilities and Sequence of Construction Parts 1.08 and 1.09 were updated to include language requiring the Contractor to obtain private property to use as an equipment/materials storage area and to obtain written permission before proceeding to the next phase of construction. Refer to the updated Specification in Item 7.

**Item 6: Domestic Manufacturer**

Specification Section 15060 – Piping and Fittings Part 1.01 was updated to include language requiring all piping and fittings to be manufactured in the United States (domestic). Refer to the updated Specification in Item 7.



**Item 7: Updated/New Specifications**

- a) See attached updated Specification Section 00301.
- b) See attached updated Specification Section 01025.
- c) See attached updated Specification Section 01010.
- d) See attached updated Specification Section 01200.
- e) See attached updated Specification Section 01500.
- f) See attached updated Specification Section 01520.
- g) See attached updated Specification Section 15060.

**Item 8: Updated Drawing Sheets**

- a) See attached updated Drawing 150992-G-000.
- b) See attached updated Drawing 150992-G-001.
- c) See attached updated Drawing 150992-G-003.

**Item 9: Meeting Minutes and Attendance List**

- a) Meeting Minutes
- b) Attendance List

ALL OTHER TERMS, CONDITIONS, AND SPECIFICATIONS SHALL REMAIN THE SAME. THIS ADDENDUM SHALL BE ATTACHED TO THE CONTRACT DOCUMENTS AND THE RECEIPT OF THE SAME SHALL BE NOTED IN THE PROPOSAL IN THE SPACE PROVIDED.



---

Jeff Jiang, P.E., Assistant Director - ECSD  
Department of Public Utilities



[Department of State](#) / [Division of Corporations](#) / [Search Records](#) / [Search by Entity Name](#) /

## Detail by Entity Name

Florida Profit Corporation  
MAN-CON, INCORPORATED

### Filing Information

<b>Document Number</b>	H40555
<b>FEI/EIN Number</b>	59-2547432
<b>Date Filed</b>	01/31/1985
<b>State</b>	FL
<b>Status</b>	ACTIVE
<b>Last Event</b>	AMENDMENT
<b>Event Date Filed</b>	05/02/2019
<b>Event Effective Date</b>	NONE

### Principal Address

3460 S.W. 11TH STREET  
DEERFIELD BEACH, FL 33442

Changed: 01/24/1994

### Mailing Address

3460 S.W. 11TH STREET  
DEERFIELD BEACH, FL 33442

Changed: 01/24/1994

### Registered Agent Name & Address

MANCINI, CAROLINE  
3460 S.W. 11TH STREET  
DEERFIELD BEACH, FL 33442

Name Changed: 11/01/2018

Address Changed: 01/24/1994

### Officer/Director Detail

#### **Name & Address**

Title DPT

MANCINI, JEFFREY J.

3460 S.W 11TH STREET  
DEERFIELD BEACH, FL 33442

Title S, VP

MANCINI, ANTHONY J.  
3460 S.W. 11TH STREET  
DEERFIELD BEACH, FL 33442

Title VP, S

MANCINI, LUKE J  
3460 S.W. 11TH STREET  
DEERFIELD BEACH, FL 33442

Title D

MANCINI, CAROLINE M  
3460 S.W. 11TH STREET  
DEERFIELD BEACH, FL 33442

#### **Annual Reports**

<b>Report Year</b>	<b>Filed Date</b>
2020	01/10/2020
2021	04/01/2021
2022	01/03/2022

#### **Document Images**

<a href="#">01/03/2022 -- ANNUAL REPORT</a>	<a href="#">View image in PDF format</a>
<a href="#">04/01/2021 -- ANNUAL REPORT</a>	<a href="#">View image in PDF format</a>
<a href="#">01/10/2020 -- ANNUAL REPORT</a>	<a href="#">View image in PDF format</a>
<a href="#">05/02/2019 -- Amendment</a>	<a href="#">View image in PDF format</a>
<a href="#">01/08/2019 -- ANNUAL REPORT</a>	<a href="#">View image in PDF format</a>
<a href="#">11/01/2018 -- Amendment</a>	<a href="#">View image in PDF format</a>
<a href="#">01/15/2018 -- ANNUAL REPORT</a>	<a href="#">View image in PDF format</a>
<a href="#">01/10/2017 -- ANNUAL REPORT</a>	<a href="#">View image in PDF format</a>
<a href="#">01/22/2016 -- ANNUAL REPORT</a>	<a href="#">View image in PDF format</a>
<a href="#">02/23/2015 -- ANNUAL REPORT</a>	<a href="#">View image in PDF format</a>
<a href="#">01/08/2014 -- ANNUAL REPORT</a>	<a href="#">View image in PDF format</a>
<a href="#">01/24/2013 -- ANNUAL REPORT</a>	<a href="#">View image in PDF format</a>
<a href="#">01/04/2012 -- ANNUAL REPORT</a>	<a href="#">View image in PDF format</a>
<a href="#">01/04/2011 -- ANNUAL REPORT</a>	<a href="#">View image in PDF format</a>
<a href="#">01/05/2010 -- ANNUAL REPORT</a>	<a href="#">View image in PDF format</a>
<a href="#">01/29/2009 -- ANNUAL REPORT</a>	<a href="#">View image in PDF format</a>
<a href="#">01/04/2008 -- ANNUAL REPORT</a>	<a href="#">View image in PDF format</a>
<a href="#">01/05/2007 -- ANNUAL REPORT</a>	<a href="#">View image in PDF format</a>
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<a href="#">01/28/2005 -- ANNUAL REPORT</a>	<a href="#">View image in PDF format</a>

<a href="#">01/20/2004 -- ANNUAL REPORT</a>	<a href="#">View image in PDF format</a>
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<a href="#">03/05/2002 -- ANNUAL REPORT</a>	<a href="#">View image in PDF format</a>
<a href="#">04/25/2001 -- ANNUAL REPORT</a>	<a href="#">View image in PDF format</a>
<a href="#">02/04/2000 -- ANNUAL REPORT</a>	<a href="#">View image in PDF format</a>
<a href="#">03/16/1999 -- ANNUAL REPORT</a>	<a href="#">View image in PDF format</a>
<a href="#">04/17/1998 -- ANNUAL REPORT</a>	<a href="#">View image in PDF format</a>
<a href="#">02/03/1997 -- ANNUAL REPORT</a>	<a href="#">View image in PDF format</a>
<a href="#">01/23/1996 -- ANNUAL REPORT</a>	<a href="#">View image in PDF format</a>
<a href="#">01/25/1995 -- ANNUAL REPORT</a>	<a href="#">View image in PDF format</a>

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must have ADDITIONAL INSURED provisions or be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer any rights to the certificate holder in lieu of such endorsement(s).

<b>PRODUCER</b> ZERVOS GROUP INC 24724 Farmbrook P O Box 2067 Southfield, MI 48037-2067	<b>CONTACT NAME:</b> Nyssa Pace
	<b>PHONE (A/C, No, Ext):</b> 248 355-4411 <b>FAX (A/C, No):</b> 248 355-2175 <b>E-MAIL ADDRESS:</b> nyssa@zervosgroup.com
<b>INSURED</b> MAN-CON INCORPORATED 3460 SW 11th Street Deerfield Beach, FL 33442	INSURER(S) AFFORDING COVERAGE      NAIC #
	INSURER A : Continental Insurance Company
	INSURER B : Valley Forge Insurance Company
	INSURER C : Evanston Insurance Company
	INSURER D : INSURER E : INSURER F :

**COVERAGES      CERTIFICATE NUMBER:      REVISION NUMBER:**


THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE	ADDL INSR	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS
A	<input checked="" type="checkbox"/> COMMERCIAL GENERAL LIABILITY <input type="checkbox"/> CLAIMS-MADE <input checked="" type="checkbox"/> OCCUR <input checked="" type="checkbox"/> Contractual <input checked="" type="checkbox"/> X, C & U GEN'L AGGREGATE LIMIT APPLIES PER: <input type="checkbox"/> POLICY <input checked="" type="checkbox"/> PRO-JECT <input checked="" type="checkbox"/> LOC OTHER:	X	X	2077256991	07/31/2021	07/31/2022	EACH OCCURRENCE \$ <b>1,000,000</b> DAMAGE TO RENTED PREMISES (Ea occurrence) \$ <b>100,000</b> MED EXP (Any one person) \$ <b>15,000</b> PERSONAL & ADV INJURY \$ <b>1,000,000</b> GENERAL AGGREGATE \$ <b>2,000,000</b> PRODUCTS - COMP/OP AGG \$ <b>2,000,000</b> \$
B	AUTOMOBILE LIABILITY <input checked="" type="checkbox"/> ANY AUTO OWNED AUTOS ONLY <input type="checkbox"/> SCHEDULED AUTOS <input checked="" type="checkbox"/> HIRED AUTOS ONLY <input checked="" type="checkbox"/> NON-OWNED AUTOS ONLY	X	X	2095076554	07/31/2021	07/31/2022	COMBINED SINGLE LIMIT (Ea accident) \$ <b>1,000,000</b> BODILY INJURY (Per person) \$ BODILY INJURY (Per accident) \$ PROPERTY DAMAGE (Per accident) \$ \$
A	<input checked="" type="checkbox"/> UMBRELLA LIAB <input checked="" type="checkbox"/> OCCUR <input type="checkbox"/> EXCESS LIAB <input type="checkbox"/> CLAIMS-MADE <input type="checkbox"/> DED <input checked="" type="checkbox"/> RETENTION \$0	X	X	2095076568	07/31/2021	07/31/2022	EACH OCCURRENCE \$ <b>5,000,000</b> AGGREGATE \$ <b>5,000,000</b> \$
B	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? <input checked="" type="checkbox"/> Y/N (Mandatory in NH) If yes, describe under DESCRIPTION OF OPERATIONS below		X	2077257008	07/31/2021	07/31/2022	<input checked="" type="checkbox"/> PER STATUTE <input type="checkbox"/> OTH-ER E.L. EACH ACCIDENT \$ <b>1,000,000</b> E.L. DISEASE - EA EMPLOYEE \$ <b>1,000,000</b> E.L. DISEASE - POLICY LIMIT \$ <b>1,000,000</b>
C	Pollution Liability	X	X	CPLMOL107467	07/31/2021	07/31/2022	\$ <b>2,000,000</b> \$ <b>4,000,000</b>
D	Install Floater			SML93021954	07/31/2021	07/31/2022	\$ <b>350,000/\$1000 Ded</b>

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (ACORD 101, Additional Remarks Schedule, may be attached if more space is required)

**RE: Hollywood - Water Main Replacement Project for N. 26th Ave (Phase 1)**

The City of Hollywood is included as an additional insured, when required by written contract.

<b>CERTIFICATE HOLDER</b> The City of Hollywood 2600 Hollywood Blvd. PO Box 229045 Hollywood, FL 33022	<b>CANCELLATION</b> SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS. AUTHORIZED REPRESENTATIVE 
--	---



**CNA PARAMOUNT**

**Policy Holder Notice - Countrywide**

It is understood and agreed that:

If the **Named Insured** has agreed under written contract to provide notice of cancellation to a party to whom the Agent of Record has issued a Certificate of Insurance, and if the Insurer cancels a policy term described on that Certificate of Insurance for any reason other than nonpayment of premium, then notice of cancellation will be provided to such Certificate holders at least 30 days in advance of the date cancellation is effective.

If notice is mailed, then proof of mailing to the last known mailing address of the Certificate holder on file with the Agent of Record will be sufficient to prove notice.

Any failure by the Insurer to notify such persons or organizations will not extend or invalidate such cancellation, or impose any liability or obligation upon the Insurer or the Agent of Record.

All other terms and conditions of the Policy remain unchanged.

This endorsement, which forms a part of and is for attachment to the Policy issued by the designated Insurers, takes effect on the effective date of said Policy at the hour stated in said Policy, unless another effective date is shown below, and expires concurrently with said Policy.

000016

00020021158060001171750450220



CNA75014XX (1-15)

Page 1 of 1

CONTINENTAL CASUALTY COMPANY

Insured Name: MAN-CON INC

Policy No: 2077256991  
Endorsement No: 37  
Effective Date: 07/31/2021



Ron DeSantis, Governor



Halsey Beshears, Secretary



STATE OF FLORIDA  
DEPARTMENT OF BUSINESS AND PROFESSIONAL REGULATION

CONSTRUCTION INDUSTRY LICENSING BOARD

THE GENERAL CONTRACTOR HEREIN IS CERTIFIED UNDER THE  
PROVISIONS OF CHAPTER 489, FLORIDA STATUTES

**MANCINI, ANTHONY JEFFREY**

MAN-CON INCORPORATED  
3460 SW 11TH STREET  
DEERFIELD BEACH FL 33442

LICENSE NUMBER: CGC1526881

EXPIRATION DATE: AUGUST 31, 2022

Always verify licenses online at [MyFloridaLicense.com](http://MyFloridaLicense.com)

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Ron DeSantis, Governor

Halsey Beshears, Secretary



**STATE OF FLORIDA  
DEPARTMENT OF BUSINESS AND PROFESSIONAL REGULATION**

**CONSTRUCTION INDUSTRY LICENSING BOARD**

THE UNDERGROUND UTILITY & EXCAVATION CO HEREIN IS CERTIFIED UNDER THE PROVISIONS OF CHAPTER 489, FLORIDA STATUTES

**MANCINI, GUY ANTHONY**

MAN-CON INCORPORATED

3460 SW 11TH STREET

DEERFIELD BCH FL 33442

**LICENSE NUMBER: CUC056856**

**EXPIRATION DATE: AUGUST 31, 2022**

Always verify licenses online at [MyFloridaLicense.com](http://MyFloridaLicense.com)



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Business Tax Office  
150 NE 2<sup>nd</sup> Ave.  
Deerfield Beach, FL 33441  
Phone: (954)480-4333  
E-mail: web.btr@deerfield-beach.com



Deerfield Beach  
Florida

Business Tax Receipt License  
2021-2022

License Number: 22-00009581

Date Issued: 8/13/2021

Expires: 9/30/2022

MAN-CON INC  
3460 SW 11 ST

DEERFIELD BEACH FL 33442

Classification: GENERAL CONTRACTOR'S OFFICE

Business Location: 3460 SW 11 ST

Service(s): OFFICE: 1 GNL CNTR; 1 EXCAV

Control Number: 0112040

Tax Amount: \$ 58.80	Add. Fees: \$ 208.40	Penalty: \$ 0.00	Total Amount Paid: \$267.20
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Notice: This Tax Receipt becomes *NULL* and *VOID* if ownership, business name, or address changed. Business owner must apply to Business Tax Office for Transfer.

Detach and retain for your records

**\*\*\* Business Tax Receipt \*\*\***

**2021-2022**

- This Business Tax Receipt represents proof of payment of your Business Tax Fee for the period of October 1<sup>st</sup> to September 30<sup>th</sup>. Please exercise diligence in maintaining this receipt.
- Once you have obtained a Deerfield Beach Business Tax Receipt, you will be sent a renewal notice each year beginning July 1st, (90 days prior to expiration) to the address listed on the Receipt. Please check all Receipt information and report any errors to us immediately. The City may impose fines and penalties for failure to renew this Receipt.
- Your current Receipt shall be posted so that it is able to be viewed by anyone upon entering your place of business.
- If you change your business name, ownership or location, you must apply for a new Tax Receipt.
- If you have more than one location, you must obtain a Receipt for each location.
- For information on signage regulations, visit the City's website at [www.deerfield-beach.com/signage](http://www.deerfield-beach.com/signage).

**Increase traffic to your business by participating in the City's Recycling Rewards Program!**

Residents who recycle on a regular basis are accumulating points to be redeemed for rewards at participating businesses to claim discounts and gift certificates. Participating businesses see increased traffic from this program and those that have a commercial recycling account serviced by the City receive additional rewards.

To learn how to have your business become a Rewards Partner, please contact Recycling Perks at [infor@recyclingperks.com](mailto:infor@recyclingperks.com). For Information on how to set up a commercial recycling account, contact the City's Recycling Division at 954-480-4454.

This Receipt does not represent an endorsement or certification of the business listed herein by the City of Deerfield Beach.

# *State of Florida*

## *Department of State*

I certify from the records of this office that MAN-CON, INCORPORATED is a corporation organized under the laws of the State of Florida, filed on January 31, 1985.

The document number of this corporation is H40555.

I further certify that said corporation has paid all fees due this office through December 31, 2021, that its most recent annual report/uniform business report was filed on April 1, 2021, and that its status is active.

I further certify that said corporation has not filed Articles of Dissolution.

*Given under my hand and the  
Great Seal of the State of Florida  
at Tallahassee, the Capital, this  
the Fourteenth day of September,  
2021*



*Randy R. Lee*  
**Secretary of State**

Tracking Number: 3573721933CU

To authenticate this certificate, visit the following site, enter this number, and then follow the instructions displayed.

<https://services.sunbiz.org/Filings/CertificateOfStatus/CertificateAuthentication>



**INCORPORATED**  
**EQUIPMENT LIST**

EQUIPMENT #	TYPE	YEAR	MODEL - MFR	SERIAL NUMBER - ID
201	GRADER	1996	CAT 135 H	3YX00143
203	ROLLER	2000	DYNAPAC CC122	60114971
204	ROLLER	1996	DYNAPAC CC102	600111930
207	DOZER	1995	JOHN DEERE 450 G LGP	TO450GH812067
209	TRACTOR		INTERNATIONAL 2500	2340062U202141
211	BROOM TRACTOR	1997	MASSEY FERGUSON 253	D51163
214	COMBO	2004	CAT 420D	FDP14988
215	COMBO	2005	CAT 420D IT	CBLN11506
216	LOADER	2006	CAT 262B SKID	0262BJPDT02887
217	LOADER	2003	938G SER 2	CRD00824
218	LOADER	1999	938G	4YS00883
222	BACKHOE	2002	CAT 345B	AGS01267
223	BACKHOE	2006	KOMATSU PC 308	30050
229	BACKHOE	2004	KOMATSU PC138 USLC-2	1345
231	MILLING MACHINE	2006	ASPHALT ZIPPER AZ 500	50000177
233	GENERATOR	2005	WACKER	5560437
234	PUMP	1994	SLOAN 6"	1322
235	PUMP	1999	THOMPSON 12"	V-654
236	PUMP	1997	THOMPSON 12"	V-661
243	PUMP	1989	THOMPSON JET 4"	4J-116
244	COMPRESSOR		HATZ DIVE	
245	COMPRESSOR		SULLIVAN AIR	D185Q5
246	WELDER		MILLER BIG 50	KD372275
248	LOADER	2008	JD 544J	DW544JZ617435
249	BROOM TRACTOR	2005	MASSEY FERGUSON MF461-2	EN24027
251	INGRAM ROLLER	1988	3 WHEEL	588648 EB 14
252	ROLLER	2007	DYNAPAC 134D	81270186
253	MINI EXCAVATOR	2011	CAT 305-5DCR	FLZ00474
254	WHEEL LOADER	2012	CAT 924K	PWR00814
255	COMPACT TRACK LOADER	2014	BOBCAT T110	AE0H11925
256	WACKER REVERSESIBLE PLATE COMPACTOR	2014	BPU4045A	10373520
259	COMPACT TRACK LOADER	2016	CAT 299 D2	FD 200514
260	KOMATSU HYDR. EXCAVATOR	2016	PC138USLC-11	50176
261	JOHN DEERE	2016	644K LOADER	1DW644KZTGF674436
262	COMPACT TRACK LOADER	2018	CAT 279D	GTL05809
263	TRACK EXCAVATOR	2018	CAT 336FL	RKB20749
264	CAT MINI EXCAVATOR	2019	CAT 301.7	JH700962
	SKID-PACK COMPACTOR			
	WACKER REVERSESIBLE PLATE COMPACTOR			DPU504514
	6X14 TRENCH BOX			132259
	ARIES SEEKER PUSH CAMERA			6072801
	PIPE LASER	2012	TRIMBLE DG711	23369
	WACKER REVERSESIBLE PLATE COMPACTOR		BPU3545A	1761031
	WACKER REVERSESIBLE PLATE COMPACTOR	2016	DPU5545HE	10631585
	GORMAN RUPP 6" PORABLE PUMP		GORMAN RUPP	1129528

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SECTION 00500

CONTRACT

THIS AGREEMENT, made and entered into, this \_\_\_\_ day of \_\_\_\_\_, A.D., 20\_, by and between the CITY OF HOLLYWOOD, Florida, a municipal corporation of the State of Florida, part of the first part, (hereinafter sometimes called the "CITY"), and

**Man-Con, Incorporated**

party of the second part (hereinafter sometimes called the "CONTRACTOR").

WITNESSETH: The parties hereto, for the considerations herein- after set forth, mutually agree as follows:

Article 1. Scope of Work: The CONTRACTOR shall furnish all labor, materials, and equipment and perform all work in the manner and form provided by the Contract Documents, for:

**UTILITY REPLACEMENT ALONG N. 26TH AVENUE  
City Project No. 16-5133**

Article 2. The Contract Sum: The CITY shall pay to the CONTRACTOR, for the faithful performance of the Contract, in lawful money of the United States of America, and subject to additions and deductions as provided in the Contract Documents, as follows:

Based upon the prices shown in the Proposal heretofore submitted to the CITY by the CONTRACTOR, a copy of said Proposal being a part of these Contract Documents, the aggregate amount of this Contract being the sum of **Four Million Ninety-Four Thousand Seven Hundred Thirty-Three Dollars and Zero Cents (\$4,094,733.00).**

Article 3. Partial and Final Payments: In accordance with the provisions fully set forth in the "General Conditions" of the "Specifications", and subject to additions and deductions as provided, the CITY shall pay the CONTRACTOR as follows:

- (a) On the 15th day, or the first business day thereafter, of each calendar month, the CITY shall make partial payments to the CONTRACTOR on the basis of a duly certified and approved estimate of work performed during the preceding calendar month by the CONTRACTOR, less five percent (5%) of the amount of such estimate which is to be retained by the CITY until all work has been performed strictly in accordance with this Agreement and until such work has been accepted by the CITY. The parties' rights and obligations regarding retainage are further specified in Florida Statute Section 218.735.



- (b) Upon submission by the CONTRACTOR of evidence satisfactory to the CITY that all payrolls, material bills and other costs incurred by the CONTRACTOR in connection with the construction of the WORK have been paid in full, and also, after all guarantees that may be required in the Specifications have been furnished and are found acceptable by the CITY, final payment on account of this Agreement shall be made within sixty (60) days after completion by the CONTRACTOR of all work covered by this Agreement and acceptance of such work by the ENGINEER and approved by the CITY.

Article 4. Time of Completion: The CONTRACTOR shall commence work to be performed under this Contract within ten (10) consecutive calendar days after date of written Notice To Proceed and shall fully complete the Contract in accordance within the Contract Documents and meet all intermediate milestone completion dates required after said date of written notice as set forth in the Proposal, as may be modified by Instructions to Bidders, and stated in the Notice to Proceed.

It is mutually agreed between the parties hereto, that time is the essence, and in the event that construction of the WORK is not completed within the Contract Time and per intermediate dates, as may have been modified solely in accordance with the General Conditions of this Contract, that from the compensation otherwise to be paid to the CONTRACTOR, the CITY is authorized and shall retain, for each day thereafter, Sundays and holidays included, the sum set forth in the Supplementary General Conditions of this Contract as liquidated damages sustained by the CITY in the event of such default by the CONTRACTOR, or shall withhold such compensation for actual and consequential damages as may be stated therein or contemplated therefrom.

Article 5. Additional Bond: It is further mutually agreed between the parties hereto, that if, at any time after the execution of this Agreement and the Payment and Performance Bonds required herein for the express purpose of assuring the faithful performance of the Contractor's work hereto attached, the CITY shall deem the surety or sureties' to be unsatisfactory, or, if for any reason, said bonds cease to be adequate to cover the performance of the work, the CONTRACTOR shall, at his expense, within five (5) days after receipt of notice from the CITY furnish an additional bond or bonds in such form and amount, and with such surety or sureties as shall be satisfactory to the CITY. In such event, no further payment to the CONTRACTOR shall be deemed to be due under this agreement until such new or additional security for the faithful performance of the work shall be furnished in manner and form satisfactory to the CITY.

Article 6. Contract Documents: All of the documents hereinafter listed form the Contract and they are as fully a part of the Contract as if hereto attached, or repeated in this Agreement:

- |                                      |                                      |
|--------------------------------------|--------------------------------------|
| 1. Notice to Bidders                 | 9. Contract                          |
| 2. Instruction to Bidders            | 10. Performance Bond                 |
| 3. Proposal                          | 11. Payment Bond                     |
| 4. Proposal Bid Form                 | 12. General Conditions               |
| 5. Bid Bond                          | 13. Supplementary General Conditions |
| 6. Information Required from Bidders | 14. Addenda                          |
| 7. Local Preference                  | 15. Specifications                   |
| 8. Trench Safety Form (N/A)          | 16. Drawings                         |

Article 7. The rate of wages and fringe benefits, or cash equivalent, for all laborers, mechanics and apprentices employed by any contractor or subcontractor on the work covered by the contract shall be not less than the prevailing rate of wages and fringe benefit payments or cash equivalent for similar skills or classifications of work as established by the General Wage Decision by the United States Department of Labor for Broward County, Florida that is in effect prior to the date the city issues its invitation for bids. If the General Wage Decision fails to provide for a fringe benefit rate for any worker classification, then



the fringe benefit rate applicable to the worker classification shall be the fringe benefit rate applicable to the worker classification with a fringe benefit rate that has a basic hourly wage closest in dollar amount to the worker classification for which no fringe benefit rate has been provided.

Article 8. No additional work or extras shall be performed unless the same be duly authorized by appropriate action of the City.

Article 9. That in the event either party brings suit for enforcement of disagreement, the prevailing party shall be entitled to attorney's fees and court costs in addition to any other remedy afforded by law.

Article 10. The Contractor shall guarantee the complete project against poor workmanship and faulty materials for a period of twelve (12) months after final payment and shall immediately correct any defects which may appear during this period upon notification by the City or the Engineer.

Article 11. The making and acceptance of the final payment shall constitute a waiver of all claims by the Contractor, except those previously made and still unsettled.

Article 12. Contract Term: The initial term of this contract shall be for a period of one (1) year beginning upon the notice to proceed. The CITY may renew twice this contract for one (1) additional one (1) year period subject to City's option, vendor acceptance, satisfactory performance, and determination that renewal will be in the best interest of the CITY.

\*\*\*\*\*

IN WITNESS WHEREOF the parties hereto have executed this Agreement on the day and date first above written in three (3) counterparts, each of which shall, without proof or accounting for the other counterparts, be deemed an original contract:

THE CITY OF HOLLYWOOD, FLORIDA  
Party of the First Part

By: \_\_\_\_\_ (SEAL)  
JOSH LEVY, MAYOR

ATTEST:

\_\_\_\_\_  
PATRICIA A. CERNY, MMC, CITY CLERK



WHEN THE CONTRACTOR IS A CORPORATION:

Attest:

\_\_\_\_\_  
Secretary

\_\_\_\_\_  
(Correct Name of Corporation)

BY: \_\_\_\_\_ (SEAL)  
President

\*\*\*\*\*

APPROVED AS TO FORM AND LEGAL  
SUFFICIENCY for the use and reliance  
of the City of Hollywood, Florida only:

APPROVED AS TO FINANCE:

By \_\_\_\_\_  
Douglas R. Gonzales  
City Attorney

By \_\_\_\_\_  
David E. Keller  
Financial Services Director

CERTIFICATE

**STATE OF FLORIDA)  
COUNTY OF BROWARD)**

**I HEREBY CERTIFY** that a meeting of the Board of Directors of \_\_\_\_\_, a corporation under the laws of the State of \_\_\_\_\_, was held on \_\_\_\_\_, 20\_\_\_\_, and the following resolution was duly passed and adopted:

"RESOLVED, that \_\_\_\_\_ as \_\_\_\_\_ President of the corporation, be and he is hereby authorized to execute the contracts on behalf of this corporation, and that his execution thereof, attested by the Secretary of the corporation and with corporate seal affixed, shall be the official act and deed of this corporation."

I further certify that said resolution is now in full force and effect.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed the official seal of the corporation, this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_\_.

\_\_\_\_\_  
Secretary

- END OF SECTION -

SECTION 00610

PERFORMANCE BOND

KNOW ALL MEN BY THESE PRESENTS:

That we \_\_\_\_\_,

Name Address Tel. No.

as Principal, and \_\_\_\_\_

Name Address Tel. No.

as Surety, are held and firmly bound unto the City of Hollywood in the sum of \_\_\_\_\_ Dollars (\$\_\_\_\_\_),

for the payment of said sum we bind ourselves, our heirs, executors, administrators and assigns, jointly and severally, for the faithful performance of a certain written contract, dated the \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_

entered into between the Principal and the City of Hollywood, Florida, for the **UTILITY REPLACEMENT ALONG N. 26TH AVENUE, City Project No. 16-5133.**

A copy of said Contract, No. 16-5133, is incorporated herein by reference and is made a part hereof as if fully copied herein.

NOW, THEREFORE, THE CONDITIONS OF THIS OBLIGATION ARE SUCH, that if the Principal shall in all respects comply with the terms and conditions of said Contract and his obligations thereunder, including all of the Contract Documents (that include the Notice to Bidders, Instructions to Bidders, Proposal, Proposal Bid Form, Basis of Payment, Approved Bid Bond, Trench Safety Form, Information Required from Bidders, Contract, Performance Bond, Payment Bond, General and Supplementary General Conditions, Technical Specifications, Addenda and Drawings), therein referred to and made a part thereof, and such alterations as may be made in said Drawings and Specifications as therein provided for, and shall indemnify and save harmless the City of Hollywood against and from all expenses, damages, injury or conduct, want of care or skill, negligence or default, including patent infringement on the part of said Principal, his agents or employees, in the execution or performance of said Contract, including errors in the Drawings furnished by said Principal, and further, if the Principal shall promptly make payments to all who supply him, with labor and/or materials, used directly or indirectly by the Principal in the prosecution of the work provided for in said Contract, then this obligation shall be null and void; otherwise, the Principal and Surety, jointly and severally, agree to pay the City of Hollywood any difference between the sum that the City of Hollywood may be obliged to pay for the completion of said work, by Contract or otherwise, and the sum that the City of Hollywood would have been obliged to pay for the completion said work had the Principal properly executed all of the provisions of said Contract, and any damages, whether direct, indirect, or consequential, which the City of Hollywood may incur as a result of the failure of the said Principal to properly execute all of the provisions of said Contract.

AND, the said Principal and Surety hereby further bind themselves, their successors, executors, administrators and assigns, jointly and severally, that they will amply and fully protect the City of Hollywood against, and will pay any and all amounts, damages, costs

and judgments which may be recovered against or which the Owner may be called upon to pay to any person or corporation by reason of any damage arising from the performance of the said work, repair or maintenance thereof, or the manner of doing the same, or his agents or his servants, or the infringements of any patent rights by reason of the use of any material furnished or work done, as aforesaid or otherwise.

AND, the said Surety, for value received, hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the Contract or to the work to be performed thereunder or the Specifications and Drawings accompanying the same, shall in any way affect its obligations on this Bond, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the Contract or to the work or to the Specifications and Drawings.

WHEN THE PRINCIPAL IS AN INDIVIDUAL:

Signed, sealed and delivered in the presence of:

\_\_\_\_\_  
(Witness)

\_\_\_\_\_  
(Signature of Individual)

\_\_\_\_\_  
(Address)

\_\_\_\_\_  
(Printed Name of Individual)

\_\_\_\_\_  
(Witness)

\_\_\_\_\_  
(Address)

WHEN THE PRINCIPAL IS A SOLE PROPRIETORSHIP OR OPERATES UNDER A TRADE NAME:

Signed, sealed and delivered in the presence of:

\_\_\_\_\_  
(Witness)

\_\_\_\_\_  
(Name of Firm)

\_\_\_\_\_  
(Address)

By: \_\_\_\_\_  
(Seal)  
(Signature of Individual)

\_\_\_\_\_  
(Witness)

\_\_\_\_\_  
Address

\*\*\*\*\*

WHEN THE PRINCIPAL IS A PARTNERSHIP:

Signed, sealed and delivered in the presence of:

\_\_\_\_\_  
(Witness)

\_\_\_\_\_  
(Name of Partnership)

\_\_\_\_\_  
(Address)

By: \_\_\_\_\_  
(Seal)  
(Partner)

\_\_\_\_\_  
(Witness)

\_\_\_\_\_  
(Printed Name of Partner)

\_\_\_\_\_  
Address

\*\*\*\*\*

WHEN THE PRINCIPAL IS A CORPORATION:

Attest:

\_\_\_\_\_  
(Secretary)

\_\_\_\_\_  
(Name of Corporation)

By: \_\_\_\_\_  
(Seal)  
(Affix Corporate Seal)

\_\_\_\_\_  
(Printed Name)

\_\_\_\_\_  
(Official Title)

CERTIFICATE AS TO CORPORATE PRINCIPAL

I, \_\_\_\_\_, certify that I am the Secretary of the corporation named as Principal in the within bond; that \_\_\_\_\_, who signed the said bond on behalf of the Principal was then \_\_\_\_\_ of said corporation; that I know his signature, and his signature thereto is genuine; and that said Bond was duly signed, sealed and attested for and on behalf of said corporation by authority of its governing body.

\_\_\_\_\_  
Secretary (SEAL)

TO BE EXECUTED BY CORPORATE SURETY

Attest:

\_\_\_\_\_  
(Secretary)

\_\_\_\_\_  
(Corporate Surety)

\_\_\_\_\_  
(Business Address)

By: \_\_\_\_\_  
(Affix Corporate Seal)

\_\_\_\_\_  
(Attorney-In-Fact)

\_\_\_\_\_  
(Name of Local Agency)

\_\_\_\_\_  
(Business Address)

STATE OF FLORIDA

Before me, a Notary Public, duly commissioned, qualified and acting, personally appeared, \_\_\_\_\_ to me well known, who being by me first duly sworn upon oath, says that he is the attorney-in-fact for the \_\_\_\_\_ and that he has been authorized by \_\_\_\_\_ to execute the foregoing bond on behalf of the CONTRACTOR named therein in favor of the City of Hollywood, Florida.

Subscribed and sworn to before me this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_\_.

\_\_\_\_\_  
Notary Public, State of Florida

My Commission Expires:

\*\*\*\*\*

APPROVED AS TO FORM  
AND LEGAL SUFFICIENCY  
for the use and reliance of the  
City of Hollywood, Florida only:

APPROVED AS TO FINANCE:

By \_\_\_\_\_  
Douglas R. Gonzales  
City Attorney

By \_\_\_\_\_  
David E. Keller  
Financial Services Director

- END OF SECTION -



SECTION 00620

PAYMENT BOND

KNOW ALL MEN BY THESE PRESENTS:

That we, \_\_\_\_\_  
Name Address Tel. No.

As Principal and \_\_\_\_\_  
Name Address Tel. No.

as Surety, are held and firmly bound to the CITY OF HOLLYWOOD, FLORIDA herein called the City, in the sum of \_\_\_\_\_ Dollars (\$\_\_\_\_\_) for the payment of said sum we bind ourselves, our heirs, executors, administrators and assigns, jointly and severally, for the faithful performance of a certain written contract dated the \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_, entered into between the Principal and the City of Hollywood, Florida for the installation of the

**UTILITY REPLACEMENT ALONG N. 26TH AVENUE  
City Project No. 16-5133**

Which contract is by reference made a part hereof, and is hereinafter referred to as the Contract.

THE CONDITION of this bond is that if Principal promptly makes payments to all claimants defined in Section 255.05 (1), F.S., supplying Principal with labor, materials or supplies used directly or indirectly by principal in the prosecution of the work provided for in the Contract, then this bond shall be null and void and of no further force and effect; otherwise to remain in full force and effect.

Said surety for value received hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the contract or any other changes in or under contract documents and compliance or noncompliance with any formalities connected with the contract does not affect Surety's obligation under this bond and Surety waives notice of any such change, extension of time, alteration or addition to the terms of the Contract or any other changes, compliance, or noncompliance to the terms of the Contract or to the Work or to the Specifications.

This bond is furnished pursuant to the statutory requirements for bond on public works projects being Florida Statute 255.05. Claimants are hereby notified that the Statute 255.05(2) specifically requires that notice be given to Contractor within 45 days after beginning to furnish labor, materials or supplies for the prosecution of the work that claimants intends to look to the bond for protection. Further notice is hereby given claimants that written notice of nonpayment within ninety (90) days after performance of the labor or after complete delivery of the materials or supplies must be delivered to the Contractor and to the Surety. Further notice is hereby given that no action for labor, materials or supplies may be instituted against the Contractor or the Surety on the bond after one year for the performance of the labor or completion of delivery of the materials or supplies.

Without modifying the foregoing, this bond shall be construed as requiring of the principal and surety no more and no less than is specified in F.S. 255.050.

SIGNED AND SEALED, this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_.

**PRINCIPAL:**

ATTEST:

\_\_\_\_\_

\_\_\_\_\_  
(Signature)

\_\_\_\_\_

\_\_\_\_\_  
(Title)

(SEAL)

**SURETY:**

\_\_\_\_\_  
(Surety)

ATTEST:

\_\_\_\_\_

\_\_\_\_\_  
(Signature)

\_\_\_\_\_

\_\_\_\_\_  
(Attorney-in-Fact)

\*\*\*\*\*

APPROVED AS TO FORM AND  
LEGAL SUFFICIENCY  
for the use and reliance of the  
City of Hollywood, Florida only:

APPROVED AS TO FINANCE:

By \_\_\_\_\_  
Douglas R. Gonzales  
City Attorney

By \_\_\_\_\_  
David E. Keller  
Financial Services Director

- END OF SECTION -

SECTION 00700  
GENERAL CONDITIONS

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**SECTION 00 70 00**

**GENERAL CONDITIONS**

**CITY OF HOLLYWOOD, FLORIDA  
GENERAL CONDITIONS  
FOR CONSTRUCTION CONTRACTS**

ARTICLE 1 - DEFINITIONS

In the interpretation of these Contract Documents the following terms shall have the meaning indicated:

**ADDENDA** - Written or graphic instruments issued prior to the opening of Bids which clarify, correct or change the Contract Documents.

**CHANGE ORDER** - A written order to CONTRACTOR executed in accordance with City procurement procedures, as amended authorizing an addition, deletion or revision in the work, or an adjustment in the Contract Price or the Contract Time, issued after the date of Award.

**CITY (OWNER)** - The City of Hollywood, Florida.

**COMMERCIALLY USEFUL FUNCTION** - shall exist when the Local MBE/SBE is responsible for execution of the work for the contract and is carrying out the responsibilities by actually performing, managing and supervising the work involved. The Local MBE/SBE must also be responsible, with respect to materials and supplies used on the contract, for negotiating price, determining quality and quantity, and ordering the material, and installing. A commercially useful function is not performed if the role of the qualified Local MBE/SBE is that of an extra participant in a transaction, contract, or project through which funds are passed in order to obtain the appearance of qualified local MBE or qualified local SBE participation.

**COMMISSION** - The City Commission of the City of Hollywood, Florida, being the legislative body of the CITY as set forth in the City of Hollywood Charter.

**CONTRACT** - The written agreement between the CITY and the CONTRACTOR covering the work to be performed in accordance with the other Contract Documents which are attached to the Contract and made a part thereof.

**CONTRACTOR** - The person, firm, or corporation with whom the CITY has entered into the Contract.

**CONTRACT DOCUMENTS** - The Notice to Bidders, Instruction to Bidders, Proposal, Information Required of Bidders, all Bonds, Agreement, and all supporting documents, these General Requirements and Covenants, the Specifications, Drawings and Permits, together with all Addenda and Change Orders issued with respect thereto.

**CONTRACT PRICE** - Total monies payable by the CITY to the CONTRACTOR under the terms and conditions of the Contract Documents.

**CONTRACT TIME** - The number of days agreed to in the Proposal, commencing with the date of the Notice to Proceed for completion of the work.

**CONTROL** - shall mean having the primary power, direct or indirect, to influence the management of a business enterprise. The controlling party must have the demonstrable ability to make independent and

unilateral business decisions on a day-to-day basis, as well as the independent and unilateral ability to make decisions which may influence and chart the future course of the business.

**DATE OF SUBSTANTIAL COMPLETION** - The date when the work on the project, or specified part thereof, is substantially completed in accordance with the Contract Documents, such that the CITY can occupy or utilize the project or specified part thereof for the use and purpose for which it was intended as determined and accepted by the Engineer.

**DAYS** - Calendar days of 24 hours measured from midnight.

**DRAWINGS** - The drawings which show the character and scope of the work to be performed and which have been prepared by the DESIGN ENGINEER approved by ENGINEER and are referred to in and are a part of the Contract Documents.

**ENGINEER** - The Director of Utilities of the CITY of Hollywood, Florida, or his authorized designee.

**EXCUSABLE DELAY** - Delay caused by the CITY, hurricane, tornadoes, fires, floods, epidemics or labor strikes.

**GENERAL CONDITIONS** - That segment of the Contract Specifications incorporating the Provisions common to all CITY Construction Contracts.

**INEXCUSABLE DELAY** - Any delay caused either (i) by events or circumstances within the control of the CONTRACTOR not specified in the definition of excusable delay.

**INSPECTOR** - The authorized field representative of the ENGINEER.

**LIQUIDATED DAMAGES** - The amount prescribed in the General Requirements to be paid the CITY, or to be deducted from any payments due the CONTRACTOR for each day's delay in completing the whole or any specified portion of the work beyond the Contract Time.

**LOCAL BUSINESS** – shall mean a business which is duly licensed and authorized to engage in the business at issue and which maintains a permanent principal place of operation with full time personnel within the corporate limits of the City of Hollywood, Florida. A Post Office Box(P.O. Box) shall not be sufficient to constitute a “local business.” The business has the burden of demonstrating that it meets this definition.

**MINORITY** – shall mean a person who is a citizen or lawful permanent resident of the United States and who is a Woman, Black American, Hispanic American, Native American, Asian Pacific American, Subcontinent Asian American or other minorities found to be disadvantaged by the SBA.

**NOTICE OF AWARD** - The written notice by the CITY to the successful Bidder stating that upon his execution of the Agreement and other requirements as listed therein within the time specified the CITY will sign and deliver the Agreement.

**MINORITY BUSINESS ENTERPRISE** – shall mean a currently functioning business enterprise which (a) is an independent for profit business concern that is a least 51% owned by minority group member(s); (b) is independently operated and controlled by the minority group member(s); (c) demonstrates the capability to perform a line of business; (d) provides a commercially useful function according to the customs and practices of the industry and (e) is qualified by the City of Hollywood, Florida.

**NOTICE TO PROCEED** - A written notice by the ENGINEER to the CONTRACTOR fixing the date on which the Contract Time will commence to run and on which the CONTRACTOR shall start to perform his obligation under the Contract Documents.



"OR EQUAL" - Equivalent or superior in construction, efficiency and effectiveness to a type, brand, model or process called out in the Contract Documents to establish a basis of quality as determined by the ENGINEER.

SHOP DRAWINGS - All certified affidavits, drawings, diagrams, illustrations, schedules and other data which are specifically prepared by CONTRACTOR, a Subcontractor, manufacturer, fabricator, supplier or distributor to illustrate some portion of the work and all illustrations, brochures, standard schedules, performance charts, instructions, diagrams and other information prepared by a manufacturer, fabricator, supplier or distributor and submitted by CONTRACTOR to illustrate material or equipment for some portion of the WORK.

SMALL BUSINESS ENTERPRISE – shall mean a currently functioning business enterprise which (a) is an independent for profit concern that is at least 51% owned by non-minority group member(s); (b) is independently operated and controlled by the non-minority group member(s); (c) demonstrates the capability to perform in a line of business; (d) provides a commercially useful function according to the customs and practices of the industry; and (e) is qualified by the City of Hollywood, Florida.

NOTE: In the event 50% of the local business is owned by a minority group member and 50% of the local business is owned by a non-minority group member, the designation selected on the Local Minority Business Enterprise and Local Small Business Enterprise Program application will be accepted.

SMALL BUSINESS NET WORTH SIZE STANDARD – The size standard for a minority business enterprise and a small business enterprise that participates in the City of Hollywood's Local MBE/SBE Program shall mean an independently owned and operated business concern that employs 50 or fewer permanent full-time employees and whose annual net worth does not exceed \$2,000,000. To determine the net worth, the City shall consider the most recent annual financial statement for the business or; in the case of sole proprietorships, annual financial statements for the business and the business owner. The applicant must provide documentation to demonstrate that the business employs 50 or fewer permanent full-time employees averaged over a two year period.

SPECIFICATIONS - Division 1 through 50 of these Contract Documents, consisting of administrative details and written technical descriptions of materials, equipment, standards and workmanship.

SUPPLEMENTARY CONDITIONS - Division 1 of the Contract Specifications incorporating the provisions peculiar to a specific project.

SUBCONTRACTOR - An individual, firm or corporation having a direct contract with CONTRACTOR or with any other Subcontractor for the performance of a part of the work

SURETY - The person, firm or corporation responsible for the Bidder's acts in the execution of the Contract, or which is bound to the CITY with and for the CONTRACTOR to insure performance of the Contract and payment of all obligations pertaining to the work.

WORK - All the work materials or products specified, indicated, shown or contemplated in the Contract Documents to construct and complete the improvement, including all alterations, modifications, amendments or extension thereto made by Change Orders.

## ARTICLE 2 - ORGANIZATIONAL ABBREVIATIONS

Abbreviations of organizations which may be used in these Specifications are:

AASHTO: American Association of State Highway and Transportation Officials

ACI: American Concrete Institute

AIA: American Institute of Architects

AISC: American Institute of Steel Construction

AITC: American Institute of Timber Construction

ANSI: American National Standards Institute

APWA: American Public Works Association

ASTM: American Society for Testing and Materials

ASCE: American Society of Civil Engineers

ASME: American Society of Mechanical Engineers

ASHRAE: American Society of Heating, Refrigerating and Air Conditioning Engineers

AWPA: American Wood Preservers Association

AWWA: American Water Works Association

AWS: American Welding Society

BCEQCB: Broward County Environmental Quality Control Board

CRSI: Concrete Reinforcing Steel Institute

FDEP: Florida Department of Environmental Protection

FDNR: Florida Department of Natural Resources

FDOT: Florida Department of Transportation

FPL: Florida Power and Light

IEEE: Institute of Electrical and Electronic Engineers

NACE: National Association of Corrosion Engineers

NCPI: National Clay Pipe Institute

NEC: National Electrical Code

NEMA: National Electrical Manufacturers Association  
NFPA: National Fire Protection Association  
OSHA: Occupational Safety and Health Act  
PCI: Prestressed Concrete Institute  
SFBC: South Florida Building Code, Broward Edition, Latest Revision  
SFWMD: South Florida Water Management District  
SSPC: Structural Steel Painting Council  
UL: Underwriters' Laboratories, Inc.  
UNCLE: Utility Notification Center for Location before Excavation (1-800-432-4770)  
USEPA: United States Environmental Protection Agency  
USGS: United States Geological Survey  
WWEMA: Water and Wastewater Equipment Manufacturers Association

## ARTICLE 3 - MISCELLANEOUS PRELIMINARY MATTERS

### 3.1 Contract Document Discrepancies:

Any discrepancies, conflicts, errors or omissions found in the Contract Documents shall be promptly reported to the ENGINEER who will issue a correction, if necessary, in writing. The CONTRACTOR shall comply with any corrective measures regarding the same as prescribed by the ENGINEER.

### 3.2 Submissions:

Unless indicated otherwise in the Contract Documents, within seven days subsequent to the CONTRACTOR executing and submitting the required documents of Article 15 in the Instructions to Bidders, the CONTRACTOR shall submit to the ENGINEER an estimated progress schedule indicating the starting and completion days of the various stages of the work. A preliminary Schedule of Values and a preliminary schedule of Shop Drawing submissions may also be required by Section 01 34 00 of Division 1 - General Requirements.

### 3.3 Pre-construction Conference:

The Contractor will be required to attend a mandatory Pre- Construction Conference for review of the above schedules, establishing procedures and establishing a working understanding among the parties as to the work.

### 3.4 Contract Time:

The Contract Time will commence on the date of the Notice to Proceed and shall exist for the total number of days as specified in the Proposal Bid Form as modified by any subsequent Change Orders, Unless the CONTRACTOR fails to complete the requirements of the Instructions to Bidders, the additional time in days (including weekends) required to correctly complete the documents will be deducted by CITY from the Contract Time specified by the CONTRACTOR in this Proposal.

### 3.5 Computation of Time:

When any period of time is referred to the Contract Documents by days, it shall be computed to exclude the first and include the last day of such period. If the last day of any such period falls on a Saturday or Sunday or on a legal holiday, such day shall be omitted from the computation.

### 3.6 Commencement of Work:

The CONTRACTOR shall not perform work at the site prior to the date of the Notice to Proceed.

### 3.7 Extension of Contract Time:

Extensions of time shall be based solely upon the effect of delays to the work as a whole. Extensions of time shall not be granted for delays to the work, unless the CONTRACTOR can clearly demonstrate, through schedule analysis, that the delay to the work as a whole arose in accordance with Article 11, Changes in Contract Time and that such delays did or will, in fact, delay the progress of work as a whole. Time extensions shall not be allowed for delays to parts of the work that are not on the critical path of the Project schedule. Time extensions shall not be

granted until all float or contingency time, at the time of the delay, available to absorb specific delays and associated impacts, is used.

3.8                    Notice and Service Thereof:

All notices, demands, requests, instructions, approvals and claims shall be in writing. Notices, demands, etc. shall be deemed to have been validly given if delivered in person to the individual or to a member of the firm or to an officer of the corporation for whom it is intended, or if delivered at or sent by registered or certified mail, postage prepaid, to the business address as defined at the Pre-Construction Conference.

3.9                    Separate Contract:

The CITY reserves the right to let other Contracts in connection with this Project. The CONTRACTOR shall afford other Contractors reasonable opportunity for the introduction and storage for their materials and the execution of their work and shall properly connect and coordinate his work with theirs.

3.10                   Assignments of Contract:

No assignment by the CONTRACTOR of the Contract or of any part thereof, or any monies due or to become due thereunder shall be made.

3.11                   Patents:

It is mutually understood and agreed that without exception, Contract prices are to include all royalties and costs arising from patents, trademarks, and copyrights in any way involved in the work. It is the intent that whenever the Contractor is required or desired to use any design, device, material or process covered by letters, patent, or copyright, the right for such use shall be provided for by suitable legal agreements with the Patentee or Owner and a copy of this agreement shall be filed with the ENGINEER. However, whether or not such an agreement is made or filed as noted, the CONTRACTOR and the Surety in all cases shall indemnify and save harmless the CITY from any and all claims for infringement by reason of the use of any such patented design, device, material or process, to be performed under the Contract, and shall indemnify the said CITY from any costs, expenses, and damages which it may be obliged to pay, by reason of such infringement, at any time during the prosecution or after the completion of the work.

3.12                   Federal Excise Tax:

The forms needed for applying for exemption certificates for materials and equipment, normally subject to the Federal Excise Tax, may be obtained from the Director of Internal Revenue, Jacksonville, Florida.

The CONTRACTOR is solely responsible for obtaining the desired exemption certificate from the Federal Government.

### 3.13 Savings Due to Excise Tax Exemptions:

The Bidder shall include in the Bid price the estimated cost of all goods, supplies and equipment which will be incorporated in the Work and the taxes that the Bidder would be required to pay if the Bidder were to purchase such goods, supplies or equipment. By subsequent Change Order(s), the parties shall reduce the Bid price to reflect any goods, supplies and equipment purchased directly by City and the resulting tax savings due to City's exemption from Excise Taxes.

CONTRACTOR shall pay all sales, consumer, use and other similar taxes required to be paid by CONTRACTOR in accordance with the laws and regulations of the State of Florida and its political subdivisions. Consistent with the tax exemption for municipalities provided by state law, CITY and CONTRACTOR shall jointly operate so that CITY may purchase directly, goods, supplies and equipment which will be incorporated into the Work. The goods, supplies and equipment that will be purchased by CITY shall be approved in advance by the parties.

With respect to all goods, supplies and equipment to be purchased by CITY, CONTRACTOR shall, on behalf of CITY, take all actions necessary and appropriate to cause all purchases to be made and shall be responsible for delivery of all such goods, supplies and equipment, including verification of correct quantities and documents or orders, coordination of purchases and delivery schedules, sequence of delivery, unloading, handling and storage through installation, obtaining warranties and guarantees required by the Contract Documents, inspection and acceptance of the goods, supplies and equipment at the time of delivery, and other arrangements normally required for the particular goods, supplies or equipment purchased. Unless otherwise directed by CITY, such actions shall also include taking the lead in efforts to resolve any and all disputes with the vendor. CONTRACTOR shall ensure that each vendor of goods, supplies and equipment purchased by CITY agrees in writing to the terms and conditions contained in CITY'S standard purchase order, which terms and conditions are set forth in Section 00 80 00 of the Contract Documents. Even though CITY may purchase such goods, supplies and equipment, the goods, supplies and equipment shall be stored at the site in the same manner as goods, supplies and equipment purchased by CONTRACTOR.

CONTRACTOR shall hold CITY harmless from delays in manufacturing, delivery, and other unforeseen conditions that may arise as part of the procurement of CITY-purchased goods, supplies and equipment.

### 3.14 Overtime Work:

The CONTRACTOR shall receive no additional compensation for overtime work, i.e., work in excess of eight hours in any one calendar day or 40 hours in any one calendar week, even though such overtime work may be required under emergency conditions and may be ordered by the ENGINEER in writing. Additional compensation will be paid the CONTRACTOR for overtime work only in the event extra work is ordered by the ENGINEER and the Change Order specifically authorizes the use of overtime work and then only to such extent as overtime wages are regularly being paid by the CONTRACTOR for overtime work of a similar nature in the same locality.

### 3.15 Inspections and Testing during Overtime:

The CONTRACTOR shall establish a normal work schedule which does not exceed eight hours per day in a normal work day nor forty hours per week in a normal work week. Normal work days shall be Monday through Friday. Whenever CONTRACTOR's work requires scheduled overtime,

unless such overtime work is specifically required by the Contract Documents, CONTRACTOR shall reimburse the CITY for the extra costs incurred for providing Inspectors. Overtime shall be scheduled only after CONTRACTOR obtains written permission from the CITY. A change order shall be prepared to cover the CITY costs. Inspector costs shall be charged to the CONTRACTOR at a rate of \$80.00 per hour with a minimum of four hours charged for weekends and holidays. If the CONTRACTOR has an overtime work force size of fifty or more persons a second Inspector will be required and the costs for two Inspectors will be \$160.00 per hour.

3.16                    Nights, Sunday or Holiday Work:

Except upon specific permission of the ENGINEER, the CONTRACTOR shall not perform any work on Sundays or on legal State or Municipal holidays. In accordance with City of Hollywood Code of Ordinances, Section 21.49, no work between 6:00 p.m. and 8:00 a.m. will be permitted, except in case of an emergency, that violates Section 21.49 concerning noise levels. All costs of testing and inspection performed during night, Sunday or holiday work shall be borne by the CONTRACTOR. The CONTRACTOR shall notify all regulatory agencies, including but not limited to the City Police Department, Fire Department, and Code Enforcement Department.

3.17                    Injury or Damage Claims:

Should CITY or CONTRACTOR suffer injury or damage to their person or property because of any error, omission or act of the other party or of any of the other party's employees or agents or others for whose acts the other party is legally liable, claim shall be made in writing to the other party within a reasonable time of the first observance of such injury or damage. However, nothing herein shall be deemed to affect the rights, privileges and immunities of City as are set forth in Section 768.28, Florida Statutes.



## ARTICLE 4 - CONTRACT DOCUMENTS

### 4.1 Intent:

The Contract Documents comprise the entire Agreement between the CITY and CONTRACTOR concerning the work. The Contract Documents can be altered only by Change Order. The Contract Documents are complementary; what is called for by one is as binding as if called for by all. It is the intent of the Contract Documents that the CONTRACTOR, for due consideration, shall furnish all equipment, material, supervision and labor, (except as may be specifically noted otherwise) required or necessary to complete the work in total accordance with said Documents. It is the intent of the Drawings and Specifications to describe the Project to be constructed in accordance with the Contract Documents. Any work that may reasonably be inferred from the Drawings or Specifications as being required to produce the intended result shall be supplied whether or not it is specifically called for.

### 4.2 Order of Precedence of Contract Documents:

In resolving differences resulting from conflicts, errors or discrepancies in any of the following Contract Documents, the order of precedence shall be as follows:

1. Permits
2. Change Orders
3. Contract Agreement
4. Specification
5. Drawings

Within the Specifications the order of precedence is as follows:

1. Addenda
2. Notice to Bidders
3. Instructions to Bidders
4. Supplementary General Conditions
5. General Conditions
6. Division 1, General Requirements
7. Technical Specifications
8. Referenced Standard Specifications

With reference to the Drawings the order of precedence is as follows:

1. Figures Govern over Scaled Dimensions
2. Detail Drawings Govern over General Drawings
3. Change Order Drawings Govern over Contract Drawings
4. Contract Drawings Govern over Standard or Shop Drawings

### 4.3 Reference To Standards:

Any reference to standard Specifications, manuals or codes of any organization or governmental authority shall mean the latest edition, in effect as of the Bid Opening Date.

## ARTICLE 5 - BONDS AND INSURANCE

### 5.1 Bid Guarantee:

Bidders maybe required to submit a Bid Guarantee in an amount indicated in the NOTICE TO BIDDERS. This Guarantee may be a Certified or Cashier's Check on a solvent National or State Bank, or a Bid Bond written by a Surety licensed to do business in Florida and rated at least "A", Class X in the latest edition of "Best's Key Rating Guide" published by A.M. Best Company.

### 5.2 Performance and Payment Bond:

CONTRACTOR shall furnish Performance and Payment Bonds, in amounts equal to the Contract Price as Security for the faithful performance and payment of CONTRACTOR's obligations. The Bond or Bonds shall remain in effect one year after the date of final payment. The Surety must be qualified as specified above in Paragraph 5.1. However, the City reserves the right to require additional bonds as set forth in Article 5 of the Contract.

### 5.3 Signatures:

All Bonds signed by an Agent must be accompanied by a Certified copy of the authority to act, with said copy having been signed (not typed nor printed) by an Officer of the Surety and carrying the seal of the Surety.

### 5.4 Insurance Coverage:

Within ten days from Notice of Award the CONTRACTOR shall purchase and maintain such insurance as will protect him from claims set forth below which may arise out of or result from the CONTRACTOR's operations under the Contract or Contract Documents, whether such operations be by himself or by any Subcontractor or by anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable:

- A. Claims under Workmen's Compensation, Disability Benefit and other similar employer's liability acts;
- B. Claims for damages because of bodily injury, sickness or disease, or death, or death of his employees;
- C. Claims for damages because of bodily injury, sickness or disease, or death of any person other than his employees;
- D. Claims for damages covered by personal injury liability which are sustained (1) by any person as a result of any offense directly or indirectly related to the employment of such person by the CONTRACTOR, or (2) by any other person;
- E. Claims for damages, other than to the work itself, because of injury to or destruction of tangible property, including loss of use resulting therefrom; and
- F. Claims for damages because of bodily injury or death of any person or property damage arising out of the ownership, maintenance or use of any motor vehicle.

5.5                    Certificates of Insurance:

Within ten days of award, the Contractor shall obtain a Certificate of Insurance reflecting the necessary coverages as required by the Contract Documents. Certificates of Insurance shall contain a provision that coverages afforded under the policies will not be canceled until at least 30 days prior written notice has been given to the CITY. The City of Hollywood must be named as additional insured on all coverage with the exception of Workmen's Compensation. Policies shall be issued by companies authorized to do business under the Laws of the State of Florida. Policyholders and Financial Ratings must be no less than "A" and Class X respectively in the latest edition of "Best Key Rating Guide", published by A.M. Best Company.

5.6                    Insurance Limits of Liability:

The insurance required by this Article shall be written for no less than the level of liability specified in "Insurance Requirements", Section 2 of the Supplementary General Conditions, or required by law, whichever is greater. The insurance shall include contractual liability insurance applicable to the CONTRACTOR's obligations under this contract.

The level required in Section 2 of the Supplementary General Conditions will not be reduced for any reason.

## ARTICLE 6 - AVAILABILITY OF LAND; REFERENCE POINTS

### 6.1 Rights-of-Way:

Lands or Rights-of-Way for the work to be constructed under the Contract will be provided by the CITY. Nothing contained in the Contract Documents shall be interpreted as giving the CONTRACTOR exclusive occupancy of the lands or Rights-of-Way provided. Any additional lands or Rights-of-Way required for construction operations shall be provided by the CONTRACTOR at his own expense; provided, that the CONTRACTOR shall not; and the CITY nor the ENGINEER shall not be liable for any claims or damages resulting from the CONTRACTOR's unauthorized trespass or use of any such properties.

### 6.2 Permits:

When required by Article 21 of the Instruction to Bidders, the CONTRACTOR shall secure, from the agencies having jurisdiction, the necessary permits to create obstructions, to make excavations if required under the Contract, and to otherwise encroach upon Rights-of-Way, and to present evidence to the ENGINEER that such permission has been granted, before work is commenced. Regulations and requirements of all agencies concerned shall be strictly adhered to in the performance of the Contract. The enforcement of such requirements under the Contract shall not be made the basis for additional compensation.

### 6.3 Lines and Grades:

The CONTRACTOR shall furnish all grades and all other lines required for the proper execution of the work.

## ARTICLE 7 - CONTRACTOR'S RESPONSIBILITIES

### 7.1 Laws/Regulations to Be Observed:

The CONTRACTOR shall familiarize himself and comply with all Federal, State, County and CITY laws, by-laws, ordinances or regulations controlling the action or operation of those engaged or employed in the work or affecting material used, and govern himself in accordance with them. He shall indemnify and save harmless the CITY and all of its officers, agents and employees against any claims or liability arising from or based on the violation of any such laws, by-laws, ordinances, regulations, orders or decrees, whether by himself or his employees or Subcontractors.

### 7.2 Indemnification of City:

- (a) CONTRACTOR shall, at all times hereafter, indemnify, hold harmless and defend CITY, its agents, servants and employees from and against any claim, demand or cause of action of any kind or nature arising out of error, omission or negligent act of CONTRACTOR, its agents, servants or employees in the performance of services under this Agreement.
- (b) CONTRACTOR further agrees, at all times hereafter, to indemnify, hold harmless and defend CITY, its agents, servants and employees from and against any claim, demand or cause of action of any kind or nature arising out of any conduct or misconduct of CONTRACTOR resulting from the performance of services under the Contract Documents.
- (c) The obligations of the CONTRACTOR above shall not extend to the liability of the City of Hollywood.
- (d) The provisions of (a) and (b) above shall survive the expiration or earlier termination of the

Contract Documents.

7.3            Guarantee of Payments:

The CONTRACTOR guarantees the payments of all just claims for materials, supplies, tools, labor and other just claims against him, or any Subcontractor in connection with this Contract, and his bond will not be released by final acceptance and payment by the CITY unless all such claims are paid or released.

7.4            Permits and Licenses:

The CONTRACTOR shall obtain all permits and licenses required by the Contract Documents. A copy of the permit(s) and such conditions and requirements thereon are a part of the Contract Documents. Failure to obtain such permits or licenses shall subject the CONTRACTOR to the provisions of the South Florida Building Code, Broward Edition.

7.5            Emergencies:

In emergencies affecting the safety or protection of persons or the work or property at the site or adjacent thereto, CONTRACTOR, without special instruction or authorization from ENGINEER or CITY, is obligated to act to prevent threatened damage, injury or loss. CONTRACTOR shall give ENGINEER prompt written notice of any significant changes in the work or deviations from the Contract Documents caused thereby.

7.6            Substitutes or "Or Equal":

A.            Substitutes or "Or-Equal" Materials or Equipment:

Whenever materials or equipment are specified or described in the Contract Documents by using the name of a proprietary item or the name of a particular supplier the naming of the item is intended to establish the type, function and quality required. Unless the name is followed by words indicating that no substitution is permitted, materials or equipment of other Suppliers may be accepted by the ENGINEER if sufficient information submitted by the CONTRACTOR to allow the ENGINEER to determine that the material or equipment proposed is equivalent or equal to that named. The ENGINEER will be allowed 30 days within which to evaluate each proposed substitute. The ENGINEER will be the sole judge of acceptability, and NO SUBSTITUTE WILL BE ORDERED, INSTALLED OR UTILIZED WITHOUT THE ENGINEER'S PRIOR WRITTEN ACCEPTANCE which will be evidenced by either a Change Order or an approved set of Shop Drawings. Requests for review of substitute items of material and equipment will not be accepted by the ENGINEER from anyone other than the CONTRACTOR. The procedure for review by the ENGINEER is as follows:

If the CONTRACTOR wishes to furnish or use a substitute item of material or equipment, the CONTRACTOR shall make written application to the ENGINEER for acceptance thereof, certifying that the proposed substitute will perform adequately the functions and achieve the results called for by the general design, be similar and of equal substance to that specified and be suited to the same use as that specified. In addition, the application shall

1. State that the evaluation and acceptance of the proposed substitute will not prejudice the CONTRACTOR's achievement of completion on time.
2. State whether or not acceptance of the substitute for use in the WORK will require a change in any of the Contract Documents to adapt design to the proposed substitute. The CONTRACTOR shall be responsible for any extra design adaptation costs

associated with a proposed substitute.

3. State whether or not incorporation or use of the substitute in connection with the work is subject to payment of any license fee or royalty.
  4. Provide complete substitute identification and description, including manufacturer's and local distributor's name and address, performance and test data, and reference standards.
  5. Provide samples, as required by ENGINEER.
  6. Provide name and address of similar projects on which the proposed substitute has been used, and date of installation.
  7. Identify all variations of the proposed substitute from that specified.
  8. Indicate available maintenance, repair and replacement service.
  9. Submit an itemized estimate of all costs that will result directly or indirectly from acceptance of such substitute, including costs of redesign and claims of other Contractors affected by the resulting change. The CONTRACTOR shall be responsible for the costs of redesign and claims of other Contractors.
  10. Provide any additional data about the proposed substitute as the ENGINEER may require of the CONTRACTOR.
- B. Substitute means, method, technique, sequence or procedure of construction:
- If a specific means, method, technique, sequence or procedure of construction is indicated in or required by the Contract Documents, the CONTRACTOR may furnish or utilize a substitute means, method, sequence, technique or procedure of construction acceptable to the ENGINEER, if the CONTRACTOR submits sufficient information to allow the ENGINEER to determine that the substitute proposed is equivalent to that indicated or required by the Contract Documents. The procedure for review by the ENGINEER will be similar to that provided in Paragraph 7.6 A.
- C. The CITY may require the CONTRACTOR to furnish at the CONTRACTOR's expense, a special performance guarantee or other surety with respect to any substitute.
- D. The ENGINEER will record time required by the ENGINEER and/or the ENGINEER's consultants in evaluating substitutions proposed by the CONTRACTOR and in making changes in the Contract Documents occasioned thereby. Whether or not the ENGINEER accepts a proposed substitute, THE CONTRACTOR SHALL REIMBURSE THE CITY FOR THE CHARGES OF THE ENGINEER AND THE ENGINEER'S CONSULTANTS FOR EVALUATING EACH PROPOSED SUBSTITUTE.
- E. Any and all costs which result from changes to/adaptations of the work shall be paid by the CONTRACTOR including but limited to design, materials, installation, etc.

#### 7.7      Shop Drawings:

Shop Drawing submittals shall be as follows:

- A. The CONTRACTOR shall submit a sufficient number of copies of each Shop Drawing to enable the ENGINEER to retain three copies unless additional copies are specified in the Contract Documents. Resubmissions of Shop Drawings shall be made in the same quantity until final approval is obtained.

- B. The CONTRACTOR shall submit Shop Drawings for all equipment, apparatus, machinery, fixtures, piping, fabricated structures, manufactured articles and structural components Manufacturer's Certified Affidavit that the item supplied complies with the design Specifications, and all other submittal requirements.
- C. Shop Drawings for structural components, electrical or mechanical systems shall be Certified by a Registered Engineer of the discipline involved.
- D. The CONTRACTOR shall thoroughly review and check the Shop Drawings, and each and every copy shall show his approval thereon. If the Shop Drawings show or indicate departures from the Contract requirements, the CONTRACTOR shall make specific mention thereof in his letter of transmittal. Failure to point out such departures shall not relieve the CONTRACTOR from his responsibility to comply with the Drawings and Specifications.
- E. No approval will be given to partial submittals of Shop Drawings for items which interconnect and/or are interdependent. It is the CONTRACTOR's responsibility to assemble the Shop Drawings for all such interconnecting and/or interdependent items, check them himself and then make one submittal to the ENGINEER along with his comments as to compliance, non-compliance, or features requiring special attention.
- F. If catalog sheets or prints of manufacturer's standard drawings are submitted as Shop Drawings, any additional information or changes on such Drawings shall be typewritten or lettered in ink.
- G. The CONTRACTOR shall keep one set of Shop Drawings marked with the ENGINEER's approval at the job site at all times.
- H. Where a Shop Drawing or sample is required by the Specifications, no related work shall be commenced until the submittal has been reviewed and approved by the ENGINEER.
- I. Approval of the Shop Drawings shall constitute approval of the subject matter thereof only, and not of any structure, material, equipment or apparatus shown or indicated. The approval of the Shop Drawings will be general and shall not relieve the CONTRACTOR of responsibility for the accuracy of such Drawings, nor for the proper fitting and construction of the work, nor for the furnishing of materials or work required by the contract and not indicated on the Drawings. Approval shall not relieve the CONTRACTOR from responsibility for errors or omissions of any sort on the Shop Drawings.

7.8      Personnel:

- A. Supervision and Superintendence:
  - 1. The CONTRACTOR shall supervise and direct the work competently and efficiently, devoting such attention thereto and applying such skills and expertise as may be necessary to perform the work in accordance with the Contract Documents. The CONTRACTOR shall be solely responsible for the means, methods, techniques, sequences and procedures of construction, but the CONTRACTOR shall not be solely responsible for the negligence of others in the design or selection of a specific means, method, technique, sequence or procedure of construction which is indicated in and required by the Contract Documents. The CONTRACTOR shall be



responsible to see that the finished work complies accurately with the Contract Documents.

2. The CONTRACTOR shall keep on the work at all times during its progress a competent resident Superintendent fluent in both oral and written communication in the English language, who shall not be replaced without written notice to the ENGINEER except under extraordinary circumstances. The Superintendent will be the CONTRACTOR's representative at the site and shall have authority to act on behalf of the CONTRACTOR. All communications given to the Superintendent shall be as binding as if given to the CONTRACTOR.

B. Workforce:

1. None but skilled workers shall be employed on work requiring special qualifications. When required in writing by the ENGINEER, the CONTRACTOR or any Subcontractor shall discharge any person who is, in the opinion of the ENGINEER, incompetent, disorderly or otherwise unsatisfactory, and shall not again employ such discharged person on the work except with the consent of the ENGINEER. Such discharge shall not be the basis of any claim for damages against the CITY or any CITY agents.
2. With respect to all skilled, semi-skilled and unskilled workers employed on the Project under this Contract, preference in employment shall be given to persons residing in Hollywood when such persons are available and qualified to perform the work to which the employment relates. No person shall be employed in violation of the State or National Labor Laws. No person under the age of 16 years shall be employed on a Project under the Contract. No person whose age or physical condition is such as to make his employment dangerous to his health or safety or to the health or safety of others shall be employed on the Project under this Contract; provided that this shall not operate against the employment of physically handicapped persons, otherwise employable where such persons may be safely assigned to work which they can ably perform. No person currently serving sentences in a penal or correctional institution and no inmate of an institution for mentally defective shall be employed on a Project under this Contract without specific approval of the ENGINEER.
3. No discrimination shall be made in the employment of persons on the work by the CONTRACTOR or by any Subcontractor under him, because of the race, color, sex, age or religion of such persons, and there shall be full compliance with the provisions of applicable State and Federal laws in this regard.

7.9      Safety and Protection:

A. Federal Safety and Health Regulations:

The CONTRACTOR and Subcontractors shall comply with the provisions of the Occupational Safety and Health Standards, promulgated by the Secretary of Labor under the "Occupational Safety and Health Act of 1970".

B. Responsibilities:

The CONTRACTOR shall be responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the work. The CONTRACTOR shall

take all necessary precautions for the safety of, and shall provide the necessary protection to prevent damage, injury or loss to:

1. All employees on the work and other persons who may be affected thereby.
2. All the work and all materials or equipment to be incorporated therein, whether in storage on or off the site.
3. Other property at the site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures and utilities not designated for removal, relocating or replacement in the course of construction.

C. Designated Safety Officer:

The CONTRACTOR shall designate a responsible member of his organization at the site whose duty shall be the prevention of accidents. This person shall be the CONTRACTOR's Superintendent unless otherwise designated in writing by the CONTRACTOR to the ENGINEER.

D. Protection of the Work:

Until acceptance of the work by the CITY, it shall be under the charge and in care of the CONTRACTOR and he shall take every necessary precaution against injury or damage to the work by action of the elements or from the execution or from the non-execution of the work. The CONTRACTOR shall rebuild, restore and make good, at his own expense, all injuries or damages to any portion of the work occasioned by any of the above causes before its completion and acceptance.

7.10 Traffic Control, Public Safety and Convenience:

- A. The CONTRACTOR shall at all times conduct his work so as to assure the least possible obstruction to traffic and inconvenience to the general public, and provide adequate protection of persons and property in the vicinity of the work.
- B. WHEN THE NORMAL FLOW OF TRAFFIC WILL BE IMPAIRED OR DISRUPTED IN ANY MANNER ON ANY STREET, THE CONTRACTOR SHALL NOTIFY THE POLICE TRAFFIC SERGEANT AT (954) 921-3610 AT LEAST 48 HOURS IN ADVANCE.
- C. Streets shall not be closed, except when and where directed by the ENGINEER, and whenever a street is not closed the work must be conducted with the provision for safe passageway for traffic at all times. The CONTRACTOR shall make all necessary arrangements concerning maintenance of traffic and selection of detours required.
- D. When permission has been granted to close an existing roadway, or portion thereof, the CONTRACTOR shall furnish and erect signs, barricades, lights, flags and other protective devices as necessary subject to the approval of the ENGINEER. From sunset to sunrise, the CONTRACTOR shall furnish and maintain as many yellow lights as the ENGINEER may direct.
- E. During working hours the CONTRACTOR shall furnish watchmen in sufficient numbers to protect and divert the vehicular and pedestrian traffic from working areas closed to traffic, or to protect any new work. Failure to comply with this requirement will result in the

ENGINEER shutting down the work until the CONTRACTOR shall have provided the necessary protection.

- F. No separate payment will be made for such signs, barricades, lights, flags, watchmen or other protective devices as required, with all costs thereof deemed to be included in the prices bid for the various items scheduled in the bid.
- G. Sidewalks, gutters, drains, fire hydrants and private drives shall, insofar as practicable, be kept in condition for their intended uses. While the work is actually going on at any location, as much as half the street width at that location may be barricaded to exclude traffic entirely, but street traffic shall not be obstructed needlessly. Fire hydrants on or adjacent to the work shall be kept accessible to fire apparatus at all times, and no material or obstruction shall be placed within ten feet of any such hydrant.
- H. Construction material stored upon the public street shall be placed so as to cause as little obstruction to the general public as is reasonably possible.

7.11            Use of Explosives:

When the use of explosives is necessary for the prosecution of the work, the CONTRACTOR shall observe the utmost care so as not to endanger life or property, and whenever directed, the number and size of charges shall be limited. All explosives shall be stored in a secure manner and all such storage places shall be marked clearly "DANGEROUS EXPLOSIVES" and shall be in care of a competent watchman at all times. The CONTRACTOR must familiarize himself with all laws and ordinances pertaining thereto, and govern himself and his employees accordingly.

7.12            Loading of Structures:

The CONTRACTOR shall not load nor permit any part of any structure to be loaded in any manner that will endanger the structure, nor shall the CONTRACTOR subject any part of the work or adjacent property to stresses or pressures that will endanger it.

7.13            Concerning Subcontractors:

- A. The CONTRACTOR, with his own forces, shall perform no less than 25% of the work as determined by the Contract price. Each Subcontractor shall be properly licensed for the type of work he is to perform.
- B. A copy of each Sub-Contract shall be filed promptly with the ENGINEER upon request. Each Sub-Contract shall contain a reference to the Contract between the CITY and the CONTRACTOR, and the terms and conditions of the Contract shall be made a part of each Sub-Contract. Each Sub-Contract shall provide for annulment of same by the CONTRACTOR upon written order of the ENGINEER if the Subcontractor fails to comply with the requirements of this Contract.
- C. The CONTRACTOR shall be responsible to the CITY and ENGINEER for the acts and omissions of his Sub-Contractors and their employees to the same extent as he is responsible for the acts and omissions of his own employees. Nothing contained in this Contract shall create any contractual relationship between any Subcontractor and the

CITY or ENGINEER nor relieve the CONTRACTOR of any liability or obligation under this Contract.

7.14      Materials and Equipment:

A.      Material for the Work:

1. The CONTRACTOR shall furnish all materials, equipment, labor, transportation, construction equipment and machinery, tools, appliances, fuel, power, light, heat, telephone, water and sanitary facilities and all other facilities and incidentals necessary for the execution, testing, initial operation and completion of the work.
2. Unless otherwise specified, shown or permitted by the ENGINEER, all material and equipment incorporated in the work shall be new and of current manufacture. The ENGINEER may request the CONTRACTOR to furnish manufacturer's certificates to this effect.
3. The ENGINEER may require any or all materials to be subjected to test by means of samples or otherwise, at production points or after delivery. The CONTRACTOR shall afford such facilities as the ENGINEER may require for collecting and forwarding samples, which samples shall be furnished by the CONTRACTOR without charge. The CONTRACTOR shall furnish evidence satisfactory to the ENGINEER that the materials and finished articles have passed the required test prior to the incorporation of such materials and finished articles in the work. Unless otherwise provided, the cost of such inspection and testing shall be as provided in Article 12.2.
4. All packaged manufactured products for use on the work shall be delivered to the work in their original, unopened packages, bearing thereon the manufacturer's name and the brand name of the product.
5. Wherever any product or material is selected to be used on the work, all such products or material shall be of the same brand and manufacture throughout the work.
6. All equipment, tools and machinery used for handling material or executing any part of the work shall be maintained in a satisfactory working condition. All equipment utilized on any portion of the work shall be such that no injury to personnel, the work, adjacent property or other objects will result from its use.
7. All materials and equipment shall be applied, installed, connected, erected, used, cleaned and conditioned in accordance with the instructions of the applicable manufacturer, fabricator, supplier or distributor, except as otherwise provided in the Contract Documents.

B.      Storage of Materials:

1. All materials and equipment including that ordered by the CITY designed for permanent installation in the work shall be properly stored by the CONTRACTOR to insure protection against deterioration of any type. These materials shall be placed

as to cause a minimum of inconvenience to other contractors on the work and to the public. The storage piles shall be arranged to facilitate inspections, and any deterioration shall be grounds for rejection.

2. Materials stored in public Rights-of-Way, shall be stored in such a manner so as to be compatible with the Traffic Control requirements set forth in Paragraph 7.10. Materials shall be stored so as not to deny access to public or private property. Stored materials shall be adequately marked with barricades and/or flashing warning lights, where necessary, so as to protect the materials from damage and to protect the public health, safety and welfare.
3. Lawns, grass plots or other private property shall not be used for storage purposes without written permission of the Owner or Lessee of that private property. Should the CONTRACTOR desire to store equipment or materials of any kind on the property of the CITY, he must obtain permission from the ENGINEER. The CITY reserves the right to order materials to be removed or relocated in such approved storage areas, if necessary.
4. The protection of stored materials shall be the CONTRACTOR's responsibility and the CITY OF HOLLYWOOD shall not be liable for any loss of materials, by theft or otherwise, nor for any damage to the stored materials.

C. Salvage of Materials and Equipment:

The CITY reserves the right to retain title to all soil, sand, stone, gravel, equipment, machinery or any other material that was a part of the structure, site or Right- of-Way and which was developed from excavations or other operations connected with the work. The CONTRACTOR will be permitted to use in the work, without charge, any such material which meets the requirements of the Contract Documents. For that material which the CITY desires to retain the CONTRACTOR shall, at his expense, transfer to a site within the CITY as designated by the ENGINEER. That material which the CITY does not wish to retain shall be the property of the CONTRACTOR and removed from the site at CONTRACTOR's expense.

7.15            Temporary Utilities:

The CONTRACTOR shall provide and maintain at his own expense, all water, power, telephone and sanitary facilities as required to comply with State and/or local Codes and Regulations. If water, including that for testing is required, it is the CONTRACTOR's responsibility to arrange through the CITY Water Department for a water meter. A deposit to be paid by the CONTRACTOR is required for meter rental and all water shall be purchased at the prevailing rate.

7.16            Review of Records:

The CONTRACTOR shall allow and permit the ENGINEER or his duly authorized representative to inspect and review all payrolls, records of personnel, conditions of employment, invoice of materials, books of accounts and other relevant data and records pertinent to the CONTRACT and Sub-Contracts.

7.17            Use of Premises:

CONTRACTOR shall confine construction equipment, the storage of materials and equipment and the operations of workmen to areas permitted by law, ordinances, permits or required by the Contract Documents, and shall not interfere with the premises or operation of the City Utilities facilities with construction equipment or other materials or equipment. Construction which interferes with Plant Operations shall be fully coordinated and approved by the ENGINEER.

7.18            CONTRACTOR's Daily Reports:

Except where otherwise provided, the CONTRACTOR shall complete a daily report indicating manpower, major equipment, Subcontractors, etc., involved in the performance of the work. The daily report shall be completed on forms approved by the ENGINEER, and shall be submitted to the ENGINEER at the conclusion of each work day.

7.19            Record Documents:

The CONTRACTOR shall keep one record copy of all Specifications, Drawings, Addenda, Modifications, Shop Drawings and samples at the site, in good order and annotated to show all changes made during the construction process. These shall be available to ENGINEER for examination and shall be delivered to ENGINEER upon completion of the work.

7.20            Cleanliness of the Site:

During the progress of the work, The CONTRACTOR shall keep the premises free from accumulations of waste materials, rubbish and other debris resulting from the work. At the completion of the work the CONTRACTOR shall remove all waste materials, rubbish and debris from and about the premises as well as all tools, appliances, construction equipment and machinery and surplus materials, and shall leave the site clean and ready for occupancy by the CITY. The CONTRACTOR shall restore to their original condition those portions of the site not designated for alteration by the Contract Documents.

7.21            Dust Control:

It shall be the CONTRACTOR's responsibility to control dust by watering as directed by the ENGINEER. The water used shall be paid for by the CONTRACTOR. Should the CONTRACTOR fail to control dust to the satisfaction of the ENGINEER, the CITY will control the dust by whatever means the CITY desires and the CONTRACTOR shall pay all expenses incurred by the CITY associated with the control of the dust.

7.22            Continuing the Work:

The CONTRACTOR shall carry on the work and maintain the Progress Schedule during all disputes or disagreements with the CITY. No work shall be delayed or postponed pending resolution of any disputes or disagreements, except as the CONTRACTOR and the CITY may otherwise agree in writing.

7.23            Indemnification:

In consideration of the amount listed in the Schedule of Prices Bid and other valuable consideration, the Contractor shall defend, indemnify and save harmless the CITY, its officers, agents, and employees from or on account of any personal injury, loss of life or damage to property received or sustained by any person or persons during or on account of any operations connected with the construction of this Project; or by or in consequence of any negligence (excluding negligence of the CITY), in connection with the same; or by use of any improper materials or by or on account of any use of any improper materials or by or on account of any act or omission of the said Contractor or his subcontractor, agents, servants or employees.

Contractor agrees to indemnify and save harmless the CITY against any liability arising from or based upon the violation of any federal, state, county or city laws, by-laws, ordinances or regulations by the Contractor, his subcontractor, agents, servants or employees. Contractor further agrees to indemnify and save harmless the CITY from all such claims and fees, and from any and all suits and actions of every name and description that may be brought against the CITY on account of any claims, fees, royalties, or costs for any invention or patent, and from any and all suits and actions that may be brought against the CITY for the infringement of any and all patents or patent rights claimed by any person, firm, or corporation.

The indemnification provided above shall obligate the Contractor to defend at his own expense or to provide for such defense, at the CITY's option, any and all claims or liability and all suits and actions of every name and description that may be brought against the Owner which may result from the operations and activities under this Contract whether the construction operations be performed by the Contractor, his subcontractor or by anyone directly or indirectly employed by either.

Nothing in this indemnification shall be deemed to affect the rights, privileges or immunities of the CITY as set forth in Section 768.28, Florida Statutes.

The CITY will pay to the Contractor the specific consideration, in the amount stated in the Schedule of Prices Bid. The Contractor shall acknowledge the receipt of payment and other good and valuable consideration from the Owner which has been paid to him as specific consideration for the indemnification provided herein and in accordance with the provisions of Chapter F.S.A., Section 725.06.

#### ARTICLE 8 - CITY'S RESPONSIBILITIES

##### 8.1 Communications:

The CITY shall issue all communications to the CONTRACTOR through the ENGINEER.

##### 8.2 Furnish Contract Documents:

The CITY shall furnish the number of Contract Documents as specified in the Supplementary General Conditions to the CONTRACTOR at no cost. Referenced Standard Specifications Manuals, guidebooks, etc., will not be provided.

##### 8.3 Furnish Right-of-Way:

The CITY shall furnish the necessary land or Right-of-Way on which the work is to be accomplished, and will provide lines and grades as specified in Article 6.

##### 8.4 Timely Delivery of Materials:

The CITY shall be responsible for the delivery of any CITY furnished material, equipment or labor as specified in the Contract Documents.

## ARTICLE 9 - ENGINEER'S STATUS

### 9.1 Authority of the Engineer:

- A. The general supervision of the execution of this Contract is vested in the ENGINEER who is the CITY's sole representative during the construction period. The instructions of the ENGINEER are to be strictly and promptly followed in every case. The CONTRACTOR's representative (Article 7.8 A. 1.) shall be responsible for the execution of any instructions given by the ENGINEER during the absence of the CONTRACTOR.
- B. The ENGINEER is the initial interpreter of the requirements of the Contract Documents and judge of the acceptability of the work. Claims, disputes and other matters relating to the acceptability of work or requirements of the Contract Documents shall be referred in writing to the ENGINEER within 15 days of the event, with a request for a formal decision, which the ENGINEER will render in writing within a reasonable time. This rendering of a decision by the ENGINEER will be a condition precedent to any exercise by the CITY or CONTRACTOR of rights or remedies as either may otherwise have under the Contract Documents or at law in respect to any such claim, dispute or other matter.
- C. The ENGINEER will issue with reasonable promptness any written clarifications or interpretations of the Contract Documents as he shall deem necessary, which shall be consistent with or reasonably inferable from the overall intent of the Contract Documents. If, as a result of a clarification or interpretation, either the CONTRACTOR or ENGINEER believes a Change Order is justified, it shall be submitted.
- D. The ENGINEER has approval authority over the acceptability of all material or equipment furnished, Shop Drawings, Change Orders, work performed and the rate of progress of the work. Verification of the quantities of work performed for pay purposes is the responsibility of the ENGINEER.
- E. The ENGINEER also has the authority to disapprove or reject work which is defective, and may require special inspection or testing of the work, whether or not it is fabricated, installed or completed.
- F. The ENGINEER has the authority to suspend the work wholly or in part for such period or periods as may be deemed necessary, due to the unsuitable prosecution of the work, or for such time as is necessary due to failure on the part of the CONTRACTOR to carry out orders given or perform any or all provisions of the Contract. The CONTRACTOR shall not suspend the work and shall not remove any equipment, tools, lumber or other materials without the written permission of the ENGINEER.

### 9.2 Access to the Work:

The ENGINEER is to have free access to the materials and work at all times for laying out, measuring or inspecting same, and the CONTRACTOR is to afford him all necessary facilities and assistance for so doing.

### 9.3 Limitations on The ENGINEER's Responsibilities:

- A. Neither the ENGINEER's authority to act under this Article or elsewhere in the Contract Documents nor any decision made by the ENGINEER in good faith either to exercise or not exercise such authority shall give rise to any duty or responsibility of the ENGINEER



to the CONTRACTOR, any Subcontractor, any manufacturer, fabricator, supplier or distributor or any of their agents or employees or any other person performing any of the work.

- B. Whenever in the Contract Documents the terms "as ordered", "as directed", "as required", "as allowed" or terms of like effect or import are used, or the adjectives "reasonable", "suitable", "acceptable", "proper" or "satisfactory" or adjectives of like effect or import are used, to describe requirement, direction, review or judgment of the ENGINEER as to the work, it is intended that such requirement, direction, review or judgment will be solely to evaluate the work for compliance with the Contract Documents (unless there is a specific statement indicating otherwise). The use of any such term or adjective never indicates that the ENGINEER has authority to supervise or direct performance of the work.
- C. The ENGINEER will not be responsible for the CONTRACTOR's means, methods, techniques, sequences or procedures of construction, nor the safety precautions and programs incident thereto, and the ENGINEER will not be responsible for the CONTRACTOR's failure to perform the work in accordance with the Contract Documents.
- D. The ENGINEER will not be responsible for the acts or omissions of the CONTRACTOR or of any Subcontractors, or of the agents or employees of any CONTRACTOR or subcontractor, or of any other persons at the site or otherwise performing any of the work.

#### 9.4      Inspectors:

- A. Inspectors employed by the CITY assist the ENGINEER in ascertaining the work conforms to the Contract Documents and are authorized to inspect all work done and material furnished as representatives of the ENGINEER. Inspectors shall be stationed at the site of the work to report to the ENGINEER as to the progress of the work and the quality of workmanship and material.
- B. In case of any dispute arising between the CONTRACTOR and the Inspector, the Inspector shall have the authority to reject material or to suspend the work until the question of issue can be referred to and decided upon by the ENGINEER.
- C. If the CONTRACTOR refuses to suspend operation on verbal order, the Inspector shall issue a written order giving the reason for shutting down the work. After placing the order in the hands of the man in charge, the Inspector shall immediately leave the job. work done during the absence of the Inspector, after such written notice, will not be accepted nor paid for.
- D. Inspectors are not authorized to revoke, alter, enlarge, relax or release any requirements of these Contract Documents, nor to issue instructions contrary to them. Inspectors shall in no case act as foreman or perform other duties for the CONTRACTOR, nor interfere with management of the work by the latter. Any instructions which Inspectors may give the CONTRACTOR shall in no way be construed as releasing the CONTRACTOR from fulfillment of the terms of the Contract.
- E. The payment of any compensation, whatever may be its character or form, or the giving of any gratuity, or the granting of any valuable favor, by the CONTRACTOR to any Inspector, directly or indirectly, is strictly prohibited and any such act on the part of the CONTRACTOR will constitute a violation of this Contract and may subject the CONTRACTOR to other penalties provided for by law or ordinance.

## 9.5

### Inspections:

- A. The ENGINEER will make, or have made, such inspections and tests as he deems necessary to assure that the work is being accomplished in accordance with the requirements of the Contract. In the event such Inspections or tests reveal non-compliance with the requirements of the Contract, the CONTRACTOR shall bear the cost of such corrective measures as well as the cost of subsequent reinspection and retesting.
- B. Work done in the absence of a prescribed inspection may be required to be removed and replaced under proper inspection. The entire cost of removal and replacement, including the cost of all material which may be furnished by the CITY and used in the work thus removed, shall be borne by the CONTRACTOR, regardless of whether the work removed is found to be defective or not. Work covered up without the authority of the ENGINEER, shall, upon order of the ENGINEER, be uncovered to the extent required, and the CONTRACTOR shall similarly bear the entire cost of performing all the work and furnishing all the material necessary for the removal of the covering and its subsequent replacement.
- C. Unless otherwise provided, the cost of inspection and all inspection fees imposed by public agencies other than the fees associated with the issuance of the Master Building Permit by the City of Hollywood shall be paid by the CONTRACTOR.
- D. No inspection nor any failure to inspect at any time or place shall relieve the CONTRACTOR from any obligation to perform all of the work in strict conformance with the requirements of the Contract Documents.

## ARTICLE 10 - CHANGES IN THE WORK/CONTRACT PRICE

## 10.1

### Changes in the Work or Terms of Contract Documents:

- A. Without invalidating the Contract and without notice to any surety CITY reserves and shall have the right, from time to time to make such increases, decreases or other changes in the character or quantity of the Work as may be considered necessary or desirable to complete fully and acceptably the proposed construction in a satisfactory manner. Any extra or additional work within the scope of this Project must be accomplished by means of appropriate Clarifications, or Change Orders.
- B. Any changes to the terms of the Contract Documents must be contained in a written document, executed by the parties hereto, with the same formality and of equal dignity prior to the initiation of any work reflecting such change.

This section shall not prohibit the issuance of Change Orders executed only by CITY as hereinafter provided.

## 10.2

### Supplemental Instructions - Clarifications:

- A. The CITY, through the ENGINEER, shall have the right to approve and issue Clarifications setting forth written interpretations of the intent of the Contract Documents and ordering minor changes in Work execution, providing the Clarifications involve no change in the Contract Price or the Contract Time.
- B. The ENGINEER shall have the right to approve and issue Clarifications setting forth written orders, instructions, or interpretations concerning the Contract Documents or its performance, provided such Clarifications involve no change in the Contract Price or the

Contract Time.

10.3      Change Orders:

- A. Changes in the quantity or character of the Work within the scope of the Project which are not properly the subject of Clarifications, including all changes resulting in changes in the Contract Price or the Contract Time, shall be authorized only by or Change Orders approved in advance and issued in accordance with the provisions of the CITY Procurement Code, as amended from time to time.
- B. CONTRACTOR shall not start work on any changes requiring an increase in the Contract Price or the Contract Time until a or Change Order setting forth the adjustments is approved by the CITY. Upon receipt of a Change Order CONTRACTOR shall promptly proceed with the work set forth within the document.
- C. Change Orders shall be issued for change in Contract Price related to Cost Allowances specifically included on the Proposal Bid Form. Change Orders shall be issued when required for all other Contract Price Changes. Hereinafter, the term "Change Order(s)" shall be used to include "Change Orders" with the exception that Change Order shall not be used for any Contract Time adjustments.
- D. In the event satisfactory adjustment cannot be reached for any item requiring a change in the Contract Price or Contract Time, and a Change Order has not been issued, CITY reserves the right at its sole option to either terminate the Contract as it applies to the items in question and make such arrangements as may be deemed necessary to complete the disputed work; or the work shall be performed on the "cost of work" basis as described in Article 10.4.
- E. On approval of any Contract change increasing the Contract Price, CONTRACTOR shall ensure that the performance bond and payment bond are increased so that each reflects the total Contract Price as increased.
- F. Under circumstances determined necessary by CITY, Change Orders may be issued unilaterally by CITY.

10.4      Value of Change Order Work:

- A. The value of any work covered by a Change Order or of any claim for an increase or decrease in the Contract Price shall be determined in one of the following ways:
  - A.1 Where the work involved is covered by unit prices contained in the Contract Documents, by application of unit prices to the quantities of items involved, subject to the provisions of Article 10.4.G.
  - A.2 By mutual acceptance of a lump sum which CONTRACTOR and CITY acknowledge contains a component for overhead and profit.
  - A.3 On the basis of the "cost of work," determined as provided in this Article, plus a CONTRACTOR's fee for overhead and profit which is determined as provided in Article 10.4.D.
- B. The term "cost of work" means the sum of all direct costs necessarily incurred and paid by CONTRACTOR in the proper performance of the Work described in the Change Order.

Except as otherwise may be agreed to in writing by CITY, such costs shall be in amounts no higher than those prevailing in the locality of the Project, shall include only the following items and shall not include any of the costs itemized in Article 10.4.C.

- B.1 Payroll costs for employees in the direct employ of CONTRACTOR in the performance of the work described in the Change Order under schedules of job classifications agreed upon by CITY and CONTRACTOR. Payroll costs for employees not employed full time on the work covered by the Change Order shall be apportioned on the basis of their time spent on the work. Payroll costs shall include, but not be limited to, salaries and wages plus the cost of fringe benefits which shall include social security contributions, unemployment, excise and payroll taxes, workers' or workmen's compensation, health and retirement benefits, bonuses, sick leave, vacation and holiday pay application thereto. Such employees shall include superintendents and foremen at the site. The expenses of performing the work after regular working hours, on Sunday or legal holidays shall be included in the above to the extent authorized by CITY.
- B.2 Cost of all materials and equipment furnished and incorporated in the work, including costs of transportation and storage thereof, and manufacturers' field services required in connection therewith. All cash discounts shall accrue to CONTRACTOR unless CITY deposits funds with CONTRACTOR with which to make payments, in which case the cash discounts shall accrue to CITY. All trade discounts, rebates and refunds, and all returns from sale of surplus materials and equipment shall accrue to CITY and CONTRACTOR shall make provisions so that they may be obtained. Rentals of all construction equipment and machinery and the parts thereof whether rented from CONTRACTOR or others in accordance with rental agreements approved by CITY with the advice of ENGINEER and the costs of transportation, loading, unloading, installation, dismantling and removal thereof, all in accordance with the terms of said agreements. The rental of any such equipment, machinery or parts shall cease when the use thereof is no longer necessary for the work.
- B.3 Payments made by CONTRACTOR to Subcontractors for work performed by Subcontractors, If required by CITY, CONTRACTOR shall obtain competitive bids from Subcontractors acceptable to CONTRACTOR and shall deliver such bids to CITY who will then determine, with the advice of ENGINEER, which bids will be accepted. If the Subcontract provides that the Subcontractor is to be paid on the basis of cost of the work plus a fee, the Subcontractor's cost of the work shall be determined in the same manner as CONTRACTOR'S cost of the work. All Subcontractors shall be subject to the other provisions of the Contract Documents insofar as applicable.
- B.4 Cost of special engineers, including, but not limited to, engineers, architects, testing laboratories, and surveyors employed for services specifically related to the performance of the work described in the Change Order.
- B.5 Supplemental costs including the following:  
The proportion of necessary transportation, travel and subsistence expenses of CONTRACTOR's employees incurred in discharge of duties connected with the work except for local travel to and from the site of the work.

Cost, including transportation and maintenance, of all materials, supplies,

equipment, machinery, appliances, office and temporary facilities at the site and hand tools not owned by the workmen, which are consumed in the performance of the work, and cost less market value of such items used but not consumed which remains the property of CONTRACTOR.

Sales, use, or similar taxes related to the work, and for which CONTRACTOR is liable, imposed by any governmental authority. Deposits lost for causes other than CONTRACTOR's negligence; royalty payments and fees for permits and licenses. The cost of utilities, fuel and sanitary facilities at the site. Receipted minor expenses such as telegrams, long distance telephone calls, telephone service at the site, expressage and similar petty cash items in connection with the work.

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

- C. The term "cost of the work" shall not include any of the following:
- C.1 Payroll costs and other compensation of CONTRACTOR's officers, executives, principals (of partnership and sole proprietorships), general managers, engineers, architects, estimators, lawyers, auditors, accountants, purchasing and contracting agents, expeditors, timekeepers, clerks and other personnel employed by CONTRACTOR whether at the site or in its principal or a branch office for general administration of the work and not specifically included in the agreed-upon schedule of job classifications referred to in this Article, all of which are to be considered administrative costs covered by CONTRACTOR's fee.
  - C.2 Expenses of CONTRACTOR's principal and branch offices other than CONTRACTOR's office at the site.
  - C.3 Any part of CONTRACTOR's capital expenses, including interest on CONTRACTOR's capital employed for the work and charges against CONTRACTOR for delinquent payments.
  - C.4 Cost of premiums for all Bonds and for all insurance whether or not CONTRACTOR is required by the Contract Documents to purchase and maintain the same, except for additional bonds and insurance required because of changes in the work.
  - C.5 Costs due to the negligence or neglect of CONTRACTOR, any Subcontractors, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, including but not limited to, the correction of defective work, disposal of materials or equipment wrongly supplied and making good any damage to property.
  - C.6 Other overhead or general expense costs of any kind and the cost of any item not specifically and expressly included in this Section.
- D. CONTRACTOR's fee allowed to CONTRACTOR for overhead and profit shall be determined as follows:
- D.1 A mutually acceptable fixed fee or if none can be agreed upon,
  - D.2 A fee based on the following percentages of the various portions of the cost of the work:

For costs incurred under Article 10.4.B.1, CONTRACTOR's fee shall not exceed ten percent (10%).

For costs incurred under Article 10.4.B.3 and B.4, CONTRACTOR's fee shall not exceed seven and one half percent (7.5%); and if a subcontract is on the basis of cost of the work plus a fee, the maximum allowable to the Subcontractor as a fee for overhead and profit shall not exceed ten percent (10%);

No fee shall be payable on the basis of costs itemized under Article 10.4.B.5 and Article 10.4.C.

- E. The amount of credit to be allowed by CONTRACTOR to CITY for any such change which results in a net decrease in cost, will be the amount of the actual net decrease. When both additions and credits are involved in anyone change, the combined overhead and profit shall be figured on the basis of the net increase, if any, however, CONTRACTOR shall not be entitled to claim lost profits for any Work not performed.
- F. Whenever the cost of any work is to be determined pursuant to Articles 10.4.B and 10.4.C, CONTRACTOR will submit in a form acceptable to CONSUL T ANT an itemized cost breakdown together with the supporting data.
- G. Where the quantity of any item of the Work that is covered by a unit price is increased or decreased by more than twenty percent (20%) from the quantity of such work indicated in the Contract Documents, an appropriate Change Order shall be issued to adjust the unit price, if warranted.
- H. Whenever a change in the Work is to be based on mutual acceptance of a lump sum, whether the amount is an addition, credit or no change-in-cost, CONTRACTOR shall submit an initial cost estimate acceptable to ENGINEER and CITY.
  - H.1 Breakdown shall list the quantities and unit prices for materials, labor, equipment and other items of cost.
  - H.2 Whenever a change involves CONTRACTOR and one or more Subcontractors and the change is an increase in the Contract Price, overhead and profit percentage for CONTRACTOR and each Subcontractor shall be itemized separately.
- I. Each Change Order must state within the body of the Change Order whether it is based upon unit price, negotiated lump sum, or "cost of the work."

#### 10.5 Notification and Claim for Chance of Contract Price:

- A. Any claim for a change in the Contract Price shall be made by written notice by CONTRACTOR to the CITY and to ENGINEER within five (5) calendar days of the commencement of the event giving rise to the claim and stating the general nature and cause of the claim. Thereafter, within twenty (20) calendar days of the termination of the event giving rise to the claim, written notice of the extent of the claim with supporting information and documentation shall be provided unless ENGINEER allows an additional period of time to ascertain more accurate data in

support of the claim and such notice shall be accompanied by CONTRACTOR's written notarized statement that the adjustment claimed is the entire adjustment to which the CONTRACTOR has reason to believe it is entitled as a result of the occurrence of said event. All claims for changes in the Contract Price shall be in accordance with Articles 10.3 and 10.4 hereof, if CITY and CONTRACTOR cannot otherwise agree. **IT IS EXPRESSLY AND SPECIFICALLY AGREED THAT ANY AND ALL CLAIMS FOR CHANGES TO THE CONTRACT PRICE SHALL BE WAIVED IF NOT SUBMITTED IN STRICT ACCORDANCE WITH THE REQUIREMENTS OF THIS SECTION.**

10.6 Notice of Change:

If notice of any change affecting the general scope of the work or change in the Contract Price is required by the provisions of any Bond to be given to the Surety, it will be CONTRACTOR's responsibility to so notify the Surety, and the amount of each applicable Bond shall be adjusted accordingly. The CONTRACTOR shall furnish proof of such adjustment to the CITY. Failure of the CONTRACTOR to obtain such approval from the Surety may be a basis for termination of this Contract by the CITY.

10.7 Records:

The CONTRACTOR's representative and the ENGINEER shall compare records of extra work done at the end of the day. Such records shall be made in duplicate upon a form provided for such purpose by the ENGINEER and shall be signed by both the Inspector and the CONTRACTOR's representative, one copy being submitted to the ENGINEER and the other being retained by the CONTRACTOR.

10.8 Cancelled Items and Payments Therefore:

The CITY COMMISSION shall have the right to cancel those portions of the Contract relating to the construction of any item provided therein. Such cancellation shall entitle the CONTRACTOR to payment in a fair and equitable amount covering all items of cost incurred by him prior to the date of cancellation or suspension of the work. The CONTRACTOR shall be allowed a profit percentage on the materials used and on construction work actually performed, at the same rates as provided for "Extra Work", but no allowance will be made for anticipated profits. Acceptable materials ordered by the CONTRACTOR or delivered on the work, prior to date of such cancellation or suspension, may be purchased from the CONTRACTOR by the CITY at actual cost and shall thereupon, become property of the CITY, or may be returned to the manufacturer for a reasonable restocking charge.

10.9 Full Payment:

The Compensation herein provided shall be received and accepted by the CONTRACTOR as payment in full for all extra work done or costs incurred in event of cancellation.

## ARTICLE 11 - CHANGES IN THE CONTRACT TIME

### 11.1 Change Order:

The Contract Time may only be changed by a Change Order. A FULLY EXECUTED CHANGE ORDER MUST EXIST PRIOR TO EXTENSION OR SHORTENING OF THE CONTRACT TIME.

### 11.2 Notification and Claim for Change of Contract Time:

- A. Any claim for a change in the Contract Time shall be made by written notice by the CONTRACTOR to the CITY and to ENGINEER within five (5) calendar days of the commencement of the event giving rise to the claim and stating the general nature and cause of the claim. Thereafter within twenty (20) calendar days of the termination of the event giving rise to the claim, written notice of the extent of the claim with supporting information and documentation shall be provided unless ENGINEER allows an additional period of time to ascertain more accurate data in support of the claim and such notice shall be accompanied by CONTRACTOR's written notarized statement that the adjustment claimed is the entire adjustment to which the CONTRACTOR has reason to believe it is entitled as a result of the occurrence of said event. All claims for changes in the Contract Time shall be determined in accordance with Articles 10.3 and 10.4 hereof, if CITY and CONTRACTOR cannot otherwise agree. **IT IS EXPRESSLY AND SPECIFICALLY AGREED THAT ANY AND ALL CLAIMS FOR CHANGES TO THE CONTRACT TIME SHALL BE WAIVED IF NOT SUBMITTED IN STRICT ACCORDANCE WITH THE REQUIREMENTS OF THIS SECTION.**
- B. The Contract Time will be extended an amount equal to time lost on critical Work items due to delays beyond the control of and through no fault or negligence of CONTRACTOR if a claim is made thereafter as provided in Article 11.2. Such delays shall include, but not be limited to, acts or neglect by any separate contractor employed by CITY, fire, floods, labor disputes, epidemics, abnormal weather conditions or acts of God

### 11.3 Basis for Extension:

Extensions of time shall be considered and will be based solely upon the effect of delays to the work as a whole. Extensions of time shall not be granted for delays to the work, unless the CONTRACTOR can clearly demonstrate, through schedule analysis, that the delay to the work as a whole arose in accordance with Article 12.3 or Article 15.1, and that such delays did or will, in fact, delay the progress of work as a whole. Time extensions shall not be allowed for delays to parts of the work that are not on the critical path of the project schedule. Time extensions shall not be granted until all float or contingency time, at the time of the delay, available to absorb specific delays and associated impacts is used.

### 11.4 Change of Time Due to Contract Execution Problems:

Refer to Article 3.4 for a decrease in Contract Time when the CONTRACTOR fails to return the correctly executed Contract Documents within the time allowed.

### 11.5 Change of Time Due to Change Order Evaluation:

When evaluating a proposed Change Order, the ENGINEER shall have access to any available float or contingency time. Extension will only be considered in accordance with Article 11.3.



11.6            Change of Time and Inspection and Testing:

Neither observations by the ENGINEER, nor inspections, tests or approvals by others, passing or failing, will be cause for consideration of time extension.

11.7            Change of Time and Defective Work:

- A. If WORK is found to be defective, CONTRACTOR shall bear all remedial expenses including any additional costs experienced by CITY due to delays to others performing additional WORK. CONTRACTOR shall further bear the responsibility for maintaining schedule, and will be excluded from a time extension and the recovery of delay damages due to the uncovering.
- B. If the WORK is found to be defective per the Specifications, but the CITY chooses to accept it at its sole discretion, CONTRACTOR shall bear the responsibility for maintaining schedule, and will be excluded from a time extension and the recovery of delay damages due to the uncovering.

11.8            Liquidated Damages:

All time limits stated in the Contract Documents are of the essence. The provisions of this Article 11 shall not exclude recovery for damages by CITY as indicated in Section 3 of the Supplementary General Conditions.

ARTICLE 12 - WARRANTY AND GUARANTEE;  
TEST AND INSPECTIONS;  
CORRECTION, REMOVAL OR ACCEPTANCE OF DEFECTIVE WORK

12.1            Warranty and Guarantee:

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

12.2            Tests and Inspections:

- A. The CONTRACTOR shall give the ENGINEER and, when appropriate, the Building Department and other regulatory authorities which have jurisdiction over the work, timely notice of readiness of the work for all required inspections, tests or approvals.
- B. All inspections performed as a result of the issuance of the Master Building Permit shall be performed by the CITY. All costs associated with such inspections shall be paid by the CITY, EXCEPT THAT should said test or inspection fail to pass the CONTRACTOR shall pay all costs associated with the rework and the retesting.
- C. When any other regulatory authority, by virtue of its rules or regulations, requires specific tests or inspections, the CONTRACTOR shall assume full responsibility for and pay all costs in connection with said tests and inspections.
- D. The CONTRACTOR shall also be responsible for and shall pay all costs in connection with any inspection or testing required in connection with the ENGINEER's acceptance of a manufacturer, fabricator, supplier or distributor of materials or equipment proposed to be

incorporated in the work, or of materials or equipment submitted for approval prior to ENGINEER's acceptance thereof for incorporation in the work and as otherwise specified in the Contract Documents.

- E. Neither observations by the ENGINEER nor inspections, tests or approvals by others shall relieve the CONTRACTOR from his obligations to perform the work in accordance with the Contract Documents.

### 12.3 Uncovering Work:

- A. If any work that is to be inspected, tested or approved is covered without written concurrence of the ENGINEER, it must, if requested, by the ENGINEER, be uncovered. Such uncovering and replacement shall be at the CONTRACTOR's expense.
- B. CONTRACTOR must contact all regulatory agencies issuing construction permits to make all necessary inspections. If CONTRACTOR fails to have the necessary inspections performed and such failure results in uncovering of work already performed, CONTRACTOR shall be responsible for all related time delays and monetary costs.
- C. If the ENGINEER considers it necessary or advisable that work previously covered with his permission or cognizance be observed, inspected or tested, the CONTRACTOR, at the ENGINEER's request, shall uncover, expose or otherwise make available for observation, inspection or testing as the ENGINEER may require, that portion of the work in question, furnishing all necessary labor, material and equipment. If it is found that such work is defective, the CONTRACTOR shall bear all the expenses of such uncovering, exposure, observation, inspection and testing and of satisfactory reconstruction, including compensation for additional professional services. If, however, such work is not found to be defective the CONTRACTOR shall be allowed an increase in the Contract Price or an extension of the Contract Time, or both, directly attributable to such uncovering, exposure, observation, inspection, testing and reconstruction if he makes a claim therefor in accordance with Article 10.2 and Article 11.2.

### 12.4 City May Stop the Work:

If the work is defective, or the CONTRACTOR fails to supply sufficient skilled workmen or suitable materials or equipment, the CITY may order the CONTRACTOR to stop the work, or any portion thereof, until the cause for such order has been eliminated; however, this right of the CITY to stop the work shall not give rise to any duty on the part of the CITY to exercise this right for the benefit of the CONTRACTOR or any other party.

### 12.5 Correction or Removal of Defective Work:

If required by the ENGINEER, the CONTRACTOR shall promptly, without cost to the CITY and as specified by the ENGINEER either correct any defective work, whether or not fabricated, installed or completed, or if the work has been rejected by the ENGINEER, remove it from the site and replace it with nondefective work.

### 12.6 One- Year Correction Period:

If within one year after the date of Substantial Completion or Final Completion as applicable, or such longer period of time as may be prescribed by the terms of any applicable special guarantee required by the Contract Documents or by any specific provision of the Contract Documents, any work is found to be defective, the CONTRACTOR shall promptly without cost to the CITY and in accordance with the ENGINEER's written instructions, either correct such defective work, or if it

has been rejected by the ENGINEER remove it from the site and replace it with nondefective work. If the CONTRACTOR does not promptly comply with the terms of such instructions, or in an emergency where delay would cause serious risk of loss or damage, the ENGINEER may have the defective work corrected or the rejected work removed and replaced, and all direct and indirect costs of such removal and replacement, including compensation for additional professional services, shall be paid by the CONTRACTOR.

12.7            Acceptance of Defective Work:

If instead of requiring correction or removal and replacement of defective work, the ENGINEER prefers to accept it, he may do so. In such case, if acceptance occurs prior to the ENGINEER's recommendation of final payment, a Change Order shall be issued incorporating the necessary revisions in the Contract Documents, including appropriate reduction in the Contract Price; or if the acceptance occurs after such recommendation, an appropriate amount shall be paid by the CONTRACTOR to the CITY.

12.8            City May Correct Defective Work:

If the CONTRACTOR fails within a reasonable time after written notice of the ENGINEER to proceed to correct and to correct defective work or to remove and replace rejected work as required by the ENGINEER in accordance with Paragraph 12.5, or if the CONTRACTOR fails to perform the work in accordance with the Contract Documents, (including any requirements of the progress schedule), the CITY may, after seven days' written notice to the CONTRACTOR, correct and remedy any such deficiency. In exercising its rights under this Paragraph the CITY shall proceed expeditiously. To the extent necessary to complete corrective and remedial action, the CITY may exclude the CONTRACTOR from all or part of the site, take possession of all or part of the work, and suspend the CONTRACTOR's services related thereto, take possession of the CONTRACTOR's tools, appliances, construction equipment and machinery at the site and incorporate in the work all materials and equipment stored at the site or for which the CITY has paid the CONTRACTOR but which are stored elsewhere. The CONTRACTOR shall allow the CITY, the CITY's representatives, agents and employees such access to the site as may be necessary to enable the CITY to exercise his rights under this Paragraph. All direct and indirect costs of the CITY in exercising such rights shall be charged against the CONTRACTOR in an amount verified by the ENGINEER, and a Change Order shall be issued incorporating the necessary revisions in the Contract Documents and a reduction in the Contract Price. Such direct and indirect costs shall include, in particular but without limitations, compensation for additional professional services required and all costs of repair and replacement of work of others destroyed or damaged by correction, removal or replacement of the CONTRACTOR's defective work. The CONTRACTOR shall not be allowed an extension of the Contract Time because of any delay in performance of the work attributable to the exercise by the CITY of the CITY's rights hereunder.

ARTICLE 13 - PAYMENTS TO THE CONTRACTOR

13.1            Basis of Payment:

Progress payments shall be based on the aggregate of the unit price amounts listed in the Proposal or in the Schedule of Values which have been incorporated in the work acceptable to the ENGINEER.

13.2            Unit Price Inclusion:

The unit prices stated in the Proposal include all costs and expenses for materials, labor, tools, equipment, transportation, commissions, patent fees and royalties, removing crossings or other obstructions, protection or maintaining pipes, drains, railroad tracks, buildings, bridges, or other

structures furnishing temporary crossings or bridges, furnishing all supplemental construction stakes, batter boards, templets, common and ordinary labor for handling materials during inspection replacing any property damage, together with any and all costs or expenses for performing and completing the work as specified.

13.3            Schedule of Values: (Lump Sum Price Breakdown)

A Schedule of Values must be submitted within seven days subsequent to the CONTRACTOR executing and submitting the Documents required of Article 16 of the Instructions to Bidders. The schedules shall be satisfactory in form and substance to the ENGINEER, and shall include quantity and unit prices aggregating the Contract Price, and shall subdivide the work into component parts in sufficient detail to serve as the basis for progress payments during construction. Upon acceptance of the schedule of values by the ENGINEER, it shall be incorporated into a form of Application for Payment acceptable to the ENGINEER.

13.4            Changed Conditions: (Unit Price Only)

It is mutually agreed that due to latent field conditions which cannot be foreseen at the time of advertising for bids, adjustments of the Plans to field conditions will be necessary during construction; and, therefore, such changes in the plans shall be recognized as constituting a normal and accepted margin of adjustment not unusual and not involving or permitting any change or modification of unit prices, in which case payment will be made for the revised quantities at the unit price bid in the Proposal.

13.5            Application for Progress Payment:

On the 20th day of the month or the first working day thereafter, the CONTRACTOR shall submit to the ENGINEER for review an Application for Payment form filled out and signed by the CONTRACTOR. The form shall be notarized, and shall cover the work completed as of the date of the application. The Application for Payment shall be accompanied by a Schedule of Values, and any other supporting documentation as the ENGINEER may reasonably require.

13.6            Payment for Materials:

If payment is requested on the basis of materials and equipment not incorporated in the work but delivered and suitably stored at the site or at another location agreed to in writing, the Application for Payment shall also be accompanied by such data, satisfactory to the ENGINEER, as will establish the CITY's title to the material and equipment and protect the CITY's interest therein, including applicable insurance.

13.7            Affidavit Required:

All Applications for Payment shall include an Affidavit of the CONTRACTOR stating that all previous progress payments received on account of the work have been applied to discharge in full all of CONTRACTOR's obligations reflected in prior Applications for Payment. The amount of retainage with respect to progress payments will be 10%.

13.8            Retainage:

The amount of retainage with respect to progress payments will be 10% until 50-percent completion of the construction services purchased pursuant to the Contract. After 50-percent completion of the construction services purchased pursuant to the Contract, the CITY shall reduce to 5 percent the amount of retainage withheld from each subsequent progress payment made to the CONTRACTOR. For purposes of this paragraph, the term "50-percent completion" means the point

at which the CITY has expended 50 percent of the total cost of the construction services purchased as identified in the Contract together with all costs associated with existing change orders and other additions or modifications to the construction services provided for in the Contract.

13.9            CONTRACTOR's Warranty of Title:

The CONTRACTOR warrants and guarantees that title to all work, materials and equipment covered by any Application for Payment whether incorporated in the Project or not, will pass to the CITY at the time of payment free and clear of all liens, claims, security interests and encumbrances (hereinafter in these General Conditions referred to as "Liens").

13.10           Review of Application for Payment:

The ENGINEER will, within seven (7) days, review the Application for Payment and either approve and submit it for payment or notify the CONTRACTOR of the deficiencies such that the CONTRACTOR may make the necessary corrections and resubmit in time for the month's payment. However, the ENGINEER may refuse to recommend the whole or any part of any payment if, in his opinion, it would be incorrect to make such representations. He may also refuse to recommend any such payment, or because of subsequently discovered evidence or the results of subsequent inspections or tests, nullify any such payment previously recommended to such extent as may be necessary in the ENGINEER's opinion to protect the CITY from loss because:

- A.     The work is defective, or completed work has been damaged requiring correction or replacement.
- B.     Written claims have been made against the CITY or Liens have been filed in connection with the work.
- C.     The Contract Price has been reduced because of Change Order.
- D.     The CITY has been required to correct defective work or complete the work in accordance with Article 12.8.
- E.     The CONTRACTOR's unsatisfactory prosecution of the work in accordance with the Contract Documents.
- F.     The CONTRACTOR's failure to make payment to Sub- Contractors, or for labor, materials or equipment.

13.11           Payment to the Contractor:

Payments are made only on the fifteenth day or first workday thereafter of each month.

ARTICLE 14 - SUBSTANTIAL COMPLETION, PARTIAL UTILIZATION,  
FINAL CLEAN UP, INSPECTION, PAYMENT AND ACCEPTANCE

14.1            Substantial Completion:

When the CONTRACTOR considers the entire work ready for its intended use, the CONTRACTOR shall, in writing to the ENGINEER, certify that the entire work is substantially complete and request that the ENGINEER issue a Certificate of Substantial Completion. Within a reasonable time thereafter the CONTRACTOR and the ENGINEER shall make an inspection of the work to determine the status of completion. If the ENGINEER does not consider the work substantially complete, the ENGINEER will notify the CONTRACTOR in writing giving his reasons therefor. If the ENGINEER considers the work substantially complete, the ENGINEER will prepare and deliver to the CONTRACTOR a Certificate of Substantial Completion, which shall fix the date of Substantial Completion. There shall be attached to the certificate a proposed Punch List, developed by the CONTRACTOR, of items to be completed or corrected before final payment.

Within 10 days after delivery of the certificate, the CITY shall review the proposed Punch List and either approve it or contact the CONTRACTOR to commence good faith efforts to develop a Punch List that is satisfactory to both parties. If the parties are unable to resolve any differences they may have in the development of the Punch List, the ENGINEER shall resolve their differences. The parties shall expedite the process of developing the Punch List with the intent of finalizing the Punch List within 30 days after the date of Substantial Completion.

At the time of delivery of the Certificate of Substantial Completion the ENGINEER will deliver to the CONTRACTOR written notice as to division of responsibilities pending final payment between the CITY and the CONTRACTOR with respect to security, operation, safety, maintenance, heat, utilities and insurance, said responsibilities will be binding on the CITY and the CONTRACTOR until final payment. Unless otherwise stated herein or on the Certificate of Substantial Completion, all building, product, equipment, and machinery warranties will commence on the date of Substantial Completion. The CITY shall have the right to exclude the CONTRACTOR from the work after the date of Substantial Completion, but the CITY shall allow the CONTRACTOR reasonable access to complete or correct items on the Punch List.

14.2            Partial Utilization:

Use by the CITY of any finished part of the work which has specifically been identified in the Contract Documents or which the ENGINEER and the CONTRACTOR agree constitutes a separately functioning and usable part of the work that can be used by the CITY without significant interference with CONTRACTOR's performance of the remainder of the work, may be accomplished prior to Substantial Completion of all the work subject to the following:

- A.        The ENGINEER at any time may request the CONTRACTOR in writing to permit the CITY to use any such part of the work which the ENGINEER believes to be ready for its intended use and substantially complete. If the CONTRACTOR agrees, the CONTRACTOR will certify to the ENGINEER that said part of the work is substantially complete and request the ENGINEER to issue a Certificate of Substantial Completion for that part of the work. The CONTRACTOR, at any time, may notify the ENGINEER in writing that the CONTRACTOR considers any such part of the work ready for its intended use and substantially complete and request the ENGINEER to issue a Certificate of Substantial Complete for the part of the work. Within a reasonable time after either such request, the CONTRACTOR and the ENGINEER shall make an inspection of that part of

the work to determine its status of completion. If the ENGINEER does not consider that part of the work to be substantially complete, the ENGINEER will notify the CONTRACTOR in writing giving the reasons therefore. If the ENGINEER considers that part of the work to be substantially complete, the provisions of Article 14.1 will apply with respect to Certificate of Substantial Completion of that part of the work and the division of responsibility in respect thereof and access thereto. It shall be understood by the CONTRACTOR that until such written notification is issued, all responsibility for care and maintenance of all of the WORK shall be borne by the CONTRACTOR. Upon issuance of said written notice of partial utilization, the OWNER will accept responsibility for the protection and maintenance of all such items or portions of the WORK described in the written notice.

#### 14.3            Final Clean-Up:

Upon completion of the work and before final inspection shall be made, the CONTRACTOR shall clean and remove from the site, the Right-of-Way and adjacent property, all surplus and discarded materials, rubbish, and temporary structures; restore in an acceptable manner all property, both public and private, which has been damaged during the prosecution of the work; and shall leave the site and vicinity unobstructed in a neat and presentable condition throughout the entire area or length of the work under Contract. The placing of materials of every character, rubbish, or equipment on the abutting property, with or without the consent of the property owners, shall not constitute the satisfactory disposal. If the work is of such a character as may be done by block or sections, the CONTRACTOR may be required to promptly remove and dispose of accumulated rubbish, debris or surplus materials from blocks or sections as completed or partially completed. No separate payment will be made for final cleaning up and restoration of property, but all costs thereof shall be included in the prices bid for the various scheduled items of work.

#### 14.4            Final Inspection:

Upon written notice from the CONTRACTOR that the entire work or an agreed portion thereof is complete and final clean-up has been completed, the ENGINEER will make a final inspection with the CONTRACTOR and will notify the CONTRACTOR in writing of all particulars in which this inspection reveals that the work is incomplete or defective. The CONTRACTOR shall immediately take such measures as are necessary to remedy such deficiencies.

#### 14.5            Final Application for Payment:

After the CONTRACTOR has completed all such corrections to the satisfaction of the ENGINEER and delivered all maintenance and operating instructions, schedules, guarantees, Bonds, certificates of inspection, marked-up record documents (as provided in Article 7.19 of the General Conditions and other documents; all as required by the Contract Documents and after the ENGINEER has indicated that the work is acceptable (subject to the provisions of Article 14.9) the CONTRACTOR may make Application for Final Payment following the procedure for progress payments. The final Application for Payment shall be accompanied by all documentation called for in the Contract Documents, together with complete and legally effective releases or waivers (satisfactory to the CITY) of all Liens arising out of or filed in connection with the work. In lieu thereof and as approved by the CITY, the CONTRACTOR may furnish receipts or releases in full; an affidavit of the CONTRACTOR that the releases and receipts include all labor, services, material and equipment for which a Lien could be filed, and that all payrolls, material and

equipment bills, and other indebtedness connected with the work for which the CITY or the CITY's property might in any way be responsible, have been paid or otherwise satisfied; and consent of the Surety, if any, to final payment. If any Subcontractor or Supplier fails to furnish a release or receipt in full, the CONTRACTOR may furnish a Bond or other collateral satisfactory to the CITY to indemnify the CITY against any Lien.

14.6            Final Payment and Acceptance:

If on the basis of the ENGINEER's observation of the work during construction and final inspection, and the ENGINEER's review of the final Application for Payment and accompanying documentation, all as required by the Contract Documents, the ENGINEER is satisfied that the work has been completed and the CONTRACTOR's other obligations under the Contract Documents have been fulfilled, the ENGINEER will recommend payment. Thereupon the ENGINEER will give written notice to the CITY and the CONTRACTOR that the work is acceptable subject to the provisions of Article 14.9.

14.7            Payment of Retainage Without Final Completion:

If through no fault of the CONTRACTOR, final completion of the work is significantly delayed and if the ENGINEER so confirms, the CITY shall, upon receipt of the CONTRACTOR's final Application for Payment and recommendation of the ENGINEER, and without terminating the Agreement, make payment of the balance due for the portion of the work fully completed and accepted. If the remaining balance to be held by the CITY for work not fully completed or corrected is less than the retainage stipulated in the Agreement and if Bonds have been furnished as required in Article 5.2, the written consent of the Surety to the payment of the balance due for that portion of the work fully completed and accepted shall be submitted by the CONTRACTOR to the ENGINEER with the application for such payment. Such payment shall be made under the terms and conditions governing final payment, except that it shall not constitute a waiver of claims.

14.8            CONTRACTOR's Continuing Obligation:

The CONTRACTOR's obligation to perform and complete the work in accordance with the Contract Documents shall be absolute. Neither recommendation of any progress or final payment by the ENGINEER, nor the issuance of a Certificate of Substantial Completion, nor any payment by the CITY to the CONTRACTOR under the Contract Documents, nor any use or occupancy of the work or any part thereof by the CITY nor any act of acceptance by the CITY nor any failure to do so, nor any review and approval of a Shop Drawing or sample submission, nor the issuance of a notice of acceptability by the ENGINEER pursuant to Article 14.6, nor any correction of defective work by the CITY will constitute an acceptance of work not in accordance with the Contract Documents or a release of the CONTRACTOR's obligation to perform the work in accordance with the Contract Documents (except as provided in Article 14.9).

14.9            Waiver of Claims:

The making and acceptance of final payment will constitute:

- A. A waiver of all claims by the CITY against the CONTRACTOR, except claims arising from unsettled Liens, from defective work appearing after final inspection pursuant to Article 14.4 or from failure to comply with the Contract Documents or the terms of any special guarantees specified therein; however, it will not constitute a waiver by the CITY of any



rights in respect of the CONTRACTOR's continuing obligations under the Contract Documents.

- B. A waiver of all claims by the CONTRACTOR against the CITY other than those previously made in writing and still unsettled.

#### ARTICLE 15 - SUSPENSION OF WORK AND TERMINATION

##### 15.1 City May Suspend Work:

The CITY may, at any time and without cause, suspend the work or any portion thereof for a period of not more than 90 days by notice in writing to the CONTRACTOR which will fix the date on which work will be resumed. The CONTRACTOR shall resume the work on the date so fixed. The CONTRACTOR shall be allowed an increase in the Contract Price or an extension of the Contract Time, or both, directly attributable to any suspension.

##### 15.2 City May Terminate:

- A. Upon the occurrence of any one or more of the following events:
1. If the CONTRACTOR commences a voluntary case under any chapter of the Bankruptcy Code (Title 11, United States Code), as now or hereafter in effect, or if the CONTRACTOR takes any equivalent or similar action by filing a petition or otherwise under any other federal or state law in effect at such time relating to the bankruptcy or insolvency.
  2. If a petition is filed against the CONTRACTOR under any chapter of the Bankruptcy Code as now or hereafter in effect at the time of filing, or if a petition is filed seeking any such equivalent or similar relief against the CONTRACTOR under any other federal or state law in effect at the time relating to bankruptcy or insolvency.
  3. If the CONTRACTOR makes a general assignment for the benefit of creditors.
  4. If a trustee, receiver, custodian or agent of the CONTRACTOR is appointed under applicable law or under contract, whose appointment or authority to take charge of property of the CONTRACTOR is for the purpose of enforcing a Lien against such property or for the purpose of general administration of such property for the benefit of the CONTRACTOR's creditors.
  5. If the CONTRACTOR admits in writing an inability to pay its debts generally as they become due.
  6. If the CONTRACTOR persistently fails to perform the work in accordance with the Contract Documents (including, but not limited to, failure to supply a qualified superintendent or sufficient skilled workers or suitable materials or equipment or failure to adhere to the approved progress schedule revised from time to time).
  7. If the CONTRACTOR disregards laws or regulations of any public body having jurisdiction.
  8. If the CONTRACTOR disregards the authority of the ENGINEER.
  9. If the CONTRACTOR otherwise violates in any substantial way any provisions of the Contract Documents.

- B. The CITY may, after giving the CONTRACTOR and the Surety seven days' written notice and to the extent permitted by laws and regulations, terminate the services of the CONTRACTOR, exclude the CONTRACTOR from the site and take possession of the work and of all the CONTRACTOR's tools, appliances, construction equipment and machinery at the site and use the same to the full extent they could be used by the CONTRACTOR (without liability to the CONTRACTOR for trespass or conversion), incorporate in the work all materials and equipment stored at the site or for which the CITY has paid the CONTRACTOR but which are stored elsewhere, and finish the work as the CITY may deem expedient. In such case the CONTRACTOR shall not be entitled to receive any further payment until the work is finished. If the unpaid balance of the Contract Price exceeds the direct, indirect and consequential costs of completing the work (including but not limited to fees and charges of engineers, architects, attorneys and other professionals, and court and arbitration costs) such excess will be paid to the CONTRACTOR. If such costs exceed such unpaid balance, the CONTRACTOR, or CONTRACTOR's Surety, shall pay the difference to the CITY.
- C. Where the CONTRACTOR's services have been so terminated by the CITY, the CITY alone shall determine the scope and description of the work to be completed and the method and schedule for completing it.
- D. Where the CONTRACTOR's services have been so terminated by the CITY the termination will not affect any rights or remedies of the CITY against the CONTRACTOR then existing or which may thereafter accrue. Any retention or payment of moneys due the CONTRACTOR by the CITY will not release the CONTRACTOR from liability.
- E. Upon seven days' written notice to the CONTRACTOR the CITY may, without cause and without prejudice to any other right or remedy, elect to abandon the work and terminate the Contract. In such case the CONTRACTOR shall be paid for all work executed and any expense sustained plus reasonable termination expenses, which will include, but not be limited to, direct, indirect and consequential costs (including, but not limited to, fees and charges of engineers, architects, attorneys and other professionals and court and arbitration costs).

15.3 Contractor May Stop Work or Terminate:

If through no act or fault of the CONTRACTOR, the work is suspended for a period of more than 90 days by the CITY or under an order of court or other public authority, or the CITY fails for 60 days to pay the CONTRACTOR any sum finally determined to be due, then the CONTRACTOR may, upon seven days' written notice to the CITY terminate the Contract and recover from the CITY payment for all work executed and any expense sustained plus reasonable termination expenses. In addition and in lieu of terminating the Contract, if the CITY has failed to make any payment as aforesaid, the CONTRACTOR may upon seven days' written notice to the CITY stop the work until payment of all amounts then due are paid. The provisions of this paragraph shall not relieve the CONTRACTOR of the obligations to carry on the work in accordance with the progress schedule and without delay during disputes and disagreements with the CITY.

- END OF SECTION -

SECTION 00800  
SUPPLEMENTARY GENERAL CONDITIONS  
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10. Prevailing Wage Requirement	00800-6
11. Inspections and Testing During Overtime	00800-7
12. Retainage	00800-7
13. Owner's Contingency	00800-8
14. SRF Funding Requirements	00800-8

**General Note:**

The General Conditions refer to specific section numbers in the Supplementary General Conditions. These reference numbers may not coordinate with the actual Article numbers utilized in the Supplementary General Conditions. The CONTRACTOR shall comply with all General Conditions and all Supplementary General Conditions as well as related conditions included in the General Requirements, Division 1 of the Technical Specifications. Incorrect cross-reference numbers shall not relieve this requirement.

**1. Project Schedule**

Time is of the essence for this work. The following defines the schedule for the project:

CONSTRUCTION WORK SCHEDULE  
CONSTRUCTION / STARTUP / ACCEPTANCE:

<u>Major Milestones</u>	<u>Completion Time (calendar days)</u>
1. Major Milestone – Substantial Completion(1)	210
2. Major Milestone – Project Closeout(2)	240

Failure to meet any of the above defined construction/startup/acceptance completion dates shall subject the CONTRACTOR to pay damages as specified in these Supplementary General Conditions in Article 3.

<sup>(1)</sup>Substantial Completion

1. Refer to General Conditions Articles 14.1 and 14.2. (Certification of Substantial Completion Services appended to the Supplementary General Conditions).
2. Substantial Completion shall also include:
  - Record drawings received and accepted by the Engineer
  - The systems shall be tested and demonstrated for the Engineer’s acceptance. The Engineer shall determine testing and demonstration sufficient for acceptance.
  - Guarantee certifications, performance affidavits, and all other certifications received and accepted by the Engineer.

Contractor shall also conform to construction sequence constraints as defined on the Drawings and in Specifications.

<sup>(2)</sup>Project Closeout

1. Refer to Division 1 General Requirement, Section 01 70 00 Project Closeout.
2. Project Closeout shall also include:
  - All requirements of substantial completion met plus the following
  - Site cleanup and restoration completed
  - All other site work completed
  - Minor punch list items completed (minor as defined by the Engineer in the field)
  - Demobilization completed
  - Releases from all parties who are entitled to claims

The title "Engineer" utilized in these descriptions for substantial and final completion shall mean the City staff engineer assigned to this project, or his designated representative.

**2. Insurance Requirements**

The insurance required by Article 5.6 of the General Conditions shall be as follows:  
Any Sub-Contractor used by the contractor shall supply such similar insurance required of the contractor. Such certificates shall name the City of Hollywood as an Additional Insured.

**1. BUILDERS RISK (BR 1) - Installation Floater: (Not Applicable)**

**2. GENERAL LIABILITY (GL3):**

Prior to the commencement of work governed by this contract, the Contractor shall obtain General Liability Insurance. Coverage shall be maintained throughout the life of the contract and include, as a minimum:

- Premises Operations
- Products and Completed Operations
- Blanket Contractual Liability
- Personal Injury Liability

Expanded Definition of Property Damage The minimum limits acceptable shall be:

\$2,000,000 Combined Single Limit (CSL)

If split limits are provided, the minimum limits acceptable shall be:

\$1,000,000 per Person  
\$2,000,000 per Occurrence  
\$100,000 Property Damage

An Occurrence Form policy is preferred. If coverage is provided on a Claims Made policy, its provisions should include coverage for claims filed on or after the effective date of this contract. In addition, the period for which claims may be reported should extend for a minimum of twelve (12)

months following the acceptance of work by the City.

The City of Hollywood shall be named as Additional Insured on all policies issued to satisfy the above requirements.

### 3. GENERAL LIABILITY (GLXCU):

Recognizing that the work governed by this contract involves either underground exposures, explosive activities, or the possibility of collapse of a structure, the Contractor's General Liability Policy shall include coverage for the XCU (explosion, collapse, and underground) exposures with limits of liability equal to those of the General Liability Insurance policy.

### 4. VEHICLE LIABILITY (VL3):

Recognizing that the work governed by this contract requires the use of vehicles, the Contractor, prior to the commencement of work, shall obtain Vehicle Liability Insurance. Coverage shall be maintained throughout the life of the contract and include, as a minimum, liability coverage for:

- Owned, Non-Owned, and Hired Vehicles

The minimum limits acceptable shall be:

\$1,000,000 Combined Single Limit (CSL)

If split limits are provided, the minimum limits acceptable shall be:

\$500,000 per Person  
\$1,000,000 per Occurrence  
\$100,000 Property Damage

The City of Hollywood shall be named as Additional Insured on all policies issued to satisfy the above requirements.

### 5. **WORKERS' COMPENSATION (WC2):**

Prior to the commencement of work governed by this contract, the Contractor shall obtain Workers' Compensation Insurance with limits sufficient to respond to the applicable state statutes.

In addition, the Contractor shall obtain Employers' Liability Insurance with limits of not less than:

\$500,000 Bodily Injury by Accident  
\$500,000 Bodily Injury by Disease, policy limits  
\$500,000 Bodily Injury by Disease, each employee

Coverage shall be maintained throughout the entire term of the contract.

### 6. **POLLUTION LIABILITY INSURANCE**

The minimum limits of liability shall be:

\$1,000,000 per each claim / \$2,000,000 aggregate

Coverage shall be provided by a company or companies authorized to transact business in the

state of Florida and the company or companies must maintain a minimum rating of "A" and Class X, as assigned by the A.M. Best Company.

The policy must be endorsed to provide the City with (30) days' notice of cancellation.

If the Contractor has been approved by the Florida's Department of Labor, as an authorized self-insurer, the City shall recognize and honor the Contractor's status. The Contractor may be required to submit a Letter of Authorization issued by the Department of Labor and a Certificate of Insurance, providing details on the Contractor's Excess Insurance Program.

If the Contractor participates in a self-insurance fund, a Certificate of Insurance will be required. In addition, the Contractor may be required to submit updated financial statements from the fund upon request from the City.

**3. Liquidated Damages**

Liquidated damages shall be paid by the CONTRACTOR to the CITY for failure to complete work on time in accordance with the following schedule:

<u>Major Milestones</u>	CONSTRUCTION/STARTUP/ACCEPTANCE:	
	<u>Completion Time (calendar days)</u>	<u>Liquidated Damages</u>
1. Substantial Completion	210	\$1000/day
2. Project Closeout	240	\$1000/day

The CITY is hereby authorized to deduct the sums described above from the monies which may be due to the CONTRACTOR for the work under this contract. Liquidated damages shall be additive such that the maximum total which may be deducted shall be \$1,000/day. Other damages for failure to meet warranty conditions as defined in other sections of the Specifications shall also be added with liquidated damages for failure to meet completion times.

4. **Restricted Area**

The CONTRACTOR shall, in installing the new facilities, confine all activities within the CITY property, easement, and right-of-ways indicated.

5. **Existing Facilities and Structures**

All existing facilities shall be protected, and if damaged, shall be repaired by the CONTRACTOR at no additional cost to the CITY.

6. **Explosives**

Explosives shall not be used on this project.

7. **Contract Documents**

The CITY will provide the CONTRACTOR with 1 (1) set of Contract Documents after the Notice to Proceed.

8. **Required Notifications**

When provisions of the pertinent codes, standards or regulations conflict with this Specification, the more stringent shall apply.

Prior to any site work, the CONTRACTOR shall notify the Engineering and Construction Services Division Inspector at (954) 921-3930.

Prior to excavation at the site, the CONTRACTOR shall notify the appropriate utilities and Sunshine State One-Call of Florida, Inc. (formerly U.N.C.L.E.) at 1-800-432-4770 for locations of buried utilities.

Prior to closure of any CITY streets or alleyways, or other activity which requires the diversion of traffic, the CONTRACTOR shall notify and obtain the permission of the CITY of Hollywood Fire and Police Communications Section at (954) 967-4321.

9. **Notice of Completion**

See attached form.

10. **Prevailing Wage Requirement**

A. The CONTRACTOR shall be responsible for ensuring payment of the rate of wages and fringe benefits, or cash equivalent, for all laborers, mechanics and apprentices employed by him/her or his/her SUBCONTRACTORS on the work covered by this contract which shall be not less than the prevailing rate of wages and fringe benefits payment or cash equivalent for similar skills or classifications of work as established by the General Wage Decision by the United States Department of Labor for Broward County, Florida that is in effect prior to



the date the CITY issued the invitation for bids for this project (the prevailing rate of wages and fringes can be obtained at website <http://www.access.gpo.gov/davisbacon>).

If the General Wage Decision fails to provide for a fringe benefit rate for any worker classification, then the fringe benefit rate applicable to such worker classification shall be the fringe benefit rate that has a basic wage rate closest in dollar amount to the work classification for which no fringe benefit rate has been provided.

- B. Upon commencement of work, the CONTRACTOR and all of his/her SUB-CONTRACTORS shall post a notice in a prominent place at the work site stating the requirements of this Article.
- C. As per the City of Hollywood Code of Ordinances, Prevailing Wage Requirements and Fringe Benefits are applicable to the following: (A) Utilities projects over \$1,000,000.00 (one million dollars) and (B) All other projects over \$500,000.00 (five hundred thousand dollars).

**11. Inspections and Testing During Overtime**

- A. The following supplement Article 3.15 and 3.16 of the General Conditions:

For weekend work, CONTRACTOR shall submit a written request to the CITY by the preceding Wednesday. A separate request is required for each week that the CONTRACTOR wished to work on a weekend. For evening and holiday work, CONTRACTOR shall submit a written request to the CITY 3 days in advance. The CITY will provide inspection services for all overtime work and the CONTRACTOR shall pay for inspection services per Article 3.15, no exceptions.

Similarly, holiday and other overtime work shall be requested a minimum of 36-hours in advance and CITY will provide inspection for all overtime.

- B. Exceptions to the hours and days of the week for work and other related limitations are allowed only for tie-ins during low flow periods / early morning hours, coatings that need to be applied during lower temperature times of the day and whenever the Documents specifically define that work shall be completed outside of the limitations for "normal" work hours, days, etc.

Inspection for tie-ins during low flow/early morning and specialty coating application performed during nighttime will not be cause for extra inspection costs unless such work is remedial in nature as a result of defective work.

**12. Retainage**

CITY shall promptly make payment to CONTRACTOR, unless CITY has grounds for withholding the payment of retainage. CITY shall have grounds for withholding the payment of retainage with respect to any amounts that are the subject of a good-faith dispute, the subject of a claim brought pursuant to Florida Statute Section 255.05, or otherwise the subject of a claim or demand by CITY or CONTRACTOR.

At acceptance of Substantial Completion, CITY shall promptly make payment to CONTRACTOR of one-half of the retainage then held by CITY. At acceptance of completion of all punch list items, CITY shall promptly make payment to CONTRACTOR the balance of retainage then held by CITY.

**13. Owner's Contingency**

*This allowance is in its entirety dedicated for the use of the Owner (The City of Hollywood) to address conditions (or work) associated with undefined conditions. All work resulting from undefined conditions shall be authorized in writing and in advance by the Owner, specifically the Director of Public Services, through the full execution of a Field Order. The actual amount to be paid per Field Order will be negotiated and agreed by both parties (the Owner and the Contractor). The final/negotiated amount of the field order will be deducted from the Owner's Allowance designated in the Bid Proposal and Schedule of Values. The Owner reserves the right to award none, any portion of, or all of the money associated with this allowance. By executing the CONTRACT between the City of Hollywood and the Contractor, the Contractor acknowledges that under no circumstances he or she should assume that he or she would be entitled to any amounts set aside by the City of Hollywood within the Owner's Allowance.*

# CERTIFICATE OF SUBSTANTIAL COMPLETION

**PROJECT:**

**ENGINEER:**

**TO:**

**CONTRACTOR:**

**CONTRACT FOR:**

**NOTICE TO PROCEED DATE:**

**DATE OF ISSUANCE:**

**PROJECT OR DESIGNATED PORTION SHALL INCLUDE:**

Portions of the work performed under this Contract as described above, have been reviewed and found to be substantially complete. The Date of Substantial Completion of Project or designated portion thereof designated above is hereby established as which is also the date of commencement of applicable warranties required by the Contract Documents for the noted area.

## **DEFINITION OF DATE OF SUBSTANTIAL COMPLETION**

The Date of Substantial Completion of the work or designated portion thereof is the date certified by the ENGINEER ("Date of Issuance" above) when construction is sufficiently complete, in accordance with the Contract Documents, so the CITY can occupy or utilize the work or designated portion thereof for the use for which it is intended, as expressed in the Contract Documents.

A list of items to be completed or corrected, prepared by the CONTRACTOR and verified and amended by the ENGINEER, for the above referenced "Project or Designated Portion" is attached to this form (attached "Punch List" dated \_\_\_\_\_).

The failure to include any items on such list does not alter the responsibility of the CONTRACTOR to complete all work in accordance with the Contract Documents.

## CERTIFICATE OF SUBSTANTIAL COMPLETION

Please note that in accordance with Article 14 General Conditions, the Contractor retains full responsibility for the satisfactory completion of all work regardless of whether the Owner occupies and / or operates a part of the facility and that the taking possession and use of such work shall not be deemed an acceptance of any work not completed in accordance with the Contract Documents.

City of Hollywood ECSD

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**ENGINEER** **BY** **DATE**

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**CONTRACTOR** **BY** **DATE**

The CITY OF HOLLYWOOD, through the City's authorized representative, accepts the work or designated portion thereof as substantially complete and will assume full possession thereof at \_\_\_\_\_ (time) on \_\_\_\_\_ (date).

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**BY** **DATE**

- END OF SECTION -

# **ADDENDUM NO. 1**



# CITY OF HOLLYWOOD, FLORIDA

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DEPARTMENT OF PUBLIC UTILITIES  
ENGINEERING AND CONSTRUCTION SERVICES DIVISION  
P. O. BOX 229045 · HOLLYWOOD, FL 33022-9045 · PHONE: 954-921-3930 · FAX: 954-921-3937

## UTILITY REPLACEMENT ALONG N. 26<sup>TH</sup> AVENUE

### **Addendum 1**

Date: February 7, 2022

Bid Number: F-4708-22-OT

ALL BIDDERS BE ADVISED OF THE FOLLOWING CHANGES TO THE ABOVE REFERENCED PROJECT AS LISTED BELOW:

This addendum is issued as part of the Bidding Documents for the above-described project. The changes incorporated in this addendum shall be considered as a part of the documents and shall supersede, amend, add to, clarify, or subtract from those conditions shown in the original documents. The bidder shall coordinate all modifications herein with all trades and disciplines related to the work. The Bidder shall acknowledge receipt of this addendum on the Bid Form by addendum number and date. Failure to do so may subject Bidder to disqualification.

#### **Item 1: Updated Bid Form Items**

The following bid items were updated as a part this addendum. Section 00301 Proposal Bid Form and Section 01025 Basis of Payment have been updated and can be found in the attachments to this document in Item 7.

Bid Item 47: Furnishing and installation of sleeves for 2-inch diameter proposed and existing service lines was added (45 EA).

Bid Item 48: Furnishing and installation of sleeves for proposed and existing service lines larger than 2-inch diameter was added (45 EA).

Bid Item 49: Adjust proposed drainage structure tops due to unforeseen conditions was added (25 EA).

Bid Item 56: This item was previously listed in the Section 00301 Proposal Bid Form, but not Section 01025 Basis of Payment. This has now been added to the Basis of Payment.

Bid Item 57: Furnishing and installation of speed humps was added (1 EA).

**Item 2: Request for Information**

Specification Section 01010 – Summary of Work was updated to include Part 1.09 Request for Information (RFI). Refer to the updated Specification in Item 7.

**Item 3: Section 01200**

Specification Section 01200 – Project Meetings was updated to include the correct section number at the bottom of the page. Refer to the updated Specification in Item 7.

**Item 4: Construction Signs**

Specification Section 01500 – Construction Considerations was updated to include Part 1.19 Construction Signs. Refer to the updated Specification in Item 7.

**Item 5: Storage Area and Written Permission Before Proceeding**

Specification Section 01520 – Maintenance of Facilities and Sequence of Construction Parts 1.08 and 1.09 were updated to include language requiring the Contractor to obtain private property to use as an equipment/materials storage area and to obtain written permission before proceeding to the next phase of construction. Refer to the updated Specification in Item 7.

**Item 6: Domestic Manufacturer**

Specification Section 15060 – Piping and Fittings Part 1.01 was updated to include language requiring all piping and fittings to be manufactured in the United States (domestic). Refer to the updated Specification in Item 7.

**Item 7: Updated/New Specifications**

- a) See attached updated Specification Section 00301.
- b) See attached updated Specification Section 01025.
- c) See attached updated Specification Section 01010.
- d) See attached updated Specification Section 01200.
- e) See attached updated Specification Section 01500.
- f) See attached updated Specification Section 01520.
- g) See attached updated Specification Section 15060.

**Item 8: Updated Drawing Sheets**

- a) See attached updated Drawing 150992-G-000.
- b) See attached updated Drawing 150992-G-001.
- c) See attached updated Drawing 150992-G-003.

**Item 9: Meeting Minutes and Attendance List**

- a) Meeting Minutes
- b) Attendance List

ALL OTHER TERMS, CONDITIONS, AND SPECIFICATIONS SHALL REMAIN THE SAME. THIS ADDENDUM SHALL BE ATTACHED TO THE CONTRACT DOCUMENTS AND THE RECEIPT OF THE SAME SHALL BE NOTED IN THE PROPOSAL IN THE SPACE PROVIDED.

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Jeff Jiang, P.E., Assistant Director - ECSD  
Department of Public Utilities



## **ITEM 7**

### **Updated/New Specifications**

## SECTION 00301

**CITY OF HOLLYWOOD  
DEPARTMENT OF PUBLIC UTILITIES  
ENGINEERING and CONSTRUCTION SERVICES DIVISION**

**PROPOSAL BID FORM**

Project No.: 16-5133

Project Name: **WATER MAIN REPLACEMENT  
PROJECT FOR N. 26<sup>TH</sup> AVENUE (PHASE 1)**

If this Proposal is accepted, the undersigned Bidder agrees to complete all work under this contract within **240** calendar days following the issuance of the Notice to Proceed. **UNIT PRICE PREVAILS OVER TOTAL PRICE.** All entries on this form must be typed or written in block form in ink. Quantities provided are for information purposes. Full descriptions of the pay items are provided in Section 01025, "Basis of Payment".

**BASE BID:****Water Main Replacement Construction Costs**

<u>No.</u>	<u>Description</u>	<u>Qty</u>	<u>Unit</u>	<u>Unit Price</u>	<u>Total</u>
1	Fire Hydrant Assemblies and Connections	10	EA	_____	_____
2	Fire Hydrant Removal and Delivery to CITY Property	10	EA	_____	_____
3	PVC C-900/C-905 Water Mains and D.I. Fittings				
a.	2" Diameter Piping (within city roads)	50	LF	_____	_____
b.	4" Diameter Piping (within city roads)	1,800	LF	_____	_____
c.	6" Diameter Piping (within city roads)	120	LF	_____	_____
d.	8" Diameter Piping (within city roads)	3,900	LF	_____	_____
4	8" D.I. Water Main (Taft Street)	70	LF	_____	_____
5	D.I. Reducers				
a.	8" x 4" Diameter	1	EA	_____	_____
b.	8" x 6" Diameter	6	EA	_____	_____
6	D.I. Tees				
a.	8" x 4" Diameter	8	EA	_____	_____
b.	8" x 6" Diameter	3	EA	_____	_____
c.	8" x 8" Diameter	4	EA	_____	_____
7	8"x8" D.I. Crosses	1	EA	_____	_____

8	D.I. Bends				
a.	4-inch 45° Bends	17	EA	_____	_____
b.	6-inch 45° Bends	19	EA	_____	_____
c.	8-inch 45° Bends	34	EA	_____	_____
d.	2-inch 11.25° Bends	2	EA	_____	_____
e.	4-inch 90° Bends	1	EA	_____	_____
9	D.I. Gate Valves				
a.	4-inch Diameter	8	EA	_____	_____
b.	6-inch Diameter	4	EA	_____	_____
c.	8-inch Diameter	10	EA	_____	_____
10	Transition Coupling				
a.	8" Transition Coupling	1	EA	_____	_____
b.	6" Transition Coupling	10	EA	_____	_____
11	Flexible Connection to Existing 2-inch WM	9	EA	_____	_____
12	Cutting, Capping, and Abandonment of Existing 2-inch Water Mains	1	LS	_____	_____
13	Cutting, Grouting, and Abandonment of Existing 4-inch, 6-inch, and 8-inch Water Mains	1	LS	_____	_____
<b>Water Main Replacement Construction Sub-Total</b>					=====

**Water Meter and Water Service Construction Costs**

14	Water Service Lines From New Water Main To Existing Water Meters				
a.	1-inch Diameter	42	EA	_____	_____
b.	2-Inch Diameter	5	EA	_____	_____
<b>Water Meter and Water Service Construction Sub-Total</b>					=====

**Storm Drainage Construction Costs**

15	4' Dia. Drainage Manhole w/USF 420 Ring and C Cover 4' - 6' depth	2	EA	_____	_____
16	4' Dia. Drainage Manhole w/USF 420 Ring and C Cover 6' - 8' depth	5	EA	_____	_____

17	4' Dia. Drainage Manhole w/USF 420 Ring and C Cover 8' - 10' depth	2	EA	_____	_____
18	5' Dia. Drainage Manhole w/USF 420 Ring and C Cover 4' - 6' depth	1	EA	_____	_____
19	5' Dia. Drainage Manhole w/USF 420 Ring and C Cover 8' - 10' depth	8	EA	_____	_____
20	FDOT Type "C" Catch Basin w/Cast iron Grate (Index 443-002)	13	EA	_____	_____
21	4' Dia. Catch Basin w/USF 4180-6172	2	EA	_____	_____
22	Replace Exist. Struct. EX-01 with 5' Dia. Catch Basin w/4122-6172 Frame-Grate, including reconnections	1	LS	_____	_____
23	Skimmer (PRB) (FDOT Index 443-002)	19	EA	_____	_____
24	6" In-Line Storm Drainage Check Valve (Procured by COH)	1	EA	_____	_____
25	12" In-Line Storm Drainage Check Valve (Procured by COH)	1	EA	_____	_____
26	24" In-Line Storm Drainage Check Valve (Procured by COH)	1	EA	_____	_____
27	6" Solid Corrugated Drainage Pipe and Couplings/ Connectors	30	LF	_____	_____
28	12" Solid Corrugated Drainage Pipe and Couplings/ Connectors	50	LF	_____	_____
29	15" Solid Corrugated Drainage Pipe and Couplings/ Connectors	290	LF	_____	_____
30	18" Solid Corrugated Drainage Pipe and Couplings/ Connectors	920	LF	_____	_____
31	French Drain, including 18" Perforated Corrugated PVC Pipe and Couplings as Shown on Drawings	2,221	LF	_____	_____
32	Cut Exist. 24" Storm Sewer and Reconnect to Prop. Manhole SD-01 w/24" Solid Corrugated PVC and Couplings as Needed (Manhole SD-01 paid under separate pay item)	1	LS	_____	_____

33	Cut Exist. 15" Storm Sewer and Reconnect to Prop. Manhole SD-02 w/15" Solid Corrugated PVC and Couplings as Needed (Manhole SD-02 paid under separate pay item)	1	LS	_____	_____
34	Core-drill Wall of Exist. Structure to Prepare for Connection of 12" Solid Corrugated PVC (EX-06 and EX-07)	2	EA	_____	_____
35	Core-drill Wall of Exist. Structure to Prepare for Connection of 15" Solid Corrugated PVC (EX-02 and EX-03)	2	EA	_____	_____
36	Core-drill Wall of Exist. Structure to Prepare for Connection of 18" Solid Corrugated PVC (EX-05)	2	EA	_____	_____
37	Remove Exist. 6" Storm Sewer Connected to South Invert of Exist. Structure EX-09, Mortar-seal Exist. Pipe Opening, and Core-drill South Wall to Prepare for Connection of Prop. 6" Solid Corrugated PVC at Invert Shown on Drawings	1	LS	_____	_____
38	Remove Exist. 6" Storm Sewer Connected to North Invert of Exist. Structure EX-08 to Prepare for Connection of Prop. 6" Solid Corrugated PVC at Same Invert	1	LS	_____	_____

**Storm Drainage Construction Costs Sub-Total**

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**Storm Drainage Allowance Items**

39	Replace Exist. Struct. with FDOT Type C Catch Basin w/Cast Iron Grate per FDOT Index 425-052. Reconnect to Exist. Pipe of Varying Diameters w/Prop. Solid Corrugated PVC Pipe and Couplings as Needed (EX-02, EX-07 and EX-09)	3	EA	_____	_____
40	Replace Exist. Struct. w/4' Dia. Catch Basin 4' - 6' deep w/USF Frame-Grate 4122-6172 or 4180-6172. Cut Exist. Pipe and Reconnect w/New Pipe and Couplings as Needed. (EX-03 and EX-04)	2	EA	_____	_____

41	Replace Exist. Struct. w/5' Dia. Catch Basin 4' - 6' deep w/USF Frame-Grate 4122-6172 or 4180-6172. Cut Exist. Pipe and Reconnect w/New Pipe and Couplings as Needed. (EX-05 and EX-06)	2	EA	_____	_____
42	Replace Exist. 24-inch Storm Sewer w/24-inch Solid Corrugated PVC Pipe and Couplings adjacent to SD-01	1	LS	_____	_____
43	Remove Section of Existing 6" Storm Sewer Connected to North Invert of Struct. EX-09 and Replace with 6" Solid Corrugated PVC Pipe and Couplings to Accommodate In-line Check Valve Installation	1	LS	_____	_____
44	Remove Section of Existing 12" Storm Sewer Connected to North Invert of Struct. EX-04 and Replace with 12" Solid Corrugated PVC Pipe and Couplings to Accommodate In-line Check Valve Installation	1	LS	_____	_____
45	Remove Section of Existing 24" Storm Sewer Connected to North Invert of Struct. EX-01 and Replace with 24" Solid Corrugated PVC Pipe and Couplings to Accommodate In-line Check Valve Installation	1	LS	_____	_____
46	Relocate 30± LF of Exist. 6" CI/DI Watermain Pipe and Fittings as Shown on Drawings to Accommodate Prop. Drainage Installation Btw. STA 49+81 and 50+09 of Sherman St.	1	LS	_____	_____
47	Furnish and Install Sleeves for Proposed Service Lines and Existing Service Lines to Remain 2-inch Diameter and Smaller that Cross Proposed French Drain in Accordance with Detail on Sheet SD-206 and FDOT Specifications.	45	EA	_____	_____
48	Furnish and Install Sleeves for Proposed Service Lines and Existing Service Lines to Remain Larger than 2-inch Diameter that Cross Proposed French Drain in Accordance with Detail on Sheet SD-206 and FDOT Specifications.	45	EA	_____	_____

49	Adjust Proposed Drainage Structure Tops due to Unforeseen Field Conditions in Accordance with FDOT Standard Index 425-001 as Modified on Sheet SD-206.	25	EA		
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**Storm Drainage Allowance Items Sub-Total**

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**City Roads Restoration Construction Costs**

50	Milling of Asphaltic Course to 1-inch Nominal Thickness within Liberty, Thomas, and Sherman Streets' ROW	5,900	SY		
51	2-inch Thick (SP9.5) Asphaltic Concrete Structural Course for Trench Restoration within City ROW (all impacted streets)	9,400	LF		
52	Roadway Patches for Large Damaged Areas (2" Asphalt)	600	SY		
53	Resurfacing of Side Streets	5,900	SY		
54	Existing Concrete Pavement, Brick Pavers and/or other specialty paving removed during re-routing of water services within private properties	100	SY		
55	Temporary Striping for N 26th Avenue and Side Streets Except Liberty, Sherman, and Thomas	1	LS		
56	Protective Concrete Slab over DI Piping on Taft Street	1	LS		
57	Speed Humps	1	EA		

**City Roads Restoration Construction Sub-Total**

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**General**

58	Mobilization / Gen. Requirements	1	LS		
59	Demobilization / Gen. Requirements	1	LS		
60	Consideration for Indemnification	1	LS	\$10.00	
61	Maintenance of Traffic, Including Design and	1	LS	\$100,000.00	

	Permitting			_____	_____
62	Permit, Licenses, Fees, and Materials Testing Allowance	1	LS	<u>\$50,000.00</u>	_____
	<b>General Sub-Total</b>				=====
63	Miscellaneous Work Allowance/Contingency	1	LS	<u>\$433,000.00</u>	_____
64	Unforeseen Utility Locates or Break Repair (besides water main work)	60	HR	_____	_____
	<b>BASE BID TOTAL FOR COMPLETE PROJECT:</b>				=====

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**BASE BID TOTAL IN WRITING**

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**NAME OF BIDDER**

**NOTES:**

1. **SUBSTANTIAL COMPLETION TIME AND PROJECT CLOSEOUT TIME FOR THE CONTRACT SHALL BE AS DEFINED IN THE PROJECT SCHEDULE IN THE SUPPLEMENTARY GENERAL CONDITIONS (SGC'S).**

- END OF SECTION -



**SECTION 01010****SUMMARY OF WORK****PART 1 -- GENERAL**

## 1.01 THE REQUIREMENT

- A. The work to be performed under this Contract shall consist of furnishing all tools, equipment, materials, supplies, and manufactured articles and for furnishing all transportation and services, including fuel, power, water, and essential communications, and for the performance of all labor, work, or other operations required for the fulfillment of the Contract in strict accordance with the Contract Documents. The work shall be complete, and all work, materials, and services not expressly shown or called for in the Contract documents which may be necessary for the complete and proper construction of the work in good faith shall be performed, furnished, and installed by the CONTRACTOR as though originally so specified or shown, at no increase in cost to the CITY.
- B. Prior to construction, the CONTRACTOR shall verify existing utilities identified on the Drawings and locate other potential utilities in their working area may not show on the Drawings. The utility verifications consist of excavation to verify tie-in points and to locate potential conflicts that may affect the work as shown on the Contract Drawings. The CONTRACTOR shall be responsible for the coordination of this work with the associated utility owners and permitting agencies having jurisdiction over the specific locations to be verified.

## 1.02 SCOPE

- A. It is the intent of the CITY to obtain a complete and working installation under this contract and any items of labor, materials or equipment, which may reasonably be assumed as necessary to accomplish this end, should be supplied whether or not specifically shown on the plans or described herein. Maintenance of the existing water utility system is required throughout the construction period.

Replacement of the potable water distribution system piping for this project includes:

- Installation of a new potable water distribution system piping – 4-inch, 6-inch, and 8-inch diameter PVC and DI pipe with ductile iron fittings, restraints, and includes tapping of existing water mains at several locations.
- Removal of existing fire hydrants and installation of new fire hydrant assemblies.
- Installation of new valves with extensions and valve boxes.
- Installation of saddles for water service lines on new water mains.
- Disconnection of all existing water service lines from associated existing water meters.
- Installation of new 2-inch diameter water meter connections to existing water mains.
- Installation of new 1-inch diameter potable water service connections between saddle on new water main and existing water meters (single and double, triple, quadruple per listing provided in Appendix D). Provide disinfection and connection of new water service lines to existing water meters.
- Installation of new air release valves.

- Installation of sample points for bacteriological testing. Several sample points are located at the new fire hydrants and others distributed in the project site.
- Concrete for replacement of damaged existing sidewalk, and damaged existing curb and gutter.
- New single, double, triple, or quadruple meter boxes to replace damaged (by contractor or found damaged during inspection).
- Cutting and abandonment (cap ends, but no grout required) in place of the existing 6-inch diameter water main piping and appurtenances or smaller as shown on the Drawings.
- Cutting, grouting and capping of abandoned (in place) existing water mains larger than 4-inch diameter.
- Perform nineteen (19) shutdowns and tie-ins of new water distribution system into existing water distribution system. See details in this Section.
- Site work to include clearing and grubbing within grassed area of some right-of-ways.
- Sodding work.
- Pressure testing, disinfection and bacteriological testing of complete length of potable water distribution piping, including fire hydrant segments and water service lines.

The work to be performed includes site, civil and structural work associated with the construction of proposed storm drainage improvements depicted on the Contract Drawings in accordance with all regulatory requirements, including but not limited to:

- Inspect existing drainage structures receiving new pipe connections for appropriate sizes and depths to receive connections.
- Perform necessary due diligence and subsurface utility exploration prior to requesting new drainage structure fabrications.
- Furnish and install new precast concrete drainage structures of varying sizes and depths, including frames, grates and covers, and pollutant retardant baffles (PRBs) or Skimmers.
- Furnish and install new 6-inch to 24-inch diameter Solid Corrugated PVC Drainage Pipe.
- Furnish and install new 4-foot minimum width and 10-foot minimum depth exfiltration trench (French drain), including non-woven filter fabric, washed rock or ballast rock, and 18-inch diameter Perforated Corrugated PVC Pipe.
- Install three In-line Storm Check Valves of 6-inch to 24" diameters (to be furnished by the City of Hollywood).
- Cut existing drainage pipe and reconnect to new pipe and structures.
- Core-drill existing drainage structures and connect new Solid Corrugated PVC Drainage Pipe.
- Restore site and rights-of-way to pre-construction conditions.

Replacement of the storm drainage system and the water main distribution system for this project includes:

- Maintenance of traffic prepared by a Florida Professional Engineer contracted by the CONTRACTOR.
- Roadway restoration (asphalt pavement and compacted limerock base) for width and length of disturbed alleys.

- Milling and resurfacing of full width where installation of water main and appurtenances is performed within CITY street and avenues.
- Restoration of existing asphalt pavement removed during re-routing of water services within private properties.
- Remove and replace existing concrete pavement, brick pavers and/or other specialty paving removed during re-routing of water services within private properties.
- Roadway paint striping and installation of pavement reflectors on intersections, and installation of blue reflectors at all fire hydrant locations.
- Prepare and obtain CITY Right-of-Way Permit from initial information to be provided by ENGINEER.

B. The following listing is provided to the CONTRACTOR as an outline of the construction activities for the project to ensure that potable water service and fire protection service is available to the area within the project boundaries at all times without interruption. The existing water distribution system shall remain in service during the full-time frame of construction activities for the new replacement water distribution system until the list identifies that the existing water distribution system can be deactivated.

1. Install the new water distribution system (piping, fittings, valves, specialty items, restraints, sample points, fire hydrant assemblies, and water service lines (terminated inside the existing water meter boxes, but not connected to the water meter at this stage). Perform all shutdowns and tie-ins for the new water distribution system with the existing water distribution system infrastructure.
2. Perform successful/passing flushing, hydrostatic and bacteriological testing activities on the segments (as developed by the CONTRACTOR) of the entire new water distribution system. The limit of the required testing shall be terminated at the shutoff valve for each of the fire hydrants. Provide all hydrostatic and bacteriological testing documentation to the CITY and ENGINEER.
3. Once the certification of construction is received from the Florida Department of Environmental Protection (FDEP) by the ENGINEER, the CONTRACTOR shall perform the balance of the construction activities associated with switchover activities.
4. Disconnect the existing water service lines from the existing water meters and immediately swab (using a chlorine solution) and attach the new water service line (previously placed in the existing water meter box) to the existing water meters.
5. Shut all appropriate valves (to be performed by CITY when notified by the CONTRACTOR) on the existing water distribution system and ensure that only the new water distribution system is functioning to provide potable water service and fire protection service. This action will deactivate the existing water distribution system, and the new water distribution system will be supplying the potable water service and fire protection service within the project boundaries.
6. Remove existing fire hydrant assemblies from the existing water distribution system. The CONTRACTOR shall load, transport and offload the existing fire hydrants at a storage facility on the City's property to be designated.
7. Cut out piping segments from existing water distribution system and fill all 4-inch, 6-inch and 8-inch diameter piping with grout and then cap all cut/exposed pipe ends to abandon the piping in place.

8. Cut out piping segments from existing water distribution system of 2-inch diameter piping and then cap all cut/exposed pipe ends to abandon the piping in place.

C. The following criteria shall be followed by the CONTRACTOR to ensure that the CITY requirements are adhered to during the construction of this project.

1. For the Work within the right-of-way (ROW) of Sheridan Street for connecting the several new water mains to the existing water mains within the Sheridan Street ROW, the CONTRACTOR shall provide the necessary sidewalk closures, and perform that specific Work in phases as "day work" (between 8:00AM and 6:00PM) to limit the impact to residents in the project area.
2. For the Work within the right-of-way (ROW) of CITY owned streets for constructions of new water mains and connecting the several new water mains to the existing water mains, the CONTRACTOR shall provide the necessary maintenance of traffic (MOT) controls for approval, and perform that specific Work in phases as "day work" (between 8:00AM and 6:00PM) to limit the impact to residents in the project area.

### 1.03 REQUIRED WORK SEQUENCE

A. The phases of construction are as follows:

1. Phase 1-A shall be constructed first, including all drainage and water main requirements. Temporary connection to existing water mains on Sherman Street, Liberty Street, and Thomas Street (Phase 1-C), and to Phase 1-B located on N. 26th Avenue.
2. Phase 1-B shall be contracted second, including all water main segments. Temporary connections to the nearly installed Phase 1-A water main shall be removed to connect to this piping system. All temporary connection fittings shall be returned to the City after usage.
3. Phase 1-C shall be constructed third, including all drainage and water main segments. Temporary connections to the newly installed phase 1-A water main shall be removed to connect to this piping system. All temporary connection fittings shall be returned to the City after usage.

B. A required work sequence is being provided by the ENGINEER to be adopted by the CONTRACTOR. This required work sequence is as follows:

1. CONTRACTOR shall install new water mains within residential areas of the project. CONTRACTOR shall install new water mains closest to Sheridan Street and move toward the south end of the project area. Newly installed valves shall remain closed. CONTRACTOR shall follow all requirements for testing and disinfection for newly installed piping.
2. CONTRACTOR shall install new water services as specified in the Contract Drawings and connect to newly installed water mains.
3. CONTRACTOR shall connect newly installed piping to existing water main distribution system as described in the Contract Drawings, Shutdown/Tie-in Details Section. Prior to shutdown/tie-in activities, CONTRACTOR shall coordinate with CITY the location and closing of existing valves in the existing water distribution system. CONTRACTOR shall follow the shutdown/tie-in requirements described in this Section.
4. CONTRACTOR shall abandon existing water mains as indicated in the Contract Drawings after shutdown/tie-in activities have been approved and cleared by CITY and ENGINEER.

5. CONTRACTOR shall connect all new water services to existing water meters before new water mains are energized. Effort shall be coordinated with CITY and ENGINEER.
- C. A detailed sequence of construction shall be submitted by the CONTRACTOR and accepted by the CITY and ENGINEER prior to the commencement of any work. The CITY reserves the right to make changes to the sequence as necessary to facilitate the Work or to minimize any operations conflict with no cost impact from the CONTRACTOR.
- D. The following list provides the primary shutdowns/tie-ins needed to connect the new water distribution system to the existing water distribution system. This list is a listing of the required shutdowns, and the list is open for discussion regarding sequencing by the CONTRACTOR with the CITY and the ENGINEER. See the Contract Drawings for details of the existing and proposed piping and valve arrangements for each of the shutdowns / tie-ins.

1. **SHUTDOWN / TIE-IN NO. 3:** Connect new 8-inch diameter PVC water main within the ROW of N. 26<sup>th</sup> Avenue to the existing 8-inch diameter water main. See Contract Drawings for details.

**Duration of Shutdown:** 4 hours

**Pre-requisites:**

- 1) Install the required MOT signage and barricades.
- 2) CONTRACTOR shall confirm the location of the existing 8-inch diameter piping within N. 26<sup>th</sup> Avenue.
- 3) Install new 8-inch diameter PVC water main, new fittings, new 8-inch by 4-inch tee, new 8-inch gate valve (V3-1) and restraints within N. 26<sup>th</sup> Avenue.
- 4) Install new 4-inch diameter PVC water main and restraints from newly installed 8-inch by 4-inch tee to new 4-inch gate valve (V3-2).
- 5) Install new 4-inch DI cap downstream of the gate valve (V3-2) and connect 2-inch flexible tubing to the cap on one end and the existing 2-inch water main on the other end, as shown on Detail 22 on sheet CD-005.
- 6) Coordinate with CITY for determination of required valve closings to allow performance of shutdown activities for existing 2-inch diameter water main.

**Activities for Shutdown /Tie-in No. 3:** (See Contract Drawing for details)

- 1) Cut, remove segments (including 45-degree bends and pipe segment), and plug existing 8-inch diameter water main within N. 26<sup>th</sup> Avenue.
  - 2) Cut, remove segments (including tee and pipe segment) of existing 2-inch water main along Sheridan Street up to point of connection.
  - 3) Perform installation of new 8-inch and 4-inch PVC water main pipe, new 2-inch tubing, cap, fittings, DI to galvanized piping connector, and restraints and connect to existing 8-inch water main and existing 2-inch water main.
  - 4) Disinfect and connect the new water main segments. Water mains above shall pass the required hydrostatic and bacteriological testing prior to being placed in service.
  - 5) Coordinate with CITY for activation of connection.
2. **SHUTDOWN / TIE-IN NO. 4:** Connect new 4-inch diameter PVC water main within the ROW of N. 26<sup>th</sup> Avenue to the existing 2-inch diameter DIP water main in the ROW of N. 26<sup>th</sup> Avenue, 100 feet south of the intersection with Sheridan Street. See Contract Drawings for details.

**Duration of Shutdown:** 2 hours

**Pre-requisites:**

- 1) Install the required MOT signage and barricades.
- 2) CONTRACTOR shall confirm the location of the existing 2-inch diameter piping within N. 26<sup>th</sup> Avenue .
- 3) Install new 8-inch by 4-inch tee, 4-inch diameter PVC water main, new fittings, restraints, and 4-inch gate valve (V4-1) within N. 26<sup>th</sup> Avenue.
- 4) Install new 4-inch DI cap downstream of the gate valve (V4-1) and connect 2-inch flexible tubing to the cap on one end and the existing 2-inch water main on the other end, as shown on Detail 22 on sheet CD-005.
- 5) Coordinate with CITY for determination of required valve closings to allow performance of shutdown activities for existing 2-inch diameter water main.

**Activities for Shutdown /Tie-in No. 4:** (See Contract Drawing for details)

- 1) Cut, remove segments (including fittings), and plug existing 2-inch diameter water main within N. 26<sup>th</sup> Avenue.
- 2) Perform installation of new 4-inch PVC water main pipe, new 2-inch tubing, cap, fittings, DI to galvanized piping connector, and restraints to newly installed valve (V4-1) under existing piping and utilities in N. 26<sup>th</sup> Avenue for connection to existing main system.
- 3) Disinfect and connect the new water main segments. Water mains above shall pass the required hydrostatic and bacteriological testing prior to being placed in service.
- 4) Coordinate with CITY for activation of connection.

3. **SHUTDOWN / TIE-IN NO. 4A:** Connect new 8-inch diameter PVC water main within the ROW of N. 26<sup>th</sup> Avenue to the existing 6-inch diameter DIP water main in the ROW of Sherman Street, 100 feet south of the intersection with Sheridan Street. See Contract Drawings for details.

**Duration of Shutdown:** 2 hours

**Pre-requisites:**

- 1) Install the required MOT signage and barricades.
- 2) CONTRACTOR shall confirm the location of the existing 6-inch diameter piping within Sherman Street.
- 3) In Phase 1-A, install temporary 8-inch by 6-inch reducer, temporary 8-inch diameter PVC water main, temporary fittings, restraints, and 8-inch gate valve (V4-2) to connect to the existing piping within Sherman Street.
- 4) After authorization to proceed with Phase 1-C has been granted and all of the items above have been installed, proceed with Phase 1-C.
- 5) In Phase 1-C, remove temporary reducer, temporary 8-inch diameter PVC water main, and temporary fittings and connect new 8-inch diameter PVC water main to the 8-inch gate valve (V4-2).
- 6) Coordinate with CITY for determination of required valve closings to allow performance of shutdown activities for existing 6-inch diameter water main.

**Activities for Shutdown /Tie-in No. 4A:** (See Contract Drawing for details)

- 1) Cut, remove segments (including fittings), and plug existing 6-inch diameter water main within Sherman Street.
- 2) Perform installation of new 8-inch PVC water main pipe, fittings, and restraints to newly installed valve (V4-2) under existing piping and utilities in Sherman Street for connection to existing main system in two different phases (Phase 1-A and Phase 1-C).
- 3) Disinfect and connect the new water main segments in two different phases (Phase 1-A and Phase 1-C). Water mains above shall pass the required hydrostatic and bacteriological testing prior to being placed in service.
- 4) Coordinate with CITY for activation of connection.

- 4. SHUTDOWN / TIE-IN NO. 5:** Connect new 6-inch diameter PVC water main within the ROW of N. 26<sup>th</sup> Avenue to the existing 6-inch diameter DIP water main in the ROW of N. 26<sup>th</sup> Avenue, 150 feet south of the intersection with Sherman Street. See Contract Drawings for details.

**Duration of Shutdown:** 4 hours

**Pre-requisites:**

- 1) Install the required MOT signage and barricades.
- 2) CONTRACTOR shall confirm the location of the existing 6-inch diameter piping within N. 26<sup>th</sup> Avenue.
- 3) Install new 6-inch diameter PVC water main, new fittings, restraints, and 6-inch gate valve (V5-1) to the existing piping within N. 26<sup>th</sup> Avenue.
- 4) Coordinate with CITY for determination of required valve closings to allow performance of shutdown activities for existing 6-inch diameter water main.

**Activities for Shutdown /Tie-in No. 5:** (See Contract Drawing for details)

- 1) Cut, remove segments (including fittings), and plug existing 6-inch diameter water main within N. 26<sup>th</sup> Avenue.
- 2) Perform installation of new 6-inch PVC water main pipe, fittings, and restraints to newly installed valve (V5-1) under existing piping and utilities in N. 26<sup>th</sup> Avenue for connection to existing main system.
- 3) Disinfect and connect the new water main segments. Water mains above shall pass the required hydrostatic and bacteriological testing prior to being placed in service.
- 4) Coordinate with CITY for activation of connection.

- 5. SHUTDOWN / TIE-IN NO. 5A:** Connect new 4-inch diameter PVC water main within the ROW of Thomas Street to the existing 2-inch diameter DIP water main in the ROW of Thomas Street. See Contract Drawings for details.

**Duration of Shutdown:** 4 hours

**Pre-requisites:**

- 1) Install the required MOT signage and barricades.
- 2) CONTRACTOR shall confirm the location of the existing 2-inch diameter piping within Thomas Street.
- 6) In Phase 1-A, install new 4-inch diameter PVC water main, new vertical fittings, restraints, and 4-inch gate valve (V5-2) to the existing piping within Thomas Street.

Also, install temporary 4-inch DI cap downstream of the gate valve (V5-2) and connect 2-inch flexible tubing to the cap on one end and the existing 2-inch water main on the other end, as shown on Detail 22 on sheet CD-005.

- 3) After authorization to proceed with Phase 1-C has been granted and all of the items above have been installed, proceed with Phase 1-C.
- 4) In Phase 1-C, remove temporary flexible tubing and temporary cap and connect new 4-inch diameter PVC water main to the 4-inch gate valve (V5-2).
- 5) Coordinate with CITY for determination of required valve closings to allow performance of shutdown activities for existing 2-inch diameter water main.

**Activities for Shutdown /Tie-in No. 5A:** (See Contract Drawing for details)

- 1) Cut, remove segments (including fittings), and plug existing 2-inch diameter water main within Thomas Street.
- 2) Perform installation of new 4-inch PVC water main pipe, fittings, and restraints to newly installed valve (V5-2) under existing piping and utilities in Thomas Street for connection to existing main system in two different phases (Phase 1-A and Phase 1-C).
- 3) Disinfect and connect the new water main segments in two different phases (Phase 1-A and Phase 1-C). Water mains above shall pass the required hydrostatic and bacteriological testing prior to being placed in service.
- 4) Coordinate with CITY for activation of connection.

- 6. SHUTDOWN / TIE-IN NO. 6:** Connect new 6-inch diameter PVC water main within the ROW of N. 26<sup>th</sup> Avenue to the existing 6-inch diameter DIP water main in the ROW of N. 26<sup>th</sup> Avenue, 150 feet north of the intersection with Liberty Street. See Contract Drawings for details.

**Duration of Shutdown:** 4 hours

**Pre-requisites:**

- 1) Install the required MOT signage and barricades.
- 2) CONTRACTOR shall confirm the location of the existing 6-inch diameter piping within N. 26<sup>th</sup> Avenue.
- 3) Install new 6-inch diameter PVC water main, new fittings, restraints, and 6-inch gate valve (V6-1) to the existing piping within N. 26<sup>th</sup> Avenue.
- 4) Coordinate with CITY for determination of required valve closings to allow performance of shutdown activities for existing 6-inch diameter water main.

**Activities for Shutdown /Tie-in No. 6:** (See Contract Drawing for details)

- 1) Cut, remove segments (including fittings), and plug existing 6-inch diameter water main within N. 26<sup>th</sup> Avenue.
- 2) Perform installation of new 6-inch PVC water main pipe, fittings, and restraints to newly installed valve (V6-1) under existing piping and utilities in N. 26<sup>th</sup> Avenue for connection to existing main system.
- 3) Disinfect and connect the new water main segments. Water mains above shall pass the required hydrostatic and bacteriological testing prior to being placed in service.
- 4) Coordinate with CITY for activation of connection.



7. **SHUTDOWN / TIE-IN NO. 6A:** Connect new 4-inch diameter PVC water main within the ROW of Liberty Street to the existing 2-inch diameter DIP water main in the ROW of Liberty Street. See Contract Drawings for details.

**Duration of Shutdown:** 4 hours

**Pre-requisites:**

- 6) Install the required MOT signage and barricades.
- 7) CONTRACTOR shall confirm the location of the existing 2-inch diameter piping within Liberty Street.
- 7) In Phase 1-A, install new 4-inch diameter PVC water main, new vertical fittings, restraints, and 4-inch gate valve (V6-2) to the existing piping within Liberty Street. Also, install temporary 4-inch DI cap downstream of the gate valve (V6-2) and connect 2-inch flexible tubing to the cap on one end and the existing 2-inch water main on the other end, as shown on Detail 22 on sheet CD-005.
- 8) After authorization to proceed with Phase 1-C has been granted and all of the items above have been installed, proceed with Phase 1-C.
- 9) In Phase 1-C, remove temporary flexible tubing and temporary cap and connect new 4-inch diameter PVC water main to the 4-inch gate valve (V6-2).
- 10) Coordinate with CITY for determination of required valve closings to allow performance of shutdown activities for existing 2-inch diameter water main.

**Activities for Shutdown /Tie-in No. 6A:** (See Contract Drawing for details)

- 1) Cut, remove segments (including fittings), and plug existing 2-inch diameter water main within Liberty Street.
- 2) Perform installation of new 4-inch PVC water main pipe, fittings, and restraints to newly installed valve (V6-2) under existing piping and utilities in Liberty Street for connection to existing main system in two different phases (Phase 1-A and Phase 1-C).
- 3) Disinfect and connect the new water main segments in two different phases (Phase 1-A and Phase 1-C). Water mains above shall pass the required hydrostatic and bacteriological testing prior to being placed in service.
- 4) Coordinate with CITY for activation of connection.

8. **SHUTDOWN / TIE-IN NO. 7:** Connect new 4-inch diameter PVC water main within the ROW of N. 26<sup>th</sup> Avenue to the existing 2-inch diameter DIP water main in the ROW of N. 26<sup>th</sup> Avenue, 200 feet south of the intersection with Liberty Street. See Contract Drawings for details.

**Duration of Shutdown:** 4 hours

**Pre-requisites:**

- 1) Install the required MOT signage and barricades.
- 2) CONTRACTOR shall confirm the location of the existing 2-inch diameter piping within N. 26<sup>th</sup> Avenue.
- 3) Install new 8-inch by 4-inch tee, 4-inch diameter PVC water main, new fittings, restraints, and 4-inch gate valve (V7-1) within N. 26th Avenue.
- 4) Install new 4-inch DI cap downstream of the gate valve (V7-1) and connect 2-inch flexible tubing to the cap on one end and the existing 2-inch water main on the other end, as shown on Detail 22 on sheet CD-005.

- 5) Coordinate with CITY for determination of required valve closings to allow performance of shutdown activities for existing 2-inch diameter water main.

**Activities for Shutdown /Tie-in No. 7:** (See Contract Drawing for details)

- 1) Cut, remove segments (including fittings), and plug existing 2-inch diameter water main within N. 26<sup>th</sup> Avenue.
- 2) Perform installation of new 4-inch PVC water main pipe, new 2-inch tubing, cap, fittings, DI to galvanized piping connector, and restraints to newly installed valve (V7-1) under existing piping and utilities in N. 26<sup>th</sup> Avenue for connection to existing main system.
- 3) Disinfect and connect the new water main segments. Water mains above shall pass the required hydrostatic and bacteriological testing prior to being placed in service.
- 4) Coordinate with CITY for activation of connection.

9. **SHUTDOWN / TIE-IN NO. 7A:** Connect new 4-inch diameter PVC water main within the ROW of Scott Street to the existing 2-inch diameter DIP water main in the ROW of Scott Street. See Contract Drawings for details.

**Duration of Shutdown:** 4 hours

**Pre-requisites:**

- 1) Install the required MOT signage and barricades.
- 2) CONTRACTOR shall confirm the location of the existing 2-inch diameter piping within Scott Street.
- 3) Install new 8-inch by 4-inch tee, 4-inch diameter PVC water main, new fittings, restraints, and 4-inch gate valve (V7-2) within Scott Street.
- 4) Install new 4-inch DI cap downstream of the gate valve (V7-1) and connect 2-inch flexible tubing to the cap on one end and the existing 2-inch water main on the other end, as shown on Detail 22 on sheet CD-005.
- 5) Coordinate with CITY for determination of required valve closings to allow performance of shutdown activities for existing 2-inch diameter water main.

**Activities for Shutdown /Tie-in No. 7A:** (See Contract Drawing for details)

- 1) Cut, remove segments (including fittings), and plug existing 2-inch diameter water main within Scott Street.
- 2) Perform installation of new 4-inch PVC water main pipe, new 2-inch tubing, cap, fittings, DI to galvanized piping connector, and restraints to newly installed valve (V7-2) under existing piping and utilities Scott Street for connection to existing main system.
- 3) Disinfect and connect the new water main segments. Water mains above shall pass the required hydrostatic and bacteriological testing prior to being placed in service.
- 4) Coordinate with CITY for activation of connection.

10. **SHUTDOWN / TIE-IN NO. 8:** Connect new 6-inch diameter PVC water main within the ROW of N. 26<sup>th</sup> Avenue to the existing 6-inch diameter DIP water main in the ROW of N. 26<sup>th</sup> Avenue, 150 feet south of the intersection with Scott Street. See Contract Drawings for details.

**Duration of Shutdown:** 4 hours

**Pre-requisites:**

- 1) Install the required MOT signage and barricades.
- 2) CONTRACTOR shall confirm the location of the existing 6-inch diameter piping within N. 26<sup>th</sup> Avenue.
- 3) Install new 6-inch diameter PVC water main, new fittings, restraints, and 6-inch gate valve (V8-1) to the existing piping within N. 26<sup>th</sup> Avenue.
- 4) Coordinate with CITY for determination of required valve closings to allow performance of shutdown activities for existing 6-inch diameter water main.

**Activities for Shutdown /Tie-in No. 8:** (See Contract Drawing for details)

- 1) Cut, remove segments (including fittings), and plug existing 6-inch diameter water main within N. 26<sup>th</sup> Avenue.
- 2) Perform installation of new 6-inch PVC water main pipe, fittings, and restraints to newly installed valve (V8-1) under existing piping and utilities in N. 26<sup>th</sup> Avenue for connection to existing main system.
- 3) Disinfect and connect the new water main segments. Water mains above shall pass the required hydrostatic and bacteriological testing prior to being placed in service.
- 4) Coordinate with CITY for activation of connection.

- 11. SHUTDOWN / TIE-IN NO. 8A:** Connect new 8-inch diameter PVC water main within the ROW of Coolidge Street to the existing 6-inch diameter DIP water main in the ROW of Coolidge Street. See Contract Drawings for details.

**Duration of Shutdown:** 4 hours

**Pre-requisites:**

- 1) Install the required MOT signage and barricades.
- 2) CONTRACTOR shall confirm the location of the existing 6-inch diameter piping within Coolidge Street.
- 3) Install new 8-inch diameter PVC water main, new fittings, restraints, and 8-inch gate valve (V8-2) to the existing piping within Coolidge Street.
- 4) Coordinate with CITY for determination of required valve closings to allow performance of shutdown activities for existing 6-inch diameter water main.

**Activities for Shutdown /Tie-in No. 8A:** (See Contract Drawing for details)

- 1) Cut, remove segments (including fittings), and plug existing 6-inch diameter water main within Coolidge Street.
- 2) Perform installation of new 8-inch PVC water main pipe, fittings, and restraints to newly installed valve (V8-2) under existing piping and utilities in Coolidge Street for connection to existing main system.
- 3) Disinfect and connect the new water main segments. Water mains above shall pass the required hydrostatic and bacteriological testing prior to being placed in service.
- 4) Coordinate with CITY for activation of connection.

- 12. SHUTDOWN / TIE-IN NO. 9:** Connect new 4-inch diameter PVC water main within the ROW of N. 26<sup>th</sup> Avenue to the existing 2-inch diameter DIP water main on the east side of the ROW of N. 26<sup>th</sup> Avenue. Connect new 8-inch diameter PVC water main within the ROW of N. 26<sup>th</sup> Avenue to the existing 6-inch diameter DIP water main on the west side of the ROW of N. 26<sup>th</sup> Avenue. See Contract Drawings for details.

**Duration of Shutdown:** 4 hours

**Pre-requisites:**

- 1) Install the required MOT signage and barricades.
- 2) CONTRACTOR shall confirm the location of the existing 2-inch and 6-inch diameter piping within N. 26<sup>th</sup> Avenue.
- 3) Install new 8-inch by 4-inch tee, 4-inch diameter PVC water main, new fittings, restraints, and 4-inch gate valve (V9-1) to the existing piping located east of the proposed location within N. 26<sup>th</sup> Avenue.
- 4) Install new 4-inch DI cap downstream of the gate valve (V9-1) and connect 2-inch flexible tubing to the cap on one end and the existing 2-inch water main on the other end, as shown on Detail 22 on sheet CD-005.
- 5) Install new 4-inch by 6-inch reducer, 8-inch diameter PVC water main, new fittings, restraints, and 8-inch gate valve (V9-2) to the existing piping located west of the proposed location within N. 26<sup>th</sup> Avenue.
- 6) Coordinate with CITY for determination of required valve closings to allow performance of shutdown activities for existing 2-inch and 6-inch diameter water mains.

**Activities for Shutdown /Tie-in No. 9:** (See Contract Drawing for details)

- 1) Cut, remove segments (including fittings), and plug existing 2-inch and 6-inch diameter water mains within N. 26<sup>th</sup> Avenue.
- 2) Perform installation of new 4-inch and 8-inch PVC water main pipe, new 2-inch tubing, cap, fittings, DI to galvanized piping connector, and restraints to newly installed valves (V9-1 and V9-2) under existing piping and utilities in N. 26<sup>th</sup> Avenue for connection to existing main system.
- 3) Disinfect and connect the new water main segments. Water mains above shall pass the required hydrostatic and bacteriological testing prior to being placed in service.
- 4) Coordinate with CITY for activation of connection.

- 13. SHUTDOWN / TIE-IN NO. 10:** Connect new 8-inch diameter PVC water main within the ROW of N. 26<sup>th</sup> Avenue to the existing 2-inch diameter DIP water main on the east side of the ROW of N. 26<sup>th</sup> Avenue. Connect new 8-inch diameter PVC water main within the ROW of N. 26<sup>th</sup> Avenue to the existing 6-inch diameter DIP water on the west side of the ROW of N. 26<sup>th</sup> Avenue. See Contract Drawings for details.

**Duration of Shutdown:** 4 hours

**Pre-requisites:**

- 1) Install the required MOT signage and barricades.
- 2) CONTRACTOR shall confirm the location of the existing 2-inch and 6-inch diameter piping within N. 26<sup>th</sup> Avenue.
- 3) Install new 4-inch diameter PVC water main, 4-inch by 8-inch reducer, 8-inch diameter PVC water main, new fittings, restraints, and 8-inch gate valve (V10-1) to the existing piping located east of the proposed location within N. 26<sup>th</sup> Avenue.
- 4) Install new 4-inch DI cap downstream of the gate valve (V10-1) and connect 2-inch flexible tubing to the cap on one end and the existing 2-inch water main on the other end, as shown on Detail 22 on sheet CD-005.

- 5) Install new 8-inch by 6-inch reducer, 8-inch and 6-inch diameter PVC water mains, new fittings, restraints, and 8-inch gate valve (V10-2) to the existing piping located west of the proposed location within N. 26<sup>th</sup> Avenue
- 6) Coordinate with CITY for determination of required valve closings to allow performance of shutdown activities for existing 6-inch diameter water main.

**Activities for Shutdown /Tie-in No. 10:** (See Contract Drawing for details)

- 1) Cut, remove segments (including fittings), and plug existing 2-inch and 6-inch diameter water main within N. 26<sup>th</sup> Avenue.
- 2) Perform installation of new 4-inch, 6-inch and 8-inch PVC water mains, new 2-inch tubing, cap, fittings, DI to galvanized piping connector, and restraints to newly installed valves (V10-1 and V10-2) under existing piping and utilities in N. 26<sup>th</sup> Avenue for connection to existing main system.
- 3) Disinfect and connect the new water main segments. Water mains above shall pass the required hydrostatic and bacteriological testing prior to being placed in service.
- 4) Coordinate with CITY for activation of connection.

- 14. SHUTDOWN / TIE-IN NO. 11:** Connect new 4-inch diameter PVC water main within the ROW of N. 26<sup>th</sup> Avenue to the existing 2-inch diameter DIP water main on the east side of the ROW of N. 26<sup>th</sup> Avenue. Connect new 8-inch diameter PVC water main within the ROW of N. 26<sup>th</sup> Avenue to the existing 6-inch diameter DIP water main on the west side of the ROW of N. 26<sup>th</sup> Avenue. See Contract Drawings for details.

**Duration of Shutdown:** 4 hours

**Pre-requisites:**

- 1) Install the required MOT signage and barricades.
- 2) CONTRACTOR shall confirm the location of the existing 2-inch and 6-inch diameter piping within N. 26<sup>th</sup> Avenue.
- 3) Install new 4-inch diameter PVC water main, new fittings, restraints, and 4-inch gate valve (V11-1) to the existing piping located east of the proposed location within N. 26<sup>th</sup> Avenue.
- 4) Install new 4-inch DI cap downstream of the gate valve (V11-1) and connect 2-inch flexible tubing to the cap on one end and the existing 2-inch water main on the other end, as shown on Detail 22 on sheet CD-005.
- 5) Install new 8-inch by 6-inch reducer, 8-inch diameter PVC water main, new fittings, restraints, and 8-inch gate valve (V11-2) to the existing piping located west of the proposed location within N. 26<sup>th</sup> Avenue.
- 6) Coordinate with CITY for determination of required valve closings to allow performance of shutdown activities for existing 2-inch diameter water main.

**Activities for Shutdown /Tie-in No. 11:** (See Contract Drawing for details)

- 1) Cut, remove segments (including fittings), and plug existing 2-inch and 6-inch diameter water main within N. 26<sup>th</sup> Avenue.
- 2) Perform installation of new 4-inch and 8-inch PVC water main pipes, new 2-inch tubing, cap, fittings, DI to galvanized piping connector, and restraints to newly installed valves (V11-1 and V11-2) under existing piping and utilities in N. 26<sup>th</sup> Avenue for connection to existing main system.

- 3) Disinfect and connect the new water main segments. Water mains above shall pass the required hydrostatic and bacteriological testing prior to being placed in service.
  - 4) Coordinate with CITY for activation of connection.
- 15. SHUTDOWN / TIE-IN NO. 12:** Connect new 8-inch diameter PVC water main within the ROW of N. 26<sup>th</sup> Avenue to the existing 8-inch diameter DI water main on the east side of the ROW of N. 26<sup>th</sup> Avenue. See Contract Drawings for details.

**Duration of Shutdown:** 4 hours

**Pre-requisites:**

- 1) Install the required MOT signage and barricades.
- 2) CONTRACTOR shall confirm the location of the existing 8-inch diameter piping within N. 26<sup>th</sup> Avenue.
- 3) Install new 8-inch diameter DIP water main, new fittings, restraints, and 8-inch gate valve (V12-1) to the existing piping located east of the proposed location within N. 26<sup>th</sup> Avenue. All piping within the ROW of Taft Street is to be DIP. DIP shall be installed from existing valve location (south connection) to 8x6-inch fire hydrant tee (north location).
- 4) Coordinate with CITY for determination of required valve closings to allow performance of shutdown activities for existing 8-inch diameter water main.

**Activities for Shutdown /Tie-in No. 12:** (See Contract Drawing for details)

- 1) Cut, remove segments (including fittings), and plug existing 8-inch diameter water main within N. 26<sup>th</sup> Avenue.
  - 2) Perform installation of new 8-inch DI water main pipes, fittings, and restraints to newly installed valve (V12-1) under existing piping and utilities in N. 26<sup>th</sup> Avenue for connection to existing main system.
  - 3) Disinfect and connect the new water main segments. Water mains above shall pass the required hydrostatic and bacteriological testing prior to being placed in service.
  - 4) Coordinate with CITY for activation of connection.
- 16. SHUTDOWN / TIE-IN NO. 14:** Connect new 8-inch diameter PVC water main within the ROW of Sherman Street just before the bridge to the existing 6-inch diameter DIP water main on the east side of the bridge on Sherman Street. See Contract Drawings for details.

**Duration of Shutdown:** 4 hours

**Pre-requisites:**

- 1) Install the required MOT signage and barricades.
- 2) CONTRACTOR shall confirm the location of the existing 6-inch diameter piping within Sherman Street
- 3) Install new 6 and 8-inch diameter PVC water main, new fittings, restraints, and 6-inch gate valve (V14-1) to the existing piping located east of the proposed location within N. 26<sup>th</sup> Avenue.
- 4) Coordinate with CITY for determination of required valve closings to allow performance of shutdown activities for existing 6-inch diameter water main.

**Activities for Shutdown /Tie-in No. 11:** (See Contract Drawing for details)

- 1) Cut, remove segments (including fittings), and plug existing 6-inch diameter water main within Sherman Street.

- 2) Perform installation of new 8-inch PVC water main pipes, fittings, and restraints to newly installed valve (V14-1) under existing piping and utilities in Sherman Street for connection to existing main system.
- 3) Disinfect and connect the new water main segments. Water mains above shall pass the required hydrostatic and bacteriological testing prior to being placed in service.
- 4) Coordinate with CITY for activation of connection.

#### 1.04 WORK BY OTHERS

- A. The CONTRACTOR shall cooperate fully with all utility forces of the CITY, or other public or private agencies engaged in the relocation, altering, or otherwise rearranging any facilities which interfere with the progress of the work, and shall schedule the work to minimize interference with said relocation, altering, or rearranging of facilities.
- B. The CONTRACTOR'S attention is directed to the fact that work will be conducted at the site by other CONTRACTORS during the performance of the work under this Contract. The CONTRACTOR shall conduct its operations to cause a minimum of interference with the Work of such other CONTRACTORS, and shall cooperate fully with such CONTRACTORS to provide continued safe access to their respective portions of the site, as required to perform their respective contracts.
- C. When two or more contracts are being executed at one time on the same or adjacent land in such manner that Work on one contract may interfere with that on another, the CITY shall determine the sequence and order of the Work. When the territory of one contract is the necessary or convenient means of access for the execution of another CONTRACTOR, such privilege of access or any other reasonable privilege may be granted by the CITY to CONTRACTOR.

#### 1.05 CONTRACTOR FURNISHED MATERIAL AND EQUIPMENT

- A. All equipment, materials, or devices incorporated in this project shall be new and unused, unless indicated otherwise in the Contract Documents and shall be the products of reliable manufacturers who, unless otherwise specified, have been regularly engaged in the manufacture of such material and equipment for at least five (5) years. Procedures and additional requirements regarding manufacturer's experience and substitutions are included in Section 01300 - Submittals.

#### 1.06 DRAWINGS OF EXISTING FACILITIES

- A. Drawings of the existing facilities may be inspected at the City's Engineering and Construction Services Office. These drawings are for information only and are not a part of the Contract Documents. In making these drawings available for inspection, the CITY makes no guarantee, either expressed or implied, as to their accuracy or completeness.
- B. The CONTRACTOR shall contact representatives for other utilities, facilities in proximity of the work and Sunshine State One Call Inc., to obtain the as-built information from them directly. The utilities shown on Drawings are based upon available records supplied from various sources. The CITY makes no guarantee, either expressed or implied, as to their accuracy or completeness.

#### 1.07 ITEMS SPECIFIED ON DRAWINGS

- A. Certain items of material and/or equipment, and their installation may be specified on the Drawings and not mentioned in the Specifications. Such items are to be considered as both shown on the Drawings and noted in the Specifications and be provided by the CONTRACTOR in accordance with the Specification on the Drawings.

#### 1.08 FIELD LAYOUT OF WORK

- A. All work under this Contract shall be constructed in accordance with the Contract Drawings or as directed by the ENGINEER. Elevations of existing ground, structures and appurtenances are believed to be reasonably correct but are not guaranteed to be absolute and therefore are presented only as an approximation. Any error or apparent discrepancy in the data shown or omissions of data required for accurately accomplishing the stake-out survey shall be referred immediately to the ENGINEER for interpretation or correction.
- B. All survey work for construction control purposes shall be made by the CONTRACTOR at CONTRACTOR'S expense.
- C. The CONTRACTOR shall establish all base lines for the location of the principal component parts of the work together with benchmarks and batter boards adjacent to the work. Based upon the information provided by the Contract Drawings, the CONTRACTOR shall develop and make all detail surveys necessary for construction. The CITY will furnish information and location of existing benchmarks.
- D. The CONTRACTOR shall have the responsibility to carefully preserve the benchmarks, reference points and stakes. In case of destruction thereof by the CONTRACTOR or resulting from CONTRACTOR'S negligence, he shall be held liable for any expense and damage resulting therefrom and shall be responsible for any mistakes that may be caused by the unnecessary loss or disturbance of such bench marks, reference points and stakes.
- E. Existing or new control points, property markers, and monuments that will be established or are destroyed during the normal causes of construction shall be re-established by the CONTRACTOR; and all reference ties recorded therefore shall be furnished to the ENGINEER. All computations necessary to establish the exact position of the work shall be made and preserved by the CONTRACTOR.
- F. The ENGINEER may check all or any portion of the work, and the CONTRACTOR shall afford all necessary assistance to the ENGINEER in carrying out such checks. Any necessary corrections to the work shall be performed immediately by the CONTRACTOR and he shall accept all responsibility for the accuracy and completeness of CONTRACTOR'S work.

#### 1.08 REQUEST FOR INFORMATION

- A. Contractor shall rearrange work in the project area while waiting for a response to a request for information (RFI) submitted to the Engineer. Engineer shall respond to the RFI within 96 hours.

#### **PART 2 -- PRODUCTS (Not Used)**

#### **PART 3 -- EXECUTION (Not Used)**

- END OF SECTION -





**SECTION 01025**  
**BASIS OF PAYMENT**

**PART 1 - GENERAL**

1.01 GENERAL

- A. Payments to the CONTRACTOR shall be made on the basis of the bid items listed on the Proposal Bid Form as full and complete payment for furnishing all materials, labor, tools, and equipment, and for performing all operations necessary to complete the work included in the Contract Documents. Such compensation shall also include payments for any loss or damages arising directly or indirectly from the work, or from any discrepancies between the actual quantities of work and those shown in the Contract Documents, or from any unforeseen difficulties which may be encountered during the prosecution of the work until the final acceptance by the CITY.
- B. The prices stated in the proposal include full compensation for overhead and profit, all costs and expenses for taxes, labor, equipment, materials, commissions, transportation charges and expenses, patent fees and royalties, labor for handling materials during inspection, furnishing and repairing small tools and ordinary equipment, mobilization, home office expenses and general supervision, bond, insurance, labor for handling materials during inspection, together with any and all other costs and expenses for performing and completing the work as shown on the Drawings and specified herein. In addition, the CONTRACTOR shall include the actual cost of social security taxes, unemployment insurance, worker's compensation, fringe benefits, inclusive of life and health insurance, union dues, pension, pension Drawings, vacations, and insurance and CONTRACTOR's public liability and property damage insurance involved in the work based on the actual wages paid to such labor and all other general costs and profits, prorated to each Item.
- C. Unless otherwise specifically stated elsewhere herein, the CONTRACTOR shall include in the prices bid all materials, electrical supply, fuel, lubricants, temporary equipment, temporary wiring, temporary piping and fittings, pumps, gages, and all other items of whatever nature required to completely test, balance, disinfect if required, and put into fully operational condition all equipment and/or systems supplied by either the CITY or the CONTRACTOR and installed as a part of this Project. Further, any test materials supplied by the CONTRACTOR shall be completely satisfactory to the CITY. Any decision as to whether a particular material is suitable for test purposes shall be at the sole discretion of the ENGINEER whose decision shall be final. Any material considered not suitable shall be immediately replaced by the CONTRACTOR with suitable material and no extra compensation will be allowed.
- D. The Basis of Payment for an item at the price shown in the Proposal shall be in accordance with its description of the item in this Section and as related to the work specified and as shown on the Drawings. Unit prices, where used, will be applied to the actual quantities furnished and installed in conformance with the Contract Documents.

- E. The CONTRACTOR'S attention is called to the fact that the quotations for the various items of work are intended to obtain a complete and working installation under this Contract, and any items of labor, equipment or materials which may reasonably be assumed as necessary to accomplish this end shall be supplied whether or not they are specifically shown on the Drawings or stated herein. Should the CONTRACTOR feel that the cost of any item of work has not been established by the Proposal Bid Form, he shall include the cost for that work in the Bid Item most closely associates with that work so that his proposal for the Project does reflect his total price for completing the work in its entirety.
- F. The CONTRACTOR shall submit, with each Payment Request, a list of MBE/WBE SUBCONTRACTOR's, that he is or will be utilizing for his contract. For each MBE/WBE SUBCONTRACTOR, the following information shall be provided:
1. Total sub-contract dollar amount.
  2. Amount paid to date.

#### 1.02 MEASUREMENT

The quantities for payment under this Contract shall be determined by actual measurement of the completed items, in place, ready for service and accepted by the CITY, in accordance with the Proposal Bid Form as described in Section 00301, unless otherwise specified. A representative of the CONTRACTOR shall witness all field measurements.

#### 1.03 PAYMENT ITEMS

For purposes of determining the monthly payments to be made to the CONTRACTOR for work accomplished, the percentage of work completed shall be determined in the following manner:

- A. Excavation, installation of pipe, valves, fittings, hydrants, and other appurtenances completed, removal and disposal of excavation, completed backfill and temporary paving repairs shall constitute eighty percent (85%) of the price bid for these Proposal Items.
- B. Completion of all interior work in the pipeline including cleaning, hydrostatic testing and disinfection of water mains shall constitute five percent (5%) of the price bid for these Proposal Items.
- C. Completion of all surface repairs, restoration of public or private facilities, appurtenances, and all other work not provided for under other Proposal Items shall constitute the remaining ten percent (10%) of the price bid for these Proposal Items.
- D. Descriptions, method of measurement and basis of payment for each pay item:

#### **Water Main Replacement Construction Costs**

1. **Bid Item No. 1 - Fire Hydrant Assemblies and Connections**: Payment for all labor, equipment, materials, delivery, testing and commissioning for all work necessary and required to furnish and install new fire hydrant assemblies where shown on the Drawings in accordance with the Specifications and Standard Details. Payment shall be at the unit

price bid times the number of fire hydrant assemblies installed, ready for service, completed and accepted by the ENGINEER. The price bid shall be full compensation for each hydrant assembly, and shall include, but not be limited to: furnishing and installing complete hydrant barrel assembly, 6-inch DI hydrant main, 6-inch gate valve and valve box, concrete collar, extension stems, 6-inch DI fittings (including hydrant tee at main), steel guard posts, blue reflective pavement markers and concrete slab as needed, joint restraints, joint materials and accessories; replacement of concrete sidewalks, curbs and pedestrian ramps (including detectable warning surface); restoration of stabilized subgrade, compacted limerock base and asphalt surface course for trench restoration, in excess of that required to restore the new water main trench, in accordance with the Drawings, details, and FDOT Index 307; and all other appurtenant and miscellaneous items and work necessary for a complete installation in accordance with the details, Specifications and locations shown on the Drawings.

2. **Bid Item No. 2 - Fire Hydrant Removal and Delivery to CITY Property:** Payment for all labor, equipment, materials, for removal of existing fire hydrant assemblies Payment shall be at the unit price bid times the number of hydrant removals completed and accepted by the ENGINEER. The price bid shall be full compensation for each removal, and shall include but not be limited to, removal and transport of existing complete fire hydrant barrel assembly and 6-inch gate valve to the Department of Public Utilities yard; replacement of concrete sidewalks, curbs and pedestrian ramps (including detectable warning surface); restoration of any stabilized subgrade, compacted limerock base, and asphalt surface (if impacted) for the trench restoration in accordance with the Drawings, details and FDOT Index 307; and all other appurtenant and miscellaneous items and work necessary to obtain a complete installation.
3. **Bid Item No. 3 (Subitems a through d) - PVC C-900/C-905 Water Mains and D.I. Fittings:** Payment for all labor, equipment, materials, delivery, testing and commissioning for all work necessary and required to furnish and install new (C-900/C905) PVC pipe with D.I. fittings necessary to address all conflicts (with polyethylene encasement) for proposed water main per the Contract Documents. This work shall include, but not be limited to: survey, clearing and grubbing, swale restoration, locating and protection of all existing utilities, preparation and submittal of shop drawings, installing storm water pollution prevention devices, dewatering, pipe and all D.I. fittings/appurtenances, restrained joints, trench excavation, shoring, bedding, backfilling, removal and disposal of unsuitable/excess fill, removal and disposal of all removed sidewalk/curb and gutter, removal and disposal of all removed asphalt pavement and lime rock base, water distribution system pressure testing and disinfection (sampling points, etc.). Pipe separation requirements and exceptions between proposed water main and existing sanitary sewer, etc. is indicated in FAC 62.555.314. Payment shall include restoration for all work in sodded areas including landscaping, irrigation, and electrical within roundabouts and swales. Payment for road restoration shall be addressed in restoration bid items herein this Basis of Payment Section.
4. **Bid Item No. 4 - 8" D.I. Water Main (Taft Street):** Payment for all labor, equipment, materials, delivery, testing and commissioning for all work necessary and required to

furnish and install DI pipe within the ROW of Taft Street per the Contract Documents. This work shall include, but not be limited to: survey, clearing and grubbing, swale restoration, locating and protection of all existing utilities, preparation and submittal of shop drawings, installing storm water pollution prevention devices, dewatering, pipe and all D.I. fittings/appurtenances, restrained joints, trench excavation, shoring, bedding, backfilling, removal and disposal of unsuitable/excess fill, removal and disposal of all removed sidewalk/curb and gutter, removal and disposal of all removed asphalt pavement and lime rock base, water distribution system pressure testing and disinfection (sampling points, etc.). Pipe separation requirements and exceptions between proposed water main and existing sanitary sewer, etc. is indicated in FAC 62.555.314. Payment shall include restoration for all work in sodded areas including landscaping, irrigation, and electrical within roundabouts and swales. Payment for road restoration shall be addressed in restoration bid items herein this Basis of Payment Section.

5. **Bid Item No. 5 (Subitems a through b) - D.I. Reducers**: Payment for all labor, equipment, materials, delivery, testing and commissioning for all work necessary and required to furnish and install permanent and temporary D.I. reducers. This work shall include, but not be limited to, survey, locating and protection of all existing utilities, polyethylene encasement, preparation and submittal of shop drawings, removal of temporary reducers, and requirements associated with the installation of the reducers. Payment shall be at the unit price bid times the number of reducers installed, tested, ready for service, and accepted by the ENGINEER.
6. **Bid Item No. 6 (Subitems a through c) - D.I. Tees**: Payment for all labor, equipment, materials, delivery, testing and commissioning for all work necessary and required to furnish and install D.I. tees. This work shall include, but not be limited to, survey, locating and protection of all existing utilities, polyethylene encasement, preparation and submittal of shop drawings, and requirements associated with the installation of the tees. Payment shall be at the unit price bid times the number of tees installed, tested, ready for service, and accepted by the ENGINEER.
7. **Bid Item No. 7 - D.I. Crosses**: Payment for all labor, equipment, materials, delivery, testing and commissioning for all work necessary and required to furnish and install D.I. crosses. This work shall include, but not be limited to, survey, locating and protection of all existing utilities, polyethylene encasement, preparation and submittal of shop drawings, and requirements associated with the installation of the crosses. Payment shall be at the unit price bid times the number of crosses installed, tested, ready for service, and accepted by the ENGINEER.
8. **Bid Item No. 8 (Subitems a through e) - D.I. Bends**: Payment for all labor, equipment, materials, delivery, testing and commissioning for all work necessary and required to furnish and install permanent and temporary D.I. bends. This work shall include, but not be limited to, survey, locating and protection of all existing utilities, polyethylene encasement, preparation and submittal of shop drawings, removal of temporary bends, and requirements associated with the installation of the bends. Payment shall be at the unit price bid times the number of bends installed, tested, ready for service, and accepted by the ENGINEER.

9. **Bid Item No. 9 (Subitems a through c) - D.I. Gate Valves**: Payment for all labor, equipment, materials, delivery, testing and commissioning for all work necessary and required to furnish and install D.I. gate valves for potable water mains of the nominal diameters specified in these bid items. Payment shall be at the unit price bid times the number of completed valves installed, tested, ready for service and accepted by the ENGINEER. Such payment shall include, but not be limited to: furnishing and installing the valves, valve boxes, risers, concrete collars, concrete thrust blocks and concrete supports; furnishing and installing polyethylene encasement for all DI valves; all applicable items and work from; and all other appurtenant and miscellaneous items and work necessary to obtain a complete installation.
10. **Bid Item No. 10 (Subitems a through b) – Transition Coupling**: Payment for all labor, equipment, materials, delivery, testing and commissioning for all work necessary and required to furnish and install transition coupling for potable water mains of the nominal diameters specified in these bid items. Payment shall be at the unit price bid times the number of transition couplings installed, tested, ready for service and accepted by the ENGINEER. Such payment shall include, but not be limited to: furnishing and installing the couplings and all other appurtenant and miscellaneous items and work necessary to obtain a complete installation.
11. **Bid Item No. 11 Flexible Connection to Existing 2-inch WM**: Payment for all labor, equipment, materials, delivery, testing and commissioning for all work necessary and required to furnish and install flexible connections to the existing 2-inch water main, as shown in the details in the Drawings. Payment shall be at the unit price bid times the number of completed flexible connections installed, tested, ready for service and accepted by the ENGINEER. Such payment shall include, but not be limited to: furnishing and installing the flexible connections and all other appurtenant and miscellaneous items and work necessary to obtain a complete installation.
12. **Bid Item No. 12 - Cutting, Capping, and Abandonment of Existing 2-inch Water Mains**: The lump sum price for this item shall be payment for all labor, equipment, materials and delivery for all work necessary and required to cut piping, cap piping, and abandon all existing 2-inch or smaller diameter water mains to be abandoned as shown in the Contract Documents.
13. **Bid Item No. 13 - Cutting, Grouting, and Abandonment of Existing 4-inch, 6-inch, and 8-inch Water Mains**: The lump sum price for this item shall be payment for all labor, equipment, materials and delivery for all work necessary and required to cut piping, install flowable grout fill and cap piping for all existing 4-inch or larger diameter water mains shown to be abandoned and grouted in place per the Contract Documents.

#### **Water Meter and Water Service Construction Costs**

14. **Bid Item No. 14 (Subitems a through b) - Water Service Lines From New Water Main To Existing Water Meters**: For cutting existing water services of diameters 3" and smaller, and reconnecting the existing meters to proposed water mains at the locations

shown on the Drawings or where directed by the ENGINEER in the field, will be paid for at the unit price bid times the number of meters reconnected in accordance with current design standards and Specifications, and accepted by the ENGINEER. The price bid shall be full compensation for each existing meter reconnected, ready for service, and shall include but not be limited to: coordination with CITY forces for temporary system deactivation; notifying affected property owners/occupants; cutting the existing services at the meters and removing existing ball valve curb stop(s), "U-branches", header piping and fittings; furnishing and installing new ball valve curb stop(s), "U-branches" and header piping and fittings; furnishing and installing HDPE tubing for domestic water service, gate valves, valve boxes, risers, concrete collars, double-strap or band service saddle and corporation stop; making connection to proposed water mains; furnishing and installing 3-inch minimum diameter Sch. 80 PVC or black iron casing (for services crossing under roadway pavement); replacement of concrete sidewalks, curbs and pedestrian ramps (including detectable warning surface); restoration of stabilized subgrade, compacted limerock base and asphalt surface course for trench restoration, in excess of that required to restore the new water main trench, in accordance with the Drawings, details, and FDOT Index 307, and all other appurtenant and miscellaneous items and work necessary for a complete installation in accordance with the details, Specifications and locations shown on the Drawings.

#### **Storm Drainage Construction Costs**

15. **Bid Item No. 15 - 4' Dia. Drainage Manhole w/USF 420 Ring and C Cover 4' - 6' depth**: Payment for all labor, equipment, materials, delivery, testing and commissioning for all work necessary and required to furnish, transport, store, protect, and install new Precast Reinforced Concrete Underground Drainage Structures of varying sizes, diameters and depths for Storm Sewer and French Drain, including the following:
- a. Manholes, Catch Basins and Junction Boxes fabricated by an approved precast concrete provider per the Contract Documents. Structures shall be provided with wall openings of the dimensions, diameters, elevations and orientation required to accommodate the pipe connections shown on the Drawings, and pre-drilled anchor holes for installation of Pollution Retardant Baffles (PRBs).
  - b. Cast iron frames/grates or rings/covers of the specified sizes/types and cast by an approved foundry in accordance with the Contract Documents.
  - c. Brick, mortar and grout for leveling, sealing and finishing.
  - d. The work shall include, but not be limited to, survey, clearing and grubbing, swale restoration, locating and protection of all existing utilities, preparation and submittal of shop drawings, installing storm water pollution prevention devices, dewatering, trench excavation, shoring, bedding, backfilling, compaction, removal and disposal of unsuitable/excess fill, removal and disposal of all removed sidewalk/curb and gutter, removal and disposal of all removed asphalt pavement and lime rock base. Payment shall include restoration for all work in sodded areas including select fill, landscaping, irrigation and electrical within roundabouts and swales. For structures located under asphalt pavement, payment shall also include compacted limerock

base and 2-inch thick SP-9.5 Asphaltic Concrete Structural Course for trench restoration. Payment for road milling and overlay shall be addressed in City Roads Restoration bid items within this Basis of Payment Section.

16. **Bid Item No. 16 - 4' Dia. Drainage Manhole w/USF 420 Ring and C Cover 6' - 8' depth:** Payment for all labor, equipment, materials, delivery, testing and commissioning for all work necessary and required to furnish, transport, store, protect, and install new Precast Reinforced Concrete Underground Drainage Structures of varying sizes, diameters and depths for Storm Sewer and French Drain, including the following:
- a. Manholes, Catch Basins and Junction Boxes fabricated by an approved precast concrete provider per the Contract Documents. Structures shall be provided with wall openings of the dimensions, diameters, elevations and orientation required to accommodate the pipe connections shown on the Drawings, and pre-drilled anchor holes for installation of Pollution Retardant Baffles (PRBs).
  - b. Cast iron frames/grates or rings/covers of the specified sizes/types and cast by an approved foundry in accordance with the Contract Documents.
  - c. Brick, mortar and grout for leveling, sealing and finishing.
  - d. The work shall include, but not be limited to, survey, clearing and grubbing, swale restoration, locating and protection of all existing utilities, preparation and submittal of shop drawings, installing storm water pollution prevention devices, dewatering, trench excavation, shoring, bedding, backfilling, compaction, removal and disposal of unsuitable/excess fill, removal and disposal of all removed sidewalk/curb and gutter, removal and disposal of all removed asphalt pavement and lime rock base. Payment shall include restoration for all work in sodded areas including select fill, landscaping, irrigation and electrical within roundabouts and swales. For structures located under asphalt pavement, payment shall also include compacted limerock base and 2-inch thick SP-9.5 Asphaltic Concrete Structural Course for trench restoration. Payment for road milling and overlay shall be addressed in City Roads Restoration bid items within this Basis of Payment Section.
17. **Bid Item No. 17 - 4' Dia. Drainage Manhole w/USF 420 Ring and C Cover 8' - 10' depth:** Payment for all labor, equipment, materials, delivery, testing and commissioning for all work necessary and required to furnish, transport, store, protect, and install new Precast Reinforced Concrete Underground Drainage Structures of varying sizes, diameters and depths for Storm Sewer and French Drain, including the following:
- a. Manholes, Catch Basins and Junction Boxes fabricated by an approved precast concrete provider per the Contract Documents. Structures shall be provided with wall openings of the dimensions, diameters, elevations and orientation required to accommodate the pipe connections shown on the Drawings, and pre-drilled anchor holes for installation of Pollution Retardant Baffles (PRBs).
  - b. Cast iron frames/grates or rings/covers of the specified sizes/types and cast by an approved foundry in accordance with the Contract Documents.
  - c. Brick, mortar and grout for leveling, sealing and finishing.
  - d. The work shall include, but not be limited to, survey, clearing and grubbing, swale restoration, locating and protection of all existing utilities, preparation and submittal



of shop drawings, installing storm water pollution prevention devices, dewatering, trench excavation, shoring, bedding, backfilling, compaction, removal and disposal of unsuitable/excess fill, removal and disposal of all removed sidewalk/curb and gutter, removal and disposal of all removed asphalt pavement and lime rock base. Payment shall include restoration for all work in sodded areas including select fill, landscaping, irrigation and electrical within roundabouts and swales. For structures located under asphalt pavement, payment shall also include compacted limerock base and 2-inch thick SP-9.5 Asphaltic Concrete Structural Course for trench restoration. Payment for road milling and overlay shall be addressed in City Roads Restoration bid items within this Basis of Payment Section.

18. **Bid Item No. 18 - 5' Dia. Drainage Manhole w/USF 420 Ring and C Cover 4' - 6' depth**: Payment for all labor, equipment, materials, delivery, testing and commissioning for all work necessary and required to furnish, transport, store, protect, and install new Precast Reinforced Concrete Underground Drainage Structures of varying sizes, diameters and depths for Storm Sewer and French Drain, including the following:
- a. Manholes, Catch Basins and Junction Boxes fabricated by an approved precast concrete provider per the Contract Documents. Structures shall be provided with wall openings of the dimensions, diameters, elevations and orientation required to accommodate the pipe connections shown on the Drawings, and pre-drilled anchor holes for installation of Pollution Retardant Baffles (PRBs).
  - b. Cast iron frames/grates or rings/covers of the specified sizes/types and cast by an approved foundry in accordance with the Contract Documents.
  - c. Brick, mortar and grout for leveling, sealing and finishing.
  - d. The work shall include, but not be limited to, survey, clearing and grubbing, swale restoration, locating and protection of all existing utilities, preparation and submittal of shop drawings, installing storm water pollution prevention devices, dewatering, trench excavation, shoring, bedding, backfilling, compaction, removal and disposal of unsuitable/excess fill, removal and disposal of all removed sidewalk/curb and gutter, removal and disposal of all removed asphalt pavement and lime rock base. Payment shall include restoration for all work in sodded areas including select fill, landscaping, irrigation and electrical within roundabouts and swales. For structures located under asphalt pavement, payment shall also include compacted limerock base and 2-inch thick SP-9.5 Asphaltic Concrete Structural Course for trench restoration. Payment for road milling and overlay shall be addressed in City Roads Restoration bid items within this Basis of Payment Section.
19. **Bid Item No. 19 - 5' Dia. Drainage Manhole w/USF 420 Ring and C Cover 8' - 10' depth**: Payment for all labor, equipment, materials, delivery, testing and commissioning for all work necessary and required to furnish, transport, store, protect, and install new Precast Reinforced Concrete Underground Drainage Structures of varying sizes, diameters and depths for Storm Sewer and French Drain, including the following:
- a. Manholes, Catch Basins and Junction Boxes fabricated by an approved precast concrete provider per the Contract Documents. Structures shall be provided with wall openings of the dimensions, diameters, elevations and orientation required to

accommodate the pipe connections shown on the Drawings, and pre-drilled anchor holes for installation of Pollution Retardant Baffles (PRBs).

- b. Cast iron frames/grates or rings/covers of the specified sizes/types and cast by an approved foundry in accordance with the Contract Documents.
- c. Brick, mortar and grout for leveling, sealing and finishing.
- d. The work shall include, but not be limited to, survey, clearing and grubbing, swale restoration, locating and protection of all existing utilities, preparation and submittal of shop drawings, installing storm water pollution prevention devices, dewatering, trench excavation, shoring, bedding, backfilling, compaction, removal and disposal of unsuitable/excess fill, removal and disposal of all removed sidewalk/curb and gutter, removal and disposal of all removed asphalt pavement and lime rock base. Payment shall include restoration for all work in sodded areas including select fill, landscaping, irrigation and electrical within roundabouts and swales. For structures located under asphalt pavement, payment shall also include compacted limerock base and 2-inch thick SP-9.5 Asphaltic Concrete Structural Course for trench restoration. Payment for road milling and overlay shall be addressed in City Roads Restoration bid items within this Basis of Payment Section.

20. **Bid Item No. 20 - FDOT Type "C" Catch Basin w/Cast iron Grate (Index 443-002):**

Payment for all labor, equipment, materials, delivery, testing and commissioning for all work necessary and required to furnish, transport, store, protect, and install new Precast Reinforced Concrete Underground Drainage Structures of varying sizes, diameters and depths for Storm Sewer and French Drain, including the following:

- a. Manholes, Catch Basins and Junction Boxes fabricated by an approved precast concrete provider per the Contract Documents. Structures shall be provided with wall openings of the dimensions, diameters, elevations and orientation required to accommodate the pipe connections shown on the Drawings, and pre-drilled anchor holes for installation of Pollution Retardant Baffles (PRBs).
- b. Cast iron frames/grates or rings/covers of the specified sizes/types and cast by an approved foundry in accordance with the Contract Documents.
- c. Brick, mortar and grout for leveling, sealing and finishing.
- d. The work shall include, but not be limited to, survey, clearing and grubbing, swale restoration, locating and protection of all existing utilities, preparation and submittal of shop drawings, installing storm water pollution prevention devices, dewatering, trench excavation, shoring, bedding, backfilling, compaction, removal and disposal of unsuitable/excess fill, removal and disposal of all removed sidewalk/curb and gutter, removal and disposal of all removed asphalt pavement and lime rock base. Payment shall include restoration for all work in sodded areas including select fill, landscaping, irrigation and electrical within roundabouts and swales. For catch basins to be located within swale areas between sidewalks and roads, payment shall also include re-grading the swale to slope toward the catch basin grates. For structures located under asphalt pavement, payment shall also include compacted limerock base and 2-inch thick SP-9.5 Asphaltic Concrete Structural Course for

trench restoration. Payment for road milling and overlay shall be addressed in City Roads Restoration bid items within this Basis of Payment Section.

21. **Bid Item No. 21 - 4' Dia. Catch Basin w/USF 4180-6172**: Payment for all labor, equipment, materials, delivery, testing and commissioning for all work necessary and required to furnish, transport, store, protect, and install new Precast Reinforced Concrete Underground Drainage Structures of varying sizes, diameters and depths for Storm Sewer and French Drain, including the following:
- a. Manholes, Catch Basins and Junction Boxes fabricated by an approved precast concrete provider per the Contract Documents. Structures shall be provided with wall openings of the dimensions, diameters, elevations and orientation required to accommodate the pipe connections shown on the Drawings, and pre-drilled anchor holes for installation of Pollution Retardant Baffles (PRBs).
  - b. Cast iron frames/grates or rings/covers of the specified sizes/types and cast by an approved foundry in accordance with the Contract Documents.
  - c. Brick, mortar and grout for leveling, sealing and finishing.
  - d. The work shall include, but not be limited to, survey, clearing and grubbing, swale restoration, locating and protection of all existing utilities, preparation and submittal of shop drawings, installing storm water pollution prevention devices, dewatering, trench excavation, shoring, bedding, backfilling, compaction, removal and disposal of unsuitable/excess fill, removal and disposal of all removed sidewalk/curb and gutter, removal and disposal of all removed asphalt pavement and lime rock base. Payment shall include restoration for all work in sodded areas including select fill, landscaping, irrigation and electrical within roundabouts and swales. For catch basins to be located within swale areas between sidewalks and roads, payment shall also include re-grading the swale to slope toward the catch basin grates. For structures located under asphalt pavement, payment shall also include compacted limerock base and 2-inch thick SP-9.5 Asphaltic Concrete Structural Course for trench restoration. Payment for road milling and overlay shall be addressed in City Roads Restoration bid items within this Basis of Payment Section.
22. **Bid Item No. 22 - Replace Exist. Struct. EX-01 with 5' Dia. Catch Basin w/4122-6172 Frame-Grate, including reconnections**: Payment includes all requirements from Items No. 15-21 above, plus all labor, equipment, materials, delivery, testing and commissioning for all work necessary and required to perform the following:
- a. Cut and remove sections of existing pipe of various diameters, as well as support and protect the sections of existing pipe to remain.
  - b. Complete removal of existing drainage structures
  - c. Furnishing and installing new Solid and Perforated Corrugated PVC Pipe of different diameters, Fittings as needed, Couplings for joining different pipe materials, and Structure Wall Connectors for reconnecting new Drainage Structures (Structures provided under separate pay items) to existing Storm Sewer Pipe and/or existing Drainage Structures in accordance with the manufacturer's recommendations and the Contract Documents.

23. **Bid Item No. 23 – Skimmer (PRB) (FDOT Index 443-002)**: Payment for all labor, equipment, materials, delivery, storage, testing and commissioning for all work necessary and required to furnish and install new Pollution Retardant Baffles (PRBs) inside new and existing Drainage Structures, including gaskets, anchors and all appurtenances required for installation in accordance with the Contract Documents and where shown on the Drawings.
24. **Bid Item No. 24 – 6" In-Line Storm Drainage Check Valve (Procured by COH)**: Payment for all labor, equipment, delivery, storage, protecting, testing and commissioning for all work necessary and required to install In-line Check Valves procured by the City of Hollywood of the types and diameters shown on the Drawings and in accordance with the Contract Documents. Payment includes assembly, placing the In-line Check Valves into new or existing Drainage Structures through the structure tops, inserting them into the receiving outlet pipes, and anchoring them to the interior structure wall using equipment, tools, installation materials, anchors and all other appurtenances recommended by the manufacturer's installation instructions.
25. **Bid Item No. 25 – 12" In-Line Storm Drainage Check Valve (Procured by COH)**: Payment for all labor, equipment, delivery, storage, protecting, testing and commissioning for all work necessary and required to install In-line Check Valves procured by the City of Hollywood of the types and diameters shown on the Drawings and in accordance with the Contract Documents. Payment includes assembly, placing the In-line Check Valves into new or existing Drainage Structures through the structure tops, inserting them into the receiving outlet pipes, and anchoring them to the interior structure wall using equipment, tools, installation materials, anchors and all other appurtenances recommended by the manufacturer's installation instructions.
26. **Bid Item No. 26 – 24" In-Line Storm Drainage Check Valve (Procured by COH)**: Payment for all labor, equipment, delivery, storage, protecting, testing and commissioning for all work necessary and required to install In-line Check Valves procured by the City of Hollywood of the types and diameters shown on the Drawings and in accordance with the Contract Documents. Payment includes assembly, placing the In-line Check Valves into new or existing Drainage Structures through the structure tops, inserting them into the receiving outlet pipes, and anchoring them to the interior structure wall using equipment, tools, installation materials, anchors and all other appurtenances recommended by the manufacturer's installation instructions.
27. **Bid Item No. 27 – 6" Solid Corrugated Drainage Pipe and Couplings/ Connectors**: Payment includes all requirements from 13.d above, plus Payment for all labor, equipment, materials, delivery, storage, testing and commissioning for all work necessary and required to furnish and install new Solid and Perforated Corrugated PVC Storm Drainage Pipe of different diameters, Fittings as needed, Couplings for joining different pipe materials, and Structure Wall Connectors in accordance with the manufacturer's recommendations and the Contract Documents.
28. **Bid Item No. 28 – 12" Solid Corrugated Drainage Pipe and Couplings/ Connectors**: Payment includes all requirements from 15.d above, plus Payment for all labor,

equipment, materials, delivery, storage, testing and commissioning for all work necessary and required to furnish and install new Solid and Perforated Corrugated PVC Storm Drainage Pipe of different diameters, Fittings as needed, Couplings for joining different pipe materials, and Structure Wall Connectors in accordance with the manufacturer's recommendations and the Contract Documents.

29. **Bid Item No. 29 – 15" Solid Corrugated Drainage Pipe and Couplings/ Connectors:** Payment includes all requirements from 15.d above, plus Payment for all labor, equipment, materials, delivery, storage, testing and commissioning for all work necessary and required to furnish and install new Solid and Perforated Corrugated PVC Storm Drainage Pipe of different diameters, Fittings as needed, Couplings for joining different pipe materials, and Structure Wall Connectors in accordance with the manufacturer's recommendations and the Contract Documents.
30. **Bid Item No. 30 – 18" Solid Corrugated Drainage Pipe and Couplings/ Connectors:** Payment includes all requirements from 15.d above, plus Payment for all labor, equipment, materials, delivery, storage, testing and commissioning for all work necessary and required to furnish and install new Solid and Perforated Corrugated PVC Storm Drainage Pipe of different diameters, Fittings as needed, Couplings for joining different pipe materials, and Structure Wall Connectors in accordance with the manufacturer's recommendations and the Contract Documents.
31. **Bid Item No. 31 – French Drain, including 18" Perforated Corrugated PVC Pipe and Couplings as Shown on Drawings :** Payment includes all requirements from Items 15.d and 27 above, plus Payment for all labor, equipment, materials, delivery, storage, testing and commissioning for all work necessary and required to furnish and install new French Drain, including Coarse Aggregate or Ballast Rock, and Filter Fabric in accordance with the Contract Documents and where shown on the Drawings.
32. **Bid Item No. 32 – Cut Exist. 24" Storm Sewer and Reconnect to Prop. Manhole SD-01 w/24" Solid Corrugated PVC and Couplings as Needed (Manhole SD-01 paid under separate pay item):** Payment includes all requirements from Items 15.d and 22.c above.
33. **Bid Item No. 33 – Cut Exist. 15" Storm Sewer and Reconnect to Prop. Manhole SD-02 w/15" Solid Corrugated PVC and Couplings as Needed (Manhole SD-02 paid under separate pay item):** Payment includes all requirements from Items 15.d and 22.c above.
34. **Bid Item No. 34 – Core-drill Wall of Exist. Structure to Prepare for Connection of 12" Solid Corrugated PVC (EX-06 and EX-07):** Payment includes all requirements from Items 15.d and 22.a above, plus Payment for all labor, equipment, materials, delivery, storage, testing and commissioning for the following:
- a. After removal of Existing Pipe, seal pipe openings with Cement Mortar as required for a smooth, finished seal in accordance with the Contract Documents.
  - b. Core-drill new pipe openings in Existing Drainage Structure walls as indicated on the Drawings and in accordance with the Contract Documents.

35. **Bid Item No. 35 – Core-drill Wall of Exist. Structure to Prepare for Connection of 15" Solid Corrugated PVC (EX-02 and EX-03)**: Payment includes all requirements from Items 15.d and 22.a above, plus Payment for all labor, equipment, materials, delivery, storage, testing and commissioning for the following:
- a. After removal of Existing Pipe, seal pipe openings with Cement Mortar as required for a smooth, finished seal in accordance with the Contract Documents.
  - b. Core-drill new pipe openings in Existing Drainage Structure walls as indicated on the Drawings and in accordance with the Contract Documents.
36. **Bid Item No. 36 – Core-drill Wall of Exist. Structure to Prepare for Connection of 18" Solid Corrugated PVC (EX-05)**: Payment includes all requirements from Items 15.d and 22.a above, plus Payment for all labor, equipment, materials, delivery, storage, testing and commissioning for the following:
- a. After removal of Existing Pipe, seal pipe openings with Cement Mortar as required for a smooth, finished seal in accordance with the Contract Documents.
  - b. Core-drill new pipe openings in Existing Drainage Structure walls as indicated on the Drawings and in accordance with the Contract Documents.
37. **Bid Item No. 37 – Remove Exist. 6" Storm Sewer Connected to South Invert of Exist. Structure EX-09, Mortar-seal Exist. Pipe Opening, and Core-drill South Wall to Prepare for Connection of Prop. 6" Solid Corrugated PVC at Invert Shown on Drawings**: Payment includes all requirements from Items 15.d and 22.a above, plus Payment for all labor, equipment, materials, delivery, storage, testing and commissioning for the following:
- a. After removal of Existing Pipe, seal pipe openings with Cement Mortar as required for a smooth, finished seal in accordance with the Contract Documents.
  - b. Core-drill new pipe openings in Existing Drainage Structure walls as indicated on the Drawings and in accordance with the Contract Documents.
38. **Bid Item No. 38 – Remove Exist. 6" Storm Sewer Connected to North Invert of Exist. Structure EX-08 to Prepare for Connection of Prop. 6" Solid Corrugated PVC at Same Invert**: Payment includes all requirements from Items 15.d and 22.a above, plus Payment for all labor, equipment, materials, delivery, storage, testing and commissioning for the following:
- a. After removal of Existing Pipe, seal pipe openings with Cement Mortar as required for a smooth, finished seal in accordance with the Contract Documents.
  - b. Core-drill new pipe openings in Existing Drainage Structure walls as indicated on the Drawings and in accordance with the Contract Documents.

#### **Storm Drainage Allowance Items**

39. **Allowance Item No. 39 – Replace Exist. Struct. with FDOT Type C Catch Basin w/Cast Iron Grate per FDOT Index 425-052. Reconnect to Exist. Pipe of Varying Diameters w/Prop. Solid Corrugated PVC Pipe and Couplings as Needed (EX-02, EX-07 and EX-09)**: Payment includes all requirements from Item No. 15 above, plus all

labor, equipment, materials, delivery, testing and commissioning for all work necessary and required to perform the following:

- a. Cut and remove sections of existing pipe of various diameters, as well as support and protect the sections of existing pipe to remain.
- b. Complete removal of existing drainage structures
- c. Furnishing and installing new Solid and Perforated Corrugated PVC Pipe of different diameters, Fittings as needed, Couplings for joining different pipe materials, and Structure Wall Connectors for reconnecting new Drainage Structures (Structures provided under separate pay items) to existing Storm Sewer Pipe and/or existing Drainage Structures in accordance with the manufacturer's recommendations and the Contract Documents.

**40. Allowance Item No. 40 – Replace Exist. Struct. w/4' Dia. Catch Basin 4' - 6' deep w/USF Frame-Grate 4122-6172 or 4180-6172. Cut Exist. Pipe and Reconnect w/New Pipe and Couplings as Needed. (EX-03 and EX-04):**

Payment includes all requirements from Item No. 15 above, plus all labor, equipment, materials, delivery, testing and commissioning for all work necessary and required to perform the following:

- a. Cut and remove sections of existing pipe of various diameters, as well as support and protect the sections of existing pipe to remain.
- b. Complete removal of existing drainage structures
- c. Furnishing and installing new Solid and Perforated Corrugated PVC Pipe of different diameters, Fittings as needed, Couplings for joining different pipe materials, and Structure Wall Connectors for reconnecting new Drainage Structures (Structures provided under separate pay items) to existing Storm Sewer Pipe and/or existing Drainage Structures in accordance with the manufacturer's recommendations and the Contract Documents.

**41. Allowance Item No. 41 – Replace Exist. Struct. w/5' Dia. Catch Basin 4' - 6' deep w/USF Frame-Grate 4122-6172 or 4180-6172. Cut Exist. Pipe and Reconnect w/New Pipe and Couplings as Needed. (EX-05 and EX-06):**

Payment includes all requirements from Item No. 15 above, plus all labor, equipment, materials, delivery, testing and commissioning for all work necessary and required to perform the following:

- a. Cut and remove sections of existing pipe of various diameters, as well as support and protect the sections of existing pipe to remain.
- b. Complete removal of existing drainage structures
- c. Furnishing and installing new Solid and Perforated Corrugated PVC Pipe of different diameters, Fittings as needed, Couplings for joining different pipe materials, and Structure Wall Connectors for reconnecting new Drainage Structures (Structures provided under separate pay items) to existing Storm Sewer Pipe and/or existing Drainage Structures in accordance with the manufacturer's recommendations and the Contract Documents.

42. **Allowance Item No. 42 – Replace Exist. 24-inch Storm Sewer w/24-inch Solid Corrugated PVC Pipe and Couplings adjacent to SD-01:** Payment includes all requirements from Items 15.d and 22.c above.
43. **Allowance Item No. 43 – Remove Section of Existing 6" Storm Sewer Connected to North Invert of Struct. EX-09 and Replace with 6" Solid Corrugated PVC Pipe and Couplings to Accommodate In-line Check Valve Installation:** In the event that Proposed In-line Check Valves cannot be installed within Existing Storm Outlet Pipes as described in Bid Items 24 – 26 because Existing Pipes are deformed or damaged, Payment includes all requirements from Items 15.d and 22.a above, plus Payment for all labor, equipment, materials, delivery, storage, testing and commissioning for furnishing and installing new Solid and Perforated Corrugated PVC Pipe of different diameters, Fittings as needed, Couplings for joining different pipe materials, and Structure Wall Connectors for reconnecting to New or Existing Drainage Structures (Structures provided under separate pay items) and to Existing Storm Sewer Pipe accordance with the manufacturer's recommendations and the Contract Documents.
44. **Allowance Item No. 44 – Remove Section of Existing 12" Storm Sewer Connected to North Invert of Struct. EX-04 and Replace with 12" Solid Corrugated PVC Pipe and Couplings to Accommodate In-line Check Valve Installation:** In the event that Proposed In-line Check Valves cannot be installed within Existing Storm Outlet Pipes as described in Bid Items 24 – 26 because Existing Pipes are deformed or damaged, Payment includes all requirements from Items 15.d and 22.a above, plus Payment for all labor, equipment, materials, delivery, storage, testing and commissioning for furnishing and installing new Solid and Perforated Corrugated PVC Pipe of different diameters, Fittings as needed, Couplings for joining different pipe materials, and Structure Wall Connectors for reconnecting to New or Existing Drainage Structures (Structures provided under separate pay items) and to Existing Storm Sewer Pipe accordance with the manufacturer's recommendations and the Contract Documents.
45. **Allowance Item No. 45 – Remove Section of Existing 24" Storm Sewer Connected to North Invert of Struct. EX-01 and Replace with 24" Solid Corrugated PVC Pipe and Couplings to Accommodate In-line Check Valve Installation:** In the event that Proposed In-line Check Valves cannot be installed within Existing Storm Outlet Pipes as described in Bid Items 24 – 26 because Existing Pipes are deformed or damaged, Payment includes all requirements from Items 15.d and 22.a above, plus Payment for all labor, equipment, materials, delivery, storage, testing and commissioning for furnishing and installing new Solid and Perforated Corrugated PVC Pipe of different diameters, Fittings as needed, Couplings for joining different pipe materials, and Structure Wall Connectors for reconnecting to New or Existing Drainage Structures (Structures provided under separate pay items) and to Existing Storm Sewer Pipe accordance with the manufacturer's recommendations and the Contract Documents.
46. **Allowance Item No. 46 – Relocate 30± LF of Exist. 6" CI/DI Watermain Pipe and Fittings as Shown on Drawings to Accommodate Prop. Drainage Installation Btw. STA 49+81 and 50+09 of Sherman St.:** Payment includes all requirements from Items



15.d above, plus Payment for all labor, equipment, materials, delivery, storage, testing and commissioning for furnishing and installing new Water Main D.I. pipe, fittings, closure sleeves, joint restraints, polyethylene encasement and all other appurtenances required for a complete water main installation necessary to avoid conflict with proposed Storm Drainage System in accordance with the Contract Documents. Payment shall also include pressure testing and disinfection (sampling points, etc.), and meeting pipe separation requirements and exceptions between proposed water main and existing storm and sanitary sewer as indicated in FAC 62.555.314.

47. **Allowance Item No. 47 – Furnish and Install Sleeves for Proposed Service Lines and Existing Service Lines to Remain 2-inch Diameter and Smaller that Cross Proposed French Drain**: Payment includes all requirements from Items 27 - 31 above, plus Payment for all labor, equipment, materials, delivery, storage, testing and commissioning for furnishing and installing new Pipe Sleeves on proposed and existing service lines that will cross through Proposed French Drain in accordance with the details on Sheet SD-206, FDOT Standard Specifications, and the Contract Documents as required for a complete installation. Contractor shall be responsible for coordinating the installation of the Pipe Sleeves with the installation of the French Drain and Water Services, and shall at all times avoid disrupting newly installed French Drain in order to install a Pipe Sleeve. Payment shall also include cutting and replacing sections of existing service lines to remain in order to accommodate the installation of the sleeves, and meeting pipe separation requirements and exceptions between proposed water services and existing storm and sanitary sewer as indicated in FAC 62.555.314.
48. **Allowance Items No. 48 – Furnish and Install Sleeves for Proposed Service Lines and Existing Service Lines Larger than 2-inch Diameter that Cross Proposed French Drain**: Payment includes all requirements from Items 27 - 31 above, plus Payment for all labor, equipment, materials, delivery, storage, testing and commissioning for furnishing and installing new Pipe Sleeves on proposed and existing service lines that will cross through Proposed French Drain in accordance with the details on Sheet SD-206, FDOT Standard Specifications, and the Contract Documents as required for a complete installation. Contractor shall be responsible for coordinating the installation of the Pipe Sleeves with the installation of the French Drain and Water Services, and shall at all times avoid disrupting newly installed French Drain in order to install a Pipe Sleeve. Payment shall also include cutting and replacing sections of existing service lines to remain in order to accommodate the installation of the sleeves, and meeting pipe separation requirements and exceptions between proposed water services and existing storm and sanitary sewer as indicated in FAC 62.555.314.
49. **Allowance Item No. 49 – Adjust Proposed Drainage Structure Tops due to Unforeseen Field Conditions in Accordance with FDOT Standard Index 425-001 as Modified on Sheet SD-206**: Payment includes all requirements from Items 15 – 22 and Allowance Items 39 - 41 above. In the event underground field conditions are different than shown on the Construction Documents, payment shall include all labor, equipment, materials, delivery, storage, testing and commissioning for furnishing and installing adjustments to proposed Drainage Structure tops in accordance with FDOT Standard

Index 425-001 as modified on Sheet SD-206. Work under this Pay Item shall include, but is not limited to, saw-cutting structure tops, constructing new structure tops/risers, furnishing and installing adjustable manhole frames and all other appurtenances required for a complete Drainage Structure installation in accordance with the Contract Documents.

### **City Roads Restoration Construction Costs**

50. **Bid Item No. 50 - Milling of Asphaltic Course to 1-inch Nominal Thickness within Liberty, Thomas, and Sherman Streets' ROW:** Payment for all labor, equipment, materials and delivery for all work necessary and required to mill 1-inch from the existing asphaltic concrete surface course for permanent asphalt pavement repairs within City of Hollywood rights-of-way disturbed during water main installation activities will be paid for at the unit price bid times the number of square yards (SY) of such surface course milled as required, measured along the curb within the limits defined by the Pavement Restoration Drawings and Standard Details, and as approved by the ENGINEER. This includes the rights-of-way within Liberty Street, Thomas Street, and Sherman Street. Milling of pavement shall be placed in the full width of the street, alleyway, and/or avenue. Greater widths are at CONTRACTOR's option and expense. The price bid shall be full compensation for saw-cutting, furnishing all materials, labor and equipment required. Asphalt cold milling shall be performed using an automated pavement planer capable of maintaining an accurate depth. Cold milling equipment shall meet the approval of the ENGINEER and the governing agency having jurisdiction at the location of the pavement milling operation. The ENGINEER's word as to the acceptability of the equipment shall be final.
51. **Bid Item No. 51 - 2-inch Thick (SP9.5) Asphaltic Concrete Structural Course for Trench Restoration within City ROW (all impacted streets):** Payment for all labor, equipment, materials, delivery, testing and commissioning for all work necessary and required to furnish and install asphaltic concrete for trench restoration for 2-inch thick (min.) SP 9.5 asphaltic concrete structural course within City of Hollywood City of Hollywood rights-of-way in accordance with Standard Detail G-12.1, where shown on the Drawings. Payment shall be at the unit price bid times the number of linear feet installed following the corresponding pavement restoration sections and meeting the compaction requirements provided on the Drawings, Specifications and standard details (whichever is more stringent), completed and accepted by the CITY and Broward County, with surface at the proper elevations. Trench restoration shall be placed on City the streets, alleyways, and/or avenues. Greater widths, lengths, and thicknesses are at the CONTRACTOR's option and expense. Restoration of asphaltic concrete structural course, limerock base and stabilized subgrade along new water services and fire hydrants, and/or reconnection of existing water services is included in the unit costs bid for those specific pay Items. The price bid shall be full compensation for furnishing all materials, labor and equipment required for a complete machine-laid asphaltic concrete surface course installation. There is no anticipated impact to asphalt driveways as shown on the Drawings. If impacted by the CONTRACTOR's operations, these shall be restored

at no additional cost to the contract. Asphalt driveway sections shall include 6" thick (min.) compacted limerock base and 1" SP-9.5 asphaltic concrete surface course meeting all other asphalt pavement requirements shown on the Drawings and Specifications. Asphalt shall be restored over the entire driveway approach regardless of extent of impact.

52. **Bid Item No. 52 – Roadway Patches for Large Damaged Areas (2" Asphalt):** Payment for all labor, equipment, materials, delivery, testing and commissioning for all work necessary and required to remove and replace existing asphalt pavement of varying thicknesses impacted by the re-routing/relocation of existing water services inside private properties by carefully cutting existing asphalt, and will be paid for at the unit price bid times the number of square yards (SY) of pavement replaced, completed, ready for service and accepted by the ENGINEER. The price bid for this pay item shall include, but not be limited to: saw-cutting, removing, hauling, and legally disposing of existing pavement; protecting any existing asphalt pavement to remain; furnishing and installing 2-inch thick (min. or to match existing) asphaltic concrete structural course, 6" thick limerock base (min. LBR 100) compacted to min. 98% max. density, and 12" Type "B" Stabilized Subgrade (min. LBR 40 compacted to 98% max. density; Measurement for payment shall be the number of square yards (SY) of pavement being removed and replaced as agreed-to by the resident or property owner. All other replacement due to removal or damage as a result of the CONTRACTOR's operation shall be at the CONTRACTOR's expense.
53. **Bid Item No. 53 - Resurfacing of Side Streets:** Payment for all labor, equipment, materials, delivery, testing and commissioning for all work necessary and required to furnish and install 1- inch min. thick SP 9.5 (Traffic B) machine laid asphaltic concrete surface course for permanent paving overlay in streets, alleyways, and avenues within the side streets Liberty, Thomas, and Sherman will be paid for at the unit price bid times the number of square yards (SY) of asphaltic concrete overlay installed and accepted by the ENGINEER and Broward County, as measured along the limits defined in the Pavement Restoration Drawings and Standard Details. The pavement overlay shall be placed in the full width of the street, alleyway, and/or avenue. Greater widths are at the CONTRACTOR's option and expense. The price bid shall be full compensation for furnishing all materials, labor and equipment required for a complete machine-laid asphaltic concrete surface course installation.
54. **Bid Item No. 54 - Existing Concrete Pavement, Brick Pavers and/or other specialty paving removed during re-routing of water services within private properties:** Payment for all labor, equipment, materials, delivery, testing and commissioning for all work necessary and required to remove and replace by carefully cutting of existing concrete pavement, brick pavers and/or other specialty paving of varying thicknesses, impacted by the re-routing/relocation of existing water services inside private properties, and will be paid for at the unit price bid times the number of square yards (SY) of pavement replaced, completed, ready for service and accepted by the ENGINEER. The price bid for this pay item shall include, but not be limited to: saw-cutting, removing, hauling, and legally disposing of existing pavement; protecting any existing concrete

pavement to remain; furnishing and installing formwork, concrete, brick pavers, sand, or mortar, water, and admixtures, reinforcing steel, and miscellaneous materials; placing, finishing, curing, and protecting the finished pavement surface. Measurement for payment shall be the number of square yards (SY) of pavement being removed and replaced as agreed-to by the resident or property owner. All other replacement due to removal or damage as a result of the CONTRACTOR's operation shall be at the CONTRACTOR's expense.

55. **Bid Item No. 55 – Temporary Striping for N 26<sup>th</sup> Avenue and Side Streets Except Liberty, Sherman, and Thomas**: Payment for all labor, equipment, material, delivery, design and permitting for all work necessary and required for temporary striping within the limits of the project for the duration of the construction period will be paid for at the lump sum amount bid. The price bid shall be full compensation for all materials, labor and equipment required for a complete painted striping along N. 26<sup>th</sup> Avenue and the relevant side streets.
56. **Bid Item No. 56 – Protective Concrete Slab over DI Piping on Taft Street**: The lump sum price bid for all labor, equipment, material, delivery, testing and commissioning for all work necessary and required to furnish and install a protective concrete slab over DI piping as shown in the contract documents; providing all necessary maintenance of traffic; survey work involving concrete slab, and all necessary appurtenances to provide a safe construction area. The price bid shall be full compensation for all materials, labor and equipment required for a complete protective concrete slab over DI piping.
57. **Bid Item No. 57 – Speed Humps**: Payment for all labor, equipment, materials, delivery, testing and commissioning for all work necessary and required to furnish and install transition coupling for potable water mains of the nominal diameters specified in these bid items. Payment shall be at the unit price bid times the number of transition couplings installed, tested, ready for service and accepted by the ENGINEER. Such payment shall include, but not be limited to: furnishing and installing the couplings and all other appurtenant and miscellaneous items and work necessary to obtain a complete installation.

### **General**

58. **Bid Item No. 58 - Mobilization / Gen. Requirements**: The lump sum price bid for this item shall be full compensation for all mobilization and demobilization activities required for the project, including but not limited to: Multiple mobilizations that may be required to comply with project phasing, providing bonds and insurance; preparing schedules and permit packages; complying with all submittal requirements; furnishing, installing and maintaining erosion and sedimentation control measures; providing/securing temporary construction facilities, staging areas, space required for laydown and storage, parking, etc.; furnishing, installing and removal of temporary water main interconnections require for project phasing; survey work involving pre-construction project layout and controls; and pre-construction audio-video. The payment items for mobilization shall not exceed 3% of the sum of Bid Items No. 1-38 and 47-52.

59. **Bid Item No. 59 – Demobilization / Gen. Requirements**: Payment for completing all other work including but not limited to finish grading, demobilization, site cleanup, pass lamp inspection for the cleaning of project drainage system, final restoration, recording horizontal and vertical locations of proposed improvements as they are constructed, and providing all necessary final record (“as-built”) documents; providing post-construction audio- video documentation of the site; finished grading; demobilization; restoration of any site items that do not relate to specific pay items in this bid; site cleanup; and all other activities necessary to complete the contract work as per the Technical Specification and Contract Drawings. The payment items for demobilization shall not exceed 2% of the sum of Bid Items No. 1-38 and 47-52.
60. **Bid Item No. 60 - Consideration for Indemnification**: In recognition of the CONTRACTOR’S indemnification obligations, the CITY will pay to the CONTRACTOR the specific consideration of ten dollars (\$10.00). Payment of said specific consideration shall be made at the time of the payment of the first progress estimate and the CONTRACTOR shall acknowledge payment of this consideration by letter to the CITY after receipt of the progress payment.
61. **Bid Item No. 61 - Maintenance of Traffic, Including Design and Permitting**: Payment for all labor, equipment, material, delivery, design and permitting for all work necessary and required for temporary traffic controls within the limits of the project for the duration of the construction period will be paid for at the lump sum amount bid. Payment shall constitute full compensation for providing traffic controls throughout project area during the duration of construction, including but not limited to: preparing maintenance of traffic (MOT) Drawings and obtaining approvals from FDOT, Broward County Traffic and CITY of Hollywood, furnishing and installing sufficient traffic signs, advance warning signs, electronic message boards, temporary pavement markings, reflective pavement markers (RPMs), barricades, temporary asphalt pavement, flagmen, and similar items and work for maintaining and/or re-directing pedestrian and vehicular traffic flow during construction in order to maintaining safety. Provide facilities needed to maintain access to residences, businesses, etc. within the project limits. Any portion of this fund remaining after all authorized payments have been made will remain with the CONTRACTOR. Conversely, no requests for additional reimbursement will be approved.
62. **Bid Item No. 62 - Permit, Licenses, Fees, and Materials Testing Allowance**: The allowance indicated for this item is to pay for all permits, licenses, other fees and testing required of the CONTRACTOR per the Contract Documents. The allowance shown on the Schedule of Bid Prices is an estimate of fees required. Payment will be based on the actual permit, license or fee paid directly to agency or Testing Company (for tests that meet criteria only), documented by paid receipts, specifically excluding any labor, mark-up, overhead and profit, administration and other costs involved in obtaining permits or licenses or paying fees or work associated with testing. The tests shall be performed by an independent testing laboratory selected by the CITY of Hollywood. Should any test(s) fail, subsequent tests shall be performed by the same testing laboratory and paid for by the CONTRACTOR at no additional cost to the Contract. Fees specifically excluded from

this allowance include but are not limited to re-inspection fees, expired permit fees, standby time, and failed tests.

63. **Bid Item 63 - Miscellaneous Work Allowance/Contingency**: Included in this allowance is work associated with undefined conditions or conflicts developing from undefined conditions. All work authorized for payment will be authorized in writing by the CITY. Amount to be paid per undefined conditions or conflict shall be negotiated or agreed to by both parties. The CITY reserves the right to award any, all, or none of the money associated with this allowance. The contingency shall not exceed 20% of the of the sum of Bid Items No. 1-35 and 44-49.
64. **Bid Item 64 – Unforeseen Utility Locates or Break Repair (besides water main work)**: Measurement and payment for unforeseen utility locates or break repairs will be based on the number of hours needed to perform such work in accordance with the requirements of the Contract Documents. Payment for unforeseen utility locates or break repairs, excluding water mains, will be made at the unit price per hour of time spent to perform such repair or locates on unforeseen or mismarked utilities as named in the Bid Form, which shall constitute full compensation for labor needed to perform such task, including but not limited to all labor for excavation, backfill, restoration work and coordination needed. This quantity has been estimated however the use of this line item will only be approved for use as deemed necessary by the Engineer. All material and equipment shall be the responsibility of the contractor and shall not be included in the bid item.

CONTRACTOR is responsible for potholing existing utilities sufficiently ahead of construction to avoid conflicts with the design alignment and grade of structures, culverts, storm drains and exfiltration trenches. Conflicts with utilities shown on the Drawings which result from the Contractors negligence to pothole sufficiently ahead of construction (a minimum of two days ahead of construction of the pipeline or as approved by the ENGINEER) shall be resolved by the Contractor at no additional cost to the OWNER.

- E. The price bid for each item shall be stated in both words and figures in the appropriate places in the Proposal Bid Form. All blank spaces for bid prices must be filled in with ink, or with a typewriter. The Bidder is further directed that any and all alterations, changes, corrections, and modifications, made to the Proposal Bid Form prior to submission of the bids, must be initialed by the Bidder. Non-compliance by the Bidder of this directive may be grounds for rejection of his bid.
- F. In the event that there is a discrepancy between the price written in words and the price written in numbers, the price written in words shall govern except where the number of units multiplied by the unit price shown in numbers equals the total price for that bid item. In such case, the unit price shown in numbers shall govern over the unit price shown in words.
- G. Where an error is made in the calculation of the total bid price of an item, the unit price shall govern.

- H. If the bidder makes an error in his addition of the total bid prices of the applicable items in the Quotation, the correct sum of its' applicable bid item totals shall be the Total Bid.

**Part 2 - PRODUCTS (Not Used)**

**Part 3 - EXECUTION (Not Used)**

- END OF SECTION -

**SECTION 01200**  
**PROJECT MEETINGS**

**Part 1 - GENERAL**

1.01 PRECONSTRUCTION

A. A mandatory preconstruction meeting will be held to acquaint representatives of the Department and various other agencies with those in responsible charge of the CONTRACTOR's activities for the project. Unless otherwise directed by the Department, no construction activities relating to this contract shall commence until after the pre-construction meeting has been adjourned, and until any pending business from the meeting has been addressed by the CONTRACTOR to the satisfaction of the Department and ENGINEER. The meeting will cover such subjects as the following:

1. Insurance certificates
2. Permits and licenses
3. Affirmative action employment
4. Construction schedules
5. Cost breakdown and applications for payment
6. Material deliveries, storage and payments
7. Shop drawings and submittals
8. Job-site inspection by the ENGINEER
9. Safety and emergency action procedures
10. Operations of the existing utilities
11. Field offices, security and other housekeeping procedures
12. List of subcontractors
13. Liquidated damages
14. Communications
15. Coordinating
16. All other appropriate matters.

1.02 PROGRESS

A. A progress meeting shall be held on a once-per-week basis for the purpose of coordinating and expediting the work. The CONTRACTOR, as a part of his



obligations under the Contract, shall attend in person or by an authorized representative to attend and to act on his behalf. The ENGINEER will conduct such meetings and as necessary, with the CONTRACTOR's input, issue an agenda.

- B. In addition, the ENGINEER or CONTRACTOR may call for special job site meetings for the purpose of resolving unforeseen problems or conflicts which may impede the construction schedule. The ENGINEER will prepare a brief summary report of the decisions or understandings concerning each of the items discussed at the meeting.
- C. At weekly progress meetings, the CONTRACTOR shall submit to the ENGINEER for review a current three (3) week progress schedule. This schedule submission shall include a two week look ahead schedule and reflect status of the work performed during the preceding week.

**Part 2 - PART 2 -- PRODUCTS (Not Used)**

**Part 3 - PART 3 -- EXECUTION (Not Used)**

– END OF SECTION –

**SECTION 01500****CONSTRUCTION CONSIDERATIONS****PART 1 – GENERAL**

## 1.01 HYDRAULIC UPLIFT ON STRUCTURES

- A. The CONTRACTOR shall be completely responsible for any structures, stormwater conflicting structure, tanks, wet wells, pipelines, manholes, foundations, cellars, or similar structures that may become buoyant during the construction operations due to the ground water, floods or buoyancy of piping caused due to the placement of flowable backfills before the structure is put into operation. Should there be any possibility of buoyancy of a pipeline or structure, the CONTRACTOR shall take the necessary steps to prevent its buoyancy. Damage to any structures due to floating or flooding shall be repaired, or the structures replaced at the CONTRACTOR'S expense.

## 1.02 WATER TIGHTNESS OF STRUCTURES

- A. General: It is the intent of these specifications that all concrete work, sealing work around built-in items and penetrations be performed as required to ensure that groundwater, rainwater, wastewater, chemical solutions or other process liquids in tanks, wetwells, channels, and containers will not leak into any buildings and/or equipment rooms, pipe galleries, habitable areas, or other generally dry areas.

1. The required watertightness shall be achieved by quality concrete construction and proper sealing of all joints and penetrations.
2. Each unit shall be tested separately, and the leakage tests shall be made prior to backfilling and before equipment is installed unless otherwise approved by the ENGINEER. Only potable water shall be used for the tests.
3. The watertightness of buildings exclusive of the portions designed to contain liquids will consist of checking for leaks due to rain or groundwater infiltration.
4. The CONTRACTOR shall provide at his own expense all labor, material, temporary bulkheads, pumps, water, measuring devices, etc., necessary to perform the required test.

- B. Built-in Items and Penetrations: All pipe sleeves, built-in items and penetrations shall be sealed as detailed and as required to ensure a continuous watertight seal.

## 1.03 CUTTING AND PATCHING

- A. The CONTRACTOR shall perform all cutting and patching of his work that may be required to make its several parts come together properly and fit it to receive or be received by such other work. The CONTRACTOR shall not endanger any work of others by cutting, excavating or otherwise altering their work and shall only cut or alter work with the written consent of the ENGINEER and of the other contractors whose work will be affected.

## 1.04 ABANDONMENT AND SALVAGE OF EXISTING FACILITIES

- A. General: The scope of work requires the CONTRACTOR to interface with existing structures, and piping which will be abandoned or otherwise removed and/or relocated as part of the work. Prior to beginning any work associated with existing facilities to be abandoned, salvaged, or otherwise removed or relocated, the CONTRACTOR shall inform the CITY and the ENGINEER

of his intent so that all arrangements can be made with the CITY for isolating pipelines (where possible) or otherwise removing existing facilities from service to the extent possible. The CONTRACTOR shall not proceed without written authorization from the CITY. **The CONTRACTOR shall contact and coordinate accordingly with utilities companies prior to and during the execution of the relocation, removal or abandonment of existing utilities structures. Existing utilities coordination is exclusively the responsibility of the CONTRACTOR.**

- B. Pipelines: The CONTRACTOR shall abandon, salvage or otherwise remove existing pipelines or segments of existing pipelines shown to be abandoned in place, salvaged, or removed as part of the contract work. Unless otherwise indicated in the Contract Documents, all piping shown on the Drawings to be abandoned shall be abandoned in place. Pipe shown to be abandoned need only be removed a minimum three feet clear of new utilities to be installed. Abandon-in-place shall be defined as installing plugs, or other permanent closure, as reviewed and accepted by the CITY, on all termination's, open ends or ends of pipe designated as being cut, capped and anchored in an acceptable manner. The pipe will remain buried unless otherwise noted.
- C. Piping indicated on the Drawings as being removed, or any piping to be abandoned which interferes with new structures or piping, shall be excavated and removed using methods which will not disturb adjacent piping or other facilities. All pipe materials shall be subject to salvage by the CITY as defined below. Any remaining piping on both ends of pipe segments removed shall be abandoned in-place, per the above definition. After piping has been removed, the CONTRACTOR shall backfill the evacuated area in accordance with requirements set forth in other sections of these specifications.
- D. Equipment: The CONTRACTOR shall abandon, salvage or otherwise remove existing equipment or other facilities as shown on the Contract Drawings or indicated herein. In all cases, the CONTRACTOR shall exercise caution when handling the existing equipment so as not to disturb or damage adjacent facilities. The CONTRACTOR shall make all repairs to adjacent facilities which may be damaged as a result of the CONTRACTOR's efforts in abandoning, salvaging or otherwise removing existing facilities, at no additional cost to the CITY.
- E. Salvage: The CITY may desire to salvage certain items of existing equipment which are to be dismantled and removed during the course of construction. Prior to removal of any existing equipment or piping from the site of work, the CONTRACTOR shall ascertain from the CITY whether or not the particular item or items are to be salvaged. Items to be salvaged shall be stockpiled on the site, in a location as designated by the CITY. All other items of equipment shall be disposed of off-site by the CONTRACTOR at his own expense, in accordance with applicable laws, ordinances and regulations.

#### 1.05 DIMENSIONS OF EXISTING STRUCTURES

- A. Where the dimensions and locations of existing structures are of critical importance in the installation or connection of new work, the CONTRACTOR shall verify such dimensions and locations in the field before the fabrication of any materials or equipment which is dependent on the correctness of such information.

#### 1.06 REHABILITATION

- A. Certain areas of existing structures, piping, conduits, and the like will be affected by work necessary to complete modifications under this Contract. The CONTRACTOR shall be responsible to rehabilitate those areas affected by its construction activities.

- B. Where new rectangular openings are to be installed in concrete or concrete masonry walls or floors, the CONTRACTOR shall score the edges of each opening (both sides of wall or elevated slab) by saw cutting clean straight lines to a minimum depth of one inch and then chipping out the concrete. Alternately, the opening can be formed by saw cutting completely through the slab or wall. Saw cuts deeper than one inch (or the depth of cover over existing reinforcing steel, whichever is less) shall not be allowed to extend beyond the limits of the opening. Corners shall be made square and true by a combination of core drilling, chipping, or grinding. All necessary precautions shall be taken during removal of concrete to prevent debris from falling and damaging adjacent equipment or piping. Saw cuts allowed to extend beyond the opening shall be repaired by filling with non-shrink grout. The concrete around any exposed reinforcement steel shall be chipped back and exposed reinforcement steel cut a minimum of 1-1/2 inches from the finished face of the new opening. The inside face of the new opening shall be grouted to fill any voids and cover the exposed aggregate and shall be trowel-finished to provide a plumb and square opening.
- C. Where new conduit or piping is to be installed through existing concrete walls, the CONTRACTOR shall accurately position the core-drill openings. Openings shall be adequately sized to allow alignment of piping or conduit and fittings without deflection and to provide adequate clearance for satisfactory packing in the annular space between the piping or conduit and the core drilling opening as shown on the Drawings.
- D. Where new piping is to be connected to existing piping, the existing piping shall be cut square and the ends properly prepared for the connection shown on the drawings. Any damage to the lining and coating of the existing piping shall be repaired by the CONTRACTOR.
- E. Where existing equipment, equipment pads and bases, piping, piping supports, electrical panels and devices, conduits, and associated appurtenances are removed, the CONTRACTOR shall rehabilitate the affected area such that little or no evidence of the previous installation remains. Opening in concrete floors, walls, and ceiling from piping, conduit, and fastener penetrations shall be filled with non-shrink grout and finished to match the adjacent area. Concrete pads and bases for equipment and supports shall be removed by chipping away concrete and cutting any exposed reinforced steel and anchor bolts a minimum of 1-1/2 inches below finished grade. The area of concrete to be rehabilitated shall be scored by saw cutting clean, straight lines to a minimum depth of 1-1/2 inches, and all concrete within the scored lines removed to a minimum depth of 1-1/2 inches. The area within the scored lines shall be patched with non-shrink grout to match the adjacent grade and finish. Abandoned connections to piping and conduits shall be terminated with blind flanges, caps, and plugs suited for the material, type, and service of the pipe or conduit.
- F. Where existing structural steel members are removed or modified, the surface of the remaining existing steel members damaged by construction activities shall be repaired. The affected areas shall be surface prepared and coated in accordance with Section entitled "Painting".
- G. Disposal of Debris: All debris, materials, piping, and miscellaneous waste products from the work described in this section shall be removed from the project as soon as possible. They shall be disposed of in accordance with applicable federal, state, and local regulations. The CONTRACTOR is responsible for determining these regulations and shall bear all costs or retain any profit associated with disposal of these items.

#### 1.07 INSTALLATION OF EQUIPMENT

- A. CONTRACTOR shall have on hand sufficient personnel, proper equipment, and machinery of ample capacity to facilitate the work.
- B. CONTRACTOR shall be responsible for locating, aligning and leveling all equipment and shall employ a licensed surveyor to set all lines and levels of equipment to the accuracy required.
- C. Complete manufacturers installation instructions, including permissible tolerances, shall be furnished in duplicate with each unit of equipment or set of identical units.
- D. All equipment shall be installed in accordance with the shop drawings; inclusive of manufacturers specifications, drawings and tolerances; under the direct supervision of the required manufacturers ENGINEER. No instructions shall be issued that are contrary to written specifications without prior written approval by the CITY's ENGINEER.
- E. Equipment shall be erected in a neat and workmanlike manner on the foundations at the locations and elevations shown on the drawings unless otherwise indicated by the ENGINEER during installation.

#### 1.08 SUPERVISION BY MANUFACTURER'S REPRESENTATIVES

- A. The CONTRACTOR shall provide the services of qualified equipment manufacturers technical representatives who shall adequately supervise the installation and testing of all equipment furnished under this Contract and instruct the CONTRACTOR's personnel and CITY's operating personnel in its maintenance and operation.

#### 1.09 EQUIPMENT MANUFACTURER'S CERTIFICATION

- A. As a condition precedent to acceptance of equipment installed and operating, the CONTRACTOR will provide the CITY with written certification, obtained from each company manufacturing equipment for the project, that the equipment is installed and does operate in accordance with the specifications and manufacturers recommendations.

#### 1.10 SLEEVES AND OPENINGS

- A. The CONTRACTOR shall provide all openings, chases, etc., to fit his own work and that of any other subcontractors and contractors. All such openings or chases shown on the Contract Drawings, or reasonably implied thereby, or as confirmed or modified by shop, setting or erecting drawings approved by the ENGINEER, shall be provided by the CONTRACTOR.
- B. Where pipes or conduits are to pass through slabs or walls, or where equipment frames or supports are to be installed as integral part of an opening, the sleeves, opening, forms or frames shall be furnished by the installer of the pipes, conduits or equipment, but shall be placed by the CONTRACTOR.
- C. Where hanger inserts, anchor bolts and similar items are to be embedded in concrete as an integral part of a slab or wall, they shall be furnished by the installer of the pipe or other equipment requiring the hanger, etc. but shall be placed by the CONTRACTOR.
- D. When requested by the CONTRACTOR, the installer of the pipes, conduit, or equipment, including those contractors or subcontractors who require openings or chases in slabs and walls for passage of ducts, mounting or equipment, etc., shall furnish all necessary information,

instructions, and materials to effect accurate installation of the required openings, chases, sleeves, frames, inserts, etc. When such items are secured in position, and just prior to construction of the surrounding slab or wall, the subcontractor or contractor for whom the items are installed shall ascertain the proper number, locations, and settings thereof; and the CONTRACTOR shall schedule his operations so as to provide a reasonable opportunity and time interval for such inspection.

- E. Any cost resulting from correction of defective, ill-timed, or mislocated work, or for subsequent work which becomes necessary because of omitted openings, chases, sleeves, frames, inserts, etc., shall be borne by the subcontractor or contractor responsible therefor. No contractor or subcontractor shall arbitrarily cut, drill, alter, damage, or otherwise endanger the work of another Contractor. In no case shall beams lintels, or other structural members be cut without the approval of the ENGINEER. The nature and extent of any corrective or additional work shall be subject to the approval of the ENGINEER following consultation with the affected parties.

#### 1.11 OBSTRUCTIONS

- A. All water pipes, storm drains, sanitary sewers, force mains, gas or other pipe, telephone or power cables or conduits and all other obstructions, whether or not shown, shall be temporarily supported across utility line excavations. The CONTRACTOR shall be responsible for any damage to any such pipes, conduits, or structures. Approximate locations of known water, sanitary, drainage, power and telephone installations along route of new pipelines or in the vicinity of new work are shown, but must be verified in the field by the CONTRACTOR. The CONTRACTOR shall uncover these pipes, ducts, cables, etc., carefully, by hand, prior to installing new lines. Any discrepancies or differences found shall be brought to the attention of the ENGINEER in order that necessary changes may be made to permit installation of new work. These conditions are supplemental to general requirements elsewhere in the Contract Documents.

#### 1.12 SITE CONDITIONS

- A. The CONTRACTOR acknowledges that he has investigated prior to bidding and satisfied himself as to the conditions affecting the Work, including but not restricted to those bearing upon transportation, disposal, handling and storage of materials, availability of labor, water, electric power, roads and uncertainties of weather, canal stages, tides, water tables or similar physical conditions at the site, the conformation and conditions of the ground, the character of equipment and facilities needed preliminary to and during prosecution of the Work. The CONTRACTOR further acknowledges that he has satisfied himself as to the character, quality and quantity of surface and subsurface materials or obstacles to be encountered insofar as this information is reasonably ascertainable from an inspection of the site, or any contiguous site, as well as from information presented by the Drawings and Specifications made a part of this Contract, or any other information made available to him prior to receipt of Bids. Any failure by the CONTRACTOR to acquaint himself with the available information will not relieve him from responsibility for estimating properly the difficulty or cost of successfully performing the Work. The CITY assumes no responsibility for any conclusions or interpretations made by the CONTRACTOR on the basis of the information made available by the CITY.

#### 1.13 SUBSURFACE INVESTIGATIONS

- A. The CONTRACTOR shall be responsible for having determined to his satisfaction, prior to the submission of his bid, the nature and location of the work, the conformation of the ground, the character and quality of the substrata, the types and quantity of materials to be encountered, the

nature of the groundwater condition, the character of equipment and facilities required preliminary to and during the performance of the work, the general and local conditions and all other matters which can in any way affect the work under this Contract. The prices established for the work to be done shall reflect all costs pertaining to the work. Any claims for extras based on the substrata or ground water table conditions will be disallowed.

- B. The CONTRACTOR further acknowledges that he assumes all risk contingent upon the nature of the subsurface conditions actually encountered by him in performing the work covered by the Contract, even though such actual conditions may result in the CONTRACTOR performing more or less work than he originally anticipated.

#### 1.14 DIFFERING SITE CONDITIONS

- A. The CONTRACTOR shall promptly and before such conditions are disturbed, notify the CITY in writing of: (1) subsurface or latent physical conditions at the site differing materially from those indicated in this contract, or (2) unknown physical conditions at the site, of an unusual nature, differing materially from those ordinarily encountered and generally recognized as inherent in work of the character provided for this contract. The CITY will promptly investigate the conditions, and if he finds that such conditions do materially so differ and cause an increase or decrease in the CONTRACTOR's cost of, or the time required for, performance of any part of the work under this contract, whether or not changed as a result of such conditions, an equitable adjustment shall be made and the contract modified in writing accordingly.

#### 1.15 PROTECTION OF PROPERTY

- A. The CONTRACTOR shall protect all property that may be affected by his work or operations. The location and extent of underground and covered facilities are not guaranteed and the CONTRACTOR is cautioned to proceed with care in order to prevent the undermining or damage to existing utilities including piping, power cable, utility poles, conduit, duck bank, fiber optic cable, gas, telephone and cable TV services, structures, piping, and other facilities.
- B. The CONTRACTOR shall take all measures necessary to protect new and existing mechanical equipment from dust and debris. All protective measures shall be furnished, installed, lighted, ventilated, maintained, and removed at the CONTRACTOR'S own cost.
- C. When city water is being used, the supply source shall be protected against contamination in accordance with existing codes and regulations.
- D. In the event any of the CONTRACTOR'S activities were to disrupt or endanger any facilities, he shall at his own expense make all necessary repairs or replacements necessary to correct the situation to the satisfaction of the ENGINEER. Such work shall progress continuously to completion on a 24-hour per day, seven workday basis. The CONTRACTOR shall be responsible for the services of repair crews on call 24 hours per day for emergencies that arise involving work under this Contract.

#### 1.16 WEATHER CONDITIONS

- A. Work that may be affected by inclement weather shall be suspended until proper conditions prevail. In the event of impending storms, the CONTRACTOR shall take necessary precautions to protect all work, materials and equipment from exposure. The CITY reserves the right, through the opinion of the ENGINEER, to order that additional protection measures over and beyond those proposed by the CONTRACTOR, be taken to safeguard all components of the project. The CONTRACTOR shall not claim any compensation for such precautionary measures

so ordered, nor claim any compensation from the CITY for damage to the work from the elements of weather.

1.17 FIRE PROTECTION

- A. The CONTRACTOR shall take all necessary precautions to prevent fires at or adjacent to the work, including his own buildings and trailers. Adequate fire extinguisher and hose line stations shall be provided throughout the work area.

1.18 SAFETY AND HEALTH REQUIREMENTS

- A. The CONTRACTOR shall comply in every respect with all Federal, State and local safety and health regulations. Copies of the Federal Regulations may be obtained from the U.S. Department of Labor, Occupational Safety and Health Administration, 3200 East Oakland Park Boulevard, Room 204, Bridge Building, Fort Lauderdale, Florida 33300.
- B. The CONTRACTOR shall provide all barricades and flashing warning lights or other devices necessary to warn pedestrians and area traffic.

1.19 CONSTRUCTION SIGNS

- A. The CONTRACTOR shall install construction signs at the following locations:
  1. Facing north at the southwest corner of the intersection of Sheridan Street and N. 26<sup>th</sup> Avenue.
  2. Facing South at the northeast corner of the intersection of Taft Street and N. 26<sup>th</sup> Avenue.
  3. Facing west at the east side of the canal bridge on Sheridan Street.
- B. Construction signs shall be 4-foot by 6-foot by ½-inch coroplast installed with two 4-inch by 4-inch by 10-foot PVC posts.
- C. Construction sign shall have the following information below:

 <p style="margin: 0;"><b>MAYOR</b> Josh Levy</p> <p style="margin: 0;"><b>VICE MAYOR</b> Caryl S. Shuham</p> <p style="margin: 0;"><b>COMMISSIONER</b> Linda Hill Anderson</p> <p style="margin: 0;"><b>COMMISSIONER</b> Traci L. Callari</p> <p style="margin: 0;"><b>COMMISSIONER</b> Adam Gruber</p> <p style="margin: 0;"><b>COMMISSIONER</b> Kevin D. Biederman</p> <p style="margin: 0;"><b>COMMISSIONER</b> Linda Sherwood</p> <p style="margin: 0;"><b>CITY MANAGER</b> Wazir Ishmael, Ph.D.</p> <p style="margin: 0;"><b>CITY ATTORNEY</b> Douglas R. Gonzales</p> <p style="margin: 0; font-size: small;">Department of Public Utilities Director Vivek Galav, P.E.</p>	<p><b>CITY OF HOLLYWOOD, FLORIDA</b></p> <p>DEPARTMENT OF PUBLIC UTILITIES ENGINEERING AND CONSTRUCTION SERVICES DIVISION</p> <p><b>UTILITY REPLACEMENT ALONG NORTH 26 AVE (PHASE 1)</b></p> <p>CITY PROJECT #16-5133</p> <p>CONTRACTOR: XXXXXXXXXXXXXXXXXXXX</p> <p>ESTIMATED PROJECT COMPLETION DATE: XXXXXXXX 2022</p> <p>ESTIMATED CONSTRUCTION COST: \$XXXXXXX</p>
	<p><b>For further information call 954-921-3930</b></p>



The PDF format of this template can be requested from the City or the ENGINEER.

**PART 2 – PRODUCTS** (Not Used)

**PART 3 – EXECUTION** (Not Used)

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**SECTION 01520****MAINTENANCE OF FACILITIES AND SEQUENCE OF CONSTRUCTION****PART 1 - GENERAL**

## 1.01 GENERAL

The CONTRACTOR shall ensure the continuous operation of all existing sanitary sewer systems, potable water systems, and stormwater facilities during construction. In addition, the CONTRACTOR shall provide temporary traffic routing and coordinate CONTRACTOR'S work so as to minimize impact to the utilities systems located in the area. In performing the work shown and specified, the CONTRACTOR shall plan and schedule CONTRACTOR'S work as outlined in this Section.

## 1.02 CONSTRUCTION SCHEDULE

The Construction Schedule shall be submitted by the CONTRACTOR in accordance with Section 01300 of these Specifications

## 1.03 USE OF FACILITIES BEFORE COMPLETION

The CITY reserves the right to enter and use any portion of the constructed facilities before final completion of the whole work to be done under this Contract in accordance with Article 14-2, Partial Utilization of the General Conditions.

## 1.04 CONNECTION OF EXISTING SYSTEMS

All connections to existing systems shall be performed in such a manner that no damage and minimal interruption is caused to the existing installation. On completion of its installation, the CONTRACTOR shall complete the connection to the existing systems in a proper manner. Any damage caused to existing installations shall be repaired or replaced by the responsible CONTRACTOR at no additional cost to the CITY.

## 1.05 COORDINATION WITH DEPARTMENT OF PUBLIC UTILITIES PERSONNEL

- A. Before commencing work involving removing or placing in operation existing or new facilities or tie-ins to existing facilities, the CONTRACTOR shall notify the CITY at least three (3) business days in advance in writing. The CITY shall be responsible for removing facilities from operation as deemed necessary.
- B. The CONTRACTOR shall, under no circumstances, interfere with wastewater treatment plant and existing potable water, sewer and stormwater facilities without the CITY's authorization, in writing, and supervision. The CONTRACTOR shall notify the CITY's representative in writing a minimum of three work days prior to each scheduled service request. This notification shall be provided on the CITY's

standard form, or on an approved equivalent form completed in full by the CONTRACTOR.

#### 1.06 COORDINATION WITH PRIVATE PROPERTY OWNERS

Prior to commencing with construction (including mobilization and maintenance of traffic) the CONTRACTOR shall distribute copies of the "Notice to Owners" and "Right of Entry Permit" (refer to Appendix B) to all property owners/tenants within the project area and shall obtain permission from property owners/tenants prior to working within their properties.

#### 1.07 GENERAL SEQUENCE OF CONSTRUCTION AND OPERATION REQUIREMENTS

- A. Work under the Contract shall be scheduled and performed in such a manner as to result in the least possible disruption to the public's use of roadways, driveways, parking areas, and utilities. Utilities shall include but not be limited to water, sewerage, irrigation, drainage structures, gas, electrical service, cable TV services, fiber optic cables, and telephone. Prior to commencing with the WORK, CONTRACTOR shall perform a location investigation of all existing underground and above ground utilities and facilities in accordance with Section 01530 entitled "Protection of Existing Facilities". Utilities that present potential conflict with the proposed piping shall be field verified with soft digging.
- B. The outlined sequence of construction does not include all items necessary to complete the work, but is intended to identify the sequence of critical events necessary to minimize any disruptions and to avoid any impact to continued collection system service. It shall be understood by the CONTRACTOR that the critical events identified are not all inclusive and that additional items of work not shown may be required. The sequence of construction is a precedence requirement and does not attempt to schedule the CONTRACTOR' work. It is intended only to indicate which activities must precede other activities in order to minimize interference's and disruptions.
- C. All work by the CONTRACTOR that disrupts the normal utilities operations shall be shown on the Construction Schedule specified in Section 01300 and specifically scheduled with the CITY. Schedule notification shall consist of a written notice defining the work to be accomplished, the normal treatment plant that will be interrupted, the duration of the interruption, and the mitigating effort to be performed by the CONTRACTOR. The written notice shall be submitted to the CITY fourteen days in advance of the proposed work and the CITY will respond to the CONTRACTOR in writing within seven days of receipt of the notice regarding the acceptability of the proposed plan.
- D. At no time, the CONTRACTOR shall undertake closing off any pipelines, or opening valves, or take any other action which would affect the operation of the

existing system, except as specifically required by the drawings and specifications, and until authorization is granted by the CITY or ENGINEER and after proper notification.

- E. Temporary installations required to complete a particular aspect of the work during the allowed time period shall be determined by the CONTRACTOR and implemented by the CONTRACTOR at no additional cost to the CITY. All such temporary installations shall be subject to the review and acceptance of the ENGINEER.
- F. Sequence of certain major events and identification of time constraints for removing existing facilities from active service and installation of new facilities are described below in paragraph 1.08. No phase of work (or tasks within a phase) shall preclude or be performed in parallel with a subsequent phase unless specifically defined so in these documents. In all cases, work in each phase shall be checked out and accepted for satisfactory use, subject to the ENGINEER's approval, prior to the CONTRACTOR proceeding to the next phase of construction.

#### 1.08 DETAILED SEQUENCE OF CONSTRUCTION AND OPERATION REQUIREMENTS

- A. Phase I - Mobilization / Site Preparation: Mobilize for work – Video working areas, set up staging and storage areas, obtain permits, develop and submit construction schedule, submit shop drawing schedule, survey, locate existing utilities and elevations with soft digging, verify existing fittings to be connected, shop drawing submittals, and procure materials.
- B. Phase II – Construction of the Water and/or Sewer Systems and Storm Drainage Systems: The tasks included under this phase consist of installation of proposed improvements as described in the approved construction plans. This phase will be broken up into three sequenced phases: Phase 1-A, Phase 1-B, and Phase 1-C. See section 1.09 of this specification for a more detailed sequence for this phase.
- C. Phase III - Final Sitework and Closeout: Final pavement and asphalt overlay of the affected road sections, final restoration, final grading, sodding, miscellaneous work, demobilization and related closeout activities as described in Section 01700 - Project Closeout.
- D. Construction Constraints: CONTRACTOR shall comply with the following constraints during construction and utilize constraints in determining a sequence of construction:

1. Construction work during the installation of the proposed work shall be limited to the public R/W. Homeowners shall have access to their driveways at all times.
  2. The excavation area shall be surrounded with barricades and obstructions illuminated with temporary light furnished, installed and maintained by the CONTRACTOR.
  3. Final restoration of roads, driveways, sidewalks and all other paved areas shall be completed within five (10) business days after piping has been installed.
  4. Contractor is expected to work regular hours between the hours of 8:00 AM and 5:00 PM, Monday through Friday. Requests for approval to work during other than regular hours must be submitted to the ENGINEER at least 72 hours in advance of the period proposed for such overtime work and shall set forth the proposed schedule for overtime work to give ENGINEER ample time to arrange for CONTRACTOR'S personnel to be at the site of the Work, even for work required to occur by contract. Contractor shall pay for the additional engineering charges on account of the overtime work, except when overtime is associated with contract-required. Such additional engineering charges shall be a subsidiary obligation of CONTRACTOR, and no extra payment shall be made by CITY on account of such overtime work. The CONTRACTOR shall not violate the Hollywood Code of Noise Ordinance.
  5. The CONTRACTOR shall pay liquidated damages of \$500/DAY for not complying with any one of the above requirements.
- E. Construction Constraints: CONTRACTOR shall comply with the following constraints during construction and utilize constraints in determining a sequence of construction:
1. The Contractor shall coordinate with the City of Hollywood to obtain, lease, rent, or borrow private property to store construction equipment and materials. Security of construction equipment and materials is the responsibility of the Contractor. Public rights-of-way may not be utilized for storage of construction equipment or materials, and all construction equipment and materials shall be removed from the street and right-of-way overnight. Contractor shall provide the City for review proof of agreement to use a property for staging/storage.
  2. The Contractor shall pay liquidated damages of \$500 per day for not complying with the storage requirements above.

#### 1.09 DETAILED SEQUENCE OF PHASE II CONSTRUCTION

- A. Phase 1-A – Construction of the Water and Storm Drainage System on North Half of 26th Avenue: The tasks included under this phase consist of installation of proposed improvements as described in the approved construction plans. Work for this task includes all proposed improvements between New Valve A (STA 80+42.7), New Valve B, and subsequent connection to the existing system. On Sherman Street, Thomas Street, and Liberty Street, temporary piping will be required that connects the existing watermain system on each of these side streets to the new 8-inch water main until approval to proceed to Phase 1-C is granted. Milling and patching of new pipe trench shall be executed to close Phase 1-A. Contractor shall not continue to Phase 1-B until FDEP permit release has been granted and City & Engineer have provided written direction to proceed.
- B. Phase 1-B – Construction of the Water and systems on South Half of 26th Avenue: The tasks included under this phase consist of installation of proposed improvements as described in the approved construction plans. Work for this task includes all proposed improvements between New Valve C (STA 80+22.7), Existing Valve F, and subsequent connection to the newly installed system (Phase 1-A). Milling and patching of new pipe trench shall be executed to close Phase 1-B. All removed fittings shall be returned to the City. Contractor shall not continue to Phase 1-C until FDEP permit release has been granted and City & Engineer have provided written direction to proceed.
- C. Phase 1-C – Construction of the Water and Storm Drainage Systems on Sherman, Thomas, and Liberty Streets: The tasks included under this phase consist of installation of proposed improvements as described in the approved construction plans. Work for this task includes all proposed improvements to be connected to the permanent piping on Sherman Street, Thomas Street, and Liberty Street that were installed in Phase 1-A. The temporary piping and fittings connected to the existing system under Phase 1-A shall be removed and replaced with the proposed piping and fittings on each of these streets. All removed fittings shall be returned to the City. In addition, drainage improvements will be made on each of these side streets that include paving, grading, and drainage structure installation. Milling, patching, and resurfacing on these streets shall be expected to close Phase 1-C.

**Part 2 - PRODUCTS (Not Used)**

**Part 3 - EXECUTION**

3.01 COORDINATION WITH EXISTING UTILITIES AND OTHER AGENCIES:

- A. The CONTRACTOR shall coordinate with Sunshine One-Call Notification at 1-800-432-4770 a minimum of 48 business hours prior to any excavation for location of existing underground facilities.

**B. CONSTRUCTION DEWATERING:**

1. All dewatering equipment such as pumps, air compressors, generators, etc. proposed for use during construction in residential areas shall be provided with noise enclosures suitable to meet the requirements of the City of Hollywood Noise Ordinance and/or Broward County Noise Ordinance, whichever is more stringent.
2. There is no dewatering permit for this project. If the CONTRACTOR considers that as part of its means and methods of construction, a dewatering permit is required, it is the responsibility of the CONTRACTOR to secure the required permit in order to proceed with the execution of the construction.

**3.02 COOPERATION:**

The CONTRACTOR shall allow the CITY or its agents, and other project contractors or their agents, to enter facilities being constructed under this Contract for the purpose of constructing, installing, operating, maintaining, removing, repairing, altering or replacing such equipment pipes, sewers, conduits, manholes, wires, or other structures and appliances which may be required to be installed at or in the work. The CONTRACTOR shall cooperate with all the aforesaid parties and shall allow reasonable provisions for the prosecution of any other work by the CITY, or others, to be done in connection with CONTRACTOR'S work, or in connection with normal use of the facilities.

- END OF SECTION -



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**SECTION 15060****PIPING AND FITTINGS****Part 1 - GENERAL**

## 1.01 SCOPE

- A. The work included in this section consists of furnishing all material, equipment and labor, and performing all operations necessary for the complete installation of all new water main piping (PVC), fire hydrant assembly piping (DIP), fittings (ductile iron fittings for 4-inch, 6-inch, 12-inch, and 16-inch diameter water main), and accessories within the limits of work, as shown on the drawings and specified herein.
- B. Where references are made to other standards or codes, unless specific date references are indicated the latest edition of said standard or code shall govern.
- C. All new piping and fittings shall be of domestic manufacturing.

## 1.02 WORK NOT INCLUDED UNDER THIS SECTION

- A. Piping installation for various types of piping systems is specified within various other sections herein. Installations specified in this section are supplementary to those sections and in the case of conflict the more stringent condition shall prevail.

## 1.03 RELATED SECTIONS

- A. All sections specifying various types of valves.

## 1.04 PIPING LAYOUT

Field-verify dimensions prior to preparation of layout and shop drawings. Obtain shop drawing approval prior to fabrication of piping. All items not specifically mentioned in the Specifications or noted on the Drawings, but which are obviously necessary to make a complete working installation shall be included.

## 1.05 DELIVERY, STORAGE AND HANDLING

- A. During shipping, delivery and installation of pipe and accessories, handle in a manner as to ensure a sound undamaged condition.
- B. Exercise particular care not to injure pipe/fitting coatings.

## **Part 2 - PRODUCTS**

2.01 PIPE AND FITTINGS: DUCTILE IRON (pipe and fittings for fire hydrant assemblies, and ductile iron fittings for 4-inch diameter, 6-inch diameter and 8-inch diameter PVC water main pipe)

### A. GENERAL

1. As used herein, "ANSI" denotes the American National Standards Institute, "AWWA" denotes the American Water Works Association, and "ASTM" denotes the American Society for Testing and Materials.
2. All pipe and fittings to be furnished hereunder shall be manufactured in the United States, and shall conform to the referenced ANSI and/or AWWA Standard as modified herein, as appearing in the following sections.
3. All markings required on pipe and fittings, shall be clearly legible and located such that they will not be hidden or destroyed when assembled into the intended system.

### B. PIPE (for fire hydrant assemblies)

1. All pipe for fire hydrant assemblies shall be ductile iron pipe conforming to ANSI/AWWA Standard C151/A21.51, "Ductile-Iron Pipe, Centrifugally Cast, for Water". All pipe and fittings for water applications shall be in full compliance with ANSI/NSF 61, "Drinking Water System Components-Health Effects". Manufacturers shall maintain their NSF certification for the duration of the Contract and any extensions thereof.
2. The pipe thickness and outside diameter of pipe for water usage shall conform to Tables 3 and 4 (for push-on and mechanical joint pipe, respectively) of ANSI/AWWA Standard C151/A21.51 for the following sizes (The pressure class specified is the minimum permitted):

<b><u>Diameter</u></b>	<b><u>Class</u></b>
4-inch through 54-inch	Thickness Class 52

3. For restrained joint pipe, the thickness of the pipe barrel remaining after grooves are cut, if required in the design of restrained end joints, shall not be less than the nominal wall thickness of equal sized non-restrained joint pipe as shown above.
4. Each piece of pipe shall be marked as required in Subsection 4.7 of AWWA C151-02. Letters and numerals on pipe sizes 12-inch and smaller shall be not less than 3/8-inch.

5. The CITY absolutely reserves the right to require the use of higher thickness or pressure class pipe in applications where in the opinion of the ENGINEER or the CITY such use is in the best interest of the CITY. The ENGINEER's decision in this regard shall be final.
6. A sufficient quantity of non-toxic vegetable soap lubricant shall be supplied with each shipment of pipe. The soap lubricant shall be suitable for use in subaqueous trench conditions.
7. For flanged ductile-iron pipe with integrally cast flanges or threaded flanges, the nominal wall thickness of the pipe barrel shall be as specified in Section D, "Joints and Accessories", under "Flanged Joints", herein below.
8. The single gasket push-on pipe shall be shipped in standard 18-foot or 20-foot lengths, but not both. The restrained single-gasket push-on joint pipe shall be shipped in standard 18 or 20-foot lengths as specified above or fabricated lengths as noted in each order. At least two lengths of each size of single gasket push-on pipe furnished under each order shall be tested with circumferential gauges to insure that the pipe may be cut at any point along its length and have an outside diameter which will be within the manufacturer's standard design dimensions and tolerances for plain pipe. These lengths shall be identified with an easily distinguished, painted marking, longitudinally along the full length of the pipe.

### C. FITTINGS

1. Fittings Conforming with ANSI/AWWA C110/A21.10-12 (Water Use) - Restrained push-on joint fittings shall be cast ductile iron for use with ductile-iron pipe as specified above. Standard mechanical joint, push-on joint and flanged joint fittings shall also be ductile iron for use with ductile iron pipe as specified above. Cast ductile iron fittings in the 3-inch through 24-inch size range shall be pressure rated at 350 psi, minimum; (except flange-joint fittings shall be rated at 250 psi, minimum); and in the 30-inch through 48-inch size range shall be pressure rated at 250 psi, minimum. All fittings with mechanical joints, flange joints and push-on joints shall conform to ANSI/AWWA Standard C110/A21.10-98, "Ductile Iron and Gray Iron Fittings, 3-inch Through 48-inch, for Water and Other Liquids". In addition, fittings with mechanical joints and push-on joints shall conform to ANSI/AWWA Standard C111/A21.11-00, "Rubber-Gasket Joints for Ductile Iron Pipe and Fittings".

The weight of fittings shall be as given in ANSI/AWWA C110/A21.11-98 for ductile-iron fittings. The weight of mechanical joint fittings shall be as established in Tables 3 through 12.

2. Fittings Conforming with ANSI/AWWA C153/A21.53-00 (Water Use) - All fittings shall be cast ductile-iron for use with ductile-iron pipe as specified above. Fittings in the 3-inch through 24-inch size range shall be pressure

rated at 350 psi minimum; 30-inch through 48-inch size range shall be pressure rated at 250 psi minimum; and in the 54-inch through 64-inch size range shall be pressure rated at 150 psi minimum (except for those fittings such as plugs, caps and sleeves which are normally rated at a higher pressure). No flanged fittings or mixtures of flanged with other end type fittings will be allowed in the range of 3-inch through 48-inch since they are not covered in the AWWA Standard. Flanged fittings conforming with and covered by this standard are allowed in sizes 54, 60 and 64-inch. In conformance with the standard, 54, 60 and 64-inch flanged tees, crosses and reducers with outlets of smaller dimension as listed in ANSI/AWWA C153/A21.53-00 are permitted. All fittings with mechanical joints, flange joints and push-on joints shall conform to ANSI/AWWA Standard C153/A21.53-00, "Ductile-Iron Compact Fittings for Water Service". In addition, fittings with mechanical joints and push-on joints shall conform to ANSI/AWWA Standard C111/A21.11-00, "Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings" except as otherwise allowed in C153. Mechanical joint glands shall be ductile-iron only.

Since the C153 Standard provides only minimum dimensions, fully detailed drawings of all fittings proposed shall be supplied by the manufacturer with his bid. The tabulated nominal weight of each size and type of fitting shall also be supplied by the manufacturer for all items proposed. This weight shall be that of the bare casting prior to application of any lining or coating. The weight of a fitting supplied under the contract shall not be less than ninety-five (95) percent of the tabulated nominal weight supplied by the manufacturer's catalog literature for that fitting. Further, the weight of fittings supplied shall not be more than five (5) percent above the same tabulated nominal weight.

#### D. JOINTS AND ACCESSORIES

1. Push-On Type Joints (Single Gasket and Single Gasket with Gasket Restraint) - Push-on joints shall conform to ANSI/AWWA Standard C111/A21.11-12, except that the gaskets for pipe and fittings shall be neoprene where so specified.

The required number of gaskets for each push-on joint pipe plus one extra for every 50 joints or fraction thereof, shall be furnished with each order. The gaskets shall be shipped in suitable protective containers. All single-gasket pipe shall be as manufactured by United States Pipe and Foundry Company (Tyton), by the American Cast Iron Pipe Company (Fastite), by McWane, Inc. (Mix of Tyton and Fastite), Tyler/Union (Tyton) or approved equal.

Push-on joints together with both their regular and gasket-restraint gaskets shall be of the design, dimensions and tolerances of either those provided by American Cast Iron Pipe Company (Fastite/Fast-Grip) or those provided by

United States Pipe and Foundry Company (Tyton/Field Lok). No other designs shall be acceptable. If required by the CITY, the Vendor shall supply complete design drawings with dimensions, tolerances and materials of the joint and gasket being supplied within fourteen (14) calendar days of the date of receipt of the letter, fax or E-mail requiring said submission. If so required by the CITY, this submission shall be signed, sealed and dated by an ENGINEER registered to practice in the State where the manufacturer is located.

2. Mechanical Joints - Mechanical joints for fittings shall conform to ANSI/AWWA Standard C111/A21.11-12, except that the gaskets for each fitting under Groups D and D1 shall be neoprene. Bolt holes for mechanical joints shall be equally spaced, and shall straddle the vertical centerline. Tee head bolts and hexagonal nuts for all mechanical joints in fittings shall be of high strength low-alloy steel with composition, dimensions and threading as specified in ANSI/AWWA Standard C111/A21.11-00. Glands shall be of ductile-iron construction for ductile iron fittings, and cast gray iron or ductile iron for cast gray-iron fittings.

The proper number of gaskets, glands, bolts and nuts, all conforming to ANSI/AWWA Standard C111/A21.11-00, plus one extra gasket for every 10 joints or fraction thereof, shall be furnished with each order. The gaskets and joint accessories shall be shipped in suitable protective containers. Follower glands held in place with set screws will not be acceptable. Segmented glands will not be acceptable.

3. Mechanical Joint and Push-on Joint "Megalug®"-type Restraining Systems

Use of this type of restraint is restricted to underground mechanical joint or push-on joint applications,

This type of restraint may be utilized as dictated by design and/or field conditions in any mechanical joint or push-on joint underground piping system of 30-inch nominal diameter and smaller.

The CITY absolutely reserves the right to require other forms of restraint and/or thrust anchoring where, in the opinion of the ENGINEER, the use of this form of restraint is not in the best interest of the CITY. In this regard, the ENGINEER's decision shall be final.

The "Megalug®" joint-restraint systems manufactured by EBAA Iron, Inc., of Eastland Texas, will be considered the standard of quality for the purpose of evaluating substitute systems. Any entity offering a substitute system for consideration shall demonstrate to the complete satisfaction of the ENGINEER that their restraint system has been in use for a minimum of three years in the United States, and shall bear the entire burden of providing all

material, documentation and performance testing data to prove substantial equivalence of their restraint system to the "Megalug®" system.

Each thrust-resistant mechanical joint or push on joint made up with this type of restraint and the pipe and fitting of which it is a part, shall be designed to withstand an axial thrust from an internal pipeline pressure of at least 150 psi at bulkhead conditions without reduction because of its position in the pipeline nor for support from external thrust blocks.

4. Restrained Push-on Joints (Single Gasket Non-Gasket Restrained) - Restrained joints in pipe and fittings shall be of the single gasket push-on type, and shall conform to all applicable provisions of ANSI/AWWA Standard C111/A21.11-12, except that gaskets for pipe and fittings shall be neoprene, where so specified, and the following requirements:
  - (a) Thickness of the pipe barrel remaining at grooves cut, if required in the design of restrained end joints, shall not be less than the nominal wall thickness of equal sized non-restrained pipe as specified in Section B above.
  - (b) Restrained joints using field welding, set screws, or gaskets with expanding metal inserts will not be acceptable.
  - (c) The restraining components, when not cast integrally with the pipe and fittings, shall be ductile iron or a high strength non-corrosive alloy steel.
  - (d) Tee head bolts and hexagonal nuts for all restrained joints in pipe and fittings shall be of high strength low-alloy steel with composition, dimensions and threading as specified in ANSI/AWWA Standard C111/A21.11-12, except that the length of the bolts shall meet the requirements for the restrained joint design.
  - (e) The proper number of gaskets, bolts, nuts and all necessary joint material, plus one extra gasket for every 10 joints or fraction thereof, shall be furnished with each order. The gaskets and joint accessories shall be shipped in suitable protection containers.
  - (f) Each thrust-resistant joint, and the pipe and fitting of which it is a part, shall be designed to withstand the axial thrust from an internal pipeline pressure of at least 150 psi at bulkhead conditions regardless of its position in the pipeline and regardless of it being supported by external thrust blocks.
  - (g) Restrained push-on joint pipe and fittings shall be capable of being deflected after assembly. During deflection, all components in the restrained system shall be in contact to provide an equal force on all contact areas.

- (h) When restrained spigot ends are ordered for items of Group A, the corresponding bell ends of the pipe to be restrained (also within Group A), shall be furnished with the required matching restraining features at no additional cost other than the price bid per foot of pipe.
5. Flanged Joints (for connection at ground level of fire hydrant assemblies) - Connecting pieces with one end flanged and the other end either plain-end or mechanical joint, shall conform to ANSI/AWWA Standard C110/A21.10-12. Joint material for both the flanged end and the mechanical joint accessories for connecting pieces with a mechanical joint end shall be furnished as specified.

Flange adapters shall be used only on a restricted basis and shall not be used as a general substitute for regular flanged joints. Further, the CITY absolutely reserves the right to require regular flanged or other types of joints when it is considered in the CITY's best interest. The decision of the ENGINEER shall be final in such situation.

Flanges shall be made of ductile iron conforming to ASTM 536. Flange shall be restrained by a number of individual gripping wedges operated by torque-limiting actuating screws. Each flange adapter shall have a permanently cast in identification number allowing tracing of the date, foundry and pour that fabricated the unit together with all test data for the material of the pour. Records for this purpose shall be retained by the foundry for a minimum of two years after the pour date and shall be supplied to the CITY within no more than two weeks after request. Factor of safety shall be a minimum of 2 to 1.

Other types of flanged fittings and flanged-joint pipe shall conform to the following requirements unless otherwise stated in the order:

- (a) Flanged fittings shall conform to ANSI/AWWA Standard C110/A21.10-12, as specified hereinabove.
- (b) Flanged ductile-iron pipe with integrally cast flanges shall be manufactured in accordance with ANSI/AWWA Standard C151/A21.51-09, and with provisions contained hereinabove for centrifugally cast ductile iron pipe, and shall be furnished with ANSI Standard Class 125 flanges, plain-faced and drilled, conforming to ANSI Standard B16.1, "Cast Iron Pipe Flanges and Flanged Fittings", latest revision. Hollow back flanges are not acceptable.
- (c) Flanged ductile-iron pipe with threaded flanges shall be manufactured in accordance with ANSI/AWWA Standard C115/A21.15-11, "Flanged Ductile-Iron Pipe With Ductile-Iron or Gray-Iron Threaded Flanges", and shall be rated for a working pressure of 250 psi, minimum. The nominal thickness of flanged ductile-iron pipe 6-inch diameter and larger shall not



be less than those shown in Table 1 of ANSI/AWWA Standard C115/A21.15-11. The nominal thickness of 4-inch diameter flanged ductile-iron pipe shall be Class 54 (min.) conforming to Tables 3 and 4 of ANSI/AWWA Standard C151/A21.51-02. The pipe shall be furnished with ANSI Standard Class 125 flanges, plain-faced and drilled, conforming to ANSI Standard B16.1, latest revision. Hollow back flanges and grey-iron flanges shall not be acceptable for use as threaded flanges. Threaded flanges shall be individually fitted and machine tightened on the threaded pipe by the manufacturer, and shall not be interchangeable in the field. Pipe lengths shall be as ordered. Removal of flanges, cutting and re-threading the pipe, and re-installing the flanges will not be permitted in any case.

- (d) All flanges on ductile-iron pipe and fittings shall be of ductile iron. All joint materials for flanged pipe and fittings shall be supplied with all pipe or fittings ordered. Bolts and nuts shall comply with all requirements of Appendix Section A.1 of ANSI/AWWA Standard C115/A21.15-99, except that both shall be stainless steel. Unless ring gaskets are specifically called for in the order, gaskets shall be full-faced and 1/8-inch thick. Gaskets shall fully conform to the requirements of ANSI/AWWA Standard C115/A21.15-99, Appendix Section A.2, except that gaskets shall be SBR for water and neoprene for sewer usages.

#### E. LININGS AND COATINGS

##### Asphaltic Coating

All pipe and fittings shall be outside-coated with an asphaltic material applied by means of the airless spray method. The exterior coating shall meet AWWA Specifications for this type of coating, shall be smooth without pinholes, thin, bare or overly thick areas. Smoothness shall be such that when hand rubbed, no "sand paper" feeling will be experienced and such that the spigot area will readily slide through the gasket without pulling, tearing, rolling or otherwise disturbing the sealing capabilities of the gasket. Spigot ends shall be beveled prior to painting and to an extent that will permit ready insertion of the spigot through the gasket area.

##### Cement-Mortar Lining

Pipe and fittings shall be cement-lined and seal-coated in accordance with ANSI/AWWA Standard C104/A21.4-13, "Cement-Mortar Lining for Ductile-Iron Pipe and Fittings for Water".

#### 2.02 PIPE AND FITTINGS: POLYVINYL CHLORIDE (PVC)

##### A. AWWA C900 AND C905 PVC (CI) PIPE AND FITTINGS

1. TYPE C900 PVC PIPE – 4-inch through 12-inch diameter

- (a) AWWA C900 Pipe for water mains and fire hydrant assemblies shall conform to ANSI/AWWA C900, "(PVC) Pressure Pipe and Fabricated Fittings", for 4-inch through 12-inch PVC pressure pipe and fabricated fittings with cast-iron-pipe-equivalent (CI) outside diameter (OD) dimensions and with wall-thickness-dimension ratios (DR) 18.
- (b) AWWA C905 pipe for water and sewer mains and laterals shall conform to ANSI/AWWA C905, "Polyvinyl Chloride (PVC) Pressure Pipe and Fabricated Fittings, 14-inch Through 48-inch for Water Transmission and Distribution", for 14-inch through 48-inch PVC pressure pipe and fabricated fittings with cast-iron-pipe-equivalent (CI) and steel-pipe-equivalent (IPS) outside diameter (OD) dimensions and wall thickness dimension ratios (DRs) of 14, 18, 21, 25, 26, 32.5, 41, and 51, except as otherwise modified herein.
- (1) AWWA C900 and C905 pipe shall be made from PVC thermoplastic having physical and chemical properties which meet or exceed a cell classification of 12454-A or 12454-B virgin compounds as defined in ASTM Standard D 1784.
- (2) The AWWA C900 and C905 pipe shall be push-on type, with bells, spigots and elastomeric gaskets in accordance with ASTM Standard D 3139, "Standard Specification for Joints for Plastic Pressure Pipes Using Flexible Elastomeric Seals ". The gaskets shall conform to ASTM Standard F477 and shall be synthetic rubber. One gasket shall be furnished with each length of elastomeric-gasket bell-end pipe. Pipe spigots shall be beveled. Pipe bells shall be extruded integral with the pipe barrel with a thickness equal to or greater than that of the barrel.
- (3) Nominal laid length of AWWA C900 and C905 PVC (CI) pipe shall be 20 feet.
- (4) The C900 and C905 pipe shall be labeled with the following at intervals of not more than five (5) feet:
- Date of manufacture - Manufacturer's Name & Code
- Nominal size - "(CI)" - DR number – Pressure Class – Test Pressure for Hydro Tested or "NOT HYDROSTATIC PROOF TESTED" – AWWA designation number – Manufacturer's name or trade mark and production run or lot code – Seal (Mark) of the testing agency verifying suitability of material for potable water service (must be NSF).
- (5) Couplings and fabricated fittings shall be marked with:

Nominal Size – “(CI)” – Deflection angle, if applicable – “PVC” – AWWA Pressure Class – AWWA designation number of the applicable standard (C900 or C905) – Manufacturer’s name or trademark - Seal (Mark) of the testing agency verifying suitability of material for potable water service (must be NSF).

- (6) The CONTRACTOR must take special care to ensure that the pipe is not over homed during the installation process. The pipe manufacturer shall provide a home line mark on all spigots. The CONTRACTOR must install the bell of the adjacent pipe such that the edge is up to, but not over, the home line mark. The home line mark must be visible at the time of delivery and not fade during storage and installation. If the home line mark is not visible on the pipe prior to installation, the CONTRACTOR must mark the pipe with the appropriate home line marks in accordance with the guidelines provided by the manufacturer

2. TYPE C900 and C905 PVC FITTINGS (for 4-inch diameter water main piping)

- a. Fittings for AWWA C900 and C905, PVC (CI) shall conform to the requirements of ASTM Standard D1784 and the specifications for AWWA C900 and C905, PVC (CI) pipe herein, except as modified below.
- b. All fittings for C900 pipe shall be manufactured from PVC compound conforming to ASTM Standard D 1784-11. Fittings shall conform to the thickness requirements of DR18. All fittings, except wye branches, shall be Class 235 and shall be manufactured to withstand 755 psi quick burst pressure tested in accordance with ASTM Standard D 1599-99, "Standard Test Method for Resistance to Short-Time Hydraulic Pressure of Plastic Pipe, Tubing, and Fittings", and withstand 500 psi for a minimum of 1,000 hours tested in accordance with ASTM Standard D1598-02, "Test Method for Time-to-Failure of Plastic Pipe Under Constant Internal Pressure".
- c. All fittings for C905 pipe shall be manufactured from PVC compound conforming to ASTM Standard D1784-11. Fittings shall conform to the thickness requirements of DR18 for sizes 14 through 30-inch and DR25 for 36 through 48-inch. All fittings, except wye branches, shall be Class 235 for sizes 14 through 30-inch and Class 165 for 36 through 48-inch. Fittings 14 through 30-inch shall be manufactured to withstand 755 psi quick burst pressure tested in accordance with ASTM Standard D1599-99, "Test Method for Short-Time Hydraulic Failure of Plastic Pipe, Tubing, and Fittings" and withstand 500 psi for a minimum of 1,000 hours tested in accordance with ASTM Standard D1598-02, "Test Method for Time-to-Failure of Plastic Pipe Under Constant Internal Pressure". Fittings 36

through 48-inch shall be manufactured to with-stand 535 psi quick burst pressure tested in accordance with ASTM Standard D1599-99, "Test Method for Short-Time Hydraulic Failure of Plastic Pipe, Tubing, and Fittings" and withstand 350 psi for a minimum of 1,000 hours tested in accordance with ASTM Standard D 1598-02, "Test Method for Time-to-Failure of Plastic Pipe Under Constant Internal Pressure".

3. JOINT RESTRAINTS FOR C900 C905 PVC PRESSURE PIPE

For restraining C900 and C905 PVC pressure pipe and fittings, refer to Section 2.01.D.3, "Mechanical Joint and Push-on Joint "Megalug®"-type Restraining Systems", elsewhere in this specification.

B. CERTIFICATION

1. The CONTRACTOR shall provide the CITY with notarized Certifications, signed by an authorized agent of the manufacturer, that the material was manufactured, sampled, tested, and inspected in accordance with these specifications, and has been found to meet the requirements. A report of said test results shall be furnished.
2. No pipe or fitting will be accepted for use in the project until the Certifications have been sub-mitted to and approved by the CITY.

C. HANDLING AND STORING PVC PIPE AND FITTINGS

1. Pipe and fittings shall at all times be handled with great care to avoid damage. In loading or unloading operations, the manufacturer's unitized package of pipe and/or fittings shall be lifted with a forklift or other suitable equipment in such a manner as to prevent damage. Pipe may be unloaded by individual lengths. However, each length shall be slid or rolled on skidways in such a manner that the pipe is not dropped, and to avoid any shock. Under no circumstances shall pipe and/or fittings be dropped or allowed to roll or slide against obstructions.
2. Pipe and/or fittings having ultraviolet degradation, warpage, impact damage, abrasion damage, or gouges or cuts will not be accepted. Bell ends showing compression set, damage or deformation will not be acceptable.
3. Gaskets, if not prepositioned in the bell ends, shall be stored and shipped in suitable protective containers. Gaskets shall not be exposed to excessive heat, direct sunlight, oil or grease.
4. Pipe and fittings shall be stored in a manner that will prevent warpage or other damage as previously specified.
5. If the pipes are to be stored for any period in excess of six months in direct sunlight the items shall be covered with an opaque material. The cover shall

be placed in such a manner that will permit air circulation above and around the items being covered to prevent excessive heat accumulation.

6. Pipe and fittings shall be manually or mechanically lowered into the trench for installation, and shall not be thrown, dropped or pushed in the trench.

## 2.03 HIGH DENSITY POLYETHYLENE (HDPE) FOR USE IN POTABLE WATER SERVICES 1-INCH NOMINAL DIAMETER

### A. HDPE PIPE/TUBING FOR WATER SERVICES:

1. All 1-inch high density polyethylene pipe used for services shall be IPS-OD-controlled with Standard Outside Dimension Ratio (SODR) of 9, pressure rating of 200 psi, nominal outside diameter of 2.375-inches, minimum wall thickness of 0.264-inches, PE 3408, all in conformance with ASTM D3035-95 "Polyethylene (PE) Plastic Pipe (DR-PR) Based on Controlled Outside Diameter".
2. Pipe shall conform with ANSI/AWWA C901-96 "Polyethylene (PE) Pressure Pipe and Tubing, ½ In. (13 mm) Through 3 In. (76 mm), for Water Service" as modified herein.
3. Pipe shall have a (natural) inner core with a blue colored outer shell.
4. Pipe shall have footage marks at a maximum interval of every two feet.
5. Polyethylene material shall have a minimum cell classification in accordance with ASTM D3350-00 "Polyethylene Plastics Pipe and Fitting Materials" of 345444D for the core, which shall be 100% virgin material, and 345444E for the outer shell. Note that both of these materials are UV stabilized as signified by the "D" for natural colored and "E" for the colored shell.
6. Pipe shall conform with NSF 61 or 14.
7. Manufacturer shall supply certification of compliance with all of the above requirements. Certification shall ship with the pipe on material sold to the Department and shall always be submitted with shop drawings and catalogue cuts. When required by the Director of the Department of Public Utilities or his designee, certification shall be signed and sealed by a professional engineer licensed to practice in the state in which the manufacturer is located or in the State of Florida.

### B. HDPE TUBING FOR WATER SERVICES:

1. All 1-inch high density polyethylene tubing used for services shall be CTS-OD-controlled with Standard Outside Dimension Ratio (SODR) of 9, pressure rating of 200 psi, nominal outside diameter of 1.125-inches, minimum wall thickness of 0.125-inches, PE 3408, all in conformance with ASTM D2737-99 "Polyethylene (PE) Plastic Tubing".

2. Tubing shall conform with ANSI/AWWA C901 "Polyethylene (PE) Pressure Pipe and Tubing, ½ In. (13 mm) Through 3 In. (76 mm), for Water Service" as modified herein.
3. Tubing shall have a (natural) inner core with a blue colored outer shell.
4. Tubing shall have footage marks at a maximum interval of every two feet.
5. Polyethylene material shall have a minimum cell classification in accordance with ASTM D3350-00 "Polyethylene Plastics Pipe and Fitting Materials" of 345444D for the core, which shall be 100% virgin material, and 345444E for the outer shell. Note that both of these materials are UV stabilized as signified by the "D" for natural colored and "E" for the colored shell.
6. Tubing shall conform with NSF 61 or 14.
7. Manufacturer shall supply certification of compliance with all of the above requirements. Certification shall ship with the tubing on material sold to the Department and shall always be submitted with shop drawings and catalogue cuts. When required by the Director of the Department of Public Utilities or his designee, certification shall be signed and sealed by a professional engineer licensed to practice in the state in which the manufacturer is located or in the State of Florida.

#### C. MECHANICAL FITTINGS UTILIZED WITH HDPE PIPE AND TUBING WATER SERVICES

1. Mechanical fittings utilized with HDPE pipe and tubing for water services shall conform with ANSI/AWWA C800, "Underground Service Line Valves and Fittings", as modified here-in.
2. Fittings shall utilize AWWA Standard (Mueller) threads on tapped pipe and tapping saddles
3. Fittings shall be designed and manufactured to withstand a sustained working pressure of 150 psi and to restrain the pipe against pull-out under loading beyond that causing tensile yield in the HDPE pipe or tubing connected.
4. The manufacturer shall supply certification of these capabilities and fittings shall not be accepted or installed without said certification. If fittings are being supplied to the Department, the certification shall ship with the fittings and payment will not be made without this certification. At the discretion of the ENGINEER, this certification may be required to be signed and sealed by a professional engineer licensed to practice in the state where the supplying firm is located or in the State of Florida. His decision in this regard shall be final.
5. In all cases, fittings shall be installed in strict accordance with the manufacturer's instructions.

**Part 3 - EXECUTION**

## 3.01 GENERAL:

- A. The CONTRACTOR shall provide all barricades and/or flashing warning lights necessary to warn of the construction throughout the Project.
- B. Pipe and fittings shall at all times be handled with great care to avoid damage. In loading and unloading, they shall be lifted with cranes or hoists or slid or rolled on skidways in such manner as to avoid shock. Under no circumstances shall this material be dropped or allowed to roll or slide against obstructions.
- C. All work shall be performed by skilled workmen experienced in similar installations.
- D. All pipe shall be thoroughly cleaned internally before being installed. All pipes shall be flushed with water and swabbed to assure removal of all foreign matter before installation.
- E. Whenever possible, the pipe will be installed with minimum 36-inches of cover.
- F. At all horizontal or vertical pipe deviation, the CONTRACTOR shall install restrained pipe. Joints may only be opened to adjust alignment by half of the AWWA or manufacturer's recommended opening (which is smaller).

## 3.02 EXCAVATION FOR PIPING

- A. The CONTRACTOR shall make all excavation necessary for the construction of the pipelines, connections, valves and appurtenances, to the lines and grades shown on the Plans.
- B. The trench shall be excavated at least 6 inches below pipe laying grade as shown on the Plans. All sheeting and shoring shall be installed at the CONTRACTOR's expense where it is necessary for pipe installation and property protection or required by the Trench Safety Act. The cost of dewatering any excavation shall be at the CONTRACTOR's expense. The disposal of water removed from an excavation shall be in a manner which will not create a hazard, or be detrimental to the public health or to public or private property.
- C. The CONTRACTOR shall obtain all necessary permits approving the location and proposed method of disposal before discharging water from any excavation into any portion of the public right-of-way or into any existing drainage structure or facility. All construction signs required shall be provided by the CONTRACTOR.



### 3.03 INSTALLATION OF PIPE, FITTINGS AND VALVES

#### A. GENERAL:

1. The Drawings are in some cases diagrammatic. They may not show every bend, off-set, elbow or other fitting which may be required in the piping for installation in the space allotted. Careful coordination of the work of this Section with that of Division 2 is necessary to avoid conflicts.
2. The top of the pipe shall not vary by more than 2 inches from the established grade, except at points where this tolerance must be changed to clear obstructions, or make connections. Deviation from this location will be permitted only upon written instructions from the ENGINEER.

#### B. INSTALLATION OF DUCTILE IRON PIPE AND FITTINGS

1. All pipe and fittings (bends, tees, and plugs, etc.), unless otherwise specified, shall be backed with concrete to undisturbed ground. Provision shall be made to prevent concrete from adhering to plugs or bolts.
2. Bolts, nuts and rubber gaskets for use in flanged and mechanical joints shall be stored under cover. Gaskets shall not be exposed to heat, light or any petroleum products, shall be kept clean and shall not be handled with greasy or dirty hands.
3. Vegetable soap lubricant shall be applied in accordance with the pipe manufacturer's recommendations, to aid in making the joint. The workmen shall exercise caution to prevent damage to the gasket or the adherence of grease or particles of sand or dirt. Deflections shall be made only after the joint has been assembled.
4. Push-on and mechanical joints in ductile iron pipe and fittings shall be made in accordance with the manufacturer's standards except as otherwise specified herein. Joints between push-on and mechanical joint pipe and/or fittings shall be made in accordance with AWWA Standard Specification C600, "Installation of Ductile Iron Water Mains and their Appurtenances, except that deflection at joints shall not exceed one-half of the manufacturer's recommended allowable deflection, or one-half of the allowable deflection specified in AWWA C600, whichever is the lesser amount.
5. Flanged joints shall be used only where indicated on the Plans. Before making up flanged joints in the pipeline, the back of each flange under the bolt heads and the face of each flange shall have all lumps, blisters and excess bituminous coating re-moved and shall be wire brushed and wiped clean and dry. Flange faces shall be kept clean and dry when making up the joint, and the workmen shall exercise caution to prevent damage to the gasket or the adherence of grease or particles of sand or dirt. Bolts and nuts



shall be tightened by opposites in order to keep flange faces square with each other, and to insure that bolt stresses are evenly distributed.

6. Bolts and nuts in flanged and mechanical joints shall be tightened in accordance with the recommendations of the pipe manufacturer for a leak-free joint. The workmen shall exercise caution to prevent overstress. Torque wrenches shall be used until, in the opinion of the ENGINEER, the workmen have become accustomed to the proper amount of pressure to apply on standard wrenches.

#### C. INSTALLATION OF PVC PIPE:

1. PVC Pipe Joints (Push-On Joints):
2. Bevel all field-cut pipe to approximately 15 degrees for all joints except for ductile iron mechanical joints. No bevel should be placed on the pipe spigot for joining to a ductile iron mechanical joint. Remove all burrs and provide a reference mark the correct distance from the pipe end.
3. Clean the pipe end and the bell thoroughly before making the joint. Insert the O-ring gasket if required, making certain it is properly oriented. Lubricate the spigot well with an approved lubricant in accordance to manufacturer's instructions; do not lubricate the bell or O-ring unless directed otherwise by manufacturer's recommendations. Insert the spigot end of the pipe carefully into the bell until the reference mark on the spigot is flush with the entrance lip of the bell.
4. PVC pipe installation shall conform to the requirement of AWWA C605.
5. In the installation of glue joint PVC pipe, the pipe shall first be cut square and smooth. Wipe all surfaces to be connected with a cloth moistened with an appropriate solvent and remove any foreign matter from socket of fitting. Using an ordinary paint brush of width about equal to the nominal pipe size, apply a generous coat of cement to inside and shoulder of socket, flowing on but not brushing out. A similar coat shall then be applied to the end of the pipe for at least the same distance on the pipe as the depth of socket, and to the cut end. Pipe and fittings shall then be pressed firmly together and the pipe turned a quarter to a half turn to evenly distribute the cement. The cementing and joining operation must not exceed one minute. Allow 24 hours setup time before applying pressure. Sand shall be used as backfill material around pipe installed underground.
6. Thread Sealant: Teflon tape.
7. All rigid PVC pipe shall be cut, made up, and installed in accordance with the pipe manufacturer's recommendations. Plastic pipe shall be laid by snaking the pipe from one side of the trench to the other. Offset shall be as

recommended by the manufacturer for the maximum temperature variation between time of solvent welding and during operation.

8. Schedule 80 pipe shall not be threaded. Use Schedule 80 threaded nipple where necessary to connect to threaded valve or fitting.
9. Only strap wrenches shall be used for tightening threaded plastic joints, and care shall be taken not to over tighten these fittings.
10. Provide adequate ventilation when working with pipe joint solvent cement.
11. Testing: All lines shall be hydrostatically tested at the pressures specified elsewhere herein or at the design pressures.

#### D. CLEANING AND TESTING:

All of the piping installed under this project shall be tested as follows and as directed by the ENGINEER:

1. With exceptions as noted below, all ductile iron piping installed under this Contract shall be cleaned and tested according to Section 15995, "Pipeline Testing and Disinfection", and as modified below:
  - (a) Only potable water piping shall be disinfected.
  - (b) No leakage shall be permitted for any above ground piping.
2. Unless otherwise specified elsewhere herein, all PVC pressure system bushings shall be tested at 150 psig. No leakage will be permitted.

#### E. INSTALLATION OF HDPE SERVICES

All HDPE services require the use of a 10-gauge stranded copper blue tracer wire.

### 3.04 FIELD QUALITY CONTROL

- A. All water mains shall be flushed to remove all sand, debris, rock and other foreign matter. Dispose of the flushing water without causing a nuisance or property damage.
- B. Pressure and leakage testing shall follow the requirements of Section 15995, "Pipeline Testing and Disinfection".
  1. Where infiltration or exfiltration exceeds the allowable limits specified herein, the defective pipe, joints, or other faulty construction shall be located and repaired by the CONTRACTOR at no additional cost or time impact to the Contract.
  2. The CONTRACTOR shall provide all labor, equipment and materials, and shall conduct all testing required under the direction of the ENGINEER of

Record. No separate payment will be made for this work and the cost for this work shall be included in the prices quoted in the Proposal.

3. The CONTRACTOR shall locate and repair all leaks until the leakage is reduced to the limits specified. Any observed leaks or obviously defective joints or pipes shall be repaired or replaced as directed by the ENGINEER, even though the total leakage is below that specified above.

- END OF SECTION -

## **ITEM 8**

### **Updated Drawings**

# CITY OF HOLLYWOOD

FLORIDA



## UTILITY REPLACEMENT ALONG N. 26TH AVENUE (No. 16-5133)

### LOCATION MAP



CITY OF HOLLYWOOD, FL

### LIST OF DRAWINGS

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003	G-002	GENERAL NOTES AND PROJECT NOTES - SHEET 2
004	G-003	LEGEND AND ABBREVIATIONS
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013	G-012	KEY MAP - SHEET 8 OF 8
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025	G-024	PROPOSED PAVEMENT RESTORATION AND STRIPING PROJECT KEY MAP
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065	C-018	SITE PLAN N.26TH AVENUE, TAFT STREET AND WILSON STREET / N.26TH AVENUE AND HARDING STREET - SHEET 18
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081	SD-101	KEYMAP
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084	SD-202	PAVING GRADING & DRAINAGE PLAN (LIBERTY ST)
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087	SD-205	PAVING GRADING & DRAINAGE DETAILS
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### VICINITY MAP



**NOTES:**

THESE DRAWINGS HAVE BEEN PROVIDED WITH THE DEPARTMENT OF PUBLIC UTILITIES STANDARD DETAILS AND SPECIFICATIONS. ALL CONSTRUCTION WILL BE PERFORMED ACCORDING TO THE DRAWINGS AND SPECIFICATIONS.

PREPARED BY:



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**DECEMBER 2021**

**FOR BID**

FLORIDA BOARD OF PROFESSIONAL ENGINEERS  
CERTIFICATE OF AUTHORIZATION #00002602


150992-000  
SHEET NUMBER 001 OF 079

**GENERAL NOTES**

- THE INFORMATION PROVIDED IN THESE DRAWINGS IS SOLELY TO ASSIST THE CONTRACTOR IN ASSESSING THE NATURE AND EXTENT OF CONDITIONS THAT MIGHT BE ENCOUNTERED DURING THE COURSE OF THE WORK. THE BIDDERS ARE DIRECTED, PRIOR TO BIDDING, TO CONDUCT WHATEVER INVESTIGATIONS THEY DEEM NECESSARY TO ARRIVE AT THEIR OWN CONCLUSIONS REGARDING THE ACTUAL CONDITIONS THAT WILL BE ENCOUNTERED, AND UPON WHICH THEIR BIDS WILL BE BASED.
- THE CONTRACTOR IS RESPONSIBLE FOR ALL CONSTRUCTION STAKING TO INCLUDE HORIZONTAL AND VERTICAL CONTROL FOR ALIGNMENT OF WORK. ALL SURVEY WORK TO ESTABLISH THE HORIZONTAL AND VERTICAL CONTROL SHALL BE UNDER THE GUIDANCE AND DIRECT SUPERVISION OF A FLORIDA REGISTERED PROFESSIONAL SURVEYOR AND MAPPER PER FLORIDA ADMINISTRATIVE CODE, CHAPTER 61G17-6, "MINIMUM TECHNICAL STANDARDS."
- RIGHTS-OF-WAY AND PROPERTY LINES SHOWN IN THESE DRAWINGS ARE BASED ON SURVEYING PERFORMED BY GIBBS LAND SURVEYORS. CONTRACTOR SHALL UTILIZE A FLORIDA REGISTERED LAND SURVEYING FIRM TO ESTABLISH RIGHT-OF-WAY, PROPERTY, EASEMENT LINES, AND THE WATER MAIN ALIGNMENT PRIOR TO COMMENCING CONSTRUCTION ACTIVITIES.
- FIELD CONDITIONS MAY NECESSITATE ALIGNMENT AND GRADE DEVIATION OF THE PROPOSED UTILITIES TO AVOID OBSTACLES, AS DIRECTED BY THE ENGINEER.
- USE TEMPORARY SHEETING OR TRENCH BOXES TO MINIMIZE THE SIZE OF THE EXCAVATIONS AND TO PROTECT ADJACENT EXISTING ROADWAYS, UTILITIES AND OTHER FACILITIES. THERE SHALL BE NO ADDITIONAL COST TO THE OWNER UNLESS THE CONTRACTOR IS DIRECTED TO LEAVE THE SHEETING IN PLACE. THE CONTRACTOR SHALL PROVIDE ALL REQUIRED SHEETING AND TRENCH SHORING, AS REQUIRED, TO MINIMIZE TRENCH WIDTH AND PROTECT EXISTING UTILITIES THAT ARE INTENDED TO REMAIN IN SERVICE.
- EXISTING SPRINKLER/IRRIGATION SYSTEMS ARE NOT SHOWN ON THE DRAWINGS. THE CONTRACTOR SHALL TAKE PRECAUTIONARY MEASURES TO PREVENT DAMAGE TO EXISTING FACILITIES AND SHALL BE RESPONSIBLE FOR THE REPAIR OF ALL SUCH DAMAGE AT NO ADDITIONAL COST TO THE OWNER.
- IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO FIELD LOCATE ALL WATER SERVICE LINE CONNECTIONS TO BE RELOCATED PRIOR TO CONSTRUCTION. UTILITY SERVICES SHALL BE MAINTAINED AT ALL TIMES DURING CONSTRUCTION AND SWITCHOVER TO THE NEW WATER MAIN FROM THE EXISTING WATER MAIN.
- THE CONTRACTOR SHALL PROVIDE AT LEAST FORTY EIGHT (48) HOURS NOTICE TO EXISTING UTILITY COMPANIES IN ORDER TO ALLOW FOR THE LOCATION OF EXISTING UNDERGROUND UTILITIES IN ADVANCE OF CONSTRUCTION. THE CONTRACTOR SHALL CONTACT THE INDIVIDUAL UTILITY COMPANIES AND/OR "SUNSHINE STATE ONE CALL" 48 HOURS PRIOR TO OPERATIONS AT 1-800-432-4770. CONTRACTOR SHALL BE AWARE OF ALL EXISTING BURIED INFRASTRUCTURE (BT, FOC, ETC.), AND OVERHEAD UTILITIES ALONG PROJECT ALIGNMENT.
- TRENCHES SHALL BE MAINTAINED FREE OF WATER AT ALL TIMES DURING PIPE INSTALLATION. CONTRACTOR SHALL SUBMIT A DEWATERING PLAN FOR APPROVAL BY THE ENGINEER. CONTRACTOR SHALL SUBMIT AN APPLICATION FOR AND OBTAIN THE DEWATERING PERMIT.
- THE CONTRACTOR SHALL COORDINATE WITH ELECTRIC COMPANY AND OTHER OVERHEAD UTILITIES TO OBTAIN SUPPORT FOR UTILITY POLES WHERE CONSTRUCTION MAY CAUSE THE POLE TO LOSE ITS SUPPORT. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PAYMENT TO THE ELECTRIC COMPANY FOR THE SUPPORT OF ANY UTILITY POLES.
- IF IT IS NECESSARY TO SHORE, BRACE OR SWING A UTILITY, CONTRACTOR SHALL CONTACT THE UTILITY COMPANY OR DEPARTMENT AFFECTED AND OBTAIN THEIR PERMISSION REGARDING THE METHOD TO USE FOR SUCH WORK. ALL COSTS RELATED TO SERVICE, MAINTENANCE, INTERRUPTION, REPAIR, RELOCATION AND RESTORATION ARE TO BE INCLUDED IN THE CONTRACTORS BID. ANY DELAY OR INCONVENIENCE CAUSED TO THE CONTRACTOR BY THE VARIOUS UTILITIES SHALL BE INCIDENTAL TO THE CONTRACT, AND NO EXTRA COMPENSATION SHALL BE PAID. CONTRACTOR IS ADVISED TO REFERENCE ACE SURFACE UTILITY ENGINEERING STANDARDS.
- UNLESS OTHERWISE SPECIFIED, THE CONTRACTOR SHALL REPLACE ALL EXISTING PAVEMENT, STABILIZED EARTH, CURBS, DRIVEWAYS, SIDEWALKS, DRAINAGE CULVERTS, LANDSCAPING, FENCES, MAILBOXES, IRRIGATION SYSTEMS, ROADWAY/Traffic SIGNS, AND OTHER ITEMS DISTURBED BY CONSTRUCTION TO A CONDITION EQUAL TO OR BETTER THAN PRE-CONSTRUCTION CONDITIONS. CONTRACTOR SHALL REPAIR/RESTRIPE ALL RESURFACED PAVEMENT TO MATCH PRE-CONSTRUCTION CONDITIONS.
- ALL SIDEWALKS THAT BECOMES UNDERMINED OR DAMAGED MUST BE REMOVED AND REPLACED. SIDEWALKS ARE TO BE RECONSTRUCTED WITHIN TWO (2) WEEKS AFTER REMOVAL UNLESS OTHERWISE APPROVED BY THE ENGINEER. WHEN EXISTING SIDEWALK IS REMOVED, IT IS TO BE REMOVED TO THE NEAREST JOINT. ALL SIDEWALK RECONSTRUCTION SHALL BE HANDICAP ACCESSIBLE AND SHALL MEET OR EXCEED THE MOST RECENT ADA AND FLORIDA ACCESSIBILITY STANDARDS. SEE DETAIL SHEETS FOR SIDEWALK DETAIL.
- CONTRACTOR SHALL MAINTAIN PEDESTRIAN AND VEHICULAR TRAFFIC PER CITY OF HOLLYWOOD AND FLORIDA DEPARTMENT OF TRANSPORTATION REQUIREMENTS. CONTRACTOR SHALL PROVIDE ALL WARNING SIGNALS, SIGNS, LIGHTS, AND FLAGMEN AS REQUIRED BY FLORIDA DEPARTMENT OF TRANSPORTATION ROADWAY DESIGN STANDARDS ON TRAFFIC CONTROL & SAFE PRACTICES, (FDOT INDEX SERIES 600 - 660), TO ENSURE SAFE PASSAGE OF VEHICULAR AND PEDESTRIAN TRAFFIC DURING CONSTRUCTION ACTIVITIES.
- CONTRACTOR SHALL COMPLY WITH THE "TRENCH SAFETY ACT", CHAPTER 90-96, FLORIDA STATUTES.
- CONTRACTOR SHALL ENFORCE OVERLAY OUTSIDE OF INTERSECTING ROADS AND DRIVEWAYS.
- ALL STORM SEWER PIPES, CATCH BASINS, OR MANHOLES THAT BECOME UNDERMINED OR DAMAGED SHALL BE REMOVED AND REPLACED TO CITY OF HOLLYWOOD APPROVED STANDARDS, AT NO ADDITIONAL COST.
- CONTRACTOR SHALL USE EXTREME CAUTION AROUND ALL BURIED AND AERIAL ELECTRICAL FACILITIES.
- AREAS DISTURBED BY WATER MAIN INSTALLATION SHALL BE RESTORED TO THEIR ORIGINAL CONDITIONS. GRADED AREAS SHALL BE RESTORED WITH SOD PER CITY OF HOLLYWOOD. TYPE OF SOD SHALL MATCH EXISTING.
- ALL TRIMMING UNDERTAKEN ON A TREE PROTECTED BY THE PROVISION OF THE LAND DEVELOPMENT CODE SHALL BE IN ACCORDANCE WITH THE AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI) A-300 PRUNING STANDARDS AND ADMINISTERED BY A CERTIFIED ARBORIST.
- DURING LAND ALTERATION AND CONSTRUCTION ACTIVITIES, WITHIN THE DRIP LINE OF A TREE REMAINING ON SITE, UNLESS OTHERWISE APPROVED BY THE CITY, IT SHALL BE UNLAWFUL TO REMOVE VEGETATION, EXCEPT BY HAND, BY GRUBBING OR TO PLACE SOIL DEPOSITS, DEBRIS, SOLVENTS, CONSTRUCTION MATERIAL, MACHINERY OR OTHER EQUIPMENT OF ANY KIND WITHIN THE DRIP LINE OF A TREE TO REMAIN ON THE SITE.
- AVOID INSTALLATION WITHIN THE DRIP LINE OF ALL TREES. USE CAUTION AROUND TREES BY HAND DIGGING OR ROOT PRUNING WITH GUIDANCE FROM A CERTIFIED ARBORIST.
- LOCATIONS OF THE EXISTING UTILITIES ARE APPROXIMATE AND NOT NECESSARILY COMPLETE. THERE MAY BE UNDERGROUND UTILITIES OTHER THAN THOSE SHOWN. ALL UTILITIES SHALL BE PROTECTED FROM ANY DAMAGE AS A RESULT OF THE WORK INCLUDED IN THIS CONTRACT.
- CONTRACTOR SHALL MAINTAIN ALL EROSION AND SEDIMENT CONTROL MEASURES FOR THE DURATION OF THE WORK PER THE EROSION AND SEDIMENT CONTROL PERMIT OBTAINED AND PROVIDED BY CONTRACTOR, AND UNTIL REQUIRED STABILIZATION MEASURES ARE FULLY IMPLEMENTED.
- NO EXCAVATED OR BACKFILL MATERIALS SHALL BE STORED OR STOCKPILED WITHIN THE LIMITS OF THE RIGHTS-OF-WAY/CONSTRUCTION SITE OVERNIGHT.
- EXCAVATED MATERIALS DETERMINED BY THE ENGINEER/CITY NOT TO MEET THE DESIRED CHARACTERISTICS OF BACKFILL MATERIAL SHALL BE TRANSPORTED AND DISPOSED OF OFF-SITE.
- CONTRACTOR SHALL RESTORE ALL DISTURBED AREAS AFTER CONSTRUCTION IS COMPLETE. VEGETATION RESTORATION WITHIN THE LIMITS OF DISTURBANCE SHALL BE LIMITED TO SOODING, REMOVE TREES, SHRUBS, AND ROOTS WITHIN RIGHTS-OF-WAY OR LIMITS OF DISTURBANCE AS SHOWN. NO ADDITIONAL COMPENSATION WILL BE MADE FOR THESE REMOVALS. CLEARING AND GRUBBING SHALL NOT EXTEND BEYOND THE LIMITS OF THE ROADWAY RIGHT-OF-WAY. RESTORATION OUTSIDE THESE LIMITS SHALL BE AT THE CONTRACTOR'S EXPENSE.
- CONTRACTOR SHALL PROVIDE SURVEY ELEVATIONS OF EXISTING GRADE OVER TOP OF WATER MAIN AND TOP OF PIPE ELEVATION EVERY 100', AND AT CHANGES IN DIRECTION.
- CONTRACTOR SHALL MAINTAIN A WATER MAIN DEPTH OF COVER OF 36-INCHES.
- CONTRACTOR SHALL VERIFY THE LOCATION AND DEPTH OF ALL EXISTING UTILITIES PRIOR TO CONSTRUCTION AND PROVIDE REQUIRED HORIZONTAL AND VERTICAL SEPARATION IN ACCORDANCE WITH FDEP AND CITY OF HOLLYWOOD STANDARDS.
- ALL PEDESTRIAN TRAVEL WAYS SHALL BE MAINTAINED IN A SAFE CONDITION ON A COMPACTED HARD SURFACE.
- CONTRACTOR MUST MAINTAIN AND MATCH ANY SWALE ELEVATIONS OR GRADES MODIFIED BY CONSTRUCTION OF THE PROPOSED WATER MAIN.
- CONTRACTOR SHALL CONTROL ALL FUGITIVE DUST ORIGINATING FROM THE PROJECT BY WATERING OR OTHER METHODS, AS REQUIRED.
- THE CONTRACTOR IS FULLY RESPONSIBLE FOR ALL SAFETY PROCEDURES AND REQUIREMENTS. SPECIAL ATTENTION SHALL BE PAID TO OSHA CONFINED SPACE ENTRY REQUIREMENTS.
- AS AGREED, THE WORK SHALL BE BROKEN INTO TWO PHASES, WITH LIBERTY STREET ACTING AS THE DIVIDING LINE BETWEEN THE TWO PHASES. NORTH OF LIBERTY STREET IS ONE PHASE, AND SOUTH OF LIBERTY STREET IS THE OTHER PHASE.
- DUE TO THE PHASED NATURE OF THE WORK INVOLVED IN THIS PROJECT, DRAWINGS WITH THE N.L.C. NOTATION DENOTES "NOT IN CONTRACT".

- ROAD GRADER
- THE CONTRACTOR SHALL COORDINATE WITH PUBLIC WORKS FOR REMOVAL AND CLEANING OF ILLEGAL DUMPING IN THE CONSTRUCTION AREA.
- IMPORTANT NOTE #1:** SOME OF THE TRENCHING FOR THE NEW WATER MAINS ARE EXTREMELY CLOSE TO THE ELECTRIC POWER/COMMUNICATION POLES AND WILL BE ADVERSELY IMPACTED BY TRENCH EXCAVATION OF THE NARROW ALLEYS. CONTRACTOR SHALL COORDINATE WITH UTILITY COMPANY TO SUPPORT THE POLES DURING TRENCH EXCAVATION ACTIVITIES.
- IMPORTANT NOTE #2:** CONTRACTOR SHALL USE EXTREME CAUTION WHEN TRENCH EXCAVATION ACTIVITIES ARE IN THE AREA OF AM/OD UNDER ELECTRIC POWER LINES, WHICH IS HAZARDOUS, SO THE CONTRACTOR SHALL USE EXTREME CARE AND CAUTION.
- IMPORTANT NOTE #3:** CONTRACTOR SHALL COORDINATE WITH RESIDENTS CONCERNING RELOCATION OF TRASH CANS DURING CONSTRUCTION OF WATER MAINS IN ALLEYS. IF RESIDENTS DO NOT RELOCATE THE TRASH CANS, THE CONTRACTOR SHALL BE RESPONSIBLE TO RELOCATE THE TRASH CANS WITH HIS OWN STAFF.

- THE MINIMUM DEPTH OF COVER OVER D.I.P. WATER MAINS IS 30". THE MINIMUM DEPTH OF COVER OVER PVC WATER MAINS IS 36".
- WHEN PVC PIPE IS USED, A METALLIZED MARKER TAPE SHALL BE INSTALLED CONTINUOUSLY 18" ABOVE THE PIPE. THE MARKER TAPE SHOULD BE IMPRINTED WITH A WARNING THAT THERE IS BURIED PIPE BELOW. THE TAPE SHALL BE MAGNA TEC, AS MANUFACTURED BY THOR ENTERPRISES INC. OR APPROVED EQUAL.
- BACTERIOLOGICAL TESTS SHALL BE REQUESTED AND PAID FOR BY THE CONTRACTOR.
- ALL CONNECTIONS TO EXISTING MAINS SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR AND SHALL BE METED, AND THE COST OF WATER AND TEMPORARY METER SHALL BE BORNE BY THE CONTRACTOR.
- ALL PIPE ETC. SHALL BE TESTED UNDER A CONSTANT PRESSURE OF 150 PSI (FIRE MAINS TO BE TESTED TO 200 PSI) FOR 2 HOURS AND SHALL NOT EXCEED THE LEAKAGE REQUIREMENTS AS PER ANSI/AWWA SPECIFICATIONS OF 600-93 LEAKAGE FORMULA:  
L = ALLOWABLE LEAKAGE IN GALLONS PER HOUR.  
S = TOTAL LENGTH OF PIPE TESTED IN FEET.  
D = DIAMETER OF THE PIPE TESTED IN INCHES.  
P = AVERAGE TEST PRESSURE IN POUNDS PER SQUARE INCH.
- CONTRACTOR SHALL BE RESPONSIBLE FOR IDENTIFYING CONFLICTS WITH WATER MAINS PLACED AT MINIMUM COVER. IN CASE OF CONFLICT, WATER MAIN SHALL BE LOWERED TO PASS UNDER CONFLICTS WITH 18" MINIMUM SEPARATION. NO ADDITIONAL PAYMENT SHALL BE DUE TO CONTRACTOR FOR LOWERING THE MAIN OR THE ADDITIONAL FITTINGS USED THEREON.
- WHENEVER IT IS NECESSARY, IN THE INTEREST OF SAFETY, TO BRACE THE SIDES OF A TRENCH, THE CONTRACTOR SHALL FURNISH, FIT IN PLACE AND MAINTAIN SUCH SHEETING OR BRACING AS MAY BE NECESSARY TO SUPPORT THE SIDES OF THE EXCAVATION TO ENSURE PERSONNEL SAFETY, AND TO PREVENT MOVEMENT WHICH CAN IN ANY WAY DAMAGE THE WORK OR ENDANGER ADJACENT STRUCTURES. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR THE SEQUENCE, METHODS AND MEANS OF CONSTRUCTION, AND FOR THE IMPLEMENTATION OF ALL OSHA AND OTHER SAFETY REQUIREMENTS.
- AN AS-BUILT SURVEY OF THE WATER SYSTEM, PREPARED BY A FLORIDA-REGISTERED SURVEYOR, SHALL BE PROVIDED TO THE ENGINEER PRIOR TO FINAL INSPECTION. THE AS-BUILT SURVEY SHALL INCLUDE:  
a. PLAN VIEW SHOWING THE HORIZONTAL LOCATIONS OF EACH VALVE, FITTING, BEND AND HORIZONTAL PIPE DEFLECTIONS WITH COORDINATES OR IN REFERENCE TO A SURVEY BASELINE OR RIGHT-OF-WAY CENTERLINE.  
b. THE PLAN VIEW SHALL ALSO SHOW THE HORIZONTAL SEPARATION FROM UNDERGROUND UTILITIES IMMEDIATELY ADJACENT OR PARALLEL TO THE WATER MAIN.  
c. PROFILE VIEW WITH SPOT ELEVATIONS OF THE TOP OF THE MAIN AND OF THE FINISHED GRADE DIRECTLY ABOVE THE MAIN AT INTERVALS NOT TO EXCEED 100 FEET AS MEASURED ALONG THE MAIN. THE PROFILE VIEW SHALL ALSO INCLUDE SPOT ELEVATIONS AT EACH VALVE, FITTING, BEND AND VERTICAL PIPE DEFLECTION.  
d. THE PROFILE VIEW SHALL SHOW ALL UNDERGROUND UTILITIES CROSSING THE WATER MAIN AND THE VERTICAL SEPARATION BETWEEN THEM THAT UNDERGROUND UTILITY AND THE WATER MAIN.

	ISSUED: 03/01/2024	DEPARTMENT OF PUBLIC UTILITIES STANDARD DETAIL	REVISED: 06/08/2024
	DRAWN: EAM	<b>WATER MAIN CONSTRUCTION NOTES</b>	DRAWING NO: W-02
	APPROVED: XXX		3

**PROJECT NOTES:**

- ALL WORK PERFORMED SHALL BE IN FULL COMPLIANCE WITH THE REQUIREMENTS OF THE CITY OF HOLLYWOOD, ENGINEER, FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION/BROWARD COUNTY HEALTH DEPARTMENT, FLORIDA DEPARTMENT OF TRANSPORTATION (FDOT) AND ALL OTHER AGENCIES THAT MAY EXERT JURISDICTION. WHEN CONFLICTS OCCUR BETWEEN REQUIREMENTS SHOWN ON THESE DRAWINGS/SPECIFICATIONS AND REGULATORY CRITERIA, THE MORE STRINGENT REQUIREMENT SHALL PREVAIL. THE CONTRACTOR SHALL VERBALLY BRING ANY CONFLICT TO THE ATTENTION OF THE ENGINEER IMMEDIATELY, FOLLOWED BY AN OFFICIAL WRITTEN NOTIFICATION WITHIN 24 HOURS.
- DETERMINING THE ACTUAL LOCATION OF ANY EXISTING UTILITIES IS THE CONTRACTOR'S RESPONSIBILITY. BEFORE COMMENCING WORK, IT IS THE CONTRACTOR'S RESPONSIBILITY TO CONTACT THE VARIOUS UTILITY COMPANIES THAT MAY HAVE BURIED OR AERIAL UTILITIES WITHIN OR NEAR THE CONSTRUCTION AREA. (PROVIDE 48 HOURS MINIMUM NOTICE TO ALL UTILITY COMPANIES PRIOR TO BEGINNING CONSTRUCTION). THE CONTRACTOR IS FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES. THE CITY AND ENGINEER ASSUME NO LIABILITY FOR ANY DAMAGES SUSTAINED, OR COSTS INCURRED BECAUSE OF THE CONTRACTOR'S OPERATIONS IN THE VICINITY OF EXISTING UTILITIES OR STRUCTURES, NOR FOR TEMPORARY BRACING AND SHORING OF SAME. SCHEDULE AND EXECUTE ALL WORK INVOLVING EXISTING UTILITIES IN ORDER TO MINIMIZE INTERRUPTION OF SERVICES. WHENEVER SUCH INTERRUPTION IS NECESSARY FOR COMPLETION OF THE WORK, NOTIFY THE ENGINEER AND THE CITY AT LEAST 48 HOURS IN ADVANCE. ALL WORK TO REPAIR/RESTORE UTILITY SERVICE SHALL BE PERFORMED AS REQUIRED BY THE APPROPRIATE UTILITY. IF IT IS NECESSARY TO SHORE, BRACE, OR SWING A UTILITY, CONTACT THE UTILITY COMPANY OR DEPARTMENT AFFECTED AND OBTAIN THEIR PERMISSION REGARDING THE METHOD TO USE FOR SUCH WORK. ALL COSTS RELATED TO SERVICE, MAINTENANCE, INTERRUPTION, REPAIR, RELOCATION, AND RESTORATION ARE TO BE INCLUDED IN THE CONTRACTOR'S BID. ANY DELAY OR INCONVENIENCE CAUSED TO THE CONTRACTOR BY THE VARIOUS UTILITIES SHALL BE INCIDENTAL TO THE CONTRACT, AND NO EXTRA COMPENSATION SHALL BE PAID.

- CONTRACTOR SHALL KEEP THE CONSTRUCTION AREA CLEAN. THE CONTRACTOR SHALL CLEAN UP THE SITE DAILY AND SWEEP THE ENTIRE CONSTRUCTION AREA EVERY TWO (2) WEEKS. CLEANING EQUIPMENT SHALL INCLUDE BUT IS NOT LIMITED TO:  
STREET SWEEPERS/STREET CLEANER  
WATER TRUCK

**GIBBS LAND SURVEYORS**  
 2131 HOLLYWOOD BOULEVARD, SUITE 204  
 HOLLYWOOD, FL 33020 (954) 923-7666  
 LICENSED BUSINESS NO. 7018

**Brown and Caldwell**  
 1560 SAWGRASS CORPORATE PARKWAY, SUITE 240  
 SUNRISE, FLORIDA 33323  
 PHONE: 954-200-7611 FAX: 954-200-7612  
 FLORIDA BOARD OF PROFESSIONAL ENGINEERS  
 CERTIFICATE OF AUTHORIZATION NO. 00002602

**SOLUTIONS**  
 410 NE 14th Court, No. 2 Fort Lauderdale, FL 33316  
 Phone 954.320.7899 Fax: 954.320.7800

**FOR BID**

ZONE	REV.	DESCRIPTION	BY	DATE	APP.
1		REVISED BY ENGINEER	GI	2/8	DH

Diego M. Herrera  
 Florida PE 73143

**REVISIONS**

ZONE	REV.	DESCRIPTION	BY	DATE	APP.
1		REVISED BY ENGINEER	GI	2/8	DH

**City of HOLLYWOOD FLORIDA**

**GENERAL**  
**GENERAL NOTES AND PROJECT NOTES - SHEET 1**

**CITY OF HOLLYWOOD, FL WATER MAIN REPLACEMENT PROJECT (NO. 16-5133) PHASE 1**

FILENAME: 150992-G-001
BC PROJECT NUMBER: 150992
CITY PROJECT NUMBER: 16-5133
DRAWING NUMBER: 150992-G-001
SHEET NUMBER: 002 OF 79

Path: C:\Users\gibbsland\OneDrive\Documents\150992-G-001.dwg - Plot Date: February 5, 2022 - 4:11 PM - CADD User: Gennaro Ibsel  
 File Name: 150992-G-001.dwg - Plot Date: February 5, 2022 - 4:11 PM - CADD User: Gennaro Ibsel



**GENERAL NOTES FOR UTILITY CONSTRUCTION:**

- UNDER NO CIRCUMSTANCES SHALL PIPE BE LAID IN A WET TRENCH, OR STRUCTURES BE CONSTRUCTED IN A WET EXCAVATION. DEWATERING SHALL BE INCLUDED IN THE CONTRACTORS BID PRICE.
- THE PIPE SHALL BE INSTALLED TO THE GRADE AND ELEVATIONS SHOWN ON THE CONTRACT DRAWINGS. CONTRACTOR SHALL MAINTAIN POSITIVE DRAINAGE DURING PIPELINE CONSTRUCTION.
- IF NECESSARY, USE TEMPORARY SHEETING OR TRENCH BOXES TO MINIMIZE THE SIZE OF THE EXCAVATIONS AND TO PROTECT ADJACENT EXISTING ROADWAYS, UTILITIES AND OTHER FACILITIES. THERE SHALL BE NO ADDITIONAL COST TO THE CITY UNLESS THE CONTRACTOR IS DIRECTED TO LEAVE THE SHEETING IN PLACE.
- TRENCHES SHALL BE BACKFILLED AND LEVELED WITH THE APPROVED ASPHALTIC CONCRETE PATCH NO LATER THAN ONE (1) WEEK AFTER THE TRENCH IS EXCAVATED. STEEL PLATES SHALL BE USED WITHIN ONE (1) WEEK OF TRENCH EXCAVATION.
- NO TRENCH SHALL BE LEFT OPEN OVERNIGHT. BACKFILL ALL TRENCHES WHILE WAITING FOR MATERIALS OR FOR DECISIONS. INSTALL AND SECURE STEEL PLATES OVER ALL TRENCHES. THE ENDS OF ALL PIPE SHALL BE PLUGGED AT THE CLOSE OF EACH DAYS WORK.
- ALL WATER MAIN PIPES, FITTINGS, VALVES, AND FIRE HYDRANTS SHALL BE IN CONFORMANCE WITH APPLICABLE AMERICAN WATER WORKS ASSOCIATION (AWWA) STANDARDS, AND THE CITY OF HOLLYWOOD STANDARDS. ALL PACKING AND JOINTING MATERIALS USED IN THE JOINTS OF WATER MAIN PIPE SHALL BE IN CONFORMANCE WITH APPLICABLE AWWA STANDARDS.
- PRIOR TO CONNECTION TO ACTIVE WATER MAINS AND BEFORE BEING PLACED INTO SERVICE, ALL PRESSURE PIPELINES SHALL BE PRESSURE TESTED AND LEAK TESTED IN ACCORDANCE WITH AWWA STANDARD C600 AND THE CONTRACT DOCUMENTS. AFTER PASSING PRESSURE AND LEAKAGE TESTS, ALL PRESSURE PIPELINES SHALL BE FLUSHED. WATER MAINS SHALL BE PIGGED BEFORE THEY ARE FLUSHED.
- INSTALL AIR RELEASE VALVES AT ALL HIGH POINTS, REGARDLESS OF WHETHER THEY ARE CALLED FOR ON THE DRAWINGS. COORDINATE ADDITIONAL AIR RELEASE VALVE LOCATIONS WITH ENGINEER.
- PERFORM SURFACE RESTORATION FOLLOWING PIPELINE INSTALLATION, INCLUDING ROADWAY, DRIVEWAY, LANDSCAPING, GRASSING OR OTHER. RESHAPE DITCHES TO PRE-CONSTRUCTION CONTOURS. GRASSING SHALL BE INSTALLED WHERE EXISTING GRASS HAS BEEN DAMAGED BY CONSTRUCTION. THE CONTRACTOR SHALL RESTORE ALL PAVED DRIVEWAY OPEN CUTS WITHIN 24 HOURS WITH "ALL WEATHER SURFACE" UNTIL FINAL RESTORATION IS COMPLETE. THE CONTRACTOR SHALL RESTORE DIRT DRIVEWAYS WITHIN 24 HOURS WITH BETTER OR SAME TYPE OF BASE MATERIAL.
- DUCTILE IRON PIPE (DIP) - (FOR FIRE HYDRANT ASSEMBLIES) SHALL CONFORM TO ANSI/AWWA STANDARD C151/A21.51, THICKNESS CLASS 52, AND SHALL BE IN FULL COMPLIANCE WITH ANSI/NFPA1 AND HAVE CEMENT LINED AND SEAL COATED INTERIOR.  
DUCTILE IRON PIPE (DIP) FITTINGS SHALL BE RESTRAINED AND SHALL CONFORM TO ANSI/AWWA C153/A21.53.00.  
POLYVINYL CHLORIDE PIPE (PVC) SHALL CONFORM TO ANSI/AWWA C900 WITH CAST IRON EQUIVALENT DIMENSIONS (OUTSIDE DIAMETER), WITH A WALL THICKNESS DIMENSION RATIO (DR) OF 18.

- ALL PIPE AND PIPE FITTINGS INSTALLED UNDER THIS PROJECT SHALL BE COLOR CODED OR MARKED IN ACCORDANCE WITH SUBPARAGRAPH 62-55.32(2)(B)3, F.A.C.
  - DUCTILE IRON PIPE SHALL ALSO BE STRIPPED PER COLOR CODE SERVICE:  
POTABLE WATER = BLUE  
STRIPES SHALL BE 2" MINIMUM WIDTH NUMBER OF STRIPES REQUIRED SHALL BE AS FOLLOWS:

PIPE DIA.	MINIMUM NO. OF STRIPES	COMMENTS
4" TO 8"	2	ONE MUST BE ON TOP OF INSTALLED PIPE ONE MUST BE ON TOP OF INSTALLED PIPE
10" TO 16"	3	ONE MUST BE ON TOP OF INSTALLED PIPE
20" +	4	ONE MUST BE ON TOP OF INSTALLED PIPE

- ALL TRAFFIC CONTROL DEVICES MAINTAINED BY BROWARD COUNTY, THAT ARE REMOVED OR DAMAGED BY CONSTRUCTION, SHALL BE REPLACE USING CURRENT BROWARD COUNTY TRAFFIC ENGINEERING DIVISION STANDARDS.
- ALL PAVEMENT MARKINGS AND SIGNING DAMAGED DURING CONSTRUCTION, SHALL BE RESTORED TO BROWARD COUNTY TRAFFIC ENGINEERING STANDARD (CURRENT EDITION).
- ALL SIGNAL/STREET LIGHT FACILITIES DAMAGED DURING CONSTRUCTION, SHALL BE RESTORED TO BROWARD COUNTY TRAFFIC ENGINEERING STANDARD (CURRENT EDITION).
- ALL INSTALLATIONS WITHIN BROWARD COUNTY JURISDICTION RIGHTS OF WAY SHALL BE IN CONFORMITY WITH "BROWARD COUNTY ENGINEERING DIVISION MINIMUM STANDARDS".
- PRIOR TO MOBILIZATION, CONTRACTOR TO SUBMIT APPROVED TRAFFIC CONTROL AND ROAD CLOSING PLANS PER SECTION 01500 OF THE SPECIFICATIONS.
- DURING CONSTRUCTION, ROADWAYS SHALL HAVE NO MORE THAN 1-INCH ELEVATION DIFFERENCE, AND PEDESTRIAN WALKWAYS SHALL HAVE NO MORE THAN 1/4-INCH ELEVATION DIFFERENCE. THE CONTRACTOR SHALL FILL ELEVATION DIFFERENCES CAUSED BY ELEVATION OF TRENCH, VALVE BOXES, MANHOLE COVERS, ETC. WITHIN 24 HOURS.

**PAVEMENT RESTORATION NOTES:**

- FOR ALL STREETS AND AVENUES DISTURBED BY THE INSTALLATION OF THE WATER MAIN, CONTRACTOR SHALL INSTALL A 2-INCH THICK PATCH OVER 12 INCHES OF NEW LIME ROCK TO REPLACE ASPHALT AND BASE MATERIAL REMOVED DURING PIPE TRENCHING ACTIVITIES. THE ASPHALT PAVEMENT, ETC. FROM THE PIPE TRENCH EXCAVATION SHALL BE REMOVED AND DISPOSED OF BY THE CONTRACTOR. CONTRACTOR SHALL INSTALL 2-INCH THICK ASPHALT PATCH ON THE TRENCH TO BE FLUSH WITH THE EXISTING ADJACENT ASPHALT ON ALL DISTURBED STREETS AND AVENUES.
- CONTRACTOR SHALL PERFORM MILLING TO REMOVE 1-INCH OF THE FULL WIDTH OF THE EXISTING ASPHALT PAVEMENT AND 1-INCH OF THE PREVIOUSLY INSTALLED 2-INCH THICK ASPHALT PIPE TRENCH PATCHES. THIS SHALL BE FOR THE FULL WIDTH OF THE STREETS AND AVENUES THAT WERE DISTURBED BY THE INSTALLATION OF THE WATER MAIN. TIMING OF MILLING ACTIVITIES SHALL BE COORDINATED WITH THE CITY.
- AFTER THE MILLING OF THE FULL WIDTH (INCLUDING TRENCH PATCH) OF THE STREETS AND AVENUES THAT WERE DISTURBED BY THE INSTALLATION OF THE WATER MAIN, THESE STREETS AND AVENUES SHALL BE PAVED WITH 1-INCH OF ASPHALT PAVEMENT (FDOT SUPERPAVE SP 9.5) FOR THE FINAL WEAR SURFACE. TIMING OF MILLING ACTIVITIES SHALL BE COORDINATED WITH THE CITY. IN ADDITION, THIS INCLUDES, BUT IS NOT LIMITED TO, TACK COAT, SPEED HUMPS, AND OTHER ASPHALT RELATED ITEMS.
- THE EXISTING ASPHALT PAVEMENT FOR THE FULL WIDTH AND LENGTH OF ALL ALLEYS/BLOCKS THAT WERE DISTRIBUTED BY THE INSTALLATION OF THE WATER MAIN SHALL BE REMOVED AND DISPOSED OF BY THE CONTRACTOR. THE CONTRACTOR SHALL RE-GRADE THE EXISTING LIME ROCK BASE, INSTALLING ADDITIONAL LIME ROCK BASE, AS NEEDED, TO MATCH THE EXISTING ALLEY BASE GRADE. NO PATCHING OF THE PIPE TRENCH IN THE DISTURBED ALLEYS/BLOCKS IS REQUIRED, AS THE EXISTING ASPHALT IS TO BE REMOVED AND DISPOSED OF BY THE CONTRACTOR.
- FOR THE WIDTH AND LENGTH OF ALL ALLEYS/BLOCKS THAT WERE DISTURBED BY THE INSTALLATION OF THE WATER MAIN, INSTALL 2-INCH THICKNESS OF ASPHALT PAVEMENT (IN TWO SEPARATE LIFTS AND AT TWO DIFFERENT TIME FRAMES - AN INTERIM AND THEN FINAL WEAR SURFACE). THE NEW PAVEMENT (FDOT SUPERPAVE SP 9.5) SHALL BE INSTALLED TO MATCH THE EXISTING ALLEY ASPHALT GRADE. IN ADDITION, THIS INCLUDES, BUT IS NOT LIMITED TO, TACK COAT AND OTHER ASPHALT RELATED ITEMS. TIMING OF PAVEMENT ACTIVITIES SHALL BE COORDINATED WITH THE CITY.
- CONTRACTOR SHALL INSTALL PAVEMENT MARKINGS (TEMPORARY AND PERMANENT) AND SIGNAGE FOR THE STREETS, AVENUES AND ALLEYS. THIS WORK SHALL ALSO INCLUDE, BUT NOT BE LIMITED TO, STRIPES (VARIOUS), RPMs, 10-30 SKIP, PAVEMENT MESSAGE, SPEED HUMP MARKINGS, REMOVAL AND RELOCATION OF SIGNS, NEW SIGN INSTALLATION, REPLACEMENT OF DAMAGED SIGNS (WHETHER SHOWN ON THE DRAWINGS OR NOT WITHIN PROJECT LIMITS), AND MODIFICATIONS TO EXISTING SIGNS.
- SEE THE CITY'S STANDARD DETAIL FOR PAVEMENT RESTORATION, DETAIL 4 ON SHEET 150992-CD-001.

**EROSION CONTROL NOTES:**

- NO UNAUTHORIZED DISTURBANCE OF EXISTING WETLANDS WILL BE PERMITTED. TEMPORARILY INSTALL SILT FENCES, BARRIERS OR HAY BALES IMMEDIATELY ADJACENT TO AND UPDRAIN FROM ALL EXISTING WETLANDS PRIOR TO CONSTRUCTION ACTIVITIES THAT MIGHT IMPACT THE WETLANDS. REMOVAL ALL WETLAND PROTECTION MEASURES AFTER THE PROJECT HAS BEEN ACCEPTED BY THE CITY. THIS WORK SHALL BE PERFORMED AT NO ADDITIONAL EXPENSE TO THE CITY WHILE COMPLYING WITH FLORIDA DEPARTMENT OF TRANSPORTATION'S ROADWAY AND TRAFFIC DESIGN STANDARDS, INDEX 102, LATEST EDITION.
- ALL CONSTRUCTION ACTIVITIES SHALL INCORPORATE BEST MANAGEMENT PRACTICES FOR THE CONTROL OF EROSION, SEDIMENTATION AND THE POTENTIAL FOR DOWNSTREAM WATER QUALITY DEGRADATION. CONSTRUCTION PRACTICES INCLUDE:
  - CONSTRUCT TEMPORARY SEDIMENTATION BASINS OR EARTHEN BERMS AT DOWN-GRADIENT ENDS OF NEWLY GRADED AREAS TO PROVIDE FOR SEDIMENT AND TURBIDITY REMOVAL.
  - LIMIT SITE CLEARING TO THOSE AREAS REQUIRED FOR A PARTICULAR PHASE OF CONSTRUCTION. EXISTING TREES AND VEGETATION ARE TO REMAIN, WHEREVER POSSIBLE.
  - TURBIDITY BARRIERS, HAY BALES, AND OTHER EROSION CONTROL MEASURES SHALL REMAIN IN PLACE UNTIL CONSTRUCTION ACTIVITIES ARE COMPLETE AND THE POTENTIAL FOR EROSION IS ELIMINATED.
- SEED AND MULCH (LAKE, DITCH, AND SWALE BANKS) AS SOON AS POSSIBLE AFTER CONSTRUCTION IN ORDER TO STABILIZE THE SLOPES AND MINIMIZE EROSION. IN AREAS DELINEATED AS WETLANDS, RE-VEGETATE IN ACCORDANCE WITH PERMIT CONDITIONS.
- DO NOT EMPLOY SILT FENCES IN A MANNER TO CAUSE THEM TO ACT AS A DAM ACROSS PERMANENTLY FLOWING WATERCOURSES. USE SILT FENCES AT UPDRAIN LOCATIONS, AND TURBIDITY BARRIERS IN PERMANENT WATER BODIES, REGARDLESS OF WATER DEPTH.
- TURBIDITY BARRIERS FOR STREAMS AND CREEKS MAY BE EITHER FLOATING OR STAKES TYPE, OR ANY COMBINATION OF TYPES THAT WILL SUEE SITE CONDITIONS, AND MEET EROSION CONTROL AND WATER QUALITY REQUIREMENTS. INSTALL POSTS IN STAKED TURBIDITY BARRIERS IN THE VERTICAL POSITION UNLESS OTHERWISE NOTED.

**GENERAL MECHANICAL NOTES NOTES:**

- THE CONTRACTOR SHALL TAKE ALL PRECAUTIONS TO PREVENT PVC PIPE CUTTINGS/FLINGS FROM ENTERY THE PIPING AND SHALL FULLY FLUSH AND DRY THE PIPING SYSTEM PRIOR TO PLACING IT INTO SERVICE.
- THE CONTRACTOR SHALL MAKE ALL PROVISIONS FOR DRAINING ALL WATER/TESTING FLUIDS FROM THE PIPING AND SHALL DRY ALL PIPING SYSTEMS PRIOR TO TURNING OVER THE SYSTEM TO THE CITY.
- CONTRACTOR TO COORDINATE WITH CITY TO FACILITATE THE SHUTDOWNS OF EXISTING WATER MAINS NECESSARY FOR TIE-INS.

**UTILITY CONTACT INFORMATION:**

- CONTRACTOR SHALL CONTACT THE FOLLOWING AGENCIES PRIOR TO CONSTRUCTION:
- AT&T
  - BROWARD COUNTY OES - TRAFFIC ENGINEERING DIVISION
  - BROWARD COUNTY OES - WATER SUPPLY
  - COMCAST CABLE
  - CITY OF HOLLYWOOD PUBLIC UTILITIES PUBLIC WORKS DEPT
  - FLORIDA GAS TRANSMISSION COMPANY
  - FLORIDA POWER & LIGHT
  - FIBERNET DIRECT
  - TECO PEOPLES GAS - SOUTH FLORIDA
  - NO COMMUNICATIONS

**LEGEND:**

	FLAG POLE		TREE
	CABLE TV RISER		BUSH
	TELEPHONE RISER		HEDGE
	ELECTRIC BOX		PALM
	BACKFLOW PREVENTER		INDICATES SET NAIL & TAB CONTROL POINT
	SIAMESE CONNECTION		METAL FENCE
	BOLLARD		METAL FENCE
	METAL LIGHT POLE		METAL FENCE
	BACKFLOW PREVENTER		METAL FENCE
	GATE VALVE		METAL FENCE
	EXISTING WATER METER		METAL FENCE
	EXISTING WATER METER		METAL FENCE
	NEW WATER METER		METAL FENCE
	RELOCATED WATER METER		METAL FENCE
	FIRE HYDRANT ASSEMBLY		METAL FENCE
	MANHOLE - SEE SURVEY		METAL FENCE
	CATCH BASIN		METAL FENCE
	SOIL BORINGS		METAL FENCE
	WOOD POWER POLE		METAL FENCE
	CONCRETE POWER POLE		METAL FENCE
	ANCHOR/GUY WIRE		METAL FENCE
	CONCRETE LIGHT POLE		METAL FENCE
	TRAFFIC SIGN POST		METAL FENCE
	CLEANOUT		METAL FENCE
	OFFICIAL RECORD BOOK		METAL FENCE
	BROWARD COUNTY RECORDS		METAL FENCE

**BROWARD COUNTY HEALTH DEPARTMENT GENERAL PERMIT PLAN REVIEW CHECKLIST**

(FOR USE BY BROWARD COUNTY HEALTH DEPARTMENT AS A REVIEW CHECKLIST FOR THIS SET OF CONTRACT DRAWINGS)

- APPLICATION FORM (FILLED OUT COMPLETELY) - SEE ATTACHED APPLICATION FORM AND ADDENDA DRAWINGS
- SIGNATURES/SEALS/DATES - PERFORMED BY PROFESSIONAL ENGINEER IN RESPONSIBLE CHARGE ON ALL DRAWING SHEETS
- SERVICE LINES < 2" - SEE NOTES ON THE INDIVIDUAL DRAWING SHEETS
- SMALL SCALE LOCATION - SEE NOTES ON THE INDIVIDUAL DRAWING SHEETS
- VALVE DESIGNATION - SEE SYMBOLS AND NOTES ON THE INDIVIDUAL DRAWING SHEETS AND LEGEND ON SHEET 150992-G-003
- SAMPLE POINT DESIGNATION - SEE SAMPLE POINTS (SP#H) ON THE INDIVIDUAL DRAWING SHEETS
- WATER AND SEWER MAIN SEPARATION - SEE DETAIL 15 ON SHEET 150992-CD-003
- PIPE SPECIFICATIONS [C151 (CLASS)/C900(SDR)] - SEE NOTES ON THE INDIVIDUAL DRAWING SHEETS
- MINIMUM PIPE COVER [36-INCHES - SEE NOTES ON THE INDIVIDUAL DRAWING SHEETS]
- TEST PRESSURE, TIME AND ALLOWABLE LEAKAGE (REFERENCE TO C600-05) - SEE NOTE ON SHEET 150992-G-001
- COLOR CODING REQUIREMENTS (62-555.320) - SEE NOTES ON THE INDIVIDUAL DRAWING SHEETS
- LOGO, SHEET NO., PROJECT NAME, NORTH ARROW & SCALE - SEE INDIVIDUAL DRAWING SHEETS
- SAMPLING POINT DETAIL - SEE NOTE ON SHEETS 150992-C-025 THROUGH 150992-C-025 REFERENCING A MAXIMUM SPACING OF 1,200 FEET - SEE THE LOCATION OF THE REQUIRED SAMPLING POINTS (SP#H) ON THE INDIVIDUAL DRAWING SHEETS, AND SEE DETAIL 12 ON SHEET 150992-CD-003
- SERVICE CONNECTION DETAIL - SEE DETAIL 5 ON SHEET 150992-CD-001
- THRUST BLOCK/RESTRAINED PIPE DETAIL - SEE DETAIL 10 ON SHEET 150992-CD-002
- FLUSHING RISER/BLOW-OFF DETAIL - SEE DETAIL 11 ON SHEET 150992-CD-002
- FIRE HYDRANT DETAIL - SEE DETAIL 9 ON SHEET 150992-CD-002
- FILL AND FLUSH DETAIL - SEE DETAIL 12 ON SHEET 150992-CD-003 (INCLUDES TWO CHECK VALVES OR AN R/C, RATHER THAN ONLY A SINGLE CHECK VALVE)
- BACKFLOW PREVENTER DETAIL - SEE DETAIL 17 ON SHEET 150992-CD-004
- DISINFECTION SPECS. (AWWA C651-05, OR MOST CURRENT VERSION) - SEE DETAIL 12 ON SHEET 150992-CD-003
- WATER MAIN APPLICATION FEE - \$4,481.25 (COMPUTED FROM APPLICATION FORM) - SEE ATTACHED CHECK
- DEP FEE - \$650.00 - SEE ATTACHED CHECK
- ALL WATER MAINS SHALL BE INSTALLED WITH A MINIMUM COVER OF 36-INCHES FOR PVC AND 30-INCHES FOR DIP. INCLUDE THIS COMMENT ON THE ENGINEERING PLANS OF FUTURE WATER PROJECT SUBMITTALS TO THIS DEPARTMENT. COVER OF 36-INCHES USED FOR THIS PROJECT; SEE NOTES ON THE INDIVIDUAL DRAWING SHEETS.
- ALL SIGNATURES ON THE APPLICATION FORMS SHALL BE DATED. SEE SIGNATURES AND DATES ON PERMIT APPLICATION FORMS.
- ALL WATER MAIN INSTALLATIONS SHALL COMPLY WITH THE COLOR CODING REQUIREMENTS OF CHAPTER 62-555.320, FAC. INCLUDE THIS STATEMENT ON THE ENGINEERING PLANS OF FUTURE WATER PROJECT SUBMITTALS TO THIS DEPARTMENT. SEE NOTES ON THE INDIVIDUAL DRAWING SHEETS.
- NO BENEFICIAL USE SHALL BE MADE OF THE PROPOSED WATER MAINS TO BE INSTALLED PER THIS PERMIT WITHOUT WRITTEN APPROVAL FROM BROWARD COUNTY HEALTH DEPARTMENT. THE FOLLOWING NOTE WILL BE IN THE NOTES ON SHEET 150992-G-001. BENEFICIAL USE OF THE WATER MAIN WILL NOT OCCUR UNTIL RECEIPT OF APPROVAL FROM BROWARD COUNTY HEALTH DEPARTMENT AFTER SUBMITTAL OF THE FDP FORM 62-555.300(9) ENTITLED "CERTIFICATION OF CONSTRUCTION COMPLETION AND REQUEST FOR CLEARANCE TO PLACE PERMITTED PWS COMPONENTS INTO OPERATION" AND THE REQUIRED SUPPORTING DOCUMENTATION.
- HYDROSTATIC TESTING OF NEW MAINS SHALL BE PERFORMED FOR A MINIMUM PERIOD OF 2 HOURS AT A MINIMUM STARTING PRESSURE OF 130 PSI AND THE FORMULA FOR CALCULATING THE MAXIMUM ALLOWABLE LEAKAGE BE APPLIED AS PER THE ANSI/AWWA G600-05 STANDARD, OR MOST CURRENT VERSION. THIS REQUIREMENT REGARDING HYDROSTATIC TESTING IS INCLUDED IN NOTES ON THE INDIVIDUAL DRAWING SHEETS, AND IN THE NOTES ON SHEET G-001.
- UPDATED REFERENCE TO CURRENT ANSI/AWWA STANDARDS (AWWA 600-05, OR MOST CURRENT VERSION) PROPER FORMULA FOR DETERMINING ALLOWABLE LEAKAGE: Q = LD X SQUARE ROOT OF P / 48,000 WHERE Q = QUANTITY OF MAKEUP WATER (IN GALLONS PER HOUR), L = LENGTH OF PIPE SECTION BEING TESTED (IN FEET), D = NOMINAL DIAMETER OF THE PIPE (IN INCHES), AND P = AVERAGE TEST PRESSURE DURING THE HYDROSTATIC TEST (IN POUNDS PER SQUARE INCH GAUGE). THIS EQUATION FOR ALLOWABLE LEAKAGE IS INCLUDED IN NOTES ON THE INDIVIDUAL DRAWING SHEETS, AND IN THE NOTES ON SHEET G-001.
- WATER MAIN DEAD ENDS THAT ARE ANY GREATER THAN 20 FEET FROM A TEE ARE REQUIRED TO HAVE A BLOW-OFF ASSEMBLY OR FIRE HYDRANT. SEE NOTES ON THE INDIVIDUAL DRAWING SHEETS.

**GIBBS LAND SURVEYORS**  
2131 HOLLYWOOD BOULEVARD, SUITE 204  
HOLLYWOOD, FL 33020 (954) 923-7666  
LICENSED BUSINESS NO. 7018

**CSOLUTIONS**  
1910 SE 14th Court, No. 2 Fort Lauderdale, FL 33316  
Phone 954.320.7899 Fax: 954.320.7890

**Brown and Caldwell**  
1560 SAWGRASS CORPORATE PARKWAY, SUITE 240  
SUNRISE, FLORIDA 33323  
PHONE: 954-200-7611 FAX: 954-200-7612  
FLORIDA BOARD OF PROFESSIONAL ENGINEERS  
CERTIFICATE OF AUTHORIZATION NO. 00002602

**FOR BID**

EXTERNAL REFERENCE FILES

LINE IS 2 INCHES AT FULL SIZE (IF NOT 2" SCALE ACCORDINGLY)

SCALE: NOT APPLICABLE

DESIGNED: M.D.  
DRAWN: A.G.J.  
CHECKED: A.F.H.  
APPROVED: J.H.

Diego M. Herrera  
Florida PE 73143

Date

REVISIONS					
ZONE	REV.	DESCRIPTION	BY	DATE	APP.
	1	REVISED BY ENGINEER	GI	2/8	DH

**GENERAL LEGEND AND ABBREVIATIONS**

CITY OF HOLLYWOOD, FL WATER MAIN REPLACEMENT PROJECT (NO. 16-5133) PHASE 1

FILENAME: 150992-G-003  
BC PROJECT NUMBER: 150992  
CITY PROJECT NUMBER: 16-5133  
DRAWING NUMBER: 150992-G-003  
SHEET NUMBER: 004 OF 79

Pinned By Powers, Monica Sheet: DRAINAGE IMPROVEMENTS ALONG N 26TH AVENUE Layout: SD-206 PAVING GRADING & DRAINAGE DETAILS February 01, 2022 05:06:09pm K:\MIB\_GW\044241032 DRAINAGE IMPROVEMENTS ALONG N. 26TH AVENUE\CIVIL\CADD\PlanSheets\SD-206 PAVING GRADING & DRAINAGE DETAILS.dwg  
 This document, together with the concepts & design presented herein, is an instrument of service, to be used only for the specific purpose & client for which it was prepared. None of our longer reasons or its adoption by any person or its modification, in whole or in part, shall be without liability to Kimley-Horn & Associates, Inc.

TABLE I WEIGHT OF CASTINGS (lb)		
Frame Type	2'-0" OPENING Frame Cover (Std. Frame)	2'-0" OPENING Frame Cover (Adjustable Frame)
I	155	220
II	145	190
III	90	190

**NOTE:**  
Frame Type I in Table I, includes Adjustable Frames.

**MANHOLE FRAMES AND MANHOLE TOPS**

**MANHOLE FRAMES**

**TYPE I** (For Manholes)  
**TYPE II** (For Curb Inlets Types 1, 2, 3, 4 & 4)  
**TYPE III** (For Curb Inlets Types 7 & 8)

**MANHOLE TOPS**

**TYPE 7**  
**TYPE 8**

**TYPE I ADJUSTABLE FRAME**

**NOTES:**

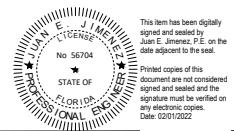
- Use Class II concrete for Manhole top Type 7 slabs.
- Manhole top Type 7 slabs may be of cast-in-place or precast construction. The optional key is for precast tops and in lieu of dowels. Omit frame and slab bearings when top is used over a junction box.
- Manhole top Type 8 may be of cast-in-place, precast concrete construction. For concrete construction, use the same concrete and steel reinforcement as the supporting wall unit. An eccentric cone may be used.
- Use construction joint options, as shown on Sheet 6 to secure manhole tops to structures.
- Frames may be adjusted to a maximum 12" height with brick or precast ASTM A678 grade rings.
- Manhole top Type 8 may be substituted for a Type 7, if the minimum thickness (t) above pipe opening cannot be maintained with Type 8.
- Manhole top Type 7 may be substituted for Type 8, if the minimum thickness (t) above pipe opening cannot be maintained with Type 8.

**FRENCH DRAIN**

**NOTES:**

- ONLY DUCTILE IRON OR C90 PIPE WILL BE ALLOWED TO PASS DIRECTLY THROUGH EXFILTRATION TRENCH (FRENCH DRAIN) WITHOUT SLEEVES.
- USE ONLY STEEL DUCTILE IRON, OR C90 SLEEVES.
- REFER TO SHEET C-205 FOR ADDITIONAL 'FRENCH DRAIN' DETAILS.

FOR BID



This item has been digitally signed and sealed by Juan E. Jimenez, P.E. on the date adjacent to the seal.  
 Printed copies of this document are not considered signed and sealed and the signature must be verified on any electronic copies.  
 Date: 02/01/2022

Always call 811 two full business days before you dig to have underground utilities located and marked.  
**sunshine 811.com**

NEW SHEET	02/01/2022	JJ	JUAN JIMENEZ, STATE OF FLORIDA, PROFESSIONAL ENGINEER, LICENSE NO. 56704. THIS ITEM HAS BEEN DIGITALLY SIGNED AND SEALED BY JUAN JIMENEZ ON THE DATE INDICATED HERE. PRINTED COPIES OF THIS DOCUMENT ARE NOT CONSIDERED SIGNED AND SEALED AND THE SIGNATURE MUST BE VERIFIED ON ANY ELECTRONIC COPIES. DATE: 02/01/2022	SCALE AS SHOWN DESIGNED BY JEJ DRAWN BY MCP CHECKED BY JEJ	<b>Kimley-Horn</b> © 2022 KIMLEY-HORN AND ASSOCIATES, INC. 355 ALHAMBRA CIRCLE, SUITE 1400, CORAL GABLES, FL 33134 PHONE: 305-473-2025 WWW.KIMLEY-HORN.COM Registry No. 35106	DATE FEB 2022 KHA PROJECT 044241052	DRAINAGE IMPROVEMENTS ALONG N 26TH AVENUE CITY PROJECT NO. 16-5133 CITY OF HOLLYWOOD	LICENSED PROFESSIONAL JUAN E. JIMENEZ FL LICENSE NUMBER 56704 02/01/2022	PAVING GRADING & DRAINAGE DETAILS	SHEET NUMBER <b>SD-206</b>
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## **ITEM 9**

### **Meeting Minutes and Attendance List**



# Meeting Minutes

1580 Sawgrass Corporate Parkway, Suite 400  
Sunrise, FL 33323

T: 954.200.7234

**Prepared for:** City of Hollywood  
**Project Title:** Water Main Replacement Project for North 26<sup>th</sup> Avenue  
**Project No.:** 150992

**Purpose of Meeting:** Pre-Bid Meeting for Bid No. F-4708-22-OT  
**Meeting Location:** Webex Conference Call  
**Minutes Prepared by:** Diego Herrera, Brown and Caldwell

**Date:** January 19, 2022  
**Time:** 10:00 a.m.

**Attendees:** See attendance list

## Summary

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### 1. Introductions

See the attached attendance list.

Otis Thomas began the conference call with introductions. Raul Weiner continued with a description of the bid conditions for prospective bidders as follows:

**Bid #:** F-4708-22-OT (Water Main Replacement Project for N. 26<sup>th</sup> Avenue Phase 1)

**Date:** January 19, 2022

Otis J. Thomas, Senior Purchasing Agent, Procurement Division

Raul Wainer, Project Manager, Department of Public Utilities

- Bid due date is **February 15, 2022 at 3:00 p.m. EST**
- No Bids will be accepted after **3:00 p.m.**
- Bid submittal location: City of Hollywood, FL  
City Clerk's Office  
2600 Hollywood Blvd.  
Hollywood, FL 33022-9045  
Suite #221
- Bid documents can be downloaded at: [www.bidsync.com](http://www.bidsync.com)
- Bid security required no less than 10% of Bid amount
- Cone of Silence in effect for this project
- Bidders responsibility to hand deliver or mail bids to City Clerk
- Deadline for questions is **February 8, 2022 at 5:00 p.m. EST**
- Must provide signatures where required
- Must provide requested information according to the Bid requirements
- All questions must be entered via [www.bidsync.com](http://www.bidsync.com)

Raul Wainer continued with the minimum requirements of the bid package to be followed by the prospective bidders:

**BID PACKAGE CONTENTS AND REQUIREMENTS**

<b>SECTION</b>	<b>TITLE</b>
00030	Notice to Bidders
00100	Instruction to Bidders
00200	Cone of Silence
00300	Proposal
00301	Proposal Bid Form
00410	Approved Bid Bond
00420	Information Required from Bidders
00435	Local Preference
00495	Trench Safety Form

## 2. Review of Project Scope

Raul Wainer asked engineers to describe the scope of the systems within the project.

a. Water Wain Replacement:

Diego Herrera from Brown and Caldwell reviewed the water main replacement portion of the project.

b. Drainage:

Juan Jimenez from Kimley Horn reviewed the site grading and drainage portion of the project.

## 3. Conference Call Adjourned

After the review of the project scope, Otis reminded the bidders that the deadline for questions via bidsync is 2/8/2022 at 5:00 p.m., and he adjourned the meeting.

## 4. Site Visit

After the conference call, a site visit for questions from bidders was held at the intersection of N 26<sup>th</sup> Ave and Scott St.

# ATTENDANCE LIST

Meeting Name	Meeting Start Time	Meeting End Time	Name	Attendee Email	Join Time	Leave Time	Attendance Duration	Connectic
Mandatory Pre-bid Meeting for F-4708-22-OT WATER MAIN REPLACEMENT PROJECT FOR N. 26TH AVENUE (PHASE 1)	2022-01-19 10:00:00	2022-01-19 11:00:00	Anna Sousa	anna@gpeeng.com	2022-01-19 09:56:34	2022-01-19 10:25:09	29 mins	Mobile ap
Mandatory Pre-bid Meeting for F-4708-22-OT WATER MAIN REPLACEMENT PROJECT FOR N. 26TH AVENUE (PHASE 1)	2022-01-19 10:00:00	2022-01-19 11:00:00	Jose Sierra	jsierra@comtecheng.com	2022-01-19 09:56:34	2022-01-19 10:25:09	29 mins	Desktop a
Mandatory Pre-bid Meeting for F-4708-22-OT WATER MAIN REPLACEMENT PROJECT FOR N. 26TH AVENUE (PHASE 1)	2022-01-19 10:00:00	2022-01-19 11:00:00	Jvaldes	jvaldes@ric-man.com	2022-01-19 09:56:34	2022-01-19 10:25:09	29 mins	Desktop a
Mandatory Pre-bid Meeting for F-4708-22-OT WATER MAIN REPLACEMENT PROJECT FOR N. 26TH AVENUE (PHASE 1)	2022-01-19 10:00:00	2022-01-19 11:00:00	Otis Thomas	othomas@hollywoodfl.org	2022-01-19 09:56:33	2022-01-19 10:25:09	29 mins	Desktop a
Mandatory Pre-bid Meeting for F-4708-22-OT WATER MAIN REPLACEMENT PROJECT FOR N. 26TH AVENUE (PHASE 1)	2022-01-19 10:00:00	2022-01-19 11:00:00	Pabon Engineering, Inc.	eppabon@outlook.com	2022-01-19 09:56:34	2022-01-19 10:25:09	29 mins	Desktop a
Mandatory Pre-bid Meeting for F-4708-22-OT WATER MAIN REPLACEMENT PROJECT FOR N. 26TH AVENUE (PHASE 1)	2022-01-19 10:00:00	2022-01-19 11:00:00	Carl Morsch - Man-Con Inc	estimating@mancon.ws	2022-01-19 09:57:45	2022-01-19 10:25:09	28 mins	Desktop a
Mandatory Pre-bid Meeting for F-4708-22-OT WATER MAIN REPLACEMENT PROJECT FOR N. 26TH AVENUE (PHASE 1)	2022-01-19 10:00:00	2022-01-19 11:00:00	Raul Cabrera	raul@floridaengineering.net	2022-01-19 09:57:25	2022-01-19 10:25:09	28 mins	Desktop a
Mandatory Pre-bid Meeting for F-4708-22-OT WATER MAIN REPLACEMENT PROJECT FOR N. 26TH AVENUE (PHASE 1)	2022-01-19 10:00:00	2022-01-19 11:00:00	Raul Wainer	rwainer@hollywoodfl.org	2022-01-19 09:57:40	2022-01-19 10:25:02	28 mins	Desktop a
Mandatory Pre-bid Meeting for F-4708-22-OT WATER MAIN REPLACEMENT PROJECT FOR N. 26TH AVENUE (PHASE 1)	2022-01-19 10:00:00	2022-01-19 11:00:00	Erica - C&W Pipeline,inc.	cwpipeline@hotmail.com	2022-01-19 10:00:11	2022-01-19 10:25:09	25 mins	Desktop a
Mandatory Pre-bid Meeting for F-4708-22-OT WATER MAIN REPLACEMENT PROJECT FOR N. 26TH AVENUE (PHASE 1)	2022-01-19 10:00:00	2022-01-19 11:00:00	Garrett Isbell	gisbell@brwncald.com	2022-01-19 10:00:54	2022-01-19 10:25:09	25 mins	Desktop a
Mandatory Pre-bid Meeting for F-4708-22-OT WATER MAIN REPLACEMENT PROJECT FOR N. 26TH AVENUE (PHASE 1)	2022-01-19 10:00:00	2022-01-19 11:00:00	Robert Lowery	rlowery@hollywoodfl.org	2022-01-19 10:00:48	2022-01-19 10:25:09	25 mins	Desktop a
Mandatory Pre-bid Meeting for F-4708-22-OT WATER MAIN REPLACEMENT PROJECT FOR N. 26TH AVENUE (PHASE 1)	2022-01-19 10:00:00	2022-01-19 11:00:00	Diego	dherrera@brwncald.com	2022-01-19 10:05:14	2022-01-19 10:25:09	20 mins	Desktop a
Mandatory Pre-bid Meeting for F-4708-22-OT WATER MAIN REPLACEMENT PROJECT FOR N. 26TH AVENUE (PHASE 1)	2022-01-19 10:00:00	2022-01-19 11:00:00	Juan Jimenez	juan.jimenez@kimley-horn.com	2022-01-19 10:08:32	2022-01-19 10:25:09	17 mins	Desktop a
Mandatory Pre-bid Meeting for F-4708-22-OT WATER MAIN REPLACEMENT PROJECT FOR N. 26TH AVENUE (PHASE 1)	2022-01-19 10:00:00	2022-01-19 11:00:00	Raul Cabrera	raul@floridaengineering.net	2022-01-19 09:56:34	2022-01-19 09:58:57	3 mins	Desktop a
Mandatory Pre-bid Meeting for F-4708-22-OT WATER MAIN REPLACEMENT PROJECT FOR N. 26TH AVENUE (PHASE 1)	2022-01-19 10:00:00	2022-01-19 11:00:00	5867****10		2022-01-19 10:14:52	2022-01-19 10:15:07	1 mins	Other app

BID F-4708-22-07 - UTILITY REPLACEMENT ALONG N. 26TH AVENUE

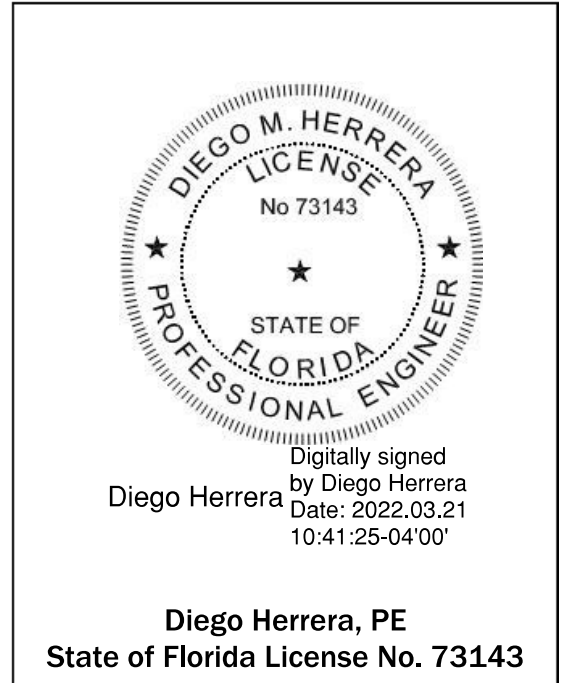
Date RFI Submitted	RFI Sender	RFI	RFI Response	Addendum Number	Addendum Rem	Addendum Date	Drawing or Spec Modification Required	DIV or Div 1 Item	Incorporated into Conformed Set
1/13/2022	Unknown	What is the engineer's estimate for this project?	\$1,438,000.00	1	N/A	2/9/2022	No	N/A	N/A
1/19/2022	Unknown	Please provide a project estimate.	\$1,438,000.00	1	N/A	2/9/2022	No	N/A	N/A
1/19/2022	Unknown	Can you please provide pre-bid meeting attendance list?	See attached Meeting minutes.	1	N/A	2/9/2022	No	N/A	N/A
1/21/2022	Unknown	Are 316 Stainless Steel Nuts and Bolts required for Mechanical Joint Fittings and PVC Bell Restraints for this project?	Per Specification Section 15000 Part 2.03 C, "Bolts, nuts and washers shall be ASTM A319, Grade B7 for above-ground applications. Buried applications shall use 316 stainless steel hardware."	1	N/A	2/9/2022	No	N/A	N/A
2/7/2022	Unknown	What is the engineers estimate?	\$1,438,000.00	1	N/A	2/9/2022	No	N/A	N/A
2/7/2022	Unknown	What are the substantial and final completion number of days?	Per Specification Section 00300, Contractor shall substantially complete all Contract Work for Phase 1 within 214 days of Notice to Proceed and with final completion within 244 days of Notice to Proceed (214 days for Substantial Completion and 30 for Final Completion).	1	N/A	2/9/2022	No	N/A	N/A
2/8/2022	Unknown	The qualifications for this project appear to be very stringent for the scope of work to be performed. Are these qualifications applicable to this job? Or were these incidentally included from another project?	The qualifications in Specification Section 00100 Part 10 are applicable to this job.	1	N/A	2/9/2022	No	N/A	N/A

**CITY OF HOLLYWOOD  
WATER MAIN REPLACEMENT PROJECT FOR N. 26<sup>TH</sup> AVENUE (PHASE 1)  
PROJECT NO. 16-5133**

**CONFORMED – FOR CONSTRUCTION SPECIFICATIONS**

**PROFESSIONAL ENGINEER – RESPONSIBLE CHARGE CERTIFICATIONS**

<b>Division 01 – General Requirements</b>	
01010	Summary of Work
01025	Basis of Payment
01090	Applicable Standards and Codes
01200	Project Meetings
01300	Submittals
01400	Testing and Inspection
01410	Contractor's Health and Safety Plan
01500	Construction Considerations
01510	Temporary Utility Services and Staging Area
01520	Maintenance of Facilities and Sequence of Construction
01530	Protection of Existing Facilities
01550	Site Access and Storage
01560	Special Controls
01570	Traffic Regulations and Maintenance of Traffic
01600	Equipment and Materials
01700	Project Closeout
01740	Permits



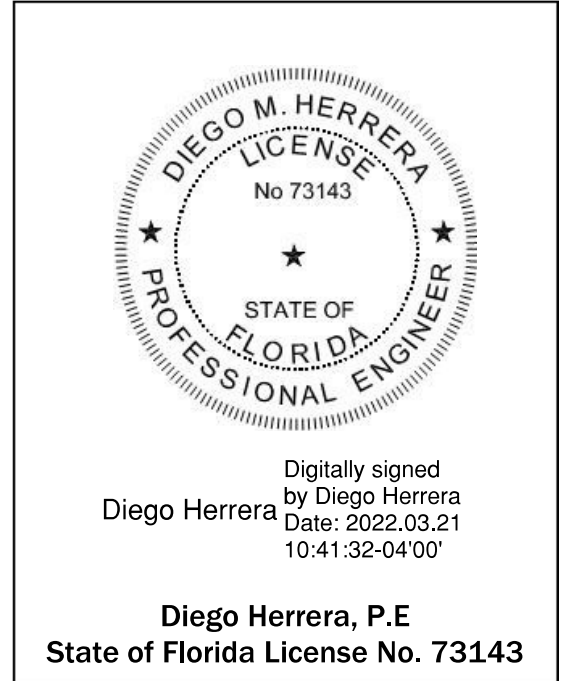
**THIS ITEM HAS BEEN DIGITALLY SIGNED AND SEALED BY DIEGO HERRERA, P.E THE DATE ADJACENT TO THE SEAL. PRINTED COPIES OF THIS DOCUMENT ARE NOT CONSIDERED SIGNED AND SEALED AND THE SIGNATURE MUST BE VERIFIED ON ANY ELECTRONIC COPIES**

**CITY OF HOLLYWOOD  
WATER MAIN REPLACEMENT PROJECT FOR N. 26<sup>TH</sup> AVENUE (PHASE 1)  
PROJECT NO. 16-5133**

**CONFORMED – FOR CONSTRUCTION SPECIFICATIONS**

**PROFESSIONAL ENGINEER – RESPONSIBLE CHARGE CERTIFICATIONS**

<b>Division 2 – Site Work</b>	
02000	Water Distribution System
02100	Clearing and Grubbing
02140	Dewatering
02160	Temporary Excavation Support Systems
02210	Earth Excavation, Backfill, Fill and Grading
02222	Excavation and Backfill for Utilities
02260	Finish Grading
02332	Limerock Base
02500	Landscaping
02507	Prime and Tack Coats
02510	Asphaltic Concrete Pavement
02515	Water Service Connections and Transfers
02526	Concrete Pavement, Curb, and Walkway
02580	Pavement Marking
02581	Traffic Signs
02582	Raised Retro-Reflective Pavement Markers and Bituminous Adhesive
02930	Sodding



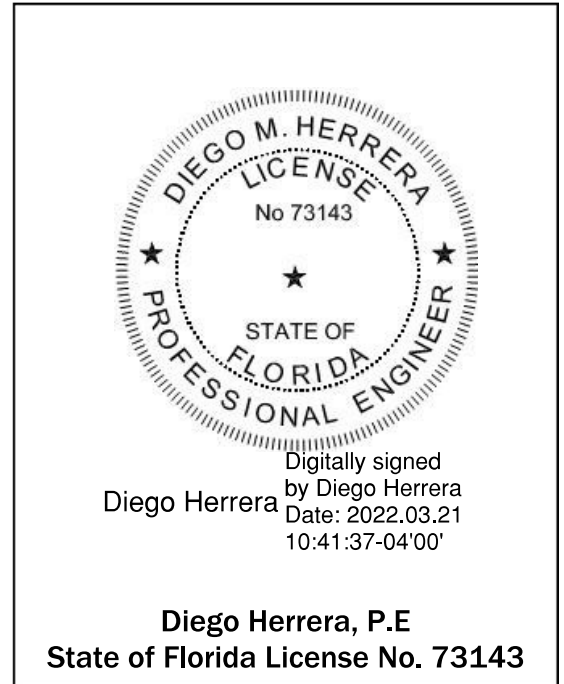
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PROJECT NO. 16-5133**

**CONFORMED – FOR CONSTRUCTION SPECIFICATIONS**

**PROFESSIONAL ENGINEER – RESPONSIBLE CHARGE CERTIFICATIONS**

<b>Division 3 – Concrete</b>	
03300	Cast-in-Place Concrete, Reinforcing and Formwork
03315	Grout
03375	Flowable Fill
<b>Division 9 – Finishes</b>	
09900	Coating Systems
<b>Division 13 – Controls</b>	
13111	Polyethylene Encasement
<b>Division 15 – Mechanical Construction</b>	
15000	Piping General
15001	Water Services and Miscellaneous Fittings
15060	Piping and Fittings
15063	Cement Mortar-Lined Welded Steelpipe
15100	Valves, General
15995	Pipeline Testing and Disinfection



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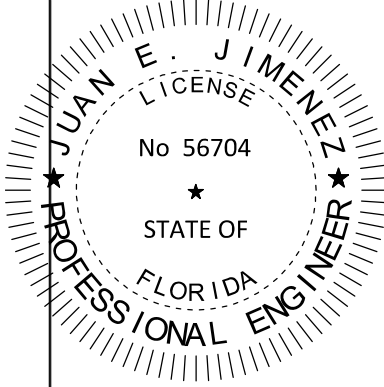


**CITY OF HOLLYWOOD  
WATER MAIN REPLACEMENT PROJECT FOR N. 26<sup>TH</sup> AVENUE (PHASE 1)  
PROJECT NO. 16-5133**

**CONFORMED – FOR CONSTRUCTION SPECIFICATIONS**

**PROFESSIONAL ENGINEER – RESPONSIBLE CHARGE CERTIFICATIONS**

<b>Division 2 – Site Work</b>	
02071	Underground Storm Drainage Structures
<b>Division 3 – Concrete</b>	
03400	Precast Concrete
<b>Division 3 – Mechanical Construction</b>	
15010	PVC Non-Pressure Storm Drainage Pipe
15020	French Drain
15120	In-Line Storm Drainage Check Valves



**Juan E Jimenez**  
Digitally signed by Juan E Jimenez  
DN: CN=Juan E Jimenez,  
OU=A01410C000001703172D1880001402F,  
O=KIMLEY-HORN AND ASSOCIATES INC.,  
C=US  
Date: 2022.03.18 17:07:13-04'00'

**Juan Jimenez, P.E**  
**State of Florida License No. 56704**

This item has been digitally signed and sealed by Juan E. Jimenez, P.E. on the date adjacent to the seal.

Printed copies of this document are not considered signed and sealed and the signature must be verified on any electronic copies.  
Date: 03/18/2022

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**SECTION 01010****SUMMARY OF WORK****PART 1 -- GENERAL**

## 1.01 THE REQUIREMENT

- A. The work to be performed under this Contract shall consist of furnishing all tools, equipment, materials, supplies, and manufactured articles and for furnishing all transportation and services, including fuel, power, water, and essential communications, and for the performance of all labor, work, or other operations required for the fulfillment of the Contract in strict accordance with the Contract Documents. The work shall be complete, and all work, materials, and services not expressly shown or called for in the Contract documents which may be necessary for the complete and proper construction of the work in good faith shall be performed, furnished, and installed by the CONTRACTOR as though originally so specified or shown, at no increase in cost to the CITY.
- B. Prior to construction, the CONTRACTOR shall verify existing utilities identified on the Drawings and locate other potential utilities in their working area may not show on the Drawings. The utility verifications consist of excavation to verify tie-in points and to locate potential conflicts that may affect the work as shown on the Contract Drawings. The CONTRACTOR shall be responsible for the coordination of this work with the associated utility owners and permitting agencies having jurisdiction over the specific locations to be verified.

## 1.02 SCOPE

- A. It is the intent of the CITY to obtain a complete and working installation under this contract and any items of labor, materials or equipment, which may reasonably be assumed as necessary to accomplish this end, should be supplied whether or not specifically shown on the plans or described herein. Maintenance of the existing water utility system is required throughout the construction period.

Replacement of the potable water distribution system piping for this project includes:

- Installation of a new potable water distribution system piping – 4-inch, 6-inch, and 8-inch diameter PVC and DI pipe with ductile iron fittings, restraints, and includes tapping of existing water mains at several locations.
- Removal of existing fire hydrants and installation of new fire hydrant assemblies.
- Installation of new valves with extensions and valve boxes.
- Installation of saddles for water service lines on new water mains.
- Disconnection of all existing water service lines from associated existing water meters.
- Installation of new 2-inch diameter water meter connections to existing water mains.
- Installation of new 1-inch diameter potable water service connections between saddle on new water main and existing water meters (single and double, triple, quadruple per listing provided in Appendix D). Provide disinfection and connection of new water service lines to existing water meters.
- Installation of new air release valves.

- Installation of sample points for bacteriological testing. Several sample points are located at the new fire hydrants and others distributed in the project site.
- Concrete for replacement of damaged existing sidewalk, and damaged existing curb and gutter.
- New single, double, triple, or quadruple meter boxes to replace damaged (by contractor or found damaged during inspection).
- Cutting and abandonment (cap ends, but no grout required) in place of the existing 6-inch diameter water main piping and appurtenances or smaller as shown on the Drawings.
- Cutting, grouting and capping of abandoned (in place) existing water mains larger than 4-inch diameter.
- Perform nineteen (19) shutdowns and tie-ins of new water distribution system into existing water distribution system. See details in this Section.
- Site work to include clearing and grubbing within grassed area of some right-of-ways.
- Sodding work.
- Pressure testing, disinfection and bacteriological testing of complete length of potable water distribution piping, including fire hydrant segments and water service lines.

The work to be performed includes site, civil and structural work associated with the construction of proposed storm drainage improvements depicted on the Contract Drawings in accordance with all regulatory requirements, including but not limited to:

- Inspect existing drainage structures receiving new pipe connections for appropriate sizes and depths to receive connections.
- Perform necessary due diligence and subsurface utility exploration prior to requesting new drainage structure fabrications.
- Furnish and install new precast concrete drainage structures of varying sizes and depths, including frames, grates and covers, and pollutant retardant baffles (PRBs) or Skimmers.
- Furnish and install new 6-inch to 24-inch diameter Solid Corrugated PVC Drainage Pipe.
- Furnish and install new 4-foot minimum width and 10-foot minimum depth exfiltration trench (French drain), including non-woven filter fabric, washed rock or ballast rock, and 18-inch diameter Perforated Corrugated PVC Pipe.
- Install three In-line Storm Check Valves of 6-inch to 24" diameters (to be furnished by the City of Hollywood).
- Cut existing drainage pipe and reconnect to new pipe and structures.
- Core-drill existing drainage structures and connect new Solid Corrugated PVC Drainage Pipe.
- Restore site and rights-of-way to pre-construction conditions.

Replacement of the storm drainage system and the water main distribution system for this project includes:

- Maintenance of traffic prepared by a Florida Professional Engineer contracted by the CONTRACTOR.
- Roadway restoration (asphalt pavement and compacted limerock base) for width and length of disturbed alleys.

- Milling and resurfacing of full width where installation of water main and appurtenances is performed within CITY street and avenues.
- Restoration of existing asphalt pavement removed during re-routing of water services within private properties.
- Remove and replace existing concrete pavement, brick pavers and/or other specialty paving removed during re-routing of water services within private properties.
- Roadway paint striping and installation of pavement reflectors on intersections, and installation of blue reflectors at all fire hydrant locations.
- Prepare and obtain CITY Right-of-Way Permit from initial information to be provided by ENGINEER.

B. The following listing is provided to the CONTRACTOR as an outline of the construction activities for the project to ensure that potable water service and fire protection service is available to the area within the project boundaries at all times without interruption. The existing water distribution system shall remain in service during the full-time frame of construction activities for the new replacement water distribution system until the list identifies that the existing water distribution system can be deactivated.

1. Install the new water distribution system (piping, fittings, valves, specialty items, restraints, sample points, fire hydrant assemblies, and water service lines (terminated inside the existing water meter boxes, but not connected to the water meter at this stage). Perform all shutdowns and tie-ins for the new water distribution system with the existing water distribution system infrastructure.
2. Perform successful/passing flushing, hydrostatic and bacteriological testing activities on the segments (as developed by the CONTRACTOR) of the entire new water distribution system. The limit of the required testing shall be terminated at the shutoff valve for each of the fire hydrants. Provide all hydrostatic and bacteriological testing documentation to the CITY and ENGINEER.
3. Once the certification of construction is received from the Florida Department of Environmental Protection (FDEP) by the ENGINEER, the CONTRACTOR shall perform the balance of the construction activities associated with switchover activities.
4. Disconnect the existing water service lines from the existing water meters and immediately swab (using a chlorine solution) and attach the new water service line (previously placed in the existing water meter box) to the existing water meters.
5. Shut all appropriate valves (to be performed by CITY when notified by the CONTRACTOR) on the existing water distribution system and ensure that only the new water distribution system is functioning to provide potable water service and fire protection service. This action will deactivate the existing water distribution system, and the new water distribution system will be supplying the potable water service and fire protection service within the project boundaries.
6. Remove existing fire hydrant assemblies from the existing water distribution system. The CONTRACTOR shall load, transport and offload the existing fire hydrants at a storage facility on the City's property to be designated.
7. Cut out piping segments from existing water distribution system and fill all 4-inch, 6-inch and 8-inch diameter piping with grout and then cap all cut/exposed pipe ends to abandon the piping in place.

8. Cut out piping segments from existing water distribution system of 2-inch diameter piping and then cap all cut/exposed pipe ends to abandon the piping in place.

C. The following criteria shall be followed by the CONTRACTOR to ensure that the CITY requirements are adhered to during the construction of this project.

1. For the Work within the right-of-way (ROW) of Sheridan Street for connecting the several new water mains to the existing water mains within the Sheridan Street ROW, the CONTRACTOR shall provide the necessary sidewalk closures, and perform that specific Work in phases as "day work" (between 8:00AM and 6:00PM) to limit the impact to residents in the project area.
2. For the Work within the right-of-way (ROW) of CITY owned streets for constructions of new water mains and connecting the several new water mains to the existing water mains, the CONTRACTOR shall provide the necessary maintenance of traffic (MOT) controls for approval, and perform that specific Work in phases as "day work" (between 8:00AM and 6:00PM) to limit the impact to residents in the project area.

### 1.03 REQUIRED WORK SEQUENCE

A. The phases of construction are as follows:

1. Phase 1-A shall be constructed first, including all drainage and water main requirements. Temporary connection to existing water mains on Sherman Street, Liberty Street, and Thomas Street (Phase 1-C), and to Phase 1-B located on N. 26th Avenue.
2. Phase 1-B shall be contracted second, including all water main segments. Temporary connections to the nearly installed Phase 1-A water main shall be removed to connect to this piping system. All temporary connection fittings shall be returned to the City after usage.
3. Phase 1-C shall be constructed third, including all drainage and water main segments. Temporary connections to the newly installed phase 1-A water main shall be removed to connect to this piping system. All temporary connection fittings shall be returned to the City after usage.

B. A required work sequence is being provided by the ENGINEER to be adopted by the CONTRACTOR. This required work sequence is as follows:

1. CONTRACTOR shall install new water mains within residential areas of the project. CONTRACTOR shall install new water mains closest to Sheridan Street and move toward the south end of the project area. Newly installed valves shall remain closed. CONTRACTOR shall follow all requirements for testing and disinfection for newly installed piping.
2. CONTRACTOR shall install new water services as specified in the Contract Drawings and connect to newly installed water mains.
3. CONTRACTOR shall connect newly installed piping to existing water main distribution system as described in the Contract Drawings, Shutdown/Tie-in Details Section. Prior to shutdown/tie-in activities, CONTRACTOR shall coordinate with CITY the location and closing of existing valves in the existing water distribution system. CONTRACTOR shall follow the shutdown/tie-in requirements described in this Section.
4. CONTRACTOR shall abandon existing water mains as indicated in the Contract Drawings after shutdown/tie-in activities have been approved and cleared by CITY and ENGINEER.

5. CONTRACTOR shall connect all new water services to existing water meters before new water mains are energized. Effort shall be coordinated with CITY and ENGINEER.
- C. A detailed sequence of construction shall be submitted by the CONTRACTOR and accepted by the CITY and ENGINEER prior to the commencement of any work. The CITY reserves the right to make changes to the sequence as necessary to facilitate the Work or to minimize any operations conflict with no cost impact from the CONTRACTOR.
- D. The following list provides the primary shutdowns/tie-ins needed to connect the new water distribution system to the existing water distribution system. This list is a listing of the required shutdowns, and the list is open for discussion regarding sequencing by the CONTRACTOR with the CITY and the ENGINEER. See the Contract Drawings for details of the existing and proposed piping and valve arrangements for each of the shutdowns / tie-ins.

1. **SHUTDOWN / TIE-IN NO. 3:** Connect new 8-inch diameter PVC water main within the ROW of N. 26<sup>th</sup> Avenue to the existing 8-inch diameter water main. See Contract Drawings for details.

**Duration of Shutdown:** 4 hours

**Pre-requisites:**

- 1) Install the required MOT signage and barricades.
- 2) CONTRACTOR shall confirm the location of the existing 8-inch diameter piping within N. 26<sup>th</sup> Avenue.
- 3) Install new 8-inch diameter PVC water main, new fittings, new 8-inch by 4-inch tee, new 8-inch gate valve (V3-1) and restraints within N. 26<sup>th</sup> Avenue.
- 4) Install new 4-inch diameter PVC water main and restraints from newly installed 8-inch by 4-inch tee to new 4-inch gate valve (V3-2).
- 5) Install new 4-inch DI cap downstream of the gate valve (V3-2) and connect 2-inch flexible tubing to the cap on one end and the existing 2-inch water main on the other end, as shown on Detail 22 on sheet CD-005.
- 6) Coordinate with CITY for determination of required valve closings to allow performance of shutdown activities for existing 2-inch diameter water main.

**Activities for Shutdown /Tie-in No. 3:** (See Contract Drawing for details)

- 1) Cut, remove segments (including 45-degree bends and pipe segment), and plug existing 8-inch diameter water main within N. 26<sup>th</sup> Avenue.
  - 2) Cut, remove segments (including tee and pipe segment) of existing 2-inch water main along Sheridan Street up to point of connection.
  - 3) Perform installation of new 8-inch and 4-inch PVC water main pipe, new 2-inch tubing, cap, fittings, DI to galvanized piping connector, and restraints and connect to existing 8-inch water main and existing 2-inch water main.
  - 4) Disinfect and connect the new water main segments. Water mains above shall pass the required hydrostatic and bacteriological testing prior to being placed in service.
  - 5) Coordinate with CITY for activation of connection.
2. **SHUTDOWN / TIE-IN NO. 4:** Connect new 4-inch diameter PVC water main within the ROW of N. 26<sup>th</sup> Avenue to the existing 2-inch diameter DIP water main in the ROW of N. 26<sup>th</sup> Avenue, 100 feet south of the intersection with Sheridan Street. See Contract Drawings for details.

**Duration of Shutdown:** 2 hours

**Pre-requisites:**

- 1) Install the required MOT signage and barricades.
- 2) CONTRACTOR shall confirm the location of the existing 2-inch diameter piping within N. 26<sup>th</sup> Avenue .
- 3) Install new 8-inch by 4-inch tee, 4-inch diameter PVC water main, new fittings, restraints, and 4-inch gate valve (V4-1) within N. 26<sup>th</sup> Avenue.
- 4) Install new 4-inch DI cap downstream of the gate valve (V4-1) and connect 2-inch flexible tubing to the cap on one end and the existing 2-inch water main on the other end, as shown on Detail 22 on sheet CD-005.
- 5) Coordinate with CITY for determination of required valve closings to allow performance of shutdown activities for existing 2-inch diameter water main.

**Activities for Shutdown /Tie-in No. 4:** (See Contract Drawing for details)

- 1) Cut, remove segments (including fittings), and plug existing 2-inch diameter water main within N. 26<sup>th</sup> Avenue.
- 2) Perform installation of new 4-inch PVC water main pipe, new 2-inch tubing, cap, fittings, DI to galvanized piping connector, and restraints to newly installed valve (V4-1) under existing piping and utilities in N. 26<sup>th</sup> Avenue for connection to existing main system.
- 3) Disinfect and connect the new water main segments. Water mains above shall pass the required hydrostatic and bacteriological testing prior to being placed in service.
- 4) Coordinate with CITY for activation of connection.

3. **SHUTDOWN / TIE-IN NO. 4A:** Connect new 8-inch diameter PVC water main within the ROW of N. 26<sup>th</sup> Avenue to the existing 6-inch diameter DIP water main in the ROW of Sherman Street, 100 feet south of the intersection with Sheridan Street. See Contract Drawings for details.

**Duration of Shutdown:** 2 hours

**Pre-requisites:**

- 1) Install the required MOT signage and barricades.
- 2) CONTRACTOR shall confirm the location of the existing 6-inch diameter piping within Sherman Street.
- 3) In Phase 1-A, install temporary 8-inch by 6-inch reducer, temporary 8-inch diameter PVC water main, temporary fittings, restraints, and 8-inch gate valve (V4-2) to connect to the existing piping within Sherman Street.
- 4) After authorization to proceed with Phase 1-C has been granted and all of the items above have been installed, proceed with Phase 1-C.
- 5) In Phase 1-C, remove temporary reducer, temporary 8-inch diameter PVC water main, and temporary fittings and connect new 8-inch diameter PVC water main to the 8-inch gate valve (V4-2).
- 6) Coordinate with CITY for determination of required valve closings to allow performance of shutdown activities for existing 6-inch diameter water main.

**Activities for Shutdown /Tie-in No. 4A:** (See Contract Drawing for details)

- 1) Cut, remove segments (including fittings), and plug existing 6-inch diameter water main within Sherman Street.
- 2) Perform installation of new 8-inch PVC water main pipe, fittings, and restraints to newly installed valve (V4-2) under existing piping and utilities in Sherman Street for connection to existing main system in two different phases (Phase 1-A and Phase 1-C).
- 3) Disinfect and connect the new water main segments in two different phases (Phase 1-A and Phase 1-C). Water mains above shall pass the required hydrostatic and bacteriological testing prior to being placed in service.
- 4) Coordinate with CITY for activation of connection.

- 4. SHUTDOWN / TIE-IN NO. 5:** Connect new 6-inch diameter PVC water main within the ROW of N. 26<sup>th</sup> Avenue to the existing 6-inch diameter DIP water main in the ROW of N. 26<sup>th</sup> Avenue, 150 feet south of the intersection with Sherman Street. See Contract Drawings for details.

**Duration of Shutdown:** 4 hours

**Pre-requisites:**

- 1) Install the required MOT signage and barricades.
- 2) CONTRACTOR shall confirm the location of the existing 6-inch diameter piping within N. 26<sup>th</sup> Avenue.
- 3) Install new 6-inch diameter PVC water main, new fittings, restraints, and 6-inch gate valve (V5-1) to the existing piping within N. 26<sup>th</sup> Avenue.
- 4) Coordinate with CITY for determination of required valve closings to allow performance of shutdown activities for existing 6-inch diameter water main.

**Activities for Shutdown /Tie-in No. 5:** (See Contract Drawing for details)

- 1) Cut, remove segments (including fittings), and plug existing 6-inch diameter water main within N. 26<sup>th</sup> Avenue.
- 2) Perform installation of new 6-inch PVC water main pipe, fittings, and restraints to newly installed valve (V5-1) under existing piping and utilities in N. 26<sup>th</sup> Avenue for connection to existing main system.
- 3) Disinfect and connect the new water main segments. Water mains above shall pass the required hydrostatic and bacteriological testing prior to being placed in service.
- 4) Coordinate with CITY for activation of connection.

- 5. SHUTDOWN / TIE-IN NO. 5A:** Connect new 4-inch diameter PVC water main within the ROW of Thomas Street to the existing 2-inch diameter DIP water main in the ROW of Thomas Street. See Contract Drawings for details.

**Duration of Shutdown:** 4 hours

**Pre-requisites:**

- 1) Install the required MOT signage and barricades.
- 2) CONTRACTOR shall confirm the location of the existing 2-inch diameter piping within Thomas Street.
- 6) In Phase 1-A, install new 4-inch diameter PVC water main, new vertical fittings, restraints, and 4-inch gate valve (V5-2) to the existing piping within Thomas Street.



Also, install temporary 4-inch DI cap downstream of the gate valve (V5-2) and connect 2-inch flexible tubing to the cap on one end and the existing 2-inch water main on the other end, as shown on Detail 22 on sheet CD-005.

- 3) After authorization to proceed with Phase 1-C has been granted and all of the items above have been installed, proceed with Phase 1-C.
- 4) In Phase 1-C, remove temporary flexible tubing and temporary cap and connect new 4-inch diameter PVC water main to the 4-inch gate valve (V5-2).
- 5) Coordinate with CITY for determination of required valve closings to allow performance of shutdown activities for existing 2-inch diameter water main.

**Activities for Shutdown /Tie-in No. 5A:** (See Contract Drawing for details)

- 1) Cut, remove segments (including fittings), and plug existing 2-inch diameter water main within Thomas Street.
- 2) Perform installation of new 4-inch PVC water main pipe, fittings, and restraints to newly installed valve (V5-2) under existing piping and utilities in Thomas Street for connection to existing main system in two different phases (Phase 1-A and Phase 1-C).
- 3) Disinfect and connect the new water main segments in two different phases (Phase 1-A and Phase 1-C). Water mains above shall pass the required hydrostatic and bacteriological testing prior to being placed in service.
- 4) Coordinate with CITY for activation of connection.

- 6. SHUTDOWN / TIE-IN NO. 6:** Connect new 6-inch diameter PVC water main within the ROW of N. 26<sup>th</sup> Avenue to the existing 6-inch diameter DIP water main in the ROW of N. 26<sup>th</sup> Avenue, 150 feet north of the intersection with Liberty Street. See Contract Drawings for details.

**Duration of Shutdown:** 4 hours

**Pre-requisites:**

- 1) Install the required MOT signage and barricades.
- 2) CONTRACTOR shall confirm the location of the existing 6-inch diameter piping within N. 26<sup>th</sup> Avenue.
- 3) Install new 6-inch diameter PVC water main, new fittings, restraints, and 6-inch gate valve (V6-1) to the existing piping within N. 26<sup>th</sup> Avenue.
- 4) Coordinate with CITY for determination of required valve closings to allow performance of shutdown activities for existing 6-inch diameter water main.

**Activities for Shutdown /Tie-in No. 6:** (See Contract Drawing for details)

- 1) Cut, remove segments (including fittings), and plug existing 6-inch diameter water main within N. 26<sup>th</sup> Avenue.
- 2) Perform installation of new 6-inch PVC water main pipe, fittings, and restraints to newly installed valve (V6-1) under existing piping and utilities in N. 26<sup>th</sup> Avenue for connection to existing main system.
- 3) Disinfect and connect the new water main segments. Water mains above shall pass the required hydrostatic and bacteriological testing prior to being placed in service.
- 4) Coordinate with CITY for activation of connection.

7. **SHUTDOWN / TIE-IN NO. 6A:** Connect new 4-inch diameter PVC water main within the ROW of Liberty Street to the existing 2-inch diameter DIP water main in the ROW of Liberty Street. See Contract Drawings for details.

**Duration of Shutdown:** 4 hours

**Pre-requisites:**

- 6) Install the required MOT signage and barricades.
- 7) CONTRACTOR shall confirm the location of the existing 2-inch diameter piping within Liberty Street.
- 7) In Phase 1-A, install new 4-inch diameter PVC water main, new vertical fittings, restraints, and 4-inch gate valve (V6-2) to the existing piping within Liberty Street. Also, install temporary 4-inch DI cap downstream of the gate valve (V6-2) and connect 2-inch flexible tubing to the cap on one end and the existing 2-inch water main on the other end, as shown on Detail 22 on sheet CD-005.
- 8) After authorization to proceed with Phase 1-C has been granted and all of the items above have been installed, proceed with Phase 1-C.
- 9) In Phase 1-C, remove temporary flexible tubing and temporary cap and connect new 4-inch diameter PVC water main to the 4-inch gate valve (V6-2).
- 10) Coordinate with CITY for determination of required valve closings to allow performance of shutdown activities for existing 2-inch diameter water main.

**Activities for Shutdown /Tie-in No. 6A:** (See Contract Drawing for details)

- 1) Cut, remove segments (including fittings), and plug existing 2-inch diameter water main within Liberty Street.
- 2) Perform installation of new 4-inch PVC water main pipe, fittings, and restraints to newly installed valve (V6-2) under existing piping and utilities in Liberty Street for connection to existing main system in two different phases (Phase 1-A and Phase 1-C).
- 3) Disinfect and connect the new water main segments in two different phases (Phase 1-A and Phase 1-C). Water mains above shall pass the required hydrostatic and bacteriological testing prior to being placed in service.
- 4) Coordinate with CITY for activation of connection.

8. **SHUTDOWN / TIE-IN NO. 7:** Connect new 4-inch diameter PVC water main within the ROW of N. 26<sup>th</sup> Avenue to the existing 2-inch diameter DIP water main in the ROW of N. 26<sup>th</sup> Avenue, 200 feet south of the intersection with Liberty Street. See Contract Drawings for details.

**Duration of Shutdown:** 4 hours

**Pre-requisites:**

- 1) Install the required MOT signage and barricades.
- 2) CONTRACTOR shall confirm the location of the existing 2-inch diameter piping within N. 26<sup>th</sup> Avenue.
- 3) Install new 8-inch by 4-inch tee, 4-inch diameter PVC water main, new fittings, restraints, and 4-inch gate valve (V7-1) within N. 26<sup>th</sup> Avenue.
- 4) Install new 4-inch DI cap downstream of the gate valve (V7-1) and connect 2-inch flexible tubing to the cap on one end and the existing 2-inch water main on the other end, as shown on Detail 22 on sheet CD-005.

- 5) Coordinate with CITY for determination of required valve closings to allow performance of shutdown activities for existing 2-inch diameter water main.

**Activities for Shutdown /Tie-in No. 7:** (See Contract Drawing for details)

- 1) Cut, remove segments (including fittings), and plug existing 2-inch diameter water main within N. 26<sup>th</sup> Avenue.
- 2) Perform installation of new 4-inch PVC water main pipe, new 2-inch tubing, cap, fittings, DI to galvanized piping connector, and restraints to newly installed valve (V7-1) under existing piping and utilities in N. 26<sup>th</sup> Avenue for connection to existing main system.
- 3) Disinfect and connect the new water main segments. Water mains above shall pass the required hydrostatic and bacteriological testing prior to being placed in service.
- 4) Coordinate with CITY for activation of connection.

9. **SHUTDOWN / TIE-IN NO. 7A:** Connect new 4-inch diameter PVC water main within the ROW of Scott Street to the existing 2-inch diameter DIP water main in the ROW of Scott Street. See Contract Drawings for details.

**Duration of Shutdown:** 4 hours

**Pre-requisites:**

- 1) Install the required MOT signage and barricades.
- 2) CONTRACTOR shall confirm the location of the existing 2-inch diameter piping within Scott Street.
- 3) Install new 8-inch by 4-inch tee, 4-inch diameter PVC water main, new fittings, restraints, and 4-inch gate valve (V7-2) within Scott Street.
- 4) Install new 4-inch DI cap downstream of the gate valve (V7-1) and connect 2-inch flexible tubing to the cap on one end and the existing 2-inch water main on the other end, as shown on Detail 22 on sheet CD-005.
- 5) Coordinate with CITY for determination of required valve closings to allow performance of shutdown activities for existing 2-inch diameter water main.

**Activities for Shutdown /Tie-in No. 7A:** (See Contract Drawing for details)

- 1) Cut, remove segments (including fittings), and plug existing 2-inch diameter water main within Scott Street.
- 2) Perform installation of new 4-inch PVC water main pipe, new 2-inch tubing, cap, fittings, DI to galvanized piping connector, and restraints to newly installed valve (V7-2) under existing piping and utilities Scott Street for connection to existing main system.
- 3) Disinfect and connect the new water main segments. Water mains above shall pass the required hydrostatic and bacteriological testing prior to being placed in service.
- 4) Coordinate with CITY for activation of connection.

10. **SHUTDOWN / TIE-IN NO. 8:** Connect new 6-inch diameter PVC water main within the ROW of N. 26<sup>th</sup> Avenue to the existing 6-inch diameter DIP water main in the ROW of N. 26<sup>th</sup> Avenue, 150 feet south of the intersection with Scott Street. See Contract Drawings for details.

**Duration of Shutdown:** 4 hours

**Pre-requisites:**

- 1) Install the required MOT signage and barricades.
- 2) CONTRACTOR shall confirm the location of the existing 6-inch diameter piping within N. 26<sup>th</sup> Avenue.
- 3) Install new 6-inch diameter PVC water main, new fittings, restraints, and 6-inch gate valve (V8-1) to the existing piping within N. 26<sup>th</sup> Avenue.
- 4) Coordinate with CITY for determination of required valve closings to allow performance of shutdown activities for existing 6-inch diameter water main.

**Activities for Shutdown /Tie-in No. 8:** (See Contract Drawing for details)

- 1) Cut, remove segments (including fittings), and plug existing 6-inch diameter water main within N. 26<sup>th</sup> Avenue.
- 2) Perform installation of new 6-inch PVC water main pipe, fittings, and restraints to newly installed valve (V8-1) under existing piping and utilities in N. 26<sup>th</sup> Avenue for connection to existing main system.
- 3) Disinfect and connect the new water main segments. Water mains above shall pass the required hydrostatic and bacteriological testing prior to being placed in service.
- 4) Coordinate with CITY for activation of connection.

- 11. SHUTDOWN / TIE-IN NO. 8A:** Connect new 8-inch diameter PVC water main within the ROW of Coolidge Street to the existing 6-inch diameter DIP water main in the ROW of Coolidge Street. See Contract Drawings for details.

**Duration of Shutdown:** 4 hours

**Pre-requisites:**

- 1) Install the required MOT signage and barricades.
- 2) CONTRACTOR shall confirm the location of the existing 6-inch diameter piping within Coolidge Street.
- 3) Install new 8-inch diameter PVC water main, new fittings, restraints, and 8-inch gate valve (V8-2) to the existing piping within Coolidge Street.
- 4) Coordinate with CITY for determination of required valve closings to allow performance of shutdown activities for existing 6-inch diameter water main.

**Activities for Shutdown /Tie-in No. 8A:** (See Contract Drawing for details)

- 1) Cut, remove segments (including fittings), and plug existing 6-inch diameter water main within Coolidge Street.
- 2) Perform installation of new 8-inch PVC water main pipe, fittings, and restraints to newly installed valve (V8-2) under existing piping and utilities in Coolidge Street for connection to existing main system.
- 3) Disinfect and connect the new water main segments. Water mains above shall pass the required hydrostatic and bacteriological testing prior to being placed in service.
- 4) Coordinate with CITY for activation of connection.

- 12. SHUTDOWN / TIE-IN NO. 9:** Connect new 4-inch diameter PVC water main within the ROW of N. 26<sup>th</sup> Avenue to the existing 2-inch diameter DIP water main on the east side of the ROW of N. 26<sup>th</sup> Avenue. Connect new 8-inch diameter PVC water main within the ROW of N. 26<sup>th</sup> Avenue to the existing 6-inch diameter DIP water main on the west side of the ROW of N. 26<sup>th</sup> Avenue. See Contract Drawings for details.

**Duration of Shutdown:** 4 hours

**Pre-requisites:**

- 1) Install the required MOT signage and barricades.
- 2) CONTRACTOR shall confirm the location of the existing 2-inch and 6-inch diameter piping within N. 26<sup>th</sup> Avenue.
- 3) Install new 8-inch by 4-inch tee, 4-inch diameter PVC water main, new fittings, restraints, and 4-inch gate valve (V9-1) to the existing piping located east of the proposed location within N. 26<sup>th</sup> Avenue.
- 4) Install new 4-inch DI cap downstream of the gate valve (V9-1) and connect 2-inch flexible tubing to the cap on one end and the existing 2-inch water main on the other end, as shown on Detail 22 on sheet CD-005.
- 5) Install new 4-inch by 6-inch reducer, 8-inch diameter PVC water main, new fittings, restraints, and 8-inch gate valve (V9-2) to the existing piping located west of the proposed location within N. 26<sup>th</sup> Avenue.
- 6) Coordinate with CITY for determination of required valve closings to allow performance of shutdown activities for existing 2-inch and 6-inch diameter water mains.

**Activities for Shutdown /Tie-in No. 9:** (See Contract Drawing for details)

- 1) Cut, remove segments (including fittings), and plug existing 2-inch and 6-inch diameter water mains within N. 26<sup>th</sup> Avenue.
- 2) Perform installation of new 4-inch and 8-inch PVC water main pipe, new 2-inch tubing, cap, fittings, DI to galvanized piping connector, and restraints to newly installed valves (V9-1 and V9-2) under existing piping and utilities in N. 26<sup>th</sup> Avenue for connection to existing main system.
- 3) Disinfect and connect the new water main segments. Water mains above shall pass the required hydrostatic and bacteriological testing prior to being placed in service.
- 4) Coordinate with CITY for activation of connection.

- 13. SHUTDOWN / TIE-IN NO. 10:** Connect new 8-inch diameter PVC water main within the ROW of N. 26<sup>th</sup> Avenue to the existing 2-inch diameter DIP water main on the east side of the ROW of N. 26<sup>th</sup> Avenue. Connect new 8-inch diameter PVC water main within the ROW of N. 26<sup>th</sup> Avenue to the existing 6-inch diameter DIP water on the west side of the ROW of N. 26<sup>th</sup> Avenue. See Contract Drawings for details.

**Duration of Shutdown:** 4 hours

**Pre-requisites:**

- 1) Install the required MOT signage and barricades.
- 2) CONTRACTOR shall confirm the location of the existing 2-inch and 6-inch diameter piping within N. 26<sup>th</sup> Avenue.
- 3) Install new 4-inch diameter PVC water main, 4-inch by 8-inch reducer, 8-inch diameter PVC water main, new fittings, restraints, and 8-inch gate valve (V10-1) to the existing piping located east of the proposed location within N. 26<sup>th</sup> Avenue.
- 4) Install new 4-inch DI cap downstream of the gate valve (V10-1) and connect 2-inch flexible tubing to the cap on one end and the existing 2-inch water main on the other end, as shown on Detail 22 on sheet CD-005.

- 5) Install new 8-inch by 6-inch reducer, 8-inch and 6-inch diameter PVC water mains, new fittings, restraints, and 8-inch gate valve (V10-2) to the existing piping located west of the proposed location within N. 26<sup>th</sup> Avenue
- 6) Coordinate with CITY for determination of required valve closings to allow performance of shutdown activities for existing 6-inch diameter water main.

**Activities for Shutdown /Tie-in No. 10:** (See Contract Drawing for details)

- 1) Cut, remove segments (including fittings), and plug existing 2-inch and 6-inch diameter water main within N. 26<sup>th</sup> Avenue.
- 2) Perform installation of new 4-inch, 6-inch and 8-inch PVC water mains, new 2-inch tubing, cap, fittings, DI to galvanized piping connector, and restraints to newly installed valves (V10-1 and V10-2) under existing piping and utilities in N. 26<sup>th</sup> Avenue for connection to existing main system.
- 3) Disinfect and connect the new water main segments. Water mains above shall pass the required hydrostatic and bacteriological testing prior to being placed in service.
- 4) Coordinate with CITY for activation of connection.

- 14. SHUTDOWN / TIE-IN NO. 11:** Connect new 4-inch diameter PVC water main within the ROW of N. 26<sup>th</sup> Avenue to the existing 2-inch diameter DIP water main on the east side of the ROW of N. 26<sup>th</sup> Avenue. Connect new 8-inch diameter PVC water main within the ROW of N. 26<sup>th</sup> Avenue to the existing 6-inch diameter DIP water main on the west side of the ROW of N. 26<sup>th</sup> Avenue. See Contract Drawings for details.

**Duration of Shutdown:** 4 hours

**Pre-requisites:**

- 1) Install the required MOT signage and barricades.
- 2) CONTRACTOR shall confirm the location of the existing 2-inch and 6-inch diameter piping within N. 26<sup>th</sup> Avenue.
- 3) Install new 4-inch diameter PVC water main, new fittings, restraints, and 4-inch gate valve (V11-1) to the existing piping located east of the proposed location within N. 26<sup>th</sup> Avenue.
- 4) Install new 4-inch DI cap downstream of the gate valve (V11-1) and connect 2-inch flexible tubing to the cap on one end and the existing 2-inch water main on the other end, as shown on Detail 22 on sheet CD-005.
- 5) Install new 8-inch by 6-inch reducer, 8-inch diameter PVC water main, new fittings, restraints, and 8-inch gate valve (V11-2) to the existing piping located west of the proposed location within N. 26<sup>th</sup> Avenue.
- 6) Coordinate with CITY for determination of required valve closings to allow performance of shutdown activities for existing 2-inch diameter water main.

**Activities for Shutdown /Tie-in No. 11:** (See Contract Drawing for details)

- 1) Cut, remove segments (including fittings), and plug existing 2-inch and 6-inch diameter water main within N. 26<sup>th</sup> Avenue.
- 2) Perform installation of new 4-inch and 8-inch PVC water main pipes, new 2-inch tubing, cap, fittings, DI to galvanized piping connector, and restraints to newly installed valves (V11-1 and V11-2) under existing piping and utilities in N. 26<sup>th</sup> Avenue for connection to existing main system.

- 3) Disinfect and connect the new water main segments. Water mains above shall pass the required hydrostatic and bacteriological testing prior to being placed in service.
  - 4) Coordinate with CITY for activation of connection.
- 15. SHUTDOWN / TIE-IN NO. 12:** Connect new 8-inch diameter PVC water main within the ROW of N. 26<sup>th</sup> Avenue to the existing 8-inch diameter DI water main on the east side of the ROW of N. 26<sup>th</sup> Avenue. See Contract Drawings for details.

**Duration of Shutdown:** 4 hours

**Pre-requisites:**

- 1) Install the required MOT signage and barricades.
- 2) CONTRACTOR shall confirm the location of the existing 8-inch diameter piping within N. 26<sup>th</sup> Avenue.
- 3) Install new 8-inch diameter DIP water main, new fittings, restraints, and 8-inch gate valve (V12-1) to the existing piping located east of the proposed location within N. 26<sup>th</sup> Avenue. All piping within the ROW of Taft Street is to be DIP. DIP shall be installed from existing valve location (south connection) to 8x6-inch fire hydrant tee (north location).
- 4) Coordinate with CITY for determination of required valve closings to allow performance of shutdown activities for existing 8-inch diameter water main.

**Activities for Shutdown /Tie-in No. 12:** (See Contract Drawing for details)

- 1) Cut, remove segments (including fittings), and plug existing 8-inch diameter water main within N. 26<sup>th</sup> Avenue.
  - 2) Perform installation of new 8-inch DI water main pipes, fittings, and restraints to newly installed valve (V12-1) under existing piping and utilities in N. 26<sup>th</sup> Avenue for connection to existing main system.
  - 3) Disinfect and connect the new water main segments. Water mains above shall pass the required hydrostatic and bacteriological testing prior to being placed in service.
  - 4) Coordinate with CITY for activation of connection.
- 16. SHUTDOWN / TIE-IN NO. 14:** Connect new 8-inch diameter PVC water main within the ROW of Sherman Street just before the bridge to the existing 6-inch diameter DIP water main on the east side of the bridge on Sherman Street. See Contract Drawings for details.

**Duration of Shutdown:** 4 hours

**Pre-requisites:**

- 1) Install the required MOT signage and barricades.
- 2) CONTRACTOR shall confirm the location of the existing 6-inch diameter piping within Sherman Street
- 3) Install new 6 and 8-inch diameter PVC water main, new fittings, restraints, and 6-inch gate valve (V14-1) to the existing piping located east of the proposed location within N. 26<sup>th</sup> Avenue.
- 4) Coordinate with CITY for determination of required valve closings to allow performance of shutdown activities for existing 6-inch diameter water main.

**Activities for Shutdown /Tie-in No. 11:** (See Contract Drawing for details)

- 1) Cut, remove segments (including fittings), and plug existing 6-inch diameter water main within Sherman Street.

- 2) Perform installation of new 8-inch PVC water main pipes, fittings, and restraints to newly installed valve (V14-1) under existing piping and utilities in Sherman Street for connection to existing main system.
- 3) Disinfect and connect the new water main segments. Water mains above shall pass the required hydrostatic and bacteriological testing prior to being placed in service.
- 4) Coordinate with CITY for activation of connection.

#### 1.04 WORK BY OTHERS

- A. The CONTRACTOR shall cooperate fully with all utility forces of the CITY, or other public or private agencies engaged in the relocation, altering, or otherwise rearranging any facilities which interfere with the progress of the work, and shall schedule the work to minimize interference with said relocation, altering, or rearranging of facilities.
- B. The CONTRACTOR'S attention is directed to the fact that work will be conducted at the site by other CONTRACTORS during the performance of the work under this Contract. The CONTRACTOR shall conduct its operations to cause a minimum of interference with the Work of such other CONTRACTORS, and shall cooperate fully with such CONTRACTORS to provide continued safe access to their respective portions of the site, as required to perform their respective contracts.
- C. When two or more contracts are being executed at one time on the same or adjacent land in such manner that Work on one contract may interfere with that on another, the CITY shall determine the sequence and order of the Work. When the territory of one contract is the necessary or convenient means of access for the execution of another CONTRACTOR, such privilege of access or any other reasonable privilege may be granted by the CITY to CONTRACTOR.

#### 1.05 CONTRACTOR FURNISHED MATERIAL AND EQUIPMENT

- A. All equipment, materials, or devices incorporated in this project shall be new and unused, unless indicated otherwise in the Contract Documents and shall be the products of reliable manufacturers who, unless otherwise specified, have been regularly engaged in the manufacture of such material and equipment for at least five (5) years. Procedures and additional requirements regarding manufacturer's experience and substitutions are included in Section 01300 - Submittals.

#### 1.06 DRAWINGS OF EXISTING FACILITIES

- A. Drawings of the existing facilities may be inspected at the City's Engineering and Construction Services Office. These drawings are for information only and are not a part of the Contract Documents. In making these drawings available for inspection, the CITY makes no guarantee, either expressed or implied, as to their accuracy or completeness.
- B. The CONTRACTOR shall contact representatives for other utilities, facilities in proximity of the work and Sunshine State One Call Inc., to obtain the as-built information from them directly. The utilities shown on Drawings are based upon available records supplied from various sources. The CITY makes no guarantee, either expressed or implied, as to their accuracy or completeness.

#### 1.07 ITEMS SPECIFIED ON DRAWINGS



- A. Certain items of material and/or equipment, and their installation may be specified on the Drawings and not mentioned in the Specifications. Such items are to be considered as both shown on the Drawings and noted in the Specifications and be provided by the CONTRACTOR in accordance with the Specification on the Drawings.

#### 1.08 FIELD LAYOUT OF WORK

- A. All work under this Contract shall be constructed in accordance with the Contract Drawings or as directed by the ENGINEER. Elevations of existing ground, structures and appurtenances are believed to be reasonably correct but are not guaranteed to be absolute and therefore are presented only as an approximation. Any error or apparent discrepancy in the data shown or omissions of data required for accurately accomplishing the stake-out survey shall be referred immediately to the ENGINEER for interpretation or correction.
- B. All survey work for construction control purposes shall be made by the CONTRACTOR at CONTRACTOR'S expense.
- C. The CONTRACTOR shall establish all base lines for the location of the principal component parts of the work together with benchmarks and batter boards adjacent to the work. Based upon the information provided by the Contract Drawings, the CONTRACTOR shall develop and make all detail surveys necessary for construction. The CITY will furnish information and location of existing benchmarks.
- D. The CONTRACTOR shall have the responsibility to carefully preserve the benchmarks, reference points and stakes. In case of destruction thereof by the CONTRACTOR or resulting from CONTRACTOR'S negligence, he shall be held liable for any expense and damage resulting therefrom and shall be responsible for any mistakes that may be caused by the unnecessary loss or disturbance of such bench marks, reference points and stakes.
- E. Existing or new control points, property markers, and monuments that will be established or are destroyed during the normal causes of construction shall be re-established by the CONTRACTOR; and all reference ties recorded therefore shall be furnished to the ENGINEER. All computations necessary to establish the exact position of the work shall be made and preserved by the CONTRACTOR.
- F. The ENGINEER may check all or any portion of the work, and the CONTRACTOR shall afford all necessary assistance to the ENGINEER in carrying out such checks. Any necessary corrections to the work shall be performed immediately by the CONTRACTOR and he shall accept all responsibility for the accuracy and completeness of CONTRACTOR'S work.

#### 1.08 REQUEST FOR INFORMATION

- A. Contractor shall rearrange work in the project area while waiting for a response to a request for information (RFI) submitted to the Engineer. Engineer shall respond to the RFI within 96 hours.

#### **PART 2 -- PRODUCTS (Not Used)**

#### **PART 3 -- EXECUTION (Not Used)**

- END OF SECTION -



**SECTION 01025**  
**BASIS OF PAYMENT**

**PART 1 - GENERAL**

1.01 GENERAL

- A. Payments to the CONTRACTOR shall be made on the basis of the bid items listed on the Proposal Bid Form as full and complete payment for furnishing all materials, labor, tools, and equipment, and for performing all operations necessary to complete the work included in the Contract Documents. Such compensation shall also include payments for any loss or damages arising directly or indirectly from the work, or from any discrepancies between the actual quantities of work and those shown in the Contract Documents, or from any unforeseen difficulties which may be encountered during the prosecution of the work until the final acceptance by the CITY.
- B. The prices stated in the proposal include full compensation for overhead and profit, all costs and expenses for taxes, labor, equipment, materials, commissions, transportation charges and expenses, patent fees and royalties, labor for handling materials during inspection, furnishing and repairing small tools and ordinary equipment, mobilization, home office expenses and general supervision, bond, insurance, labor for handling materials during inspection, together with any and all other costs and expenses for performing and completing the work as shown on the Drawings and specified herein. In addition, the CONTRACTOR shall include the actual cost of social security taxes, unemployment insurance, worker's compensation, fringe benefits, inclusive of life and health insurance, union dues, pension, pension Drawings, vacations, and insurance and CONTRACTOR's public liability and property damage insurance involved in the work based on the actual wages paid to such labor and all other general costs and profits, prorated to each Item.
- C. Unless otherwise specifically stated elsewhere herein, the CONTRACTOR shall include in the prices bid all materials, electrical supply, fuel, lubricants, temporary equipment, temporary wiring, temporary piping and fittings, pumps, gages, and all other items of whatever nature required to completely test, balance, disinfect if required, and put into fully operational condition all equipment and/or systems supplied by either the CITY or the CONTRACTOR and installed as a part of this Project. Further, any test materials supplied by the CONTRACTOR shall be completely satisfactory to the CITY. Any decision as to whether a particular material is suitable for test purposes shall be at the sole discretion of the ENGINEER whose decision shall be final. Any material considered not suitable shall be immediately replaced by the CONTRACTOR with suitable material and no extra compensation will be allowed.
- D. The Basis of Payment for an item at the price shown in the Proposal shall be in accordance with its description of the item in this Section and as related to the work specified and as shown on the Drawings. Unit prices, where used, will be applied to the actual quantities furnished and installed in conformance with the Contract Documents.

- E. The CONTRACTOR'S attention is called to the fact that the quotations for the various items of work are intended to obtain a complete and working installation under this Contract, and any items of labor, equipment or materials which may reasonably be assumed as necessary to accomplish this end shall be supplied whether or not they are specifically shown on the Drawings or stated herein. Should the CONTRACTOR feel that the cost of any item of work has not been established by the Proposal Bid Form, he shall include the cost for that work in the Bid Item most closely associates with that work so that his proposal for the Project does reflect his total price for completing the work in its entirety.
- F. The CONTRACTOR shall submit, with each Payment Request, a list of MBE/WBE SUBCONTRACTOR's, that he is or will be utilizing for his contract. For each MBE/WBE SUBCONTRACTOR, the following information shall be provided:
1. Total sub-contract dollar amount.
  2. Amount paid to date.

#### 1.02 MEASUREMENT

The quantities for payment under this Contract shall be determined by actual measurement of the completed items, in place, ready for service and accepted by the CITY, in accordance with the Proposal Bid Form as described in Section 00301, unless otherwise specified. A representative of the CONTRACTOR shall witness all field measurements.

#### 1.03 PAYMENT ITEMS

For purposes of determining the monthly payments to be made to the CONTRACTOR for work accomplished, the percentage of work completed shall be determined in the following manner:

- A. Excavation, installation of pipe, valves, fittings, hydrants, and other appurtenances completed, removal and disposal of excavation, completed backfill and temporary paving repairs shall constitute eighty percent (85%) of the price bid for these Proposal Items.
- B. Completion of all interior work in the pipeline including cleaning, hydrostatic testing and disinfection of water mains shall constitute five percent (5%) of the price bid for these Proposal Items.
- C. Completion of all surface repairs, restoration of public or private facilities, appurtenances, and all other work not provided for under other Proposal Items shall constitute the remaining ten percent (10%) of the price bid for these Proposal Items.
- D. Descriptions, method of measurement and basis of payment for each pay item:

#### **Water Main Replacement Construction Costs**

1. **Bid Item No. 1 - Fire Hydrant Assemblies and Connections**: Payment for all labor, equipment, materials, delivery, testing and commissioning for all work necessary and required to furnish and install new fire hydrant assemblies where shown on the Drawings in accordance with the Specifications and Standard Details. Payment shall be at the unit

price bid times the number of fire hydrant assemblies installed, ready for service, completed and accepted by the ENGINEER. The price bid shall be full compensation for each hydrant assembly, and shall include, but not be limited to: furnishing and installing complete hydrant barrel assembly, 6-inch DI hydrant main, 6-inch gate valve and valve box, concrete collar, extension stems, 6-inch DI fittings (including hydrant tee at main), steel guard posts, blue reflective pavement markers and concrete slab as needed, joint restraints, joint materials and accessories; replacement of concrete sidewalks, curbs and pedestrian ramps (including detectable warning surface); restoration of stabilized subgrade, compacted limerock base and asphalt surface course for trench restoration, in excess of that required to restore the new water main trench, in accordance with the Drawings, details, and FDOT Index 307; and all other appurtenant and miscellaneous items and work necessary for a complete installation in accordance with the details, Specifications and locations shown on the Drawings.

2. **Bid Item No. 2 - Fire Hydrant Removal and Delivery to CITY Property:** Payment for all labor, equipment, materials, for removal of existing fire hydrant assemblies Payment shall be at the unit price bid times the number of hydrant removals completed and accepted by the ENGINEER. The price bid shall be full compensation for each removal, and shall include but not be limited to, removal and transport of existing complete fire hydrant barrel assembly and 6-inch gate valve to the Department of Public Utilities yard; replacement of concrete sidewalks, curbs and pedestrian ramps (including detectable warning surface); restoration of any stabilized subgrade, compacted limerock base, and asphalt surface (if impacted) for the trench restoration in accordance with the Drawings, details and FDOT Index 307; and all other appurtenant and miscellaneous items and work necessary to obtain a complete installation.
3. **Bid Item No. 3 (Subitems a through d) - PVC C-900/C-905 Water Mains and D.I. Fittings:** Payment for all labor, equipment, materials, delivery, testing and commissioning for all work necessary and required to furnish and install new (C-900/C905) PVC pipe with D.I. fittings necessary to address all conflicts (with polyethylene encasement) for proposed water main per the Contract Documents. This work shall include, but not be limited to: survey, clearing and grubbing, swale restoration, locating and protection of all existing utilities, preparation and submittal of shop drawings, installing storm water pollution prevention devices, dewatering, pipe and all D.I. fittings/appurtenances, restrained joints, trench excavation, shoring, bedding, backfilling, removal and disposal of unsuitable/excess fill, removal and disposal of all removed sidewalk/curb and gutter, removal and disposal of all removed asphalt pavement and lime rock base, water distribution system pressure testing and disinfection (sampling points, etc.). Pipe separation requirements and exceptions between proposed water main and existing sanitary sewer, etc. is indicated in FAC 62.555.314. Payment shall include restoration for all work in sodded areas including landscaping, irrigation, and electrical within roundabouts and swales. Payment for road restoration shall be addressed in restoration bid items herein this Basis of Payment Section.
4. **Bid Item No. 4 - 8" D.I. Water Main (Taft Street):** Payment for all labor, equipment, materials, delivery, testing and commissioning for all work necessary and required to

furnish and install DI pipe within the ROW of Taft Street per the Contract Documents. This work shall include, but not be limited to: survey, clearing and grubbing, swale restoration, locating and protection of all existing utilities, preparation and submittal of shop drawings, installing storm water pollution prevention devices, dewatering, pipe and all D.I. fittings/appurtenances, restrained joints, trench excavation, shoring, bedding, backfilling, removal and disposal of unsuitable/excess fill, removal and disposal of all removed sidewalk/curb and gutter, removal and disposal of all removed asphalt pavement and lime rock base, water distribution system pressure testing and disinfection (sampling points, etc.). Pipe separation requirements and exceptions between proposed water main and existing sanitary sewer, etc. is indicated in FAC 62.555.314. Payment shall include restoration for all work in sodded areas including landscaping, irrigation, and electrical within roundabouts and swales. Payment for road restoration shall be addressed in restoration bid items herein this Basis of Payment Section.

5. **Bid Item No. 5 (Subitems a through b) - D.I. Reducers**: Payment for all labor, equipment, materials, delivery, testing and commissioning for all work necessary and required to furnish and install permanent and temporary D.I. reducers. This work shall include, but not be limited to, survey, locating and protection of all existing utilities, polyethylene encasement, preparation and submittal of shop drawings, removal of temporary reducers, and requirements associated with the installation of the reducers. Payment shall be at the unit price bid times the number of reducers installed, tested, ready for service, and accepted by the ENGINEER.
6. **Bid Item No. 6 (Subitems a through c) - D.I. Tees**: Payment for all labor, equipment, materials, delivery, testing and commissioning for all work necessary and required to furnish and install D.I. tees. This work shall include, but not be limited to, survey, locating and protection of all existing utilities, polyethylene encasement, preparation and submittal of shop drawings, and requirements associated with the installation of the tees. Payment shall be at the unit price bid times the number of tees installed, tested, ready for service, and accepted by the ENGINEER.
7. **Bid Item No. 7 - D.I. Crosses**: Payment for all labor, equipment, materials, delivery, testing and commissioning for all work necessary and required to furnish and install D.I. crosses. This work shall include, but not be limited to, survey, locating and protection of all existing utilities, polyethylene encasement, preparation and submittal of shop drawings, and requirements associated with the installation of the crosses. Payment shall be at the unit price bid times the number of crosses installed, tested, ready for service, and accepted by the ENGINEER.
8. **Bid Item No. 8 (Subitems a through e) - D.I. Bends**: Payment for all labor, equipment, materials, delivery, testing and commissioning for all work necessary and required to furnish and install permanent and temporary D.I. bends. This work shall include, but not be limited to, survey, locating and protection of all existing utilities, polyethylene encasement, preparation and submittal of shop drawings, removal of temporary bends, and requirements associated with the installation of the bends. Payment shall be at the unit price bid times the number of bends installed, tested, ready for service, and accepted by the ENGINEER.

9. **Bid Item No. 9 (Subitems a through c) - D.I. Gate Valves**: Payment for all labor, equipment, materials, delivery, testing and commissioning for all work necessary and required to furnish and install D.I. gate valves for potable water mains of the nominal diameters specified in these bid items. Payment shall be at the unit price bid times the number of completed valves installed, tested, ready for service and accepted by the ENGINEER. Such payment shall include, but not be limited to: furnishing and installing the valves, valve boxes, risers, concrete collars, concrete thrust blocks and concrete supports; furnishing and installing polyethylene encasement for all DI valves; all applicable items and work from; and all other appurtenant and miscellaneous items and work necessary to obtain a complete installation.
10. **Bid Item No. 10 (Subitems a through b) – Transition Coupling**: Payment for all labor, equipment, materials, delivery, testing and commissioning for all work necessary and required to furnish and install transition coupling for potable water mains of the nominal diameters specified in these bid items. Payment shall be at the unit price bid times the number of transition couplings installed, tested, ready for service and accepted by the ENGINEER. Such payment shall include, but not be limited to: furnishing and installing the couplings and all other appurtenant and miscellaneous items and work necessary to obtain a complete installation.
11. **Bid Item No. 11 Flexible Connection to Existing 2-inch WM**: Payment for all labor, equipment, materials, delivery, testing and commissioning for all work necessary and required to furnish and install flexible connections to the existing 2-inch water main, as shown in the details in the Drawings. Payment shall be at the unit price bid times the number of completed flexible connections installed, tested, ready for service and accepted by the ENGINEER. Such payment shall include, but not be limited to: furnishing and installing the flexible connections and all other appurtenant and miscellaneous items and work necessary to obtain a complete installation.
12. **Bid Item No. 12 - Cutting, Capping, and Abandonment of Existing 2-inch Water Mains**: The lump sum price for this item shall be payment for all labor, equipment, materials and delivery for all work necessary and required to cut piping, cap piping, and abandon all existing 2-inch or smaller diameter water mains to be abandoned as shown in the Contract Documents.
13. **Bid Item No. 13 - Cutting, Grouting, and Abandonment of Existing 4-inch, 6-inch, and 8-inch Water Mains**: The lump sum price for this item shall be payment for all labor, equipment, materials and delivery for all work necessary and required to cut piping, install flowable grout fill and cap piping for all existing 4-inch or larger diameter water mains shown to be abandoned and grouted in place per the Contract Documents.

#### **Water Meter and Water Service Construction Costs**

14. **Bid Item No. 14 (Subitems a through b) - Water Service Lines From New Water Main To Existing Water Meters**: For cutting existing water services of diameters 3" and smaller, and reconnecting the existing meters to proposed water mains at the locations

shown on the Drawings or where directed by the ENGINEER in the field, will be paid for at the unit price bid times the number of meters reconnected in accordance with current design standards and Specifications, and accepted by the ENGINEER. The price bid shall be full compensation for each existing meter reconnected, ready for service, and shall include but not be limited to: coordination with CITY forces for temporary system deactivation; notifying affected property owners/occupants; cutting the existing services at the meters and removing existing ball valve curb stop(s), "U-branches", header piping and fittings; furnishing and installing new ball valve curb stop(s), "U-branches" and header piping and fittings; furnishing and installing HDPE tubing for domestic water service, gate valves, valve boxes, risers, concrete collars, double-strap or band service saddle and corporation stop; making connection to proposed water mains; furnishing and installing 3-inch minimum diameter Sch. 80 PVC or black iron casing (for services crossing under roadway pavement); replacement of concrete sidewalks, curbs and pedestrian ramps (including detectable warning surface); restoration of stabilized subgrade, compacted limerock base and asphalt surface course for trench restoration, in excess of that required to restore the new water main trench, in accordance with the Drawings, details, and FDOT Index 307, and all other appurtenant and miscellaneous items and work necessary for a complete installation in accordance with the details, Specifications and locations shown on the Drawings.

#### **Storm Drainage Construction Costs**

15. **Bid Item No. 15 - 4' Dia. Drainage Manhole w/USF 420 Ring and C Cover 4' - 6' depth**: Payment for all labor, equipment, materials, delivery, testing and commissioning for all work necessary and required to furnish, transport, store, protect, and install new Precast Reinforced Concrete Underground Drainage Structures of varying sizes, diameters and depths for Storm Sewer and French Drain, including the following:
- a. Manholes, Catch Basins and Junction Boxes fabricated by an approved precast concrete provider per the Contract Documents. Structures shall be provided with wall openings of the dimensions, diameters, elevations and orientation required to accommodate the pipe connections shown on the Drawings, and pre-drilled anchor holes for installation of Pollution Retardant Baffles (PRBs).
  - b. Cast iron frames/grates or rings/covers of the specified sizes/types and cast by an approved foundry in accordance with the Contract Documents.
  - c. Brick, mortar and grout for leveling, sealing and finishing.
  - d. The work shall include, but not be limited to, survey, clearing and grubbing, swale restoration, locating and protection of all existing utilities, preparation and submittal of shop drawings, installing storm water pollution prevention devices, dewatering, trench excavation, shoring, bedding, backfilling, compaction, removal and disposal of unsuitable/excess fill, removal and disposal of all removed sidewalk/curb and gutter, removal and disposal of all removed asphalt pavement and lime rock base. Payment shall include restoration for all work in sodded areas including select fill, landscaping, irrigation and electrical within roundabouts and swales. For structures located under asphalt pavement, payment shall also include compacted limerock



base and 2-inch thick SP-9.5 Asphaltic Concrete Structural Course for trench restoration. Payment for road milling and overlay shall be addressed in City Roads Restoration bid items within this Basis of Payment Section.

16. **Bid Item No. 16 - 4' Dia. Drainage Manhole w/USF 420 Ring and C Cover 6' - 8' depth:** Payment for all labor, equipment, materials, delivery, testing and commissioning for all work necessary and required to furnish, transport, store, protect, and install new Precast Reinforced Concrete Underground Drainage Structures of varying sizes, diameters and depths for Storm Sewer and French Drain, including the following:
- a. Manholes, Catch Basins and Junction Boxes fabricated by an approved precast concrete provider per the Contract Documents. Structures shall be provided with wall openings of the dimensions, diameters, elevations and orientation required to accommodate the pipe connections shown on the Drawings, and pre-drilled anchor holes for installation of Pollution Retardant Baffles (PRBs).
  - b. Cast iron frames/grates or rings/covers of the specified sizes/types and cast by an approved foundry in accordance with the Contract Documents.
  - c. Brick, mortar and grout for leveling, sealing and finishing.
  - d. The work shall include, but not be limited to, survey, clearing and grubbing, swale restoration, locating and protection of all existing utilities, preparation and submittal of shop drawings, installing storm water pollution prevention devices, dewatering, trench excavation, shoring, bedding, backfilling, compaction, removal and disposal of unsuitable/excess fill, removal and disposal of all removed sidewalk/curb and gutter, removal and disposal of all removed asphalt pavement and lime rock base. Payment shall include restoration for all work in sodded areas including select fill, landscaping, irrigation and electrical within roundabouts and swales. For structures located under asphalt pavement, payment shall also include compacted limerock base and 2-inch thick SP-9.5 Asphaltic Concrete Structural Course for trench restoration. Payment for road milling and overlay shall be addressed in City Roads Restoration bid items within this Basis of Payment Section.
17. **Bid Item No. 17 - 4' Dia. Drainage Manhole w/USF 420 Ring and C Cover 8' - 10' depth:** Payment for all labor, equipment, materials, delivery, testing and commissioning for all work necessary and required to furnish, transport, store, protect, and install new Precast Reinforced Concrete Underground Drainage Structures of varying sizes, diameters and depths for Storm Sewer and French Drain, including the following:
- a. Manholes, Catch Basins and Junction Boxes fabricated by an approved precast concrete provider per the Contract Documents. Structures shall be provided with wall openings of the dimensions, diameters, elevations and orientation required to accommodate the pipe connections shown on the Drawings, and pre-drilled anchor holes for installation of Pollution Retardant Baffles (PRBs).
  - b. Cast iron frames/grates or rings/covers of the specified sizes/types and cast by an approved foundry in accordance with the Contract Documents.
  - c. Brick, mortar and grout for leveling, sealing and finishing.
  - d. The work shall include, but not be limited to, survey, clearing and grubbing, swale restoration, locating and protection of all existing utilities, preparation and submittal

of shop drawings, installing storm water pollution prevention devices, dewatering, trench excavation, shoring, bedding, backfilling, compaction, removal and disposal of unsuitable/excess fill, removal and disposal of all removed sidewalk/curb and gutter, removal and disposal of all removed asphalt pavement and lime rock base. Payment shall include restoration for all work in sodded areas including select fill, landscaping, irrigation and electrical within roundabouts and swales. For structures located under asphalt pavement, payment shall also include compacted limerock base and 2-inch thick SP-9.5 Asphaltic Concrete Structural Course for trench restoration. Payment for road milling and overlay shall be addressed in City Roads Restoration bid items within this Basis of Payment Section.

18. **Bid Item No. 18 - 5' Dia. Drainage Manhole w/USF 420 Ring and C Cover 4' - 6' depth**: Payment for all labor, equipment, materials, delivery, testing and commissioning for all work necessary and required to furnish, transport, store, protect, and install new Precast Reinforced Concrete Underground Drainage Structures of varying sizes, diameters and depths for Storm Sewer and French Drain, including the following:
- a. Manholes, Catch Basins and Junction Boxes fabricated by an approved precast concrete provider per the Contract Documents. Structures shall be provided with wall openings of the dimensions, diameters, elevations and orientation required to accommodate the pipe connections shown on the Drawings, and pre-drilled anchor holes for installation of Pollution Retardant Baffles (PRBs).
  - b. Cast iron frames/grates or rings/covers of the specified sizes/types and cast by an approved foundry in accordance with the Contract Documents.
  - c. Brick, mortar and grout for leveling, sealing and finishing.
  - d. The work shall include, but not be limited to, survey, clearing and grubbing, swale restoration, locating and protection of all existing utilities, preparation and submittal of shop drawings, installing storm water pollution prevention devices, dewatering, trench excavation, shoring, bedding, backfilling, compaction, removal and disposal of unsuitable/excess fill, removal and disposal of all removed sidewalk/curb and gutter, removal and disposal of all removed asphalt pavement and lime rock base. Payment shall include restoration for all work in sodded areas including select fill, landscaping, irrigation and electrical within roundabouts and swales. For structures located under asphalt pavement, payment shall also include compacted limerock base and 2-inch thick SP-9.5 Asphaltic Concrete Structural Course for trench restoration. Payment for road milling and overlay shall be addressed in City Roads Restoration bid items within this Basis of Payment Section.
19. **Bid Item No. 19 - 5' Dia. Drainage Manhole w/USF 420 Ring and C Cover 8' - 10' depth**: Payment for all labor, equipment, materials, delivery, testing and commissioning for all work necessary and required to furnish, transport, store, protect, and install new Precast Reinforced Concrete Underground Drainage Structures of varying sizes, diameters and depths for Storm Sewer and French Drain, including the following:
- a. Manholes, Catch Basins and Junction Boxes fabricated by an approved precast concrete provider per the Contract Documents. Structures shall be provided with wall openings of the dimensions, diameters, elevations and orientation required to

accommodate the pipe connections shown on the Drawings, and pre-drilled anchor holes for installation of Pollution Retardant Baffles (PRBs).

- b. Cast iron frames/grates or rings/covers of the specified sizes/types and cast by an approved foundry in accordance with the Contract Documents.
- c. Brick, mortar and grout for leveling, sealing and finishing.
- d. The work shall include, but not be limited to, survey, clearing and grubbing, swale restoration, locating and protection of all existing utilities, preparation and submittal of shop drawings, installing storm water pollution prevention devices, dewatering, trench excavation, shoring, bedding, backfilling, compaction, removal and disposal of unsuitable/excess fill, removal and disposal of all removed sidewalk/curb and gutter, removal and disposal of all removed asphalt pavement and lime rock base. Payment shall include restoration for all work in sodded areas including select fill, landscaping, irrigation and electrical within roundabouts and swales. For structures located under asphalt pavement, payment shall also include compacted limerock base and 2-inch thick SP-9.5 Asphaltic Concrete Structural Course for trench restoration. Payment for road milling and overlay shall be addressed in City Roads Restoration bid items within this Basis of Payment Section.

20. **Bid Item No. 20 - FDOT Type "C" Catch Basin w/Cast iron Grate (Index 443-002):**

Payment for all labor, equipment, materials, delivery, testing and commissioning for all work necessary and required to furnish, transport, store, protect, and install new Precast Reinforced Concrete Underground Drainage Structures of varying sizes, diameters and depths for Storm Sewer and French Drain, including the following:

- a. Manholes, Catch Basins and Junction Boxes fabricated by an approved precast concrete provider per the Contract Documents. Structures shall be provided with wall openings of the dimensions, diameters, elevations and orientation required to accommodate the pipe connections shown on the Drawings, and pre-drilled anchor holes for installation of Pollution Retardant Baffles (PRBs).
- b. Cast iron frames/grates or rings/covers of the specified sizes/types and cast by an approved foundry in accordance with the Contract Documents.
- c. Brick, mortar and grout for leveling, sealing and finishing.
- d. The work shall include, but not be limited to, survey, clearing and grubbing, swale restoration, locating and protection of all existing utilities, preparation and submittal of shop drawings, installing storm water pollution prevention devices, dewatering, trench excavation, shoring, bedding, backfilling, compaction, removal and disposal of unsuitable/excess fill, removal and disposal of all removed sidewalk/curb and gutter, removal and disposal of all removed asphalt pavement and lime rock base. Payment shall include restoration for all work in sodded areas including select fill, landscaping, irrigation and electrical within roundabouts and swales. For catch basins to be located within swale areas between sidewalks and roads, payment shall also include re-grading the swale to slope toward the catch basin grates. For structures located under asphalt pavement, payment shall also include compacted limerock base and 2-inch thick SP-9.5 Asphaltic Concrete Structural Course for

trench restoration. Payment for road milling and overlay shall be addressed in City Roads Restoration bid items within this Basis of Payment Section.

21. **Bid Item No. 21 - 4' Dia. Catch Basin w/USF 4180-6172**: Payment for all labor, equipment, materials, delivery, testing and commissioning for all work necessary and required to furnish, transport, store, protect, and install new Precast Reinforced Concrete Underground Drainage Structures of varying sizes, diameters and depths for Storm Sewer and French Drain, including the following:
- a. Manholes, Catch Basins and Junction Boxes fabricated by an approved precast concrete provider per the Contract Documents. Structures shall be provided with wall openings of the dimensions, diameters, elevations and orientation required to accommodate the pipe connections shown on the Drawings, and pre-drilled anchor holes for installation of Pollution Retardant Baffles (PRBs).
  - b. Cast iron frames/grates or rings/covers of the specified sizes/types and cast by an approved foundry in accordance with the Contract Documents.
  - c. Brick, mortar and grout for leveling, sealing and finishing.
  - d. The work shall include, but not be limited to, survey, clearing and grubbing, swale restoration, locating and protection of all existing utilities, preparation and submittal of shop drawings, installing storm water pollution prevention devices, dewatering, trench excavation, shoring, bedding, backfilling, compaction, removal and disposal of unsuitable/excess fill, removal and disposal of all removed sidewalk/curb and gutter, removal and disposal of all removed asphalt pavement and lime rock base. Payment shall include restoration for all work in sodded areas including select fill, landscaping, irrigation and electrical within roundabouts and swales. For catch basins to be located within swale areas between sidewalks and roads, payment shall also include re-grading the swale to slope toward the catch basin grates. For structures located under asphalt pavement, payment shall also include compacted limerock base and 2-inch thick SP-9.5 Asphaltic Concrete Structural Course for trench restoration. Payment for road milling and overlay shall be addressed in City Roads Restoration bid items within this Basis of Payment Section.
22. **Bid Item No. 22 - Replace Exist. Struct. EX-01 with 5' Dia. Catch Basin w/4122-6172 Frame-Grate, including reconnections**: Payment includes all requirements from Items No. 15-21 above, plus all labor, equipment, materials, delivery, testing and commissioning for all work necessary and required to perform the following:
- a. Cut and remove sections of existing pipe of various diameters, as well as support and protect the sections of existing pipe to remain.
  - b. Complete removal of existing drainage structures
  - c. Furnishing and installing new Solid and Perforated Corrugated PVC Pipe of different diameters, Fittings as needed, Couplings for joining different pipe materials, and Structure Wall Connectors for reconnecting new Drainage Structures (Structures provided under separate pay items) to existing Storm Sewer Pipe and/or existing Drainage Structures in accordance with the manufacturer's recommendations and the Contract Documents.

23. **Bid Item No. 23 – Skimmer (PRB) (FDOT Index 443-002)**: Payment for all labor, equipment, materials, delivery, storage, testing and commissioning for all work necessary and required to furnish and install new Pollution Retardant Baffles (PRBs) inside new and existing Drainage Structures, including gaskets, anchors and all appurtenances required for installation in accordance with the Contract Documents and where shown on the Drawings.
24. **Bid Item No. 24 – 6" In-Line Storm Drainage Check Valve (Procured by COH)**: Payment for all labor, equipment, delivery, storage, protecting, testing and commissioning for all work necessary and required to install In-line Check Valves procured by the City of Hollywood of the types and diameters shown on the Drawings and in accordance with the Contract Documents. Payment includes assembly, placing the In-line Check Valves into new or existing Drainage Structures through the structure tops, inserting them into the receiving outlet pipes, and anchoring them to the interior structure wall using equipment, tools, installation materials, anchors and all other appurtenances recommended by the manufacturer's installation instructions.
25. **Bid Item No. 25 – 12" In-Line Storm Drainage Check Valve (Procured by COH)**: Payment for all labor, equipment, delivery, storage, protecting, testing and commissioning for all work necessary and required to install In-line Check Valves procured by the City of Hollywood of the types and diameters shown on the Drawings and in accordance with the Contract Documents. Payment includes assembly, placing the In-line Check Valves into new or existing Drainage Structures through the structure tops, inserting them into the receiving outlet pipes, and anchoring them to the interior structure wall using equipment, tools, installation materials, anchors and all other appurtenances recommended by the manufacturer's installation instructions.
26. **Bid Item No. 26 – 24" In-Line Storm Drainage Check Valve (Procured by COH)**: Payment for all labor, equipment, delivery, storage, protecting, testing and commissioning for all work necessary and required to install In-line Check Valves procured by the City of Hollywood of the types and diameters shown on the Drawings and in accordance with the Contract Documents. Payment includes assembly, placing the In-line Check Valves into new or existing Drainage Structures through the structure tops, inserting them into the receiving outlet pipes, and anchoring them to the interior structure wall using equipment, tools, installation materials, anchors and all other appurtenances recommended by the manufacturer's installation instructions.
27. **Bid Item No. 27 – 6" Solid Corrugated Drainage Pipe and Couplings/ Connectors**: Payment includes all requirements from 13.d above, plus Payment for all labor, equipment, materials, delivery, storage, testing and commissioning for all work necessary and required to furnish and install new Solid and Perforated Corrugated PVC Storm Drainage Pipe of different diameters, Fittings as needed, Couplings for joining different pipe materials, and Structure Wall Connectors in accordance with the manufacturer's recommendations and the Contract Documents.
28. **Bid Item No. 28 – 12" Solid Corrugated Drainage Pipe and Couplings/ Connectors**: Payment includes all requirements from 15.d above, plus Payment for all labor,

equipment, materials, delivery, storage, testing and commissioning for all work necessary and required to furnish and install new Solid and Perforated Corrugated PVC Storm Drainage Pipe of different diameters, Fittings as needed, Couplings for joining different pipe materials, and Structure Wall Connectors in accordance with the manufacturer's recommendations and the Contract Documents.

29. **Bid Item No. 29 – 15" Solid Corrugated Drainage Pipe and Couplings/ Connectors:** Payment includes all requirements from 15.d above, plus Payment for all labor, equipment, materials, delivery, storage, testing and commissioning for all work necessary and required to furnish and install new Solid and Perforated Corrugated PVC Storm Drainage Pipe of different diameters, Fittings as needed, Couplings for joining different pipe materials, and Structure Wall Connectors in accordance with the manufacturer's recommendations and the Contract Documents.
30. **Bid Item No. 30 – 18" Solid Corrugated Drainage Pipe and Couplings/ Connectors:** Payment includes all requirements from 15.d above, plus Payment for all labor, equipment, materials, delivery, storage, testing and commissioning for all work necessary and required to furnish and install new Solid and Perforated Corrugated PVC Storm Drainage Pipe of different diameters, Fittings as needed, Couplings for joining different pipe materials, and Structure Wall Connectors in accordance with the manufacturer's recommendations and the Contract Documents.
31. **Bid Item No. 31 – French Drain, including 18" Perforated Corrugated PVC Pipe and Couplings as Shown on Drawings :** Payment includes all requirements from Items 15.d and 27 above, plus Payment for all labor, equipment, materials, delivery, storage, testing and commissioning for all work necessary and required to furnish and install new French Drain, including Coarse Aggregate or Ballast Rock, and Filter Fabric in accordance with the Contract Documents and where shown on the Drawings.
32. **Bid Item No. 32 – Cut Exist. 24" Storm Sewer and Reconnect to Prop. Manhole SD-01 w/24" Solid Corrugated PVC and Couplings as Needed (Manhole SD-01 paid under separate pay item):** Payment includes all requirements from Items 15.d and 22.c above.
33. **Bid Item No. 33 – Cut Exist. 15" Storm Sewer and Reconnect to Prop. Manhole SD-02 w/15" Solid Corrugated PVC and Couplings as Needed (Manhole SD-02 paid under separate pay item):** Payment includes all requirements from Items 15.d and 22.c above.
34. **Bid Item No. 34 – Core-drill Wall of Exist. Structure to Prepare for Connection of 12" Solid Corrugated PVC (EX-06 and EX-07):** Payment includes all requirements from Items 15.d and 22.a above, plus Payment for all labor, equipment, materials, delivery, storage, testing and commissioning for the following:
- a. After removal of Existing Pipe, seal pipe openings with Cement Mortar as required for a smooth, finished seal in accordance with the Contract Documents.
  - b. Core-drill new pipe openings in Existing Drainage Structure walls as indicated on the Drawings and in accordance with the Contract Documents.

35. **Bid Item No. 35 – Core-drill Wall of Exist. Structure to Prepare for Connection of 15" Solid Corrugated PVC (EX-02 and EX-03)**: Payment includes all requirements from Items 15.d and 22.a above, plus Payment for all labor, equipment, materials, delivery, storage, testing and commissioning for the following:
- a. After removal of Existing Pipe, seal pipe openings with Cement Mortar as required for a smooth, finished seal in accordance with the Contract Documents.
  - b. Core-drill new pipe openings in Existing Drainage Structure walls as indicated on the Drawings and in accordance with the Contract Documents.
36. **Bid Item No. 36 – Core-drill Wall of Exist. Structure to Prepare for Connection of 18" Solid Corrugated PVC (EX-05)**: Payment includes all requirements from Items 15.d and 22.a above, plus Payment for all labor, equipment, materials, delivery, storage, testing and commissioning for the following:
- a. After removal of Existing Pipe, seal pipe openings with Cement Mortar as required for a smooth, finished seal in accordance with the Contract Documents.
  - b. Core-drill new pipe openings in Existing Drainage Structure walls as indicated on the Drawings and in accordance with the Contract Documents.
37. **Bid Item No. 37 – Remove Exist. 6" Storm Sewer Connected to South Invert of Exist. Structure EX-09, Mortar-seal Exist. Pipe Opening, and Core-drill South Wall to Prepare for Connection of Prop. 6" Solid Corrugated PVC at Invert Shown on Drawings**: Payment includes all requirements from Items 15.d and 22.a above, plus Payment for all labor, equipment, materials, delivery, storage, testing and commissioning for the following:
- a. After removal of Existing Pipe, seal pipe openings with Cement Mortar as required for a smooth, finished seal in accordance with the Contract Documents.
  - b. Core-drill new pipe openings in Existing Drainage Structure walls as indicated on the Drawings and in accordance with the Contract Documents.
38. **Bid Item No. 38 – Remove Exist. 6" Storm Sewer Connected to North Invert of Exist. Structure EX-08 to Prepare for Connection of Prop. 6" Solid Corrugated PVC at Same Invert**: Payment includes all requirements from Items 15.d and 22.a above, plus Payment for all labor, equipment, materials, delivery, storage, testing and commissioning for the following:
- a. After removal of Existing Pipe, seal pipe openings with Cement Mortar as required for a smooth, finished seal in accordance with the Contract Documents.
  - b. Core-drill new pipe openings in Existing Drainage Structure walls as indicated on the Drawings and in accordance with the Contract Documents.

#### **Storm Drainage Allowance Items**

39. **Allowance Item No. 39 – Replace Exist. Struct. with FDOT Type C Catch Basin w/Cast Iron Grate per FDOT Index 425-052. Reconnect to Exist. Pipe of Varying Diameters w/Prop. Solid Corrugated PVC Pipe and Couplings as Needed (EX-02, EX-07 and EX-09)**: Payment includes all requirements from Item No. 15 above, plus all

labor, equipment, materials, delivery, testing and commissioning for all work necessary and required to perform the following:

- a. Cut and remove sections of existing pipe of various diameters, as well as support and protect the sections of existing pipe to remain.
- b. Complete removal of existing drainage structures
- c. Furnishing and installing new Solid and Perforated Corrugated PVC Pipe of different diameters, Fittings as needed, Couplings for joining different pipe materials, and Structure Wall Connectors for reconnecting new Drainage Structures (Structures provided under separate pay items) to existing Storm Sewer Pipe and/or existing Drainage Structures in accordance with the manufacturer's recommendations and the Contract Documents.

**40. Allowance Item No. 40 – Replace Exist. Struct. w/4' Dia. Catch Basin 4' - 6' deep w/USF Frame-Grate 4122-6172 or 4180-6172. Cut Exist. Pipe and Reconnect w/New Pipe and Couplings as Needed. (EX-03 and EX-04):**

Payment includes all requirements from Item No. 15 above, plus all labor, equipment, materials, delivery, testing and commissioning for all work necessary and required to perform the following:

- a. Cut and remove sections of existing pipe of various diameters, as well as support and protect the sections of existing pipe to remain.
- b. Complete removal of existing drainage structures
- c. Furnishing and installing new Solid and Perforated Corrugated PVC Pipe of different diameters, Fittings as needed, Couplings for joining different pipe materials, and Structure Wall Connectors for reconnecting new Drainage Structures (Structures provided under separate pay items) to existing Storm Sewer Pipe and/or existing Drainage Structures in accordance with the manufacturer's recommendations and the Contract Documents.

**41. Allowance Item No. 41 – Replace Exist. Struct. w/5' Dia. Catch Basin 4' - 6' deep w/USF Frame-Grate 4122-6172 or 4180-6172. Cut Exist. Pipe and Reconnect w/New Pipe and Couplings as Needed. (EX-05 and EX-06):**

Payment includes all requirements from Item No. 15 above, plus all labor, equipment, materials, delivery, testing and commissioning for all work necessary and required to perform the following:

- a. Cut and remove sections of existing pipe of various diameters, as well as support and protect the sections of existing pipe to remain.
- b. Complete removal of existing drainage structures
- c. Furnishing and installing new Solid and Perforated Corrugated PVC Pipe of different diameters, Fittings as needed, Couplings for joining different pipe materials, and Structure Wall Connectors for reconnecting new Drainage Structures (Structures provided under separate pay items) to existing Storm Sewer Pipe and/or existing Drainage Structures in accordance with the manufacturer's recommendations and the Contract Documents.



42. **Allowance Item No. 42 – Replace Exist. 24-inch Storm Sewer w/24-inch Solid Corrugated PVC Pipe and Couplings adjacent to SD-01:** Payment includes all requirements from Items 15.d and 22.c above.
43. **Allowance Item No. 43 – Remove Section of Existing 6" Storm Sewer Connected to North Invert of Struct. EX-09 and Replace with 6" Solid Corrugated PVC Pipe and Couplings to Accommodate In-line Check Valve Installation:** In the event that Proposed In-line Check Valves cannot be installed within Existing Storm Outlet Pipes as described in Bid Items 24 – 26 because Existing Pipes are deformed or damaged, Payment includes all requirements from Items 15.d and 22.a above, plus Payment for all labor, equipment, materials, delivery, storage, testing and commissioning for furnishing and installing new Solid and Perforated Corrugated PVC Pipe of different diameters, Fittings as needed, Couplings for joining different pipe materials, and Structure Wall Connectors for reconnecting to New or Existing Drainage Structures (Structures provided under separate pay items) and to Existing Storm Sewer Pipe accordance with the manufacturer's recommendations and the Contract Documents.
44. **Allowance Item No. 44 – Remove Section of Existing 12" Storm Sewer Connected to North Invert of Struct. EX-04 and Replace with 12" Solid Corrugated PVC Pipe and Couplings to Accommodate In-line Check Valve Installation:** In the event that Proposed In-line Check Valves cannot be installed within Existing Storm Outlet Pipes as described in Bid Items 24 – 26 because Existing Pipes are deformed or damaged, Payment includes all requirements from Items 15.d and 22.a above, plus Payment for all labor, equipment, materials, delivery, storage, testing and commissioning for furnishing and installing new Solid and Perforated Corrugated PVC Pipe of different diameters, Fittings as needed, Couplings for joining different pipe materials, and Structure Wall Connectors for reconnecting to New or Existing Drainage Structures (Structures provided under separate pay items) and to Existing Storm Sewer Pipe accordance with the manufacturer's recommendations and the Contract Documents.
45. **Allowance Item No. 45 – Remove Section of Existing 24" Storm Sewer Connected to North Invert of Struct. EX-01 and Replace with 24" Solid Corrugated PVC Pipe and Couplings to Accommodate In-line Check Valve Installation:** In the event that Proposed In-line Check Valves cannot be installed within Existing Storm Outlet Pipes as described in Bid Items 24 – 26 because Existing Pipes are deformed or damaged, Payment includes all requirements from Items 15.d and 22.a above, plus Payment for all labor, equipment, materials, delivery, storage, testing and commissioning for furnishing and installing new Solid and Perforated Corrugated PVC Pipe of different diameters, Fittings as needed, Couplings for joining different pipe materials, and Structure Wall Connectors for reconnecting to New or Existing Drainage Structures (Structures provided under separate pay items) and to Existing Storm Sewer Pipe accordance with the manufacturer's recommendations and the Contract Documents.
46. **Allowance Item No. 46 – Relocate 30± LF of Exist. 6" CI/DI Watermain Pipe and Fittings as Shown on Drawings to Accommodate Prop. Drainage Installation Btw. STA 49+81 and 50+09 of Sherman St.:** Payment includes all requirements from Items

15.d above, plus Payment for all labor, equipment, materials, delivery, storage, testing and commissioning for furnishing and installing new Water Main D.I. pipe, fittings, closure sleeves, joint restraints, polyethylene encasement and all other appurtenances required for a complete water main installation necessary to avoid conflict with proposed Storm Drainage System in accordance with the Contract Documents. Payment shall also include pressure testing and disinfection (sampling points, etc.), and meeting pipe separation requirements and exceptions between proposed water main and existing storm and sanitary sewer as indicated in FAC 62.555.314.

47. **Allowance Item No. 47 – Furnish and Install Sleeves for Proposed Service Lines and Existing Service Lines to Remain 2-inch Diameter and Smaller that Cross Proposed French Drain**: Payment includes all requirements from Items 27 - 31 above, plus Payment for all labor, equipment, materials, delivery, storage, testing and commissioning for furnishing and installing new Pipe Sleeves on proposed and existing service lines that will cross through Proposed French Drain in accordance with the details on Sheet SD-206, FDOT Standard Specifications, and the Contract Documents as required for a complete installation. Contractor shall be responsible for coordinating the installation of the Pipe Sleeves with the installation of the French Drain and Water Services, and shall at all times avoid disrupting newly installed French Drain in order to install a Pipe Sleeve. Payment shall also include cutting and replacing sections of existing service lines to remain in order to accommodate the installation of the sleeves, and meeting pipe separation requirements and exceptions between proposed water services and existing storm and sanitary sewer as indicated in FAC 62.555.314.
48. **Allowance Items No. 48 – Furnish and Install Sleeves for Proposed Service Lines and Existing Service Lines Larger than 2-inch Diameter that Cross Proposed French Drain**: Payment includes all requirements from Items 27 - 31 above, plus Payment for all labor, equipment, materials, delivery, storage, testing and commissioning for furnishing and installing new Pipe Sleeves on proposed and existing service lines that will cross through Proposed French Drain in accordance with the details on Sheet SD-206, FDOT Standard Specifications, and the Contract Documents as required for a complete installation. Contractor shall be responsible for coordinating the installation of the Pipe Sleeves with the installation of the French Drain and Water Services, and shall at all times avoid disrupting newly installed French Drain in order to install a Pipe Sleeve. Payment shall also include cutting and replacing sections of existing service lines to remain in order to accommodate the installation of the sleeves, and meeting pipe separation requirements and exceptions between proposed water services and existing storm and sanitary sewer as indicated in FAC 62.555.314.
49. **Allowance Item No. 49 – Adjust Proposed Drainage Structure Tops due to Unforeseen Field Conditions in Accordance with FDOT Standard Index 425-001 as Modified on Sheet SD-206**: Payment includes all requirements from Items 15 – 22 and Allowance Items 39 - 41 above. In the event underground field conditions are different than shown on the Construction Documents, payment shall include all labor, equipment, materials, delivery, storage, testing and commissioning for furnishing and installing adjustments to proposed Drainage Structure tops in accordance with FDOT Standard

Index 425-001 as modified on Sheet SD-206. Work under this Pay Item shall include, but is not limited to, saw-cutting structure tops, constructing new structure tops/risers, furnishing and installing adjustable manhole frames and all other appurtenances required for a complete Drainage Structure installation in accordance with the Contract Documents.

### **City Roads Restoration Construction Costs**

50. **Bid Item No. 50 - Milling of Asphaltic Course to 1-inch Nominal Thickness within Liberty, Thomas, and Sherman Streets' ROW:** Payment for all labor, equipment, materials and delivery for all work necessary and required to mill 1-inch from the existing asphaltic concrete surface course for permanent asphalt pavement repairs within City of Hollywood rights-of-way disturbed during water main installation activities will be paid for at the unit price bid times the number of square yards (SY) of such surface course milled as required, measured along the curb within the limits defined by the Pavement Restoration Drawings and Standard Details, and as approved by the ENGINEER. This includes the rights-of-way within Liberty Street, Thomas Street, and Sherman Street. Milling of pavement shall be placed in the full width of the street, alleyway, and/or avenue. Greater widths are at CONTRACTOR's option and expense. The price bid shall be full compensation for saw-cutting, furnishing all materials, labor and equipment required. Asphalt cold milling shall be performed using an automated pavement planer capable of maintaining an accurate depth. Cold milling equipment shall meet the approval of the ENGINEER and the governing agency having jurisdiction at the location of the pavement milling operation. The ENGINEER's word as to the acceptability of the equipment shall be final.
51. **Bid Item No. 51 - 2-inch Thick (SP9.5) Asphaltic Concrete Structural Course for Trench Restoration within City ROW (all impacted streets):** Payment for all labor, equipment, materials, delivery, testing and commissioning for all work necessary and required to furnish and install asphaltic concrete for trench restoration for 2-inch thick (min.) SP 9.5 asphaltic concrete structural course within City of Hollywood City of Hollywood rights-of-way in accordance with Standard Detail G-12.1, where shown on the Drawings. Payment shall be at the unit price bid times the number of linear feet installed following the corresponding pavement restoration sections and meeting the compaction requirements provided on the Drawings, Specifications and standard details (whichever is more stringent), completed and accepted by the CITY and Broward County, with surface at the proper elevations. Trench restoration shall be placed on City the streets, alleyways, and/or avenues. Greater widths, lengths, and thicknesses are at the CONTRACTOR's option and expense. Restoration of asphaltic concrete structural course, limerock base and stabilized subgrade along new water services and fire hydrants, and/or reconnection of existing water services is included in the unit costs bid for those specific pay Items. The price bid shall be full compensation for furnishing all materials, labor and equipment required for a complete machine-laid asphaltic concrete surface course installation. There is no anticipated impact to asphalt driveways as shown on the Drawings. If impacted by the CONTRACTOR's operations, these shall be restored

at no additional cost to the contract. Asphalt driveway sections shall include 6" thick (min.) compacted limerock base and 1" SP-9.5 asphaltic concrete surface course meeting all other asphalt pavement requirements shown on the Drawings and Specifications. Asphalt shall be restored over the entire driveway approach regardless of extent of impact.

52. **Bid Item No. 52 – Roadway Patches for Large Damaged Areas (2" Asphalt):** Payment for all labor, equipment, materials, delivery, testing and commissioning for all work necessary and required to remove and replace existing asphalt pavement of varying thicknesses impacted by the re-routing/relocation of existing water services inside private properties by carefully cutting existing asphalt, and will be paid for at the unit price bid times the number of square yards (SY) of pavement replaced, completed, ready for service and accepted by the ENGINEER. The price bid for this pay item shall include, but not be limited to: saw-cutting, removing, hauling, and legally disposing of existing pavement; protecting any existing asphalt pavement to remain; furnishing and installing 2-inch thick (min. or to match existing) asphaltic concrete structural course, 6" thick limerock base (min. LBR 100) compacted to min. 98% max. density, and 12" Type "B" Stabilized Subgrade (min. LBR 40 compacted to 98% max. density; Measurement for payment shall be the number of square yards (SY) of pavement being removed and replaced as agreed-to by the resident or property owner. All other replacement due to removal or damage as a result of the CONTRACTOR's operation shall be at the CONTRACTOR's expense.
53. **Bid Item No. 53 - Resurfacing of Side Streets:** Payment for all labor, equipment, materials, delivery, testing and commissioning for all work necessary and required to furnish and install 1- inch min. thick SP 9.5 (Traffic B) machine laid asphaltic concrete surface course for permanent paving overlay in streets, alleyways, and avenues within the side streets Liberty, Thomas, and Sherman will be paid for at the unit price bid times the number of square yards (SY) of asphaltic concrete overlay installed and accepted by the ENGINEER and Broward County, as measured along the limits defined in the Pavement Restoration Drawings and Standard Details. The pavement overlay shall be placed in the full width of the street, alleyway, and/or avenue. Greater widths are at the CONTRACTOR's option and expense. The price bid shall be full compensation for furnishing all materials, labor and equipment required for a complete machine-laid asphaltic concrete surface course installation.
54. **Bid Item No. 54 - Existing Concrete Pavement, Brick Pavers and/or other specialty paving removed during re-routing of water services within private properties:** Payment for all labor, equipment, materials, delivery, testing and commissioning for all work necessary and required to remove and replace by carefully cutting of existing concrete pavement, brick pavers and/or other specialty paving of varying thicknesses, impacted by the re-routing/relocation of existing water services inside private properties, and will be paid for at the unit price bid times the number of square yards (SY) of pavement replaced, completed, ready for service and accepted by the ENGINEER. The price bid for this pay item shall include, but not be limited to: saw-cutting, removing, hauling, and legally disposing of existing pavement; protecting any existing concrete

pavement to remain; furnishing and installing formwork, concrete, brick pavers, sand, or mortar, water, and admixtures, reinforcing steel, and miscellaneous materials; placing, finishing, curing, and protecting the finished pavement surface. Measurement for payment shall be the number of square yards (SY) of pavement being removed and replaced as agreed-to by the resident or property owner. All other replacement due to removal or damage as a result of the CONTRACTOR's operation shall be at the CONTRACTOR's expense.

55. **Bid Item No. 55 – Temporary Striping for N 26<sup>th</sup> Avenue and Side Streets Except Liberty, Sherman, and Thomas**: Payment for all labor, equipment, material, delivery, design and permitting for all work necessary and required for temporary striping within the limits of the project for the duration of the construction period will be paid for at the lump sum amount bid. The price bid shall be full compensation for all materials, labor and equipment required for a complete painted striping along N. 26<sup>th</sup> Avenue and the relevant side streets.
56. **Bid Item No. 56 – Protective Concrete Slab over DI Piping on Taft Street**: The lump sum price bid for all labor, equipment, material, delivery, testing and commissioning for all work necessary and required to furnish and install a protective concrete slab over DI piping as shown in the contract documents; providing all necessary maintenance of traffic; survey work involving concrete slab, and all necessary appurtenances to provide a safe construction area. The price bid shall be full compensation for all materials, labor and equipment required for a complete protective concrete slab over DI piping.
57. **Bid Item No. 57 – Speed Humps**: Payment for all labor, equipment, materials, delivery, testing and commissioning for all work necessary and required to furnish and install transition coupling for potable water mains of the nominal diameters specified in these bid items. Payment shall be at the unit price bid times the number of transition couplings installed, tested, ready for service and accepted by the ENGINEER. Such payment shall include, but not be limited to: furnishing and installing the couplings and all other appurtenant and miscellaneous items and work necessary to obtain a complete installation.

### **General**

58. **Bid Item No. 58 - Mobilization / Gen. Requirements**: The lump sum price bid for this item shall be full compensation for all mobilization and demobilization activities required for the project, including but not limited to: Multiple mobilizations that may be required to comply with project phasing, providing bonds and insurance; preparing schedules and permit packages; complying with all submittal requirements; furnishing, installing and maintaining erosion and sedimentation control measures; providing/securing temporary construction facilities, staging areas, space required for laydown and storage, parking, etc.; furnishing, installing and removal of temporary water main interconnections require for project phasing; survey work involving pre-construction project layout and controls; and pre-construction audio-video. The payment items for mobilization shall not exceed 3% of the sum of Bid Items No. 1-38 and 47-52.

59. **Bid Item No. 59 – Demobilization / Gen. Requirements**: Payment for completing all other work including but not limited to finish grading, demobilization, site cleanup, pass lamp inspection for the cleaning of project drainage system, final restoration, recording horizontal and vertical locations of proposed improvements as they are constructed, and providing all necessary final record (“as-built”) documents; providing post-construction audio- video documentation of the site; finished grading; demobilization; restoration of any site items that do not relate to specific pay items in this bid; site cleanup; and all other activities necessary to complete the contract work as per the Technical Specification and Contract Drawings. The payment items for demobilization shall not exceed 2% of the sum of Bid Items No. 1-38 and 47-52.
60. **Bid Item No. 60 - Consideration for Indemnification**: In recognition of the CONTRACTOR’S indemnification obligations, the CITY will pay to the CONTRACTOR the specific consideration of ten dollars (\$10.00). Payment of said specific consideration shall be made at the time of the payment of the first progress estimate and the CONTRACTOR shall acknowledge payment of this consideration by letter to the CITY after receipt of the progress payment.
61. **Bid Item No. 61 - Maintenance of Traffic, Including Design and Permitting**: Payment for all labor, equipment, material, delivery, design and permitting for all work necessary and required for temporary traffic controls within the limits of the project for the duration of the construction period will be paid for at the lump sum amount bid. Payment shall constitute full compensation for providing traffic controls throughout project area during the duration of construction, including but not limited to: preparing maintenance of traffic (MOT) Drawings and obtaining approvals from FDOT, Broward County Traffic and CITY of Hollywood, furnishing and installing sufficient traffic signs, advance warning signs, electronic message boards, temporary pavement markings, reflective pavement markers (RPMs), barricades, temporary asphalt pavement, flagmen, and similar items and work for maintaining and/or re-directing pedestrian and vehicular traffic flow during construction in order to maintaining safety. Provide facilities needed to maintain access to residences, businesses, etc. within the project limits. Any portion of this fund remaining after all authorized payments have been made will remain with the CONTRACTOR. Conversely, no requests for additional reimbursement will be approved.
62. **Bid Item No. 62 - Permit, Licenses, Fees, and Materials Testing Allowance**: The allowance indicated for this item is to pay for all permits, licenses, other fees and testing required of the CONTRACTOR per the Contract Documents. The allowance shown on the Schedule of Bid Prices is an estimate of fees required. Payment will be based on the actual permit, license or fee paid directly to agency or Testing Company (for tests that meet criteria only), documented by paid receipts, specifically excluding any labor, mark-up, overhead and profit, administration and other costs involved in obtaining permits or licenses or paying fees or work associated with testing. The tests shall be performed by an independent testing laboratory selected by the CITY of Hollywood. Should any test(s) fail, subsequent tests shall be performed by the same testing laboratory and paid for by the CONTRACTOR at no additional cost to the Contract. Fees specifically excluded from

this allowance include but are not limited to re-inspection fees, expired permit fees, standby time, and failed tests.

63. **Bid Item 63 - Miscellaneous Work Allowance/Contingency**: Included in this allowance is work associated with undefined conditions or conflicts developing from undefined conditions. All work authorized for payment will be authorized in writing by the CITY. Amount to be paid per undefined conditions or conflict shall be negotiated or agreed to by both parties. The CITY reserves the right to award any, all, or none of the money associated with this allowance. The contingency shall not exceed 20% of the of the sum of Bid Items No. 1-35 and 44-49.
64. **Bid Item 64 – Unforeseen Utility Locates or Break Repair (besides water main work)**: Measurement and payment for unforeseen utility locates or break repairs will be based on the number of hours needed to perform such work in accordance with the requirements of the Contract Documents. Payment for unforeseen utility locates or break repairs, excluding water mains, will be made at the unit price per hour of time spent to perform such repair or locates on unforeseen or mismarked utilities as named in the Bid Form, which shall constitute full compensation for labor needed to perform such task, including but not limited to all labor for excavation, backfill, restoration work and coordination needed. This quantity has been estimated however the use of this line item will only be approved for use as deemed necessary by the Engineer. All material and equipment shall be the responsibility of the contractor and shall not be included in the bid item.

CONTRACTOR is responsible for potholing existing utilities sufficiently ahead of construction to avoid conflicts with the design alignment and grade of structures, culverts, storm drains and exfiltration trenches. Conflicts with utilities shown on the Drawings which result from the Contractors negligence to pothole sufficiently ahead of construction (a minimum of two days ahead of construction of the pipeline or as approved by the ENGINEER) shall be resolved by the Contractor at no additional cost to the OWNER.

- E. The price bid for each item shall be stated in both words and figures in the appropriate places in the Proposal Bid Form. All blank spaces for bid prices must be filled in with ink, or with a typewriter. The Bidder is further directed that any and all alterations, changes, corrections, and modifications, made to the Proposal Bid Form prior to submission of the bids, must be initialed by the Bidder. Non-compliance by the Bidder of this directive may be grounds for rejection of his bid.
- F. In the event that there is a discrepancy between the price written in words and the price written in numbers, the price written in words shall govern except where the number of units multiplied by the unit price shown in numbers equals the total price for that bid item. In such case, the unit price shown in numbers shall govern over the unit price shown in words.
- G. Where an error is made in the calculation of the total bid price of an item, the unit price shall govern.

- H. If the bidder makes an error in his addition of the total bid prices of the applicable items in the Quotation, the correct sum of its' applicable bid item totals shall be the Total Bid.

**Part 2 - PRODUCTS (Not Used)**

**Part 3 - EXECUTION (Not Used)**

- END OF SECTION -



**SECTION 01090****APPLICABLE STANDARDS AND CODES****Part 1 - GENERAL**

## 1.00 THE REQUIREMENT

- A. Wherever references are made in these specifications to any published standards, codes, standard specifications, or other published data of the various national, regional, or local organizations, such organizations may be referred to by their acronym or abbreviation only. References shall be to the latest versions currently in effect, unless otherwise specified by the CITY and/or ENGINEER. As a guide to the user of these specifications, the following acronyms or abbreviations which may appear in these specifications shall have the meanings indicated herein.
- B. The following is a partial list of typical abbreviations which may be used in the Specifications, and the organizations to which they refer. Abbreviated titles for other governing standards are used throughout these specifications and, although most of them are widely known, their complete titles are given below to avoid misunderstanding:
1. AAMA - Architectural Aluminum Manufacturer's Association
  2. AASHTO - American Association of the State Highway and Transportation Officials
  3. ACI - American Concrete Institute
  4. ACI - American Concrete Institute
  5. ACIFS - American Cast Iron Flange Standards
  6. ACOE - Army Corps of Engineers
  7. ACPA - American Concrete Pipe Association
  8. AFBMA - Anti-Friction Bearing Manufacturer's Association
  9. AGMA - American Gear Manufacturer's Association
  10. AGA - American Gas Association
  11. AGMA - American Gear Manufacturers Association
  12. AHGDA - American Hot Dip Galvanizers Association
  13. AI - The Asphalt Institute
  14. AIA - American Institute of Architects
  15. AISC - American Institute of Steel Construction
  16. AISI - American Iron and Steel Institute

17. AITC - American Institute of Timber Construction
18. AMCA - Air Moving and Conditioning Association
19. ANSI - American National Standards Institute, Inc.
20. APA - American Plywood Association
21. API - American Petroleum Institute
22. APHA - American Public Health Association
23. APWA - American Public Works Association
24. ASA - Acoustical Society of America
25. ASAE - American Society of Agriculture Engineers
26. ASCE - American Society of Civil Engineers
27. ASHRAE - American Society of Heating, Refrigerating, and Air-Conditioning Engineers
28. ASLE - American Society of Lubricating Engineers
29. ASME - American Society of Mechanical Engineers
30. ASMM - Architectural Sheet Metal Manual
31. ASSE - American Society of Sanitary Engineers
32. ASTM - American Society for Testing and Materials
33. AWI - Architectural Woodwork Institute
34. AWPA - American Wood Preservers Association
35. AWPI - American Wood Preservers Institute
36. AWS - American Welding Society
37. AWWA - American Water Works Association
38. BCEPGMD - Broward County Environmental Protection and Growth Management Department (formerly BCEPD)
39. BCHD - Broward County Health Department
40. BHMA - Builders Hardware Manufacturer's Association
41. CMA - Concrete Masonry Association
42. CRSI - Concrete Reinforcing Steel Institute
43. CSA - Canadian Standards Association
44. DHI - Door and Hardware Institute
45. DIPRA - Ductile Iron Pipe Research Association
46. EIA - Electronic Industries Association

47. ETL - Electrical Test Laboratories
48. FBC - Florida Building Code
49. FDEP - Florida Department of Environmental Protection
50. FDOT - Florida Department of Transportation
51. FS - Federal Specifications
52. ICEA - Insulated Cable Engineers Association
53. IEEE - Institute of Electrical and Electronics Engineers
54. IES - Illuminating Engineering Society
55. IPCEA - Insulated Power Cable Engineers Association
56. ISA - Instrument Systems and Automation
57. ISO - International Organization for Standardization
58. MBMA - Metal Building Manufacturers Association
59. MMA - Monorail Manufacturers Association
60. MTI - Marine Testing Institute
61. NAAMM - National Association of Architectural Metal Manufacturers
62. NACE - National Association of Corrosion Engineers
63. NBS - National Bureau of Standards
64. NCPI - National Clay Pipe Institute
65. NEC - National Electrical Code
66. NEMA - National Electrical Manufacturer's Association
67. NFPA - National Fire Protection Association
68. NLMA - National Lumber Manufacturers Association
69. NIOSH - National Institute of Occupational Safety and Health
70. NIST - National Institute of Standards and Testing
71. NRCA - National Roofing Contractors Association
72. NSF - National Science Foundation
73. OSHA - Occupational Safety and Health Administration
74. PCA - Portland Cement Association
75. SMACCNA - Sheet Metal and Air Conditioning Contractors National Association
76. SAE - Society of Automotive Engineers Standards
77. SHBI - Steel Heating Boiler Institute
78. SMACCNA - Sheet Metal and Air Conditioning Contractors National Association

- 79. SSPC - Steel Structures Painting Council
- 80. SSPWC - Standard Specifications for Public Works Construction
- 81. SFWMD - South Florida Water Management District
- 82. UL - Underwriters Laboratories, Inc.

C. CONTRACTOR shall, when required, furnish evidence satisfactory to the ENGINEER that materials and methods are in accordance with such standards where so specified.

D. In the event any questions arise as to the application of these standards or codes, copies shall be supplied on site by the CONTRACTOR.

**Part 2 - PRODUCTS (Not Used)**

**Part 3 - EXECUTION (Not Used)**

– END OF SECTION –

**SECTION 01200**  
**PROJECT MEETINGS**

**Part 1 - GENERAL**

1.01 PRECONSTRUCTION

A. A mandatory preconstruction meeting will be held to acquaint representatives of the Department and various other agencies with those in responsible charge of the CONTRACTOR's activities for the project. Unless otherwise directed by the Department, no construction activities relating to this contract shall commence until after the pre-construction meeting has been adjourned, and until any pending business from the meeting has been addressed by the CONTRACTOR to the satisfaction of the Department and ENGINEER. The meeting will cover such subjects as the following:

1. Insurance certificates
2. Permits and licenses
3. Affirmative action employment
4. Construction schedules
5. Cost breakdown and applications for payment
6. Material deliveries, storage and payments
7. Shop drawings and submittals
8. Job-site inspection by the ENGINEER
9. Safety and emergency action procedures
10. Operations of the existing utilities
11. Field offices, security and other housekeeping procedures
12. List of subcontractors
13. Liquidated damages
14. Communications
15. Coordinating
16. All other appropriate matters.

1.02 PROGRESS

A. A progress meeting shall be held on a once-per-week basis for the purpose of coordinating and expediting the work. The CONTRACTOR, as a part of his

obligations under the Contract, shall attend in person or by an authorized representative to attend and to act on his behalf. The ENGINEER will conduct such meetings and as necessary, with the CONTRACTOR's input, issue an agenda.

- B. In addition, the ENGINEER or CONTRACTOR may call for special job site meetings for the purpose of resolving unforeseen problems or conflicts which may impede the construction schedule. The ENGINEER will prepare a brief summary report of the decisions or understandings concerning each of the items discussed at the meeting.
- C. At weekly progress meetings, the CONTRACTOR shall submit to the ENGINEER for review a current three (3) week progress schedule. This schedule submission shall include a two week look ahead schedule and reflect status of the work performed during the preceding week.

**Part 2 - PART 2 -- PRODUCTS (Not Used)**

**Part 3 - PART 3 -- EXECUTION (Not Used)**

– END OF SECTION –

**SECTION 01300****SUBMITTALS****Part 1 - GENERAL**

## 1.01 THE REQUIREMENT

- A. This section specifies the means of all submittals. All submittals, whether their final destination is to the Department, ENGINEER, or other representatives of the Department, shall be directed through the ENGINEER. A summary of the key types of submittals and the number of copies required is as follows:

<u>Copies to ENGINEER</u>	<u>Type of Submittal</u>
4	Construction schedule
4	Schedule of payment items
1	Audio visual preconstruction record
6	Progress estimates
4	Shop drawings
4	Certificates of compliance
2	Warranties
1*	Product samples
1	Record drawings
5	Final Record Drawings

\*Unless otherwise required in the specific Section where requested.

## 1.02 SUBMITTAL PROCEDURES

- A. Transmit each submittal with a form acceptable to the ENGINEER, clearly identifying the project CONTRACTOR, the enclosed material and other pertinent information specified in other parts of this section. Identify variations from Contract Documents and Product or system limitations which may be detrimental to successful performance of the completed Work.
- B. Revise and resubmit submittals as required, identify all changes made since previous submittals. Resubmittals shall be noted as such.
- C. Distribute copies of reviewed submittals to concerned parties. Instruct parties to promptly report any inability to comply with provisions.

## 1.03 CONSTRUCTION PROGRESS SCHEDULE

- A. The CONTRACTOR shall have the capability of preparing and utilizing the specified construction progress scheduling techniques. A statement of capability shall be submitted in writing to the ENGINEER with the return of the executed Agreement to the Department and will verify that either the CONTRACTOR's organization has in-house capability qualified to use the technique or that the CONTRACTOR employs a consultant who is so qualified. Capability shall be verified by description of the construction projects to which the CONTRACTOR or its consultant has successfully applied the scheduling technique and which were controlled throughout the duration of the project by means of systematic use and updating of the construction progress schedule, the network analysis and associated reports. The submittal shall include the name of the individual on the CONTRACTOR's staff who will be responsible for the construction progress schedule, and associated reports and for providing the required updating information of same. The CONTRACTOR shall submit its proposed progress (baseline) schedule to the ENGINEER for review and comment within thirty days of the Notice to Award. The ENGINEER shall have the authority to determine acceptability/correctness of the schedule logic and activity interrelationships. The use of extraneous, nonworking activities and activities which add restraints to the construction schedule shall not be accepted. Baseline schedules that do not meet their contract completion dates shall not be accepted.
- B. The CONTRACTOR's progress schedule (baseline and monthly updates) shall be computer generated and resource loaded. Each construction progress schedule, and associated report shall include the following tabulations: a list of activities in numerical order, a list of activity precedence, schedules sequenced by Early Start Date, Total Float, and Late Start Date. Each schedule and report shall include the following minimum items.
1. Activity Numbers
  2. Estimated Duration
  3. Activity Description
  4. Early Start Date (Calendar Dated)
  5. Early Finish Date (Calendar Dated)
  6. Latest Allowable Start Date (Calendar Dated)
  7. Latest Allowable Finish Date (Calendar Dated)
  8. Status (whether critical)
  9. Estimated Cost of The Activity
  10. Total Float and Free Float
- C. In addition, each construction progress schedule, network analysis and report shall be prefaced with the following summary data:



1. Contract Name and Number
  2. CONTRACTOR's Name
  3. Contract Duration and Float
  4. Contract Schedule
  5. The Effective or Starting Date of The Schedule (the date indicated in the Notice-to-Proceed)
- D. The work day to calendar date correlation shall be based on an 8-hour day and 40-hour week with adequate allowance for holidays and all other special requirements of the Work. A total of six (6) days for adverse weather shall also be allowed for in the progress schedule.
- E. If the CONTRACTOR desires to make changes in its method of operating which affect the construction progress schedule and related items, the CONTRACTOR shall notify the ENGINEER in writing stating what changes are proposed and the reason for the change. If the ENGINEER accepts these changes, in writing, the CONTRACTOR shall revise and submit, without additional cost to the Department, all of the affected portions of the construction progress schedule, and associated reports. The construction progress schedule and related items shall be adjusted by the CONTRACTOR only after prior acceptance, in writing by the ENGINEER. Adjustments may consist of changing portions of the activity sequence, activity durations, division of activities, or other adjustments as may be required. The addition of extraneous, nonworking activities and activities which add restraints to the construction progress schedule shall not be accepted.
- F. Except where earlier completions are specified, schedule dates which show completion of all Work prior to the contract completion date shall, in no event, be the basis for claim for delay against the Department by the CONTRACTOR.
- G. Construction progress schedules and related items which contain activities showing negative float or which extend beyond the contract completion date will not be accepted by the ENGINEER.
- H. Whenever it becomes apparent from the current construction progress schedule and associated reports that delays to the critical path have resulted and the contract completion date will not be met, or when so directed by the ENGINEER, the CONTRACTOR shall take some or all of the following actions at no additional cost to the Department. They shall submit to the ENGINEER for approval, a written statement of the steps they intend to take to remove or arrest the delay to the critical path in the current construction progress schedule, including a computer-generated schedule revision to reflect proposed actions.

1. Increase construction manpower in such quantities and crafts as will substantially eliminate the backlog of work.
  2. Increase the number of working hours per shift, shifts per day, working days per week, the amount of construction equipment, or any combination of the foregoing, sufficiently to substantially eliminate the backlog of work.
  3. Reschedule activities to achieve maximum practical concurrency of accomplishment of activities, and comply with the revised schedule.
- I. If when so requested by the ENGINEER, the CONTRACTOR should fail to submit a written statement of the steps they intend to take or should fail to take such steps as reviewed and accepted in writing by the ENGINEER, the ENGINEER may direct the CONTRACTOR to increase the level of effort in manpower (trades), equipment and work schedule (overtime, weekend and holiday work, etc.) to be employed by the CONTRACTOR in order to remove or arrest the delay to the critical path in the current construction progress schedule, and the CONTRACTOR shall promptly provide such level of effort at no additional cost to the Department.
- J. If the completion of any activity, whether or not critical, falls more than 100 percent behind its previously scheduled and accepted duration, the CONTRACTOR shall submit for approval a schedule adjustment showing each such activity divided into two activities reflecting completed versus uncompleted work.
- K. Shop drawings which are not approved on the first submittal or within the time scheduled, and equipment which does not pass the specified tests and certifications shall be immediately rescheduled.
- L. The contract time will be adjusted only in accordance with the General Requirements and other portions of the Contract Documents as may be applicable. If the ENGINEER finds that the CONTRACTOR is entitled to any extension of the contract completion date, the ENGINEER's determination as to the total number of days extension shall be based upon the current construction progress schedule and on all data relevant to the extension. Such data shall be included in the next updating of the schedule and related items. Actual delays in activities which, according to the construction progress schedule, do not affect any contract completion date will not be the basis for a change therein.
- M. From time to time it may be necessary for the contract schedule of completion time to be adjusted by the Department in accordance with the General Requirements and other portions of the Contract Documents as may be applicable. Under such conditions, the ENGINEER will direct the CONTRACTOR to reschedule the Work or contract completion time to reflect the changed conditions, and the CONTRACTOR shall revise the construction progress schedule and related items accordingly, at no additional cost to the Department.

- N. Available float time may be used by the Department through the Department's ENGINEER.
- O. The Department controls the float time and, therefore, without obligation to extend either the overall completion date or any intermediate completion dates, the Department may initiate changes that absorb float time only. Department initiated changes that affect the critical path on the network diagram shall be the sole grounds for extending the completion dates. CONTRACTOR initiated changes that encroach on the float time may be accomplished only with the Department's concurrence. Such changes, however, shall give way to Department initiated changes competing for the same float time.
- P. To the extent that the construction project schedule, or associated report or any revision thereof shows anything not jointly agreed upon or fails to show anything jointly agreed upon, it shall not be deemed to have been accepted by the ENGINEER. Failure to include on a schedule any element of Work required for the performance of this Contract shall not excuse the CONTRACTOR from completing all Work required within any applicable completion date, notwithstanding the review of the schedule by the ENGINEER.
- Q. Review and acceptance of the construction progress schedule, and related reports, by the ENGINEER is advisory only and shall not relieve the CONTRACTOR of the responsibility for accomplishing the Work within the contract completion date. Omissions and errors in the construction progress schedule, and related reports shall not excuse performance less than that required by the Contract and in no way make the ENGINEER an insurer of the CONTRACTOR's success or liable for time or cost overruns flowing from any shortcomings in the construction progress schedule, and related reports.
- R. The CONTRACTOR shall present and discuss the proposed schedule at the preconstruction conference.
- S. The construction progress schedule shall be based upon the precedence diagramming method of scheduling and shall be prepared in the form of a horizontal bar chart showing in detail the proposed sequence of the Work and identifying all construction activities included but not limited to yard piping, all structures and treatment units and all related Work specified herein to be performed under the Contract. The schedule shall be time scaled, identifying the first day of each week, with the estimated date of starting and completion of each stage of the Work in order to complete the project within the contract time. The project critical path shall be clearly identified in color or by other means acceptable to the ENGINEER.
- T. The progress schedule shall be plotted on 22-inch by 34-inch and 11-inch by 17-inch paper and shall be revised and updated monthly, depicting progress through the last

day of the current month and scheduled progress through completion. Ten (one 22-inch by 34-inch and nine 11-inch by 17-inch), schedules, required schedule "sorts" (tabulations) and an electronic copy of the baseline schedule shall be submitted for review and acceptance. Five (one 22-inch by 34-inch and four 11-inch x 17-inch) up-to-date copies of the schedule and five copies of tabulations and an electronic copy shall be submitted along with the application for monthly progress payments for the same period.

- U. The construction progress schedule shall be developed and maintained using Primavera Sure Trak as manufactured by Primavera Systems, Inc., or equal.

#### 1.04 SCHEDULE OF PAYMENT VALUES

- A. The CONTRACTOR shall submit a Schedule of Payment Values, in accordance with Section 01025, for all items in the proposal that are to be paid for on a lump sum basis. The schedule shall contain the labor and material values of the component parts of Work for the purpose of making progress payments during the construction period. The Schedule of Payment Values shall directly correlate on an item by item basis (unless otherwise accepted by the ENGINEER) to each individual activity detailed in the construction progress schedule.
- B. The schedule shall be given in sufficient detail for the proper identification of Work accomplished. Each item shall include its proportional share of all costs including the CONTRACTOR's overhead, contingencies and profit. The sum of all scheduled items shall equal the total value of the Contract.
- C. If the CONTRACTOR anticipates the need for payment for materials stored on the project site, it shall also submit a separate list covering the cost of materials, delivered and unloaded with taxes paid. This list shall also include the installed value of the item with coded reference to the Work items in the Schedule of Payment Items.
- D. The CONTRACTOR shall expand or modify the above schedule and materials listing as required by the ENGINEER's initial or subsequent reviews.
- E. The CONTRACTOR shall update the Schedule of Payment Values monthly for reviewing by the ENGINEER. The payment applications shall be reviewed by the ENGINEER in accordance with the updated Schedule of Payment Values.

#### 1.05 SHOP DRAWINGS, PROJECT DATA AND SAMPLES

- A. General: A Shop Drawing Submittal Schedule shall be provided by the CONTRACTOR within thirty (30) days of the Notice to Proceed.
- B. The CONTRACTOR shall furnish for review four (4) copies of shop drawings, project data, samples and other submittal items required by the Contract Documents. Two

(2) copies shall be returned to the CONTRACTOR stamped "Furnish as Submitted" or "Furnish as Corrected". Where major corrections are indicated, two (2) copies will be returned stamped "Revise and Resubmit" and a new submittal is required (4 copies).

- C. The review of the CONTRACTOR's submissions shall in no way relieve the CONTRACTOR of any of his responsibilities under the Contract. An acceptance of a submission shall be interpreted to mean that there are no specific objections to the submitted material, subject to conformance with the Contract Drawings and Specifications.
- D. All submissions shall be dated and properly referenced to the specifications section and Contract Drawing number. The submittal number shall match the following submittal numbering system (or an equivalent system as approved by the ENGINEER):

#### Submittal Numbering System

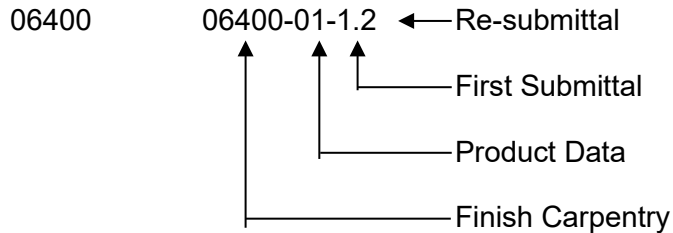
1. Package ID: The package number will reflect the CSI (specification) section number as it appears in the specifications.
2. Subgroup ID: The submittal number will include the CSI number followed by two additional codes. The first will define the type of submittal as follows:

- 01 - Product Data, Specifications, Cut Sheets, Manufacturers certification or approval letters.
- 02 - Shop Drawings
- 03 - Product Samples and Mock-Ups
- 04 - Special requirements as required in the contract documents
- 05 - As-Built Drawings
- 06 - Warranties
- 07 - O&M
- 08 - Spare Parts

The second code will identify individual submittals within that submittal type. The number to the left of the decimal represents the submittal number and the number to the right of the decimal represents the revision number.

Example:

<b><u>Package</u></b>	<b><u>Submittal</u></b>	<b><u>Description</u></b>
03300	03300-01-1.1	Concrete Admixture A, First Submittal



By the following this code system, all submittals may be entered into the Document Tracking System prior to receipt of submittals. When a particular submittal is received, locate the entry in the Document Tracking project file, add the appropriate information and process. The Document Tracking System will provide the next sequence number.

- E. Shop Drawings and Project Data within practical limits shall be submitted as a single complete package for any operating system and shall include all items of equipment and mechanical units involved in the functioning of such system. Where applicable, the submission shall include elementary wiring diagrams showing circuit functioning and necessary interconnection wiring diagrams for construction.
- F. All submissions shall bear the CONTRACTOR's stamp certifying that they have been checked for conformance and accuracy. Submissions without the CONTRACTOR's stamp of approval will not be reviewed by the ENGINEER and will be returned to the CONTRACTOR.
- G. For any submission containing any departure from the Contract Documents and the CONTRACTOR shall include proper explanation in his letter of submittal.
- H. Work on fabricated or special items shall not be commenced until the required submission information has been reviewed and accepted.
- I. Standard items shall not be assembled or shipped until the required submission information has been reviewed and accepted.
- J. Prior review actions shall not relieve the CONTRACTOR of the responsibility for correcting errors, deviations, and/or omissions discovered at a later date.
- K. Shop Drawings: Shop Drawings include, but are not limited to, layout drawings, installation drawings, construction drawings, certified and interconnecting wiring diagrams, etc. The CONTRACTOR shall be responsible for security of all the information, details, dimension, drawings, etc. necessary to prepare submission drawings required and necessary under this Contract and to fulfill all other requirements of his Contract. The CONTRACTOR shall secure such information, details, drawings, etc. from all possible sources including the Contract Drawings, drawings prepared by subcontractor's, ENGINEER, manufacturers, Contractors, etc.

- L. Submission drawings shall accurately and clearly present the following:
1. All working and installation dimensions.
  2. Arrangement and sectional views.
  3. Units of equipment in the proposed position for installation, details of required attachments and connections and dimensioned locations between units and in relation to the structures.
  4. Necessary details and information for making connections between the various trades including but not limited to, power supplies and interconnection wiring between units, accessories, appurtenances, etc.
- M. Product Data: Where manufacturer's publications in the form of catalogs, brochures, illustrations, or other data sheets are submitted in lieu of prepared shop drawings, such submission shall specifically indicate the particular item offered. Identification of such items and relative pertinent information shall be made with indelible ink. Submissions showing only general information will not be accepted.
- N. Product data shall include materials of construction, dimensions, performance characteristics, capacities, wiring diagrams, piping and controls, etc.
- O. Samples: CONTRACTOR shall furnish for review all samples as required by the Contract Documents or requested by the ENGINEER.
- P. Samples shall be of sufficient size or quantity to clearly illustrate the quality, type, range of color, finish or texture and shall be properly labeled to show the nature of the work where the material represented by the sample will be used.
- Q. Samples shall be checked by the CONTRACTOR for conformance to the Contract Documents before being submitted to the ENGINEER and shall bear the CONTRACTOR's stamp certifying that they have been so checked. Transportation charges on samples submitted to the ENGINEER shall be prepaid by the CONTRACTOR.
- R. ENGINEER's review will be for compliance with the Contract Documents, and his comments will be transmitted to the CONTRACTOR with reasonable promptness.
- S. Accepted samples will establish the standards by which the completed work will be judged.

#### 1.06 OPERATION AND MAINTENANCE INSTRUCTIONS (MANUALS)

- A. Individual Instructions: The CONTRACTOR, through manufacturer's representatives or other qualified individuals, shall provide instruction of designated employees of the CITY in the operation and care of all equipment furnished.

- B. Written Instructions: The CONTRACTOR shall furnish and deliver to the ENGINEER, prior to the fifty percent completion point of construction, and no later than thirty (30) days prior to operator training, ten (10) complete sets of instructions, technical bulletins, and any other printed matter such as diagrams, prints or drawings, containing full information required for the proper operation, maintenance, and repair of the equipment. As a minimum, the following shall be included in this submittal:
1. Operating Instructions
  2. Troubleshooting Information
  3. Maintenance Schedule(s)
  4. Lubrication Schedule
  5. Location of Service Centers
  6. Parts Diagram and List
  7. Spare Parts List (spare parts furnished shall be defined)
  8. Special Tools List
  9. Installation Instructions
  10. Assembly & Erection Drawings
  11. Dimensional Drawings
  12. Wiring Diagram(s)
  13. Storage Instructions
- C. These requirements are a prerequisite to the operation and acceptance of equipment. Each set of instructions shall be bound together in appropriate three-ring binders. A detailed Table of Contents shall be provided for each set. Written operation and maintenance instructions shall be required for all equipment items supplied for this project. The amount of detail shall be commensurate with the complexity of the equipment item. Submittal shall be made for all mechanical and electrical equipment included but not limited to pumps, valves, gates, etc.
- D. Information not applicable to the specific piece of equipment installed on this project shall be struck from the submission. Information provided shall include a source of replacement parts and names of service representatives, including address and telephone number.
- E. Extensive pictorial cuts of equipment are required for operator reference in servicing.
- F. When written instructions include shop drawings and other information previously reviewed by the ENGINEER, only those editions thereof which were accepted by the



ENGINEER, and which accurately depict the equipment installed, shall be incorporated in the instructions.

#### 1.07 RECORD DRAWINGS

- A. The CONTRACTOR shall keep and maintain, at the job site, one record set of Drawings. On these, it shall mark all project conditions, locations, configurations, and any other changes or deviations which may vary from the details represented on the original Contract Drawings, including buried or concealed construction and utility features which are revealed during the course of construction. Special attention shall be given to recording the horizontal and vertical location of all buried utilities that differ from the locations indicated, or which were not indicated on the Drawings. As-Built furnished grade information shall be included on the record drawings. Said record drawings shall be supplemented by detailed sketches as necessary or directed to indicate, fully, the Work as actually constructed. These master record drawings of the CONTRACTOR's representation of as-build conditions, including all revisions made necessary by addenda and change orders shall be maintained up-to-date during the progress of Work.
- B. The record drawings shall be received on the 20th working day of every third month after the month in which the final notice to proceed is given as well as on completion of Work. Failure to maintain the record drawings up-to-date shall be grounds of withholding monthly progress payments until such time as the record drawings are brought up-to-date.
- C. In the case of those drawings which depict the detail requirement for equipment to be assembled and wired in the factory, such as motor control centers and the like, the record drawing shall be updated by indicating those portions which are superseded by change order drawings or final shop drawings, and by including appropriate reference information describing the change orders by number and the shop drawings by manufacturer, drawing, and revision numbers.
- D. Record drawings shall be accessible to the ENGINEER at all times during the construction period.
- E. Upon substantial completion of the Work and prior to final acceptance, the CONTRACTOR shall finalize and deliver a complete set of final record drawings to the ENGINEER for transmittal to the Department, conforming to the construction records of the CONTRACTOR. This set of drawings shall consist of corrected drawings showing the reported location of the Work. The information submitted by the CONTRACTOR and incorporated in the Final Record Drawings will be assumed to be correct, and the ENGINEER will not be responsible for the accuracy of such information, and for any errors or omissions which may appear on the Final Record Drawings as a result.

- F. The information submitted by the CONTRACTOR in the Final Record Drawings shall be certified by a land surveyor registered in the State of Florida. For clarity, Final Record Drawings needs to be redrawn and clearly labeled as "Record Drawings". Notations indicated in the drawings shall be legible and printed in black ink. No handwritten notes are allowed.
- G. Final payment will not be acted upon until the ENGINEER certifies the record drawings as required by the agencies having jurisdiction. Said up-to-date record drawings shall be in the form of a set of prints with carefully plotted information.
- H. All final record drawings shall be certified by the ENGINEER of Record. Such certification shall evidence that ENGINEER has reviewed the information, finds it in substantial accordance with the design; and where deviations from the design exist, that said deviations are not to the detriment of the system. ENGINEER's certification shall read as follows:

"I HEREBY NOTIFY THE CITY OF THE COMPLETION OF CONSTRUCTION OF ALL THE COMPONENTS OF THE WATER, SEWER AND STORMWATER FACILITIES FOR THE ABOVE REFERENCED PROJECT AND CERTIFY THAT THEY HAVE BEEN CONSTRUCTED IN SUBSTANTIAL CONFORMANCE WITH THE PLANS AND SPECIFICATIONS PERMITTED BY THE AGENCIES HAVING JURISDICTION"

- I. The CONTRACTOR shall submit all electronic media files of the paving, grading, water, sewer and drainage plans, reports, other supporting information, and the final version of as-builts drawings shall be submitted to the ENGINEER's office. The information provided shall contain an index file with a brief description of the electronic filing contents, and shall be labeled with project name, company name, and point of contact. Documents and spreadsheets shall be submitted in either MS Word, Word Perfect, Excel, Lotus, or other format approved by the ENGINEER. Drawings shall be submitted in AutoCad, Microstation, or other format approved by the ENGINEER.
- J. Final Record Drawings submitted to the Department as part of the project acceptance shall contain at least the following information:
  - 1. Drawings shall be legibly marked to record actual construction.
  - 2. Drawings shall show actual location of all underground and above ground water and wastewater, stormwater piping and related appurtenances. All changes to piping location including horizontal and vertical locations of utilities and appurtenances shall be clearly shown and referenced to permanent surface improvements. Drawings shall also show actual installed pipe material, class, etc. Profile sheets shall be updated to include all field measurements and elevations taken during construction.

3. Drawings shall clearly show all field changes of dimension and detail including changes made by field order or by change order.
4. Drawings shall clearly show all details not on original contract drawings but constructed in the field. All equipment and piping relocation shall be clearly shown.
5. Location of all manholes, hydrants, tees, reducers, crosses, valves, and valve boxes shall be shown. All tees, reducers, crosses, and valves shall be referenced from at least two (2) and preferably three (3) permanent points such as building corners and roadway intersections.
6. Dimensions between all manholes shall be field verified and shown. The rim, inverts and grade elevations of all manholes shall be shown.

#### 1.08 WARRANTIES

- A. Original warranties, called for in the Contract Documents, shall be submitted to the Department through the ENGINEER. When warranties are required, they shall be submitted prior to request for payment.
- B. When advance copies of warranties are requested, they shall be submitted with, and considered as shop drawings.
- C. The CONTRACTOR shall warrant to the Department that all material and labor used in the construction are covered by his warrantee for a minimum of a one-year period upon approval and acceptance by the Department. The CONTRACTOR shall replace or repair defects at no cost to the Department during the warrantee period. No visible or potential leakage shall be allowed during the warrantee period.

#### 1.09 CERTIFICATES

- A. Copies of certificates of compliance and test reports shall be submitted for requested items to the ENGINEER prior to request for payment.

#### 1.10 AUDIO-VISUAL PRECONSTRUCTION RECORD

- A. General: Prior to commencing work, the CONTRACTOR shall have a continuous color audio-video DVD recording taken of the entire Project, including existing areas that will be disturbed by the CONTRACTOR's operations, to serve as a record of preconstruction conditions. No construction shall begin prior to review and acceptance of the tapes covering the respective, affected construction area by the ENGINEER. The ENGINEER shall have the authority to reject all or any portion of the video DVD not conforming to the specifications and order that it be redone at no additional charge. The CONTRACTOR shall reschedule unacceptable coverage within five days after being notified. The ENGINEER shall designate those areas, if

any, to be omitted from or added to the audio-video coverage. Audio-video recordings shall not be performed more than ninety days prior to construction in any area. All DVDs and written records shall become property of the Department.

- B. Services: The CONTRACTOR shall engage the services of a professional electrographer. The color audio-video tapes shall be prepared by a responsible commercial firm known to be skilled and regularly engaged in the business of preconstruction color audio-video tape documentation. The electrographer shall furnish to the ENGINEER a list of all equipment to be used for the audio-video taping, i.e., manufacturer's name, model number, specifications and other pertinent information. Additional information to be furnished by the electrographer is the names and addresses of two references that the electrographer has performed color audio-video taping for on projects of a similar nature within the last twelve months.
- C. Audio-Video DVDs: Audio-video DVDs shall be new. The DVDs shall be compatible for with a standard player-receiver.
- D. Equipment: All equipment, accessories, materials and labor to perform this service shall be furnished by the CONTRACTOR.
1. The total audio-video system shall reproduce bright, sharp, clear pictures with accurate colors and shall be free from distortion, tearing, rolls or any other form of imperfection. The audio portion of the recording shall reproduce the commentary of the camera operator with proper volume and clarity, and be free from distortion and interruptions.
  2. When conventional wheeled vehicles are used, the distance from the camera lens to the ground shall not be less than twelve feet. In some instances, audio-video tape coverage may be required in areas not accessible by conventional wheeled vehicles. Such coverage shall be obtained by walking or special conveyance acceptable to the ENGINEER.
  3. The color video camera used in the recording system shall have a horizontal resolution of 300 lines at center, a luminance signal to noise ratio of 45 dB and a minimum illumination requirement of twenty-five foot-candles.
- E. Recorded Information - Audio: Each tape shall begin with the current date, project name and municipality and be followed by the general location; i.e., process structure, or area, viewing side and direction of progress. The audio track shall consist of an original live recording. The recording shall contain the narrative commentary of the electrographer, recorded simultaneously with his fixed elevation video record of the zone of influence of construction.
- F. Recorded Information - Video: All video recordings must, by electronic means, display continuously and simultaneously, generated with the actual taping, transparent digital information to include the date and time of recording. The date

information shall contain the month, day and year. The time information shall contain the hours, minutes, and seconds. Additional information shall be displayed periodically. Such information shall include, but not be limited to, project name, bid package number, process structure or area, and the viewing side. This transparent information shall appear on the extreme upper left hand third of the screen.

- G. Conditions for Taping: All taping shall be done during times of good visibility. No taping shall be done during precipitation, mist or fog. The recording shall only be done when sufficient sunlight is present to properly illuminate the subjects of recordings and to produce bright, sharp video recordings of those subjects.
- H. Tape Coverage: Tape coverage shall include all surface features located within the zone of influence of construction supported by appropriate audio coverage. Such coverage shall include, but not be limited to, existing road, driveways, sidewalks, curbs, pavement, landscaping, fences, signs and interior and exterior of existing structures affected by the work and the exteriors of structures adjacent to the work, and any other on-site area that will be occupied or impacted by the CONTRACTOR or any of his subcontractors or suppliers within the area covered.

**Part 2 - PRODUCTS (Not Used)**

**Part 3 - EXECUTION (Not Used)**

– END OF SECTION –

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**SECTION 01400****TESTING AND INSPECTION****PART 1 – GENERAL**

## 1.01 DESCRIPTION

- A. All testing and inspection will be in accordance with Article 12 of the General Conditions.
- B. The work or actions of the testing laboratory shall in no way relieve the CONTRACTOR of his obligations under the Contract. The laboratory testing work will include such inspections and testing required by the Contract Document, existing laws, codes, ordinances, etc. The testing laboratory will have no authority to change the requirements of the Contract Documents, nor perform or approve any of the CONTRACTOR'S work.
- C. The CONTRACTOR shall allow the ENGINEER ample time and opportunity for testing materials and equipment to be used in the work. He shall advise the ENGINEER promptly upon placing orders for materials and equipment so that arrangements may be made, if desired, for inspection before shipment from the place of manufacture. The CONTRACTOR shall at all times furnish the ENGINEER and his representatives, facilities including labor, and allow proper time for inspecting and testing materials, equipment, and workmanship. The CONTRACTOR must anticipate that possible delays may be caused him in the execution of his work due to the necessity of materials and equipment being inspected and accepted for use. The CONTRACTOR shall furnish, at his own expense, all samples of materials required by the ENGINEER for testing, and shall make his own arrangement for providing water, electric power, or fuel for the various inspections and tests of structures and equipment. As a minimum, 24-hours advance written notice shall be provided by the CONTRACTOR for rebar, structural and similar inspections by the ENGINEER. The amount of time required for advance written notice by the CONTRACTOR to the ENGINEER for other inspections depends upon other factors and shall be solely at the ENGINEER's discretion.
- D. The CONTRACTOR shall furnish the services of representatives of the manufacturers of certain equipment, as prescribed in other sections of the Specifications. The CONTRACTOR shall also place his orders for such equipment on the basis that, after the equipment has been tested prior to final acceptance of the work, the manufacturer will furnish to the CITY the certified statements that the equipment has been installed properly and is ready to be placed in functional operation. Tests and analyses required of equipment shall be paid for by the CONTRACTOR, unless specified otherwise in the section which covers a particular piece of equipment.
- E. The CITY will bear the cost of all additional tests, inspections, or investigations undertaken by the order of the ENGINEER for the purpose of determining conformance with the Contract Documents if such test, inspection, or investigations are not specifically required by the Contract Documents, and if conformance is ascertained thereby. Whenever nonconformance is determined by the ENGINEER as a result of such test, inspections, or investigations, the CONTRACTOR shall bear the full cost thereof or shall reimburse the CITY for said cost. The cost of any additional tests and investigations, which are ordered by the ENGINEER to ascertain subsequent conformance with the Contract Documents, shall be borne by the CONTRACTOR.

**PART 2 – PRODUCTS** (Not Used)

**PART 3 – EXECUTION** (Not Used)

- END OF SECTION -



**SECTION 01410****CONTRACTOR'S HEALTH AND SAFETY PLAN****PART 1 – GENERAL**

## 1.01 DESCRIPTION

## A. Scope:

1. This Section describes CONTRACTOR's responsibilities for a written site-specific health and safety plan (SSHP). CONTRACTOR shall conduct all construction activities in a safe manner so as not to result in:
  - a. injuries to employees, Subcontractors or other persons with an interest at or near the Site;
  - b. employee exposures to health hazards above the occupational limits established by the Occupational Health and Safety Administration (OSHA), the American Conference of Governmental Industrial Hygienists (ACGIH), or the Nuclear Regulatory Commission (NRC);
  - c. exposure of area residents to air contaminants above the levels established for general public exposure by the Environmental Protection Agency (EPA), NRC, or the State in which the Project is located;
  - d. significant increases in the levels of contaminants in soil, water, or sediment near the Site; or
  - e. violations of OSHA, or other Laws or Regulations.

- B. Any disregard of the provisions of the SSHP may, without limitation, be deemed just and sufficient reason for termination of CONTRACTOR's services for cause.

## 1.02 QUALITY ASSURANCE

## A. Qualifications:

1. Engage an industrial hygienist certified by the American Board of Industrial Hygiene or a safety professional certified by the Board of Certified Safety Professionals to prepare or supervise the preparation of the SSHP.
2. Submit qualifications along with SSHP.

- B. Regulatory Requirements: CONTRACTOR's health and safety practices shall follow the standards and guidelines established in the following:

1. 29 CFR 1904, OSHA, Record Keeping.
2. 29 CFR 1910, OSHA, General Industry Standards.
3. 29 CFR 1926, OSHA, Construction Industry Standards.
4. 29 CFR 1926.65, OSHA, Hazardous Waste Operations and Emergency Response.
5. 49 CFR 171.8, DOT, Hazardous Materials in Transport.
6. 40 CFR Parts 261.3, 264 and 265, EPA, Resource Conservation and Recovery Act.
7. 29 CFR 1910.146, OSHA, Permit-Required Confined Spaces.

8. 29 CFR 1926.1101, OSHA, Asbestos

### 1.03 SUBMITTALS

- A. Submit to ENGINEER the following:
  1. CONTRACTOR's SSHP.
  2. Qualifications of industrial hygienist or safety professional.
  3. Health and safety reports.
  4. Accident reports.

## **PART 2 – GENERAL**

### 2.01 GENERAL PROVISIONS

- A. Submit SSHP to ENGINEER one week prior to the Preconstruction Conference, or 30 days prior to planned mobilization at the Site, whichever is sooner.
- B. The SSHP shall bear a stamp or specific written indication that CONTRACTOR has satisfied CONTRACTOR's obligations under the Contract Documents with respect to CONTRACTOR's review and approval of the SSHP.
- C. ENGINEER will review and either accept or return for revision CONTRACTOR's SSHP in accordance with the Schedule of Submittals acceptable to ENGINEER. ENGINEER's review and acceptance will be only to determine if the topics covered by the SSHP conform to the Contract Documents.
- D. ENGINEER's review and acceptance will not extend to means, methods, techniques, procedures of construction, or to whether the representations made in the SSHP comply with regulatory standards or standards of good practice.
- E. At the time of submittal, CONTRACTOR shall give ENGINEER specific written notice of variations, if any, that the SSHP may have from the requirements of the Contract Documents. This notice shall be both a written communication separate from the submittal; and, in addition, by a specific notation made on each submittal to ENGINEER for review and acceptance of each such variation.
- F. No Work shall be performed on the Site until the written SSHP has been accepted by the ENGINEER.
- G. Notwithstanding any other provision of the Contract Documents, extensions to the Contract Times will not be granted if caused by undue delay by CONTRACTOR in developing or revising the SSHP.

### 2.02 WRITTEN HEALTH AND SAFETY PROGRAM

- A. The SSHP, which shall be kept on the Site, shall address the safety and health hazards of each phase of operations on the Site and include the requirements and procedures for employee protection. The SSHP as a minimum, shall address and include the following:
  1. The organizational structure of CONTRACTOR's organization.

2. A comprehensive work plan.
3. A safety and health risk or hazard analysis for each task and operation found in the work plan.
4. Employee training assignments including copies of 40-hour, 24-hour Supervised Field Activities, 8-hour Supervisors, and 8-hour Refresher Training Certificates for all CONTRACTOR's employees assigned to the Project.
5. Personal protective equipment to be used by employees for each of the tasks and operations being conducted. Respirator fit test certificates for all CONTRACTOR employees assigned to the Project.
6. Medical Surveillance Requirements: Medical clearance certificates for all CONTRACTOR's employees assigned to the Project.
7. Frequency and types of air monitoring, personnel monitoring, and environmental sampling techniques and instrumentation to be used, including methods of maintenance and calibration of monitoring and sampling equipment.
8. Site control measures for purposes, including but not limited to:
  - a. preventing trespassing;
  - b. preventing unqualified or unprotected workers from entering restricted areas;
  - c. preventing tracking of contaminants out of the Site;
  - d. maintaining log of employees on and visitors to the Site;
  - e. delineating hot, cold and support zones;
  - f. locating personnel and equipment decontamination zones; and
  - g. communicating routes of escape and gathering points.
9. Decontamination procedures.
10. An emergency response plan for safe and effective responses to emergencies, including the necessary PPE and other equipment.
11. Confined space entry procedures (if applicable).
12. A spill containment program.

B. Organizational Structure:

1. The organizational structure part of the SSHP shall refer to or incorporate information on the specific chain of command and specify the overall responsibilities of supervisors and employees, and shall include, at a minimum, the following elements:
  - a. designation of a general supervisor who has the responsibility and authority to direct all hazardous waste operations.
  - b. a Site safety and health supervisor who has the responsibility and authority to implement and modify the SSHP and verify compliance.
  - c. all other personnel needed for hazardous waste Site operations and emergency response and their general functions and responsibilities.
  - d. The lines of authority, responsibility, and communication.
2. The organizational structure shall be reviewed and updated as necessary to reflect the current status of Site operations.

C. Work Plan:

1. The comprehensive work plan part of the SSHP shall refer to or incorporate information on the following:
  - a. The tasks and objectives of the Site operations and the logistics and resources required to achieve those tasks and objectives.
  - b. The anticipated activities as well as the CONTRACTOR's normal operating procedures.
  - c. The personnel and equipment requirements for implementing the work plan.

- D. The SSHP shall include procedures that will be used to ensure safe waste handling during the excavating, handling, loading, and transporting activities.

2.03 ACCIDENT REPORTING AND INVESTIGATION

- A. Document all accidents resulting in bodily injury using OSHA 301 form.
- B. Submit copies of completed OSHA 301 forms to the ENGINEER weekly.
- C. Based upon the results of an accident investigation, make modifications to the SSHP by changing tasks or procedures to prevent a reoccurrence.
- D. Post a copy of CONTRACTOR's OSHA 300A report in a conspicuous place onsite.

2.04 DAILY HEALTH AND SAFETY FIELD REPORTS

- A. Submit to ENGINEER daily health and safety field reports including, but not limited to, weather conditions, delays encountered in construction, and acknowledgment of deficiencies noted along with corrective actions taken on current and previous deficiencies. In addition, the daily health and safety air monitoring results, documentation of instrument calibration, new hazards encountered, and PPE utilized shall be included.
- B. The daily health and safety field reports shall include a description of problems, real or anticipated, encountered during the course of Work that should be brought to the attention of the ENGINEER and notification of deviations from planned Work shown in the previously submitted daily health and safety field report(s).

**PART 3 – EXECUTION (Not Used)**

- END OF SECTION -

**SECTION 01500****CONSTRUCTION CONSIDERATIONS****PART 1 – GENERAL**

## 1.01 HYDRAULIC UPLIFT ON STRUCTURES

- A. The CONTRACTOR shall be completely responsible for any structures, stormwater conflicting structure, tanks, wet wells, pipelines, manholes, foundations, cellars, or similar structures that may become buoyant during the construction operations due to the ground water, floods or buoyancy of piping caused due to the placement of flowable backfills before the structure is put into operation. Should there be any possibility of buoyancy of a pipeline or structure, the CONTRACTOR shall take the necessary steps to prevent its buoyancy. Damage to any structures due to floating or flooding shall be repaired, or the structures replaced at the CONTRACTOR'S expense.

## 1.02 WATER TIGHTNESS OF STRUCTURES

- A. General: It is the intent of these specifications that all concrete work, sealing work around built-in items and penetrations be performed as required to ensure that groundwater, rainwater, wastewater, chemical solutions or other process liquids in tanks, wetwells, channels, and containers will not leak into any buildings and/or equipment rooms, pipe galleries, habitable areas, or other generally dry areas.

1. The required watertightness shall be achieved by quality concrete construction and proper sealing of all joints and penetrations.
2. Each unit shall be tested separately, and the leakage tests shall be made prior to backfilling and before equipment is installed unless otherwise approved by the ENGINEER. Only potable water shall be used for the tests.
3. The watertightness of buildings exclusive of the portions designed to contain liquids will consist of checking for leaks due to rain or groundwater infiltration.
4. The CONTRACTOR shall provide at his own expense all labor, material, temporary bulkheads, pumps, water, measuring devices, etc., necessary to perform the required test.

- B. Built-in Items and Penetrations: All pipe sleeves, built-in items and penetrations shall be sealed as detailed and as required to ensure a continuous watertight seal.

## 1.03 CUTTING AND PATCHING

- A. The CONTRACTOR shall perform all cutting and patching of his work that may be required to make its several parts come together properly and fit it to receive or be received by such other work. The CONTRACTOR shall not endanger any work of others by cutting, excavating or otherwise altering their work and shall only cut or alter work with the written consent of the ENGINEER and of the other contractors whose work will be affected.

## 1.04 ABANDONMENT AND SALVAGE OF EXISTING FACILITIES

- A. General: The scope of work requires the CONTRACTOR to interface with existing structures, and piping which will be abandoned or otherwise removed and/or relocated as part of the work. Prior to beginning any work associated with existing facilities to be abandoned, salvaged, or otherwise removed or relocated, the CONTRACTOR shall inform the CITY and the ENGINEER

of his intent so that all arrangements can be made with the CITY for isolating pipelines (where possible) or otherwise removing existing facilities from service to the extent possible. The CONTRACTOR shall not proceed without written authorization from the CITY. **The CONTRACTOR shall contact and coordinate accordingly with utilities companies prior to and during the execution of the relocation, removal or abandonment of existing utilities structures. Existing utilities coordination is exclusively the responsibility of the CONTRACTOR.**

- B. Pipelines: The CONTRACTOR shall abandon, salvage or otherwise remove existing pipelines or segments of existing pipelines shown to be abandoned in place, salvaged, or removed as part of the contract work. Unless otherwise indicated in the Contract Documents, all piping shown on the Drawings to be abandoned shall be abandoned in place. Pipe shown to be abandoned need only be removed a minimum three feet clear of new utilities to be installed. Abandon-in-place shall be defined as installing plugs, or other permanent closure, as reviewed and accepted by the CITY, on all termination's, open ends or ends of pipe designated as being cut, capped and anchored in an acceptable manner. The pipe will remain buried unless otherwise noted.
- C. Piping indicated on the Drawings as being removed, or any piping to be abandoned which interferes with new structures or piping, shall be excavated and removed using methods which will not disturb adjacent piping or other facilities. All pipe materials shall be subject to salvage by the CITY as defined below. Any remaining piping on both ends of pipe segments removed shall be abandoned in-place, per the above definition. After piping has been removed, the CONTRACTOR shall backfill the evacuated area in accordance with requirements set forth in other sections of these specifications.
- D. Equipment: The CONTRACTOR shall abandon, salvage or otherwise remove existing equipment or other facilities as shown on the Contract Drawings or indicated herein. In all cases, the CONTRACTOR shall exercise caution when handling the existing equipment so as not to disturb or damage adjacent facilities. The CONTRACTOR shall make all repairs to adjacent facilities which may be damaged as a result of the CONTRACTOR's efforts in abandoning, salvaging or otherwise removing existing facilities, at no additional cost to the CITY.
- E. Salvage: The CITY may desire to salvage certain items of existing equipment which are to be dismantled and removed during the course of construction. Prior to removal of any existing equipment or piping from the site of work, the CONTRACTOR shall ascertain from the CITY whether or not the particular item or items are to be salvaged. Items to be salvaged shall be stockpiled on the site, in a location as designated by the CITY. All other items of equipment shall be disposed of off-site by the CONTRACTOR at his own expense, in accordance with applicable laws, ordinances and regulations.

#### 1.05 DIMENSIONS OF EXISTING STRUCTURES

- A. Where the dimensions and locations of existing structures are of critical importance in the installation or connection of new work, the CONTRACTOR shall verify such dimensions and locations in the field before the fabrication of any materials or equipment which is dependent on the correctness of such information.

#### 1.06 REHABILITATION

- A. Certain areas of existing structures, piping, conduits, and the like will be affected by work necessary to complete modifications under this Contract. The CONTRACTOR shall be responsible to rehabilitate those areas affected by its construction activities.

- B. Where new rectangular openings are to be installed in concrete or concrete masonry walls or floors, the CONTRACTOR shall score the edges of each opening (both sides of wall or elevated slab) by saw cutting clean straight lines to a minimum depth of one inch and then chipping out the concrete. Alternately, the opening can be formed by saw cutting completely through the slab or wall. Saw cuts deeper than one inch (or the depth of cover over existing reinforcing steel, whichever is less) shall not be allowed to extend beyond the limits of the opening. Corners shall be made square and true by a combination of core drilling, chipping, or grinding. All necessary precautions shall be taken during removal of concrete to prevent debris from falling and damaging adjacent equipment or piping. Saw cuts allowed to extend beyond the opening shall be repaired by filling with non-shrink grout. The concrete around any exposed reinforcement steel shall be chipped back and exposed reinforcement steel cut a minimum of 1-1/2 inches from the finished face of the new opening. The inside face of the new opening shall be grouted to fill any voids and cover the exposed aggregate and shall be trowel-finished to provide a plumb and square opening.
- C. Where new conduit or piping is to be installed through existing concrete walls, the CONTRACTOR shall accurately position the core-drill openings. Openings shall be adequately sized to allow alignment of piping or conduit and fittings without deflection and to provide adequate clearance for satisfactory packing in the annular space between the piping or conduit and the core drilling opening as shown on the Drawings.
- D. Where new piping is to be connected to existing piping, the existing piping shall be cut square and the ends properly prepared for the connection shown on the drawings. Any damage to the lining and coating of the existing piping shall be repaired by the CONTRACTOR.
- E. Where existing equipment, equipment pads and bases, piping, piping supports, electrical panels and devices, conduits, and associated appurtenances are removed, the CONTRACTOR shall rehabilitate the affected area such that little or no evidence of the previous installation remains. Opening in concrete floors, walls, and ceiling from piping, conduit, and fastener penetrations shall be filled with non-shrink grout and finished to match the adjacent area. Concrete pads and bases for equipment and supports shall be removed by chipping away concrete and cutting any exposed reinforced steel and anchor bolts a minimum of 1-1/2 inches below finished grade. The area of concrete to be rehabilitated shall be scored by saw cutting clean, straight lines to a minimum depth of 1-1/2 inches, and all concrete within the scored lines removed to a minimum depth of 1-1/2 inches. The area within the scored lines shall be patched with non-shrink grout to match the adjacent grade and finish. Abandoned connections to piping and conduits shall be terminated with blind flanges, caps, and plugs suited for the material, type, and service of the pipe or conduit.
- F. Where existing structural steel members are removed or modified, the surface of the remaining existing steel members damaged by construction activities shall be repaired. The affected areas shall be surface prepared and coated in accordance with Section entitled "Painting".
- G. Disposal of Debris: All debris, materials, piping, and miscellaneous waste products from the work described in this section shall be removed from the project as soon as possible. They shall be disposed of in accordance with applicable federal, state, and local regulations. The CONTRACTOR is responsible for determining these regulations and shall bear all costs or retain any profit associated with disposal of these items.

#### 1.07 INSTALLATION OF EQUIPMENT

- A. CONTRACTOR shall have on hand sufficient personnel, proper equipment, and machinery of ample capacity to facilitate the work.
- B. CONTRACTOR shall be responsible for locating, aligning and leveling all equipment and shall employ a licensed surveyor to set all lines and levels of equipment to the accuracy required.
- C. Complete manufacturers installation instructions, including permissible tolerances, shall be furnished in duplicate with each unit of equipment or set of identical units.
- D. All equipment shall be installed in accordance with the shop drawings; inclusive of manufacturers specifications, drawings and tolerances; under the direct supervision of the required manufacturers ENGINEER. No instructions shall be issued that are contrary to written specifications without prior written approval by the CITY's ENGINEER.
- E. Equipment shall be erected in a neat and workmanlike manner on the foundations at the locations and elevations shown on the drawings unless otherwise indicated by the ENGINEER during installation.

#### 1.08 SUPERVISION BY MANUFACTURER'S REPRESENTATIVES

- A. The CONTRACTOR shall provide the services of qualified equipment manufacturers technical representatives who shall adequately supervise the installation and testing of all equipment furnished under this Contract and instruct the CONTRACTOR's personnel and CITY's operating personnel in its maintenance and operation.

#### 1.09 EQUIPMENT MANUFACTURER'S CERTIFICATION

- A. As a condition precedent to acceptance of equipment installed and operating, the CONTRACTOR will provide the CITY with written certification, obtained from each company manufacturing equipment for the project, that the equipment is installed and does operate in accordance with the specifications and manufacturers recommendations.

#### 1.10 SLEEVES AND OPENINGS

- A. The CONTRACTOR shall provide all openings, chases, etc., to fit his own work and that of any other subcontractors and contractors. All such openings or chases shown on the Contract Drawings, or reasonably implied thereby, or as confirmed or modified by shop, setting or erecting drawings approved by the ENGINEER, shall be provided by the CONTRACTOR.
- B. Where pipes or conduits are to pass through slabs or walls, or where equipment frames or supports are to be installed as integral part of an opening, the sleeves, opening, forms or frames shall be furnished by the installer of the pipes, conduits or equipment, but shall be placed by the CONTRACTOR.
- C. Where hanger inserts, anchor bolts and similar items are to be embedded in concrete as an integral part of a slab or wall, they shall be furnished by the installer of the pipe or other equipment requiring the hanger, etc. but shall be placed by the CONTRACTOR.
- D. When requested by the CONTRACTOR, the installer of the pipes, conduit, or equipment, including those contractors or subcontractors who require openings or chases in slabs and walls for passage of ducts, mounting or equipment, etc., shall furnish all necessary information,



instructions, and materials to effect accurate installation of the required openings, chases, sleeves, frames, inserts, etc. When such items are secured in position, and just prior to construction of the surrounding slab or wall, the subcontractor or contractor for whom the items are installed shall ascertain the proper number, locations, and settings thereof; and the CONTRACTOR shall schedule his operations so as to provide a reasonable opportunity and time interval for such inspection.

- E. Any cost resulting from correction of defective, ill-timed, or mislocated work, or for subsequent work which becomes necessary because of omitted openings, chases, sleeves, frames, inserts, etc., shall be borne by the subcontractor or contractor responsible therefor. No contractor or subcontractor shall arbitrarily cut, drill, alter, damage, or otherwise endanger the work of another Contractor. In no case shall beams lintels, or other structural members be cut without the approval of the ENGINEER. The nature and extent of any corrective or additional work shall be subject to the approval of the ENGINEER following consultation with the affected parties.

#### 1.11 OBSTRUCTIONS

- A. All water pipes, storm drains, sanitary sewers, force mains, gas or other pipe, telephone or power cables or conduits and all other obstructions, whether or not shown, shall be temporarily supported across utility line excavations. The CONTRACTOR shall be responsible for any damage to any such pipes, conduits, or structures. Approximate locations of known water, sanitary, drainage, power and telephone installations along route of new pipelines or in the vicinity of new work are shown, but must be verified in the field by the CONTRACTOR. The CONTRACTOR shall uncover these pipes, ducts, cables, etc., carefully, by hand, prior to installing new lines. Any discrepancies or differences found shall be brought to the attention of the ENGINEER in order that necessary changes may be made to permit installation of new work. These conditions are supplemental to general requirements elsewhere in the Contract Documents.

#### 1.12 SITE CONDITIONS

- A. The CONTRACTOR acknowledges that he has investigated prior to bidding and satisfied himself as to the conditions affecting the Work, including but not restricted to those bearing upon transportation, disposal, handling and storage of materials, availability of labor, water, electric power, roads and uncertainties of weather, canal stages, tides, water tables or similar physical conditions at the site, the conformation and conditions of the ground, the character of equipment and facilities needed preliminary to and during prosecution of the Work. The CONTRACTOR further acknowledges that he has satisfied himself as to the character, quality and quantity of surface and subsurface materials or obstacles to be encountered insofar as this information is reasonably ascertainable from an inspection of the site, or any contiguous site, as well as from information presented by the Drawings and Specifications made a part of this Contract, or any other information made available to him prior to receipt of Bids. Any failure by the CONTRACTOR to acquaint himself with the available information will not relieve him from responsibility for estimating properly the difficulty or cost of successfully performing the Work. The CITY assumes no responsibility for any conclusions or interpretations made by the CONTRACTOR on the basis of the information made available by the CITY.

#### 1.13 SUBSURFACE INVESTIGATIONS

- A. The CONTRACTOR shall be responsible for having determined to his satisfaction, prior to the submission of his bid, the nature and location of the work, the conformation of the ground, the character and quality of the substrata, the types and quantity of materials to be encountered, the

nature of the groundwater condition, the character of equipment and facilities required preliminary to and during the performance of the work, the general and local conditions and all other matters which can in any way affect the work under this Contract. The prices established for the work to be done shall reflect all costs pertaining to the work. Any claims for extras based on the substrata or ground water table conditions will be disallowed.

- B. The CONTRACTOR further acknowledges that he assumes all risk contingent upon the nature of the subsurface conditions actually encountered by him in performing the work covered by the Contract, even though such actual conditions may result in the CONTRACTOR performing more or less work than he originally anticipated.

#### 1.14 DIFFERING SITE CONDITIONS

- A. The CONTRACTOR shall promptly and before such conditions are disturbed, notify the CITY in writing of: (1) subsurface or latent physical conditions at the site differing materially from those indicated in this contract, or (2) unknown physical conditions at the site, of an unusual nature, differing materially from those ordinarily encountered and generally recognized as inherent in work of the character provided for this contract. The CITY will promptly investigate the conditions, and if he finds that such conditions do materially so differ and cause an increase or decrease in the CONTRACTOR's cost of, or the time required for, performance of any part of the work under this contract, whether or not changed as a result of such conditions, an equitable adjustment shall be made and the contract modified in writing accordingly.

#### 1.15 PROTECTION OF PROPERTY

- A. The CONTRACTOR shall protect all property that may be affected by his work or operations. The location and extent of underground and covered facilities are not guaranteed and the CONTRACTOR is cautioned to proceed with care in order to prevent the undermining or damage to existing utilities including piping, power cable, utility poles, conduit, duck bank, fiber optic cable, gas, telephone and cable TV services, structures, piping, and other facilities.
- B. The CONTRACTOR shall take all measures necessary to protect new and existing mechanical equipment from dust and debris. All protective measures shall be furnished, installed, lighted, ventilated, maintained, and removed at the CONTRACTOR'S own cost.
- C. When city water is being used, the supply source shall be protected against contamination in accordance with existing codes and regulations.
- D. In the event any of the CONTRACTOR'S activities were to disrupt or endanger any facilities, he shall at his own expense make all necessary repairs or replacements necessary to correct the situation to the satisfaction of the ENGINEER. Such work shall progress continuously to completion on a 24-hour per day, seven workday basis. The CONTRACTOR shall be responsible for the services of repair crews on call 24 hours per day for emergencies that arise involving work under this Contract.

#### 1.16 WEATHER CONDITIONS

- A. Work that may be affected by inclement weather shall be suspended until proper conditions prevail. In the event of impending storms, the CONTRACTOR shall take necessary precautions to protect all work, materials and equipment from exposure. The CITY reserves the right, through the opinion of the ENGINEER, to order that additional protection measures over and beyond those proposed by the CONTRACTOR, be taken to safeguard all components of the project. The CONTRACTOR shall not claim any compensation for such precautionary measures

so ordered, nor claim any compensation from the CITY for damage to the work from the elements of weather.

1.17 FIRE PROTECTION

- A. The CONTRACTOR shall take all necessary precautions to prevent fires at or adjacent to the work, including his own buildings and trailers. Adequate fire extinguisher and hose line stations shall be provided throughout the work area.

1.18 SAFETY AND HEALTH REQUIREMENTS

- A. The CONTRACTOR shall comply in every respect with all Federal, State and local safety and health regulations. Copies of the Federal Regulations may be obtained from the U.S. Department of Labor, Occupational Safety and Health Administration, 3200 East Oakland Park Boulevard, Room 204, Bridge Building, Fort Lauderdale, Florida 33300.
- B. The CONTRACTOR shall provide all barricades and flashing warning lights or other devices necessary to warn pedestrians and area traffic.

1.19 CONSTRUCTION SIGNS

- A. The CONTRACTOR shall install construction signs at the following locations:
  1. Facing north at the southwest corner of the intersection of Sheridan Street and N. 26<sup>th</sup> Avenue.
  2. Facing South at the northeast corner of the intersection of Taft Street and N. 26<sup>th</sup> Avenue.
  3. Facing west at the east side of the canal bridge on Sheridan Street.
- B. Construction signs shall be 4-foot by 6-foot by ½-inch coroplast installed with two 4-inch by 4-inch by 10-foot PVC posts.
- C. Construction sign shall have the following information below:

 <p style="margin: 0;"><b>MAYOR</b> Josh Levy</p> <p style="margin: 0;"><b>VICE MAYOR</b> Caryl S. Shuham</p> <p style="margin: 0;"><b>COMMISSIONER</b> Linda Hill Anderson</p> <p style="margin: 0;"><b>COMMISSIONER</b> Traci L. Callari</p> <p style="margin: 0;"><b>COMMISSIONER</b> Adam Gruber</p> <p style="margin: 0;"><b>COMMISSIONER</b> Kevin D. Biederman</p> <p style="margin: 0;"><b>COMMISSIONER</b> Linda Sherwood</p> <p style="margin: 0;"><b>CITY MANAGER</b> Wazir Ishmael, Ph.D.</p> <p style="margin: 0;"><b>CITY ATTORNEY</b> Douglas R. Gonzales</p> <p style="margin: 0; font-size: small;">Department of Public Utilities Director Vivek Galav, P.E.</p>	<p><b>CITY OF HOLLYWOOD, FLORIDA</b></p> <p>DEPARTMENT OF PUBLIC UTILITIES ENGINEERING AND CONSTRUCTION SERVICES DIVISION</p> <p><b>UTILITY REPLACEMENT ALONG NORTH 26 AVE (PHASE 1)</b></p> <p>CITY PROJECT #16-5133</p> <p>CONTRACTOR: XXXXXXXXXXXXXXXXXXXX</p> <p>ESTIMATED PROJECT COMPLETION DATE: XXXXXXXX 2022</p> <p>ESTIMATED CONSTRUCTION COST: \$XXXXXXX</p>
	<p><b>For further information call 954-921-3930</b></p>

The PDF format of this template can be requested from the City or the ENGINEER.

**PART 2 – PRODUCTS** (Not Used)

**PART 3 – EXECUTION** (Not Used)

- END OF SECTION –

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**SECTION 01510****TEMPORARY UTILITY SERVICES AND STAGING AREA****PART 1 – GENERAL**

## 1.01 GENERAL

- A. The CONTRACTOR shall provide for temporary utilities and services for CONTRACTOR'S own operations. These shall include electrical power, water, ventilation, sanitary facilities. The CONTRACTOR shall furnish, install and maintain all temporary utilities during the contract period including removal upon completion of the work. Such facilities shall comply with regulations and requirements of the National Electrical Code, OSHA, Florida Power and Light, and applicable Federal, State and local codes, etc. In addition, the CONTRACTOR shall provide the following:

## 1.02 TEMPORARY POWER (NOT USED)

## 1.03 TEMPORARY WATER

- A. The CONTRACTOR shall supply all water used for construction, flushing, testing, and temporary sanitary facilities. The CONTRACTOR shall provide and maintain all piping, fittings, adapters, and valving required. It is the CONTRACTOR'S responsibility to arrange through the City Underground Utilities Division for a 2-inch fire hydrant water meter. A deposit to be paid by the CONTRACTOR is required for meter rental and all water shall be purchased at the prevailing rate.

## 1.04 TEMPORARY VENTILATION (NOT USED)

## 1.05 TEMPORARY SANITARY FACILITIES

- A. The CONTRACTOR shall provide and maintain adequate and clean sanitary facilities for the construction work force and visitors. The facilities shall comply with local codes and regulations and be situated at approved locations.

## 1.06 TEMPORARY TELEPHONE SERVICE (NOT USED)

## 1.07 SECURITY (NOT USED)

## 1.08 STAGING AREA

- A. The CONTRACTOR shall arrange, coordinate and take all necessary steps regarding CONTRACTOR'S work effort to comply with constraints defined in Section 01520, including off site parking, staging, storage, etc., as required. Costs associated with these efforts shall be included in the bid for this project.

**PART 2 – PRODUCTS** (Not Used)

**PART 3 – EXECUTION** (Not Used)

- END OF SECTION -

**SECTION 01520****MAINTENANCE OF FACILITIES AND SEQUENCE OF CONSTRUCTION****PART 1 - GENERAL**

## 1.01 GENERAL

The CONTRACTOR shall ensure the continuous operation of all existing sanitary sewer systems, potable water systems, and stormwater facilities during construction. In addition, the CONTRACTOR shall provide temporary traffic routing and coordinate CONTRACTOR'S work so as to minimize impact to the utilities systems located in the area. In performing the work shown and specified, the CONTRACTOR shall plan and schedule CONTRACTOR'S work as outlined in this Section.

## 1.02 CONSTRUCTION SCHEDULE

The Construction Schedule shall be submitted by the CONTRACTOR in accordance with Section 01300 of these Specifications

## 1.03 USE OF FACILITIES BEFORE COMPLETION

The CITY reserves the right to enter and use any portion of the constructed facilities before final completion of the whole work to be done under this Contract in accordance with Article 14-2, Partial Utilization of the General Conditions.

## 1.04 CONNECTION OF EXISTING SYSTEMS

All connections to existing systems shall be performed in such a manner that no damage and minimal interruption is caused to the existing installation. On completion of its installation, the CONTRACTOR shall complete the connection to the existing systems in a proper manner. Any damage caused to existing installations shall be repaired or replaced by the responsible CONTRACTOR at no additional cost to the CITY.

## 1.05 COORDINATION WITH DEPARTMENT OF PUBLIC UTILITIES PERSONNEL

- A. Before commencing work involving removing or placing in operation existing or new facilities or tie-ins to existing facilities, the CONTRACTOR shall notify the CITY at least three (3) business days in advance in writing. The CITY shall be responsible for removing facilities from operation as deemed necessary.
- B. The CONTRACTOR shall, under no circumstances, interfere with wastewater treatment plant and existing potable water, sewer and stormwater facilities without the CITY's authorization, in writing, and supervision. The CONTRACTOR shall notify the CITY's representative in writing a minimum of three work days prior to each scheduled service request. This notification shall be provided on the CITY's



standard form, or on an approved equivalent form completed in full by the CONTRACTOR.

#### 1.06 COORDINATION WITH PRIVATE PROPERTY OWNERS

Prior to commencing with construction (including mobilization and maintenance of traffic) the CONTRACTOR shall distribute copies of the "Notice to Owners" and "Right of Entry Permit" (refer to Appendix B) to all property owners/tenants within the project area and shall obtain permission from property owners/tenants prior to working within their properties.

#### 1.07 GENERAL SEQUENCE OF CONSTRUCTION AND OPERATION REQUIREMENTS

- A. Work under the Contract shall be scheduled and performed in such a manner as to result in the least possible disruption to the public's use of roadways, driveways, parking areas, and utilities. Utilities shall include but not be limited to water, sewerage, irrigation, drainage structures, gas, electrical service, cable TV services, fiber optic cables, and telephone. Prior to commencing with the WORK, CONTRACTOR shall perform a location investigation of all existing underground and above ground utilities and facilities in accordance with Section 01530 entitled "Protection of Existing Facilities". Utilities that present potential conflict with the proposed piping shall be field verified with soft digging.
- B. The outlined sequence of construction does not include all items necessary to complete the work, but is intended to identify the sequence of critical events necessary to minimize any disruptions and to avoid any impact to continued collection system service. It shall be understood by the CONTRACTOR that the critical events identified are not all inclusive and that additional items of work not shown may be required. The sequence of construction is a precedence requirement and does not attempt to schedule the CONTRACTOR' work. It is intended only to indicate which activities must precede other activities in order to minimize interference's and disruptions.
- C. All work by the CONTRACTOR that disrupts the normal utilities operations shall be shown on the Construction Schedule specified in Section 01300 and specifically scheduled with the CITY. Schedule notification shall consist of a written notice defining the work to be accomplished, the normal treatment plant that will be interrupted, the duration of the interruption, and the mitigating effort to be performed by the CONTRACTOR. The written notice shall be submitted to the CITY fourteen days in advance of the proposed work and the CITY will respond to the CONTRACTOR in writing within seven days of receipt of the notice regarding the acceptability of the proposed plan.
- D. At no time, the CONTRACTOR shall undertake closing off any pipelines, or opening valves, or take any other action which would affect the operation of the

existing system, except as specifically required by the drawings and specifications, and until authorization is granted by the CITY or ENGINEER and after proper notification.

- E. Temporary installations required to complete a particular aspect of the work during the allowed time period shall be determined by the CONTRACTOR and implemented by the CONTRACTOR at no additional cost to the CITY. All such temporary installations shall be subject to the review and acceptance of the ENGINEER.
- F. Sequence of certain major events and identification of time constraints for removing existing facilities from active service and installation of new facilities are described below in paragraph 1.08. No phase of work (or tasks within a phase) shall preclude or be performed in parallel with a subsequent phase unless specifically defined so in these documents. In all cases, work in each phase shall be checked out and accepted for satisfactory use, subject to the ENGINEER's approval, prior to the CONTRACTOR proceeding to the next phase of construction.

#### 1.08 DETAILED SEQUENCE OF CONSTRUCTION AND OPERATION REQUIREMENTS

- A. Phase I - Mobilization / Site Preparation: Mobilize for work – Video working areas, set up staging and storage areas, obtain permits, develop and submit construction schedule, submit shop drawing schedule, survey, locate existing utilities and elevations with soft digging, verify existing fittings to be connected, shop drawing submittals, and procure materials.
- B. Phase II – Construction of the Water and/or Sewer Systems and Storm Drainage Systems: The tasks included under this phase consist of installation of proposed improvements as described in the approved construction plans. This phase will be broken up into three sequenced phases: Phase 1-A, Phase 1-B, and Phase 1-C. See section 1.09 of this specification for a more detailed sequence for this phase.
- C. Phase III - Final Sitework and Closeout: Final pavement and asphalt overlay of the affected road sections, final restoration, final grading, sodding, miscellaneous work, demobilization and related closeout activities as described in Section 01700 - Project Closeout.
- D. Construction Constraints: CONTRACTOR shall comply with the following constraints during construction and utilize constraints in determining a sequence of construction:

1. Construction work during the installation of the proposed work shall be limited to the public R/W. Homeowners shall have access to their driveways at all times.
  2. The excavation area shall be surrounded with barricades and obstructions illuminated with temporary light furnished, installed and maintained by the CONTRACTOR.
  3. Final restoration of roads, driveways, sidewalks and all other paved areas shall be completed within five (10) business days after piping has been installed.
  4. Contractor is expected to work regular hours between the hours of 8:00 AM and 5:00 PM, Monday through Friday. Requests for approval to work during other than regular hours must be submitted to the ENGINEER at least 72 hours in advance of the period proposed for such overtime work and shall set forth the proposed schedule for overtime work to give ENGINEER ample time to arrange for CONTRACTOR'S personnel to be at the site of the Work, even for work required to occur by contract. Contractor shall pay for the additional engineering charges on account of the overtime work, except when overtime is associated with contract-required. Such additional engineering charges shall be a subsidiary obligation of CONTRACTOR, and no extra payment shall be made by CITY on account of such overtime work. The CONTRACTOR shall not violate the Hollywood Code of Noise Ordinance.
  5. The CONTRACTOR shall pay liquidated damages of \$500/DAY for not complying with any one of the above requirements.
- E. Construction Constraints: CONTRACTOR shall comply with the following constraints during construction and utilize constraints in determining a sequence of construction:
1. The Contractor shall coordinate with the City of Hollywood to obtain, lease, rent, or borrow private property to store construction equipment and materials. Security of construction equipment and materials is the responsibility of the Contractor. Public rights-of-way may not be utilized for storage of construction equipment or materials, and all construction equipment and materials shall be removed from the street and right-of-way overnight. Contractor shall provide the City for review proof of agreement to use a property for staging/storage.
  2. The Contractor shall pay liquidated damages of \$500 per day for not complying with the storage requirements above.

#### 1.09 DETAILED SEQUENCE OF PHASE II CONSTRUCTION

- A. Phase 1-A – Construction of the Water and Storm Drainage System on North Half of 26th Avenue: The tasks included under this phase consist of installation of proposed improvements as described in the approved construction plans. Work for this task includes all proposed improvements between New Valve A (STA 80+42.7), New Valve B, and subsequent connection to the existing system. On Sherman Street, Thomas Street, and Liberty Street, temporary piping will be required that connects the existing watermain system on each of these side streets to the new 8-inch water main until approval to proceed to Phase 1-C is granted. Milling and patching of new pipe trench shall be executed to close Phase 1-A. Contractor shall not continue to Phase 1-B until FDEP permit release has been granted and City & Engineer have provided written direction to proceed.
- B. Phase 1-B – Construction of the Water and systems on South Half of 26th Avenue: The tasks included under this phase consist of installation of proposed improvements as described in the approved construction plans. Work for this task includes all proposed improvements between New Valve C (STA 80+22.7), Existing Valve F, and subsequent connection to the newly installed system (Phase 1-A). Milling and patching of new pipe trench shall be executed to close Phase 1-B. All removed fittings shall be returned to the City. Contractor shall not continue to Phase 1-C until FDEP permit release has been granted and City & Engineer have provided written direction to proceed.
- C. Phase 1-C – Construction of the Water and Storm Drainage Systems on Sherman, Thomas, and Liberty Streets: The tasks included under this phase consist of installation of proposed improvements as described in the approved construction plans. Work for this task includes all proposed improvements to be connected to the permanent piping on Sherman Street, Thomas Street, and Liberty Street that were installed in Phase 1-A. The temporary piping and fittings connected to the existing system under Phase 1-A shall be removed and replaced with the proposed piping and fittings on each of these streets. All removed fittings shall be returned to the City. In addition, drainage improvements will be made on each of these side streets that include paving, grading, and drainage structure installation. Milling, patching, and resurfacing on these streets shall be expected to close Phase 1-C.

**Part 2 - PRODUCTS (Not Used)**

**Part 3 - EXECUTION**

3.01 COORDINATION WITH EXISTING UTILITIES AND OTHER AGENCIES:

- A. The CONTRACTOR shall coordinate with Sunshine One-Call Notification at 1-800-432-4770 a minimum of 48 business hours prior to any excavation for location of existing underground facilities.

**B. CONSTRUCTION DEWATERING:**

1. All dewatering equipment such as pumps, air compressors, generators, etc. proposed for use during construction in residential areas shall be provided with noise enclosures suitable to meet the requirements of the City of Hollywood Noise Ordinance and/or Broward County Noise Ordinance, whichever is more stringent.
2. There is no dewatering permit for this project. If the CONTRACTOR considers that as part of its means and methods of construction, a dewatering permit is required, it is the responsibility of the CONTRACTOR to secure the required permit in order to proceed with the execution of the construction.

**3.02 COOPERATION:**

The CONTRACTOR shall allow the CITY or its agents, and other project contractors or their agents, to enter facilities being constructed under this Contract for the purpose of constructing, installing, operating, maintaining, removing, repairing, altering or replacing such equipment pipes, sewers, conduits, manholes, wires, or other structures and appliances which may be required to be installed at or in the work. The CONTRACTOR shall cooperate with all the aforesaid parties and shall allow reasonable provisions for the prosecution of any other work by the CITY, or others, to be done in connection with CONTRACTOR'S work, or in connection with normal use of the facilities.

- END OF SECTION -

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## SECTION 01530

### PROTECTION OF EXISTING FACILITIES

#### **PART 1 – GENERAL**

##### 1.01 THE REQUIREMENT

- A. The CONTRACTOR shall protect all existing utilities and improvements not designated for removal and shall restore damaged or temporarily relocated utilities and improvements to a condition equal to or better than they were prior to such damage or temporary relocation, all in accordance with requirements of the Contract Documents.
- B. The CONTRACTOR shall verify the exact locations and depths of all utilities shown and the CONTRACTOR shall make exploratory excavations of all utilities that may interfere with the Work. All such exploratory excavations shall be performed as soon as practicable after award of 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 CITY.
- C. The number of exploratory excavations required shall be that number which is sufficient to determine the alignment and grade of the utility.

##### 1.02 RIGHTS-OF-WAY (NOT USED)

##### 1.03 PROTECTION OF STREET OR ROADWAY MARKERS (NOT USED)

##### 1.04 RESTORATION OF FACILITIES

- A. General: All paved areas including asphaltic concrete berms cut or damaged during construction shall be replaced with similar materials and of equal thickness to match the existing adjacent undisturbed areas, except where specific resurfacing requirements have been called for in the Contract Documents or in the requirements of the agency issuing the permit. All temporary and permanent pavement shall conform to the requirements of the affected pavement CITY. All pavements which are subject to partial removal shall be neatly saw cut in straight lines.
- B. Temporary Restoration: Temporary restoration includes repair to 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.
- C. 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 and improvements.

- E. 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, unless otherwise shown on the drawings.
- F. Final Restoration: 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, installation or replacement of any trees or shrubs, repair of irrigation systems, pavement markings, etc., all complete and finished, acceptable to the ENGINEER.

#### 1.05 EXISTING UTILITIES AND IMPROVEMENTS

- A. General: The CONTRACTOR shall protect all underground utilities and other improvements which may be impaired during construction operations. It shall be the CONTRACTOR'S responsibility to ascertain the actual location of all existing utilities and other improvements that will be encountered in its construction operations, and to see that such utilities or other improvements are adequately protected from damage due to such operations.
- B. Utilities to be Moved: 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 CITY 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 CITY a sufficient time in advance for the necessary measures to be taken to prevent interruption of service.
- C. Where the proper completion of the Work requires the temporary or permanent removal and / or relocation of an existing utility or other improvement which is shown, the CONTRACTOR shall remove and temporarily replace or relocate such utility or improvement in a manner satisfactory to the CITY and the OWNER of the utility/facility. In all cases of such temporary removal or relocation, restoration to former location shall be accomplished by the CONTRACTOR in a manner that will restore or replace the utility or improvement as nearly as possible to its former locations and to as good or better condition than found prior to removal.
- D. CITY'S Right of Access: The right is reserved to the CITY and to the OWNER'S of public utilities and franchises to enter at any time upon any public street, alley, right-of-way, or easement for the purpose of making changes in their property made necessary by the Work of this Contract.
- E. Underground Utilities Shown or Indicated: Existing utility lines that are shown 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 by the CONTRACTOR.

- F. Underground Utilities Not Shown or Indicated: In the event that the CONTRACTOR damages any existing utility lines that are not shown or the locations of which are not made known to the CONTRACTOR prior to excavation by the CITY and Sunshine One-Call Notification, a written report thereof shall be made immediately to the CITY. The CONTRACTOR shall make the repairs immediately under the provisions for changes and extra work contained in the General Conditions.
- G. Approval of Repairs: All repairs to a damaged improvement are subject to inspection and approval by an authorized representative of the CITY before being concealed by backfill or other Work.
- H. No fill, excavation material, construction generated debris or equipment shall obstruct water valves, gas meters or sewer manholes. Water, sewer and gas service shall be made accessible to repair or maintenance crews representing the CITY or a privately-owned utility company.
- I. Maintaining in Service: All oil and gasoline pipelines, power, and telephone or other communication cable ducts, gas and water mains, irrigation lines, reuse lines, sewer lines, storm drain lines, poles, and overhead power and communication wires and cables encountered along the line of the Work shall remain continuously in service during all the operations under the Contract, unless other arrangements satisfactory to the CITY are made with the owner of said utilities. 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.

#### 1.06 TREES WITHIN STREET RIGHTS-OF-WAY AND PROJECT LIMITS

If any tree removal or relocation is required, the CONTRACTOR needs to coordinate with the ENGINEER, accordingly. All required permits related to tree removal are the responsibility of the CONTRACTOR.

#### **PART 2 – PRODUCTS (Not Used)**

#### **PART 3 – EXECUTION (Not Used)**

- END OF SECTION -

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**SECTION 01550****SITE ACCESS AND STORAGE****PART 1 – GENERAL****1.01 SITE ACCESS**

- A. The CONTRACTOR shall make its own investigation of the condition of available public and private roads and of clearances, restrictions, bridge load limits, and other limitations affecting transportation and ingress and egress to the site of the Work. It shall be the CONTRACTOR's responsibility to construct and maintain any haul roads required for its construction operations.
- B. The CONTRACTOR will be responsible for monitoring the main gate for its personnel, equipment and material deliveries.

**1.02 STORAGE**

- A. Limited storage area is available within the work areas shown on the Drawings. Any equipment and materials stored here shall be in accordance with the manufacturer's recommendations and as indicated by the CITY.
- B. Responsibility for protection and safekeeping of equipment and materials will be solely that of the CONTRACTOR, and no claim shall be made against the CITY by reason of any act of an employee or trespasser. Should an occasion arise necessitating access to an area occupied by stored equipment and/or materials, the CONTRACTOR shall immediately move them.
- C. If the CONTRACTOR requires additional staging and storage area than shown on the Drawings, the CONTRACTOR shall obtain such areas from off site sources at no additional cost to the CITY.
- D. Upon completion of the Contract, the CONTRACTOR shall remove from the storage and work areas all of their equipment, temporary fencing, surplus materials, rubbish, etc., and restore the area to its original or better conditions.

**PART 2 – PRODUCTS (Not Used)****PART 3 – EXECUTION (Not Used)**

- END OF SECTION -

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**SECTION 01560**  
**SPECIAL CONTROLS**

**PART 1 – GENERAL**

**1.01 CHEMICALS**

- A. All chemicals used during project construction or furnished for testing of project operation, whether herbicide, pesticide, disinfectant, polymer, reactant of other classification, will be required to show approval of either EPA or HUD. The handling, use, storage and disposal of such materials, containers or residues shall be in strict conformance with manufacturer and/or CONTRACTOR'S secured storage. Copies of antidote literature and a supply of antidotes shall be kept at the job site office.

**1.02 DUST**

- A. During all work for this Contract, the CONTRACTOR shall by the application of water and/or calcium chloride or other means, approved by the ENGINEER, eliminate dust annoyance to adjacent property, business establishments and the plant site in accordance with Article 7.21, Dust Control, of the General Conditions. The CONTRACTOR shall take all protective measures, to the satisfaction of the ENGINEER, necessary to ensure that dust and debris does not enter any of the mechanical or electrical equipment. The CONTRACTOR shall be responsible for the cleanup of existing buildings, equipment, controls, etc., which have become soiled due to the lack of proper dust control as determined by the ENGINEER. The CONTRACTOR shall provide daily application of water to all unpaved areas designated by the ENGINEER in the field and to the satisfaction of the ENGINEER in the field.

**1.03 NOISE**

- A. Noise resulting from the CONTRACTOR'S work shall not violate the Hollywood Code of Ordinance Chapter 100, with specific note to the restrictions of paragraph 100.05 or exceed the noise levels and other requirements stated in the Broward County Chapter 27 Pollution Control, relating to noise abatement in Broward County. The CONTRACTOR shall be responsible for curtailing noise resulting from CONTRACTOR'S operation. He shall, upon written notification from the ENGINEER or the noise control officers, make any repairs, replacements, adjustments, additions and furnish mufflers when necessary to fulfill requirements.

**1.04 EROSION ABATEMENT AND WATER POLLUTION**

- A. It is imperative that the CONTRACTOR'S dewatering operations not contaminate or disturb the plant environment or properties adjacent to the Work. The CONTRACTOR, shall, therefore, schedule and control CONTRACTOR'S operations to confine all runoff water from disturbed surfaces, water from dewatering and/or from excavation below the ground water table operations that becomes contaminated with lime silt, muck and other deleterious matter, fuels, oils, bitumens, calcium chloride, chemicals and other polluting materials.

- B. The CONTRACTOR shall construct temporary stilling basin(s) of adequate size and provide all necessary temporary materials, operations and controls including, but not limited to, filters, coagulants, screens and other means necessary to attain the required discharge water quality.
- C. The CONTRACTOR shall be responsible for providing, operating and maintaining materials and equipment used for conveying the clear water to the point of discharge. All pollution prevention procedures, materials, equipment and related items shall be operated and maintained until such time as the dewatering operation is discontinued. Upon the removal of the materials, equipment and related items the CONTRACTOR shall restore the area to the condition prior to CONTRACTOR'S commencing work.

#### 1.05 HURRICANE AND STORM WARNINGS

- A. As the schedule for this project coincides, in part, with the recognized South Florida hurricane season, the CONTRACTOR's attention is drawn to the possibility of hurricane conditions, or severe storm conditions, occurring at the plant site during the course of Contract work.
- B. Within 30-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 which the CONTRACTOR proposes to perform at no additional cost to the Owner in case of a hurricane warning.
- C. In the event of inclement weather, or whenever the ENGINEER shall direct, the CONTRACTOR shall, and will cause Sub-Contractors to protect carefully the Work and materials against damage or injury by reasons of failure on the part of the CONTRACTOR to so protect the Work. Such Work and materials so damaged shall be removed and replaced at the expense of the CONTRACTOR.
  - 1. Hurricane Watch: Upon designation of a hurricane watch, CONTRACTORS shall be responsible for storing all loose supplies and equipment on the job site that may pose a danger. In addition, the CONTRACTOR shall remove all bulkheads and plugs in pipelines that would impede drainage in the case of flooding. Structures that may be in danger of floatation shall be flooded. The CONTRACTOR shall also cooperate with CITY personnel in protecting other structures at the site.
  - 2. Hurricane Warning: No mobile "temporary facility" under the control of the City of Hollywood, or on CITY property, shall be staffed during a hurricane warning. CONTRACTOR facilities meeting these criteria shall comply.
- D. The CONTRACTOR is advised to take all necessary precautions to protect CONTRACTOR'S equipment by moving it to higher ground if in an area subject to flooding. Known areas of Hollywood that would be subject to flooding from storm tides include:

Hollywood Blvd.  
A1A  
US Highway 1

North Lake Area  
Sheridan Street  
46<sup>th</sup> Avenue

South Lake Area  
Dania Beach Blvd.  
Hallandale Beach Blvd.

#### 1.06 PESTS AND RODENTS

- A. The CONTRACTOR shall be responsible for maintaining the jobsite free from litter, rubbish and garbage. CONTRACTOR shall provide containers for the disposal of garbage and other materials that attract and are breeding places for pests and rodents. The CONTRACTOR

shall provide the services of an exterminator to inspect the jobsite on a periodic basis and to provide service as required to control pests and rodents.

#### 1.07 PERIODIC CLEAN-UP; BASIC SITE RESTORATION

- A. During construction, the CONTRACTOR shall regularly remove from the site all accumulated debris and surplus materials of any kind which result from CONTRACTOR'S operations, or whenever the accumulation in excess of one truck load. Unused equipment and tools shall be stored at the CONTRACTOR'S yard or base of operations for the project.
- B. When the work involves installation of sewers, drains, water mains, manholes, underground structures, or other disturbance of existing features in or across streets, rights-of-way, easements, or private property, the CONTRACTOR shall (as the work progresses) promptly backfill, compact, grade and otherwise restore the disturbed area to a basic condition which will permit resumption of pedestrian or vehicular traffic and any other critical activity or function consistent with the original use of the land. Unightly mounds of earth, large stones, boulders, and debris shall be removed so that the site presents a neat appearance.
- C. The CONTRACTOR shall perform the clean-up work on a regular basis and as frequently as ordered by the ENGINEER. Basic site restoration in a particular area shall be accomplished immediately following the installation or completion of the required facilities in that area. Furthermore, such work shall also be accomplished, when ordered by the ENGINEER, if partially completed facilities must remain incomplete for some time period due to unforeseen circumstances.
- D. Upon failure of the CONTRACTOR to perform periodic clean-up and basic restoration of the site to the ENGINEER'S satisfaction, the ENGINEER may, upon five (5) days prior written notice to the CONTRACTOR, employ such labor and equipment as he deems necessary for the purpose, and all costs resulting therefrom shall be charged to the CONTRACTOR and deducted from the amounts of money that may be due him.

#### 1.08 SECURITY

- A. The CONTRACTOR shall care for and protect against loss or damage of all material to be incorporated in the construction for the duration of the Contract and shall repair or replace damaged or lost materials and damage to structures.
- B. The CONTRACTOR shall be responsible for providing, and maintaining temporary fencing and gates and the daily securing of temporary fencing and gates used for construction purposes for the duration of the project.
- C. The CONTRACTOR shall strictly comply with working hours on the project site. Prior to any work outside of the standard working hours, the CONTRACTOR shall request the CITY's approval via written request (at least 8 hours in advance). The written request shall clearly define the work to be performed, the names of the employees, their employer and their trade and the hours and days during which the work is planed.

The CITY is considering and the CONTRACTOR shall comply with additional security requirements including employee photo identification at all times on-site and employee parking passes.

**PART 2 – PRODUCTS** (Not Used)

**PART 3 – EXECUTION** (Not Used)

- END OF SECTION -



**SECTION 01570****TRAFFIC REGULATIONS AND MAINTENANCE OF TRAFFIC****PART 1 – GENERAL**

## 1.01 TRAFFIC CONTROL

- A. CONTRACTOR shall obey all traffic laws and comply with all the requirements, rules and regulations of the State of Florida Department of Transportation (FDOT), the City of Hollywood, Broward County and other local authorities having jurisdiction, to maintain adequate warning signs, lights, barriers, etc., for the protection of traffic on public roadways and the treatment plant site.
- B. The CONTRACTOR shall maintain traffic and protect the public from all damage to persons and property within the Contract Limits, in accordance with the Contract Documents and all applicable state, city and local regulations. The CONTRACTOR shall conduct its construction operations so as to maintain and protect access, for vehicular and pedestrian traffic, to and from all properties and business establishments adjoining or adjacent to those streets affected by CONTRACTOR'S operations, and to subject the public to a minimum of delay and inconvenience. Suitable signs, barricades, railing, etc. shall be erected and the work outlined by adequate lighting at night. Danger lights shall be provided as required. Watchmen, flagmen, and crossing guards shall be provided as may be necessary for the protection of traffic. Traffic Control and Maintenance of traffic during construction shall be included in the CONTRACTOR's bid and no additional payment shall be requested to the City for these activities
- C. For the protection of traffic in public or private streets and alleyways, 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 (MUTCD), 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).
- D. The CONTRACTOR shall submit a Maintenance of Traffic (MOT) Plan for ENGINEER and/or CITY approval at least 60 days prior to construction work.
- E. Prior to performing any work within or abutting the State rights-of-way, the Contractor shall submit a Maintenance of Traffic (MOT) Plan to FDOT for approval as required by the FDOT Utility Permit.
- F. All signs, signals, and barricades shall conform to the requirements of Subpart G, Part 1926, of the OSHA Safety and Health Standards for Construction.
- G. All dirt spilled from the CONTRACTOR'S trucks on existing pavements shall be removed by the CONTRACTOR immediately and whenever in the opinion of the CITY the

accumulation is sufficient to cause the formation of mud, dust, interference with traffic or create a traffic hazard.

- H. Areas designated by the Broward County Traffic Engineering Division as “Safe Walk Routes” shall adhere to the requirements of the Broward County Maintenance of Traffic School/Pedestrian.

## 1.02 TEMPORARY CROSSINGS

- A. General: Wherever necessary or required for the convenience of the public or individual residents at street or highway crossings, private driveways, or elsewhere, the CONTRACTOR shall provide suitable temporary bridges over unfilled excavations, except in such cases as the CONTRACTOR shall secure the written consent of the individuals or authorities concerned to omit such temporary bridges, which written consent shall be delivered to the CITY prior to excavation. All such bridges shall be maintained in service until access is provided across the backfilled excavation. Temporary bridges for street and highway crossing shall conform to the requirements of the authority having jurisdiction in each case, and the CONTRACTOR shall adopt designs furnished by said authority for such bridges, or shall submit designs to said authority for approval, as may be required.
- B. Street Use: Nothing herein shall be construed to entitle the CONTRACTOR to the exclusive use of any public street, alleyway, or parking area during the performance of Work hereunder, and it shall so conduct its operations as not to interfere unnecessarily with the authorized work of utility companies or other agencies in such streets, alleyways, or parking areas. No street shall be closed to the public without first obtaining permission of the CITY and proper governmental authority. Where excavation is being performed in primary streets or highways, one lane in each direction shall be kept open to traffic at all times unless otherwise provided or shown. Toe boards shall be provided to retain excavated material if required by the CITY or the agency having jurisdiction over the street or highway. Fire hydrants on or adjacent to the Work shall be kept accessible to fire-fighting equipment at all times. Temporary provisions shall be made by the CONTRACTOR to assure the use of sidewalks and the proper functioning of all gutters, sewer inlets, and other drainage facilities.
- 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 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, repair all damage caused by installation of the devices, and shall remove post settings and backfill the resulting holes to match grade.

- E. Temporary Street Closure: If closure of any street is required during construction, a formal application for a street closure shall be made to the authority having jurisdiction at least 30 days prior to the required street closure in order to determine necessary sign and detour requirements. Detour signs shall be provided, installed prior to street closure, and removed after construction by the CONTRACTOR.
- F. Temporary Driveway Closure: The CONTRACTOR shall notify the CITY or occupant (if not owner-occupied) of closure of driveways to be closed more than one eight-hour work day, at least three working days prior to the closure. The CONTRACTOR shall minimize the inconvenience and minimize the time period that the driveways will be closed. The CONTRACTOR shall fully explain to the owner/occupant how long the work will take and when closure is to start.
- G. Temporary Bridges: Whenever necessary, the CONTRACTOR shall provide suitable temporary bridges or steel plates over unfilled excavations, except in such cases as the CONTRACTOR shall secure the written consent of the individuals or authorities concerned to omit such temporary bridges or steel plates, which written consent shall be delivered to the ENGINEER prior to excavation. All such bridges or steel plates shall be maintained in service until access is provided across the backfilled excavation. Temporary bridges or steel plates for street and highway crossing shall conform to the requirements of the authority having jurisdiction in each case, and the CONTRACTOR shall adopt designs furnished by said authority for such bridges or steel plates, or shall submit designs to said authority for approval, as may be required.

### 1.03 CONTRACTOR PARKING

- A. The CONTRACTOR shall obtain off-site parking for all personnel vehicles as required.

### **PART 2 – PRODUCTS (NOT USED)**

### **PART 3 – EXECUTION (NOT USED)**

- END OF SECTION -

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**SECTION 01600****EQUIPMENT AND MATERIALS****PART 1 – GENERAL****1.01 GENERAL**

- A. All equipment, materials, instruments or devices incorporated in this project shall be new and unused, unless indicated otherwise in the Contract Documents.
- B. Equipment and materials to be incorporated in the work shall be delivered sufficiently in advance of their installation and use to prevent delay in the execution of the work, and they shall be delivered as nearly as feasible in the order required for executing the work.
- C. The CONTRACTOR shall protect all equipment and materials from deterioration and damage. The equipment and materials shall be handled and stored by the manufacturer, fabricator CONTRACTOR and CONTRACTOR before, during, and after shipment to prevent warping, twisting, bending, breaking, chipping, rusting, and any injury, damage or theft of any kind whatsoever. Any equipment exhibiting any of the above, shall be removed and replaced at the CONTRACTOR'S expense for both labor and materials.

**1.02 STORAGE**

- A. The CONTRACTOR shall store its equipment and materials at their site in accordance with the manufacturer's recommendations and as directed by the ENGINEER in the field. No storage area will be provided by CITY. The CONTRACTOR shall enforce the instructions of the CITY and the ENGINEER regarding the posting of regulatory signs for loadings on structures, fire safety, and smoking areas.

**1.03 HANDLING AND MAINTENANCE**

- A. The manufacturer's storage instructions shall be carefully followed and any deviations shall be approved by the manufacturer in writing with a copy to the ENGINEER. Equipment with moving parts shall be rotated per the manufacturer's recommendations while in storage and during the period between installation and acceptance.
- B. All equipment shall be stored fully lubricated unless otherwise instructed by the manufacturer. Lubricants shall be changed upon completion of installation and as frequently as required thereafter during the period between installation and acceptance. New lubricants shall be put into the equipment at the time of acceptance.
- C. Equipment with electric motors having space heaters shall have the space heaters energized unless stored in a temperature and humidity controlled building. Space heaters shall be energized at the time of installation and maintained until acceptance of the equipment.

**PART 2 – PRODUCTS** (Not Used)

**PART 3 – EXECUTION** (Not Used)

- END OF SECTION -

## SECTION 01700

### PROJECT CLOSEOUT

#### PART 1 – GENERAL

##### 1.01 PROJECT CLOSEOUT

- A. As construction of the project enters the final stages of completion, the CONTRACTOR shall, in accordance with the requirements set forth in the Contract Documents, attend to or have already completed the following items:
1. Scheduling start-up and initial operation.
  2. Correcting or replacing defective work, including completion of items previously overlooked or work which remains incomplete, all as evidenced by the CITY's "Punch" lists.
  3. Make final submittals.
  4. Attend to any other items listed herein or brought to the CONTRACTOR's attention by the CITY.

##### 1.02 CLOSEOUT TIMETABLE

- A. The CONTRACTOR shall establish dates for equipment testing, acceptance periods, and on-site instructional periods (as required under the Contract). Such dates shall be established not less than one week prior to beginning any of the foregoing items, to allow the CITY, the ENGINEER, and their authorized representatives sufficient time to schedule attendance at such activities.

##### 1.03 FINAL SUBMITTALS

- A. Before the acceptance of the project major milestones for substantial completion, the CONTRACTOR shall submit to the ENGINEER (or to the CITY if indicated) certain records, certifications, etc., which are specified elsewhere in the Contract Documents. Missing, incomplete or unacceptable items, as determined by the ENGINEER or the CITY, shall indicate non-compliance with substantial completion major milestone dates. A partial list of such items appears below, but it shall be the CONTRACTOR'S responsibility to submit any other items which are required in the Contract Documents:
1. Written Test results of project components.
  2. Performance affidavits for equipment and materials.
  3. Operation and Maintenance Manuals for equipment.
  4. Record Drawings: during the entire construction operation, the CONTRACTOR shall maintain records of all deviations from the Drawings and Specifications and shall prepare therefrom record drawings showing correctly and accurately all changes and deviations from the Work made during construction to reflect the Work as it was actually constructed. These drawings shall conform to recognized standards of drafting, shall be neat, legible and on mylar or other reproducible material acceptable to the ENGINEER.
  5. Written guarantees, where required.

6. Certificates of inspection and acceptance by local governing agencies having jurisdiction.
7. Releases from all parties who are entitled to claims against the subject project, property, or improvement pursuant to the provisions of law.

#### 1.04 PUNCH LISTS

- A. Final cleaning and repairing shall be scheduled upon completion of the project.
- B. The ENGINEER will make his final inspection whenever the CONTRACTOR has notified the ENGINEER that the work is ready for the inspection. Any work not found acceptable and requiring cleaning, repair and/or replacement will be noted on the "Punch" list. Work that has been inspected and accepted by the ENGINEER shall be maintained by the CONTRACTOR, until final acceptance of the entire project.
- C. Whenever the CONTRACTOR has completed the items on the punch list, he shall again notify the ENGINEER that it is ready for final inspection. This procedure will continue until the entire project is accepted by the ENGINEER. The "Final Payment" will not be processed until the entire project has been accepted by the ENGINEER and all of the requirements in previous Article 1.03 "Final Submittals" have been satisfied.

#### 1.05 MAINTENANCE AND GUARANTEE

- A. The CONTRACTOR shall comply with all maintenance and guarantee requirements of the Contract Documents.
- B. Replacement of earth fill or backfill, where it has settled below the required finish elevations, shall be considered as a part of such required repair work, and any repair or resurfacing constructed by the CONTRACTOR which becomes necessary by reason of such settlement shall likewise be considered as a part of such required repair work unless the CONTRACTOR shall have obtained a statement in writing from the affected private CITY or public agency releasing the CITY from further responsibility in connection with such repair or resurfacing.
- C. The CONTRACTOR shall make all repairs and replacements promptly upon receipt of written order from the CITY. If the CONTRACTOR fails to make such repairs or replacements promptly, the CITY reserves the right to do the Work and the CONTRACTOR and CONTRACTOR'S surety shall be liable to the CITY for the cost thereof.

#### 1.06 TOUCH-UP AND REPAIR

- A. The CONTRACTOR shall touch-up and repair damage to all field painted and factory finished equipment. Touch-up of equipment panels, etc., shall match as nearly as possible the original finish. If in the opinion of the ENGINEER the touch-up work is not satisfactory, the CONTRACTOR shall repaint the item.

#### 1.07 FINAL CLEANUP

- A. The CONTRACTOR shall promptly remove from the vicinity of the completed Work, all rubbish, unused materials, concrete forms, construction equipment, and temporary structures and facilities used during construction. Final acceptance of the Work by the CITY will be withheld until the CONTRACTOR has satisfactorily complied with the foregoing requirements for final cleanup of the project site.



**PART 2 – PRODUCTS (Not Used)**

**PART 3 – EXECUTION (Not Used)**

- END OF SECTION -

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**SECTION 01740****PERMITS****Part 1 - GENERAL**

## 1.01 DESCRIPTION:

- A. The CONTRACTOR shall obtain and pay for all permits and fees in connection with the work. The CONTRACTOR shall also initiate the Department's review and secure Department approval prior to commencement of the work. Inspection by Department personnel is required in addition to, not in lieu of, municipal and County department inspections. No project will be accepted until it has passed all inspections, including pavement installation or replacement.
- B. The CONTRACTOR shall familiarize himself with, and comply with, all requirements of required permits governing all work under this Contract. The CONTRACTOR's particular attention is called to any Special Conditions of the permits relating to construction procedures, excavation and backfill requirements, open trench restrictions, turbidity control, traffic control, pavement restoration and all other general and special conditions. In the event any of the conditions of the permits are in conflict with the requirements of these Specifications, the most stringent conditions shall take precedence.
- C. Any deviations from the Plans, Specifications or required permits, must first be approved by the Department even if approval for the change has been given by the permitting agency.
- D. The CONTRACTOR shall fully assume all obligations and responsibilities, monetary and otherwise, imposed by the permits throughout the life of the project, including but not limited to:
  - 1. Proper maintenance of permit documentation and field records
  - 2. Proper maintenance of all permit-required field controls, including but not limited to the following:
    - (a) Chemical spill prevention
    - (b) Erosion, sedimentation, turbidity and dust retention
    - (c) Protection of storm drainage facilities
    - (d) Temporary vehicular and pedestrian traffic controls
  - 3. Payment of fines resulting from permit non-compliance
  - 4. Maintaining active permits and obtaining permit extensions when needed

5. Providing certifications of all materials and equipment installed
  6. Performing successful inspections and tests required by the permits
  7. Correcting any work that is not in compliance with permits
  8. Performing successful equipment start-ups
  9. Providing Operation and Maintenance (O&M) manuals for installed equipment as required by permits
  10. Repair of any permanent traffic controls impacted by CONTRACTOR
  11. Close-out of all permits
- E. All surveying required by the project permits will be done by the CONTRACTOR's Florida registered Land Surveyor. This includes staking out limits of construction.

**Part 2 - PRODUCTS (Not Used)**

**Part 3 - EXECUTION (Not Used)**

- END OF SECTION -

**SECTION 02000****WATER DISTRIBUTION SYSTEM****Part 1 - GENERAL**

## 1.01 SCOPE

- A. The purpose of these Specifications is to establish uniform requirements for material and installation procedures for water mains. The CITY does not permit the use of 10-inch, 14-inch or 18-inch pipe, fittings or valves, except as may be approved for connections to existing mains. References herein to pipe, fittings and valves in these size ranges are for informational purposes only. Only those features which are considered necessary to provide acceptable materials and a satisfactory installation have been included.
- B. This Specification does not purport to cover all material or installation procedures which may be required, whether by the nature of the proposed work, or by the CITY, or by other regulatory agencies.
- C. It is intent of the CITY to obtain a complete and working installation under this project, and any items of labor, equipment or materials which may reasonably be assumed as necessary to accomplish this end shall be supplied whether or not they are specifically shown on the Drawings or stated herein.

## 1.02 QUALITY ASSURANCE

- A. All material and installation shall be in accordance with the CITY's Standard Specifications and Details.
- B. The material and installation for this project shall be in full compliance with all applicable standards listed in Section 01090, "Applicable Standards and Codes".
- C. In accordance with the "Reduction of Lead in Drinking Water Act" (Act) enacted by the USEPA on January 4, 2011, effective January 4, 2014 all piping, fittings, fixtures, valves, and other appurtenances used in potable water supply and distribution systems shall be "lead free" as defined in Section 1417(d) of the Safe Drinking Water Act (SDWA). All requirements of the Act as it relates to the work under this Contract shall be strictly adhered to.
- D. All ductile iron piping, valves and other appurtenances shall be manufactured in the United States.

## 1.03 PROJECT APPROVAL

- A. The approval of the CITY, as defined in the Contract Documents, shall be secured prior to any construction related activity.

## 1.04 SPECIAL CONDITIONS

A. The work shall proceed in accordance with the following specification sections, bound herein:

1. Section 01010 – Summary of Work
2. Section 01410 – Contractor's Health and Safety Plan
3. Section 01500 – Construction Considerations
4. Section 01510 – Temporary Utility Services and Staging Area
5. Section 01520 – Maintenance of Facilities and Sequence of Construction
6. Section 01530 – Protection of Existing Facilities
7. Section 01550 – Site Access and Storage
8. Section 01560 – Special Controls
9. Section 01570 – Traffic Regulations and Maintenance of Traffic
10. Section 01600 – Equipment and Materials

B. Water for construction shall be provided in accordance with Section 01510.

#### 1.05 PERMITS, INSPECTIONS AND FEES

- A. The CONTRACTOR shall obtain and pay for all permits, official inspections and all other official fees, in connection with the work, in accordance with Section 01740, "Permits".
- B. Inspection by CITY personnel is required in addition to, not in lieu of, municipal and other County department inspections (if any).
- C. No installation will be accepted until it has passed all inspections, including pavement installation or replacement.

#### 1.06 PRECONSTRUCTION CONFERENCE

- A. Prior to commencement of the work, the CONTRACTOR shall attend a "Preconstruction Conference" in accordance with Section 01200, "Project Meetings".

#### 1.07 SUBMITTALS

- A. The CONTRACTOR shall submit all shop drawings in accordance with Section 01300, "Submittals".
- B. The CONTRACTOR shall furnish Record Drawings ("as-builts"), other Project Record Documents, operating and maintenance (O&M) manuals/instructions and all other submittals in accordance with Section 01300, "Submittals".
- C. Where the Specifications require test certification or certification that certain products or material furnished are as specified, the CONTRACTOR shall deliver such certification to the CITY. No material or equipment shall be approved for use in the work until individual certification has been received.

#### 1.08 SAFETY REQUIREMENTS

- A. The CONTRACTOR shall conduct the work in compliance with all applicable provisions of the Occupational Safety and Health Act of 1970, in general, and any subsequent amendments and revisions thereto and specifically to the provisions concerning confined space entry. The CONTRACTOR shall comply with all provisions of the State of Florida Trench Safety Act (TSA).
- B. The CONTRACTOR shall conduct CONTRACTOR'S operations in such a manner, utilizing warning devices such as traffic cones, barricades and warning lights, and personnel such as flagmen and uniformed police officers, that the public is given adequate warning of hazards of the work site as may be deemed necessary by the CITY and/or the ENGINEER. See Section 01570, "Traffic Regulations and Maintenance of Traffic".
- C. Certain products specified in these Specifications contain warnings by the manufacturers that under certain conditions, if instructions for use of the product are not followed, a hazardous condition may exist. It is the CONTRACTOR's responsibility to instruct CONTRACTOR'S workmen in the safe use of the product, or any product substitution.

## **Part 2 - PRODUCTS**

### 2.01 GENERAL

- A. The general requirements specified herein shall apply to all items of material and equipment, in addition to the Specifications for individual items appearing in PART 2, "PRODUCTS", of this section.
- B. All material for use in the Project shall be new and of recent domestic manufacture and shall be the products of reliable manufacturers or suppliers who, unless otherwise specified, have been regularly engaged in the manufacture of such materials and equipment for at least five (5) years.
- C. All fittings and components shall, wherever possible, be standard stock articles of well-known manufacturers.
- D. Where the Specifications designate the products of a particular manufacturer, the product specified has been found suitable for the intended use, but, unless otherwise provided, articles or products of similar characteristics may be offered ENGINEER.
- E. Copies of complete descriptive data shall be furnished regarding all material, consisting of dimension drawings, catalog references and other information necessary to clearly identify and evaluate each article.
- F. When substitutions are permitted, the CONTRACTOR shall make all necessary changes in adjacent or connected structures and equipment, at CONTRACTOR'S expense.
- G. Unless otherwise specified, all steel bolts, nuts, washers and all other miscellaneous ferrous metal items (except cast iron and stainless steel) furnished by the Contractor shall be hot-dip galvanized in accordance with ASTM A386,

"Zinc Coating (Hot-Dip) on Assembled Steel Products" and ASTM A385, "Providing High-Quality Zinc Coatings (Hot-Dip)". Where the word "galvanized" or its abbreviation is used on the Plans or in the Specifications, it shall mean hot-dip galvanized. Fabricated items shall be hot-dip galvanized after fabrication. Internal threads shall be tapped or re-tapped after galvanizing.

- H. Where miscellaneous materials are required for a complete installation, the Contractor shall provide such materials in conformance with Section 15001, "Water Services and Miscellaneous Fittings".
- I. The requirements of Section 01600, "Equipment and Materials" shall be strictly adhered to, where applicable.

## 2.02 FIRE HYDRANTS

See Part 2.07, "Fire Hydrants", of Section 15001, "Water Services and Miscellaneous Fittings".

## 2.03 PIPE AND FITTINGS - DUCTILE IRON

See Section 15060, "Piping and Fittings"

## 2.04 PIPE AND FITTINGS - POLYVINYL CHLORIDE (PVC)

See Section 15060, "Piping and Fittings".

## 2.05 TAPPING SLEEVES

See Section 15102, "Tapping Sleeves and Tapping Valves"

## 2.06 VALVES

- A. Gate Valves - Section 15100
- B. Tapping Valve - Section 15102
- C. Other miscellaneous valves - Section 15001

## 2.07 BACKFILL AND EMBEDMENT MATERIAL

Backfill, Select Backfill and Embedment material, for bedding, shall be as specified in Section 02222.

## 2.08 MISCELLANEOUS MATERIAL

- A. Section 15001 specifies material necessary for a complete installation, not specified herein. These materials, including the following, shall be furnished and installed by the CONTRACTOR, when required, whether shown on the Drawings or not:
  - 1. Anchor bolts, nuts and washers
  - 2. Corporation stops



3. Coupling adapters
4. Gasket lubricant
5. Guard post for fire hydrants
6. Joint materials for flanged pipe, valves and fittings
7. Meter couplings
8. Paint, for fire hydrants and guard posts
9. Polyethylene encasement material

### **Part 3 - EXECUTION**

#### 3.01 CONSTRUCTION METHODS

- A. The CONTRACTOR's Registered Land Surveyor shall establish the line and grade in the field for the pipeline. Except as otherwise approved by the CITY, line and grade shall consist of establishing all points of bend and other stations not more than 100 feet apart along the proposed centerline of the pipe, or along a stationed offset line as shown on the Drawings, marked by a nail in a metal cap if in pavement, with the station painted nearby or by a nail in the top of a wooden stake driven flush with the ground with the station marked on a flag stake nearby, if not in pavement. The CONTRACTOR shall install the pipe to the lines and grades shown on the Drawings without help from the CITY, and shall supply all equipment and personnel necessary to accomplish this end.
- B. The CONTRACTOR shall make CONTRACTOR'S equipment and men available to the CITY for spot checking the accuracy of the pipe laying but shall not rely on the Inspector to set each pipe and fitting for him. The CITY shall require the pipe to be brought within the tolerances specified in subsection 3.04, "Installation of Pipe and Fittings," herein, before the backfill is placed. If, due to unforeseen conditions, the line or grade of the pipe has to be changed from the planned location, the pipe shall not be concealed until the Inspector has noted the actual location, and the CONTRACTOR shall record the same for use in the preparation of Record Drawings.
- C. The ends of existing mains shall be temporarily capped or plugged and anchored to keep them clean and the joints from blowing apart from internal pressure until the new main can be connected to them.
- D. Where existing paving is damaged or removed by the CONTRACTOR, temporary road base material shall be placed the same day as the ditch backfill, and the full alley width and length shall be replaced with permanent asphalt paving, where shown on the Drawings within thirty (30) days.
- E. In addition to specific construction methods specified elsewhere, the following general requirements shall apply to the work under this project.
  1. Pipe and fittings shall at all times be handled with great care to avoid damage. In loading and unloading, they shall be lifted with cranes or hoists or slid or rolled on skid ways in such manner as to avoid shock. Under no

circumstances shall this material be dropped or allowed to roll or slide against obstructions. Pipe and other material shall be distributed along the right-of-way in advance of installation only to the extent approved by the CITY. Such materials shall be so placed as to keep obstruction to traffic at a minimum.

2. Any work within the pipe and fittings shall be performed with care to prevent damage to the lining. Damaged lining shall be repaired or the pipe section or fitting replaced as required by the CITY. No cables, lifting arms, hooks or other devices shall be inserted into the pipe or fitting. All lifting, pulling or pushing mechanisms shall be applied to the exterior of the pipe or fitting.
  3. The CONTRACTOR's attention is called to the fact that connections to existing mains will probably involve the removal of a concrete anchor and cast iron plug; also that the existing mains may be cast iron with poured lead sulfur compound, or rubber gasket-type joints, concrete with flanged outlet connections, galvanized iron with threaded joints, or others. The Contractor should be equipped with the proper tools and equipment to make connections to any one or more of these existing mains.
  4. Where required by the CITY and at CONTRACTOR'S discretion, the Contractor shall eliminate dust annoyance to adjacent property owners by sprinkling CONTRACTOR'S work area with water or by other approved means.
- F. When mains are to be installed within existing street areas, the CONTRACTOR shall limit the amount of ditch open at any one time to one block (approximately 600 feet). The work in each block, including excavation, pipe laying, backfilling and temporary paving shall be completed before proceeding with the work in the next block.
- G. Boring and jacking operations and trenches remaining open to facilitate the repair of existing underground utilities damaged by the CONTRACTOR during excavation shall not be deemed a portion of the allowable 600 feet of open trench, unless otherwise decided by the CITY at its discretion.
- H. When mains are to be installed within existing street areas, the CONTRACTOR may employ more than one installation crew on the Project but not less than 1,200 feet shall separate any two open trench sections as defined hereinbefore.

### 3.02 EXCAVATION

See Section 02222, "Excavation and Backfill for Utilities"

### 3.03 WATER SERVICE INSTALLATIONS

See Section 02515, "Water Service Connections and Transfers"

### 3.04 INSTALLATION OF PIPE AND FITTINGS

- A. The top of the pipe shall not vary by more than two inches from the location shown on the Drawings from the established grade, except at points where this tolerance must be changed to clear obstructions or make connections. Deviation from this location will be permitted only upon approval from the CITY.
- B. Upon satisfactory excavation of the pipe trench and completion of the pipe bedding, up to the level of the outside bottom of the proposed pipe barrel, recesses for the pipe bells, or couplings, shall be excavated by hand digging. When the pipe is laid in the prepared trench, true to line and grade, the pipe barrel shall receive continuous, uniform support and no pressure will be exerted on the pipe joints from the trench bottom. Placing and compacting the bedding up to the level of the lower one-third of the pipe barrel shall immediately follow the installation of the pipe.
- C. The interior of the pipes shall be thoroughly cleaned of all foreign matter before being gently lowered into the trench and shall be kept clean during laying operations by means of plugs or other approved methods. During suspension of work for any reason at any time, a suitable stopper shall be placed in the end of the pipe last laid to prevent mud or other foreign material from entering the pipe. Any pipe found defective shall be immediately removed and replaced with sound pipe.
- D. Lines shall be laid straight and depth of cover shall be maintained as shown on the drawings. Top of pipes require 36-inches of cover as shown on the drawings. The CONTRACTOR shall use surveying instruments to maintain alignment and grade. At least one elevation shot shall be taken every one hundred feet (100') or portion thereof for the top of the water main and at any change of direction along the pipeline.
- E. All bends, tees and plugs shall be backed with concrete thrust blocks to undisturbed ground. Encasement type thrust anchors and collars shall be placed where indicated on the Drawings. The bearing area and/or volume of concrete in the anchors and blocks shall be as shown on the Drawings or Standards.
- F. All bolts, nuts, gaskets and other joint materials for use in the pipeline shall be properly protected.
- G. Gaskets shall be properly stored, and care shall be exercised to keep them away from heat, light, oil, gasoline or other petroleum products. Gaskets shall be kept clean at all times and not handled with greasy or dirty hands. Gaskets shall be installed just prior to installation of pipe.
- H. The joints of all pipelines shall be properly homed. The particular joint used shall be approved by the ENGINEER prior to installation.
- I. Unless otherwise directed, cast iron pipe shall be laid with the bell ends facing in the direction of laying; and for lines on an appreciable slope, the bells shall, at the discretion of the ENGINEER, face upgrade.
- J. Push-on, restrained push-on and mechanical joints in ductile cast iron pipe and fittings shall be made in accordance with the manufacturer's standards except as otherwise specified herein. Joints between push-on and mechanical joint pipe

and/or fittings shall be made in accordance with AWWA Standard C600, "Installation of Ductile Iron Water Mains and Their Appurtenances", except that deflection at joints shall not exceed one half of the manufacturer's recommended allowable deflection, or one-half of the allowable deflection specified in AWWA C600, whichever is the lesser amount.

- K. Before laying push-on, restrained push-on and mechanical joint pipe and fittings, all lumps, blisters and excess bituminous coating shall be removed from the bell and spigot ends. The outside of each spigot and the inside of each bell shall be wire brushed, and wiped clean and dry. The entire gasket groove area shall be free of bumps or any foreign matter which might displace the gasket. The cleaned spigot and gasket shall not be allowed to touch the trench walls or trench bottom at any time. Vegetable soap lubricant shall be applied in accordance with the pipe manufacturer's recommendations, to aid in making the joint. The workmen shall exercise caution to prevent damage to the gasket or the adherence of grease or particles of sand or dirt. Deflections shall be made only after the joint has been assembled.
- L. Flanged joints shall be used only where indicated on the Drawings. Before making up flanged joints in the pipeline, the back of each flange under the bolt heads and the face of each flange shall have all lumps, blisters and excess bituminous coating removed and shall be wire brushed and wiped clean and dry. Flange faces shall be kept clean and dry when making up the joint, and the workmen shall exercise caution to prevent damage to the gasket or the adherence of grease or particles of sand or dirt. Bolts and nuts shall be tightened by opposites in order to keep flange faces square with each other, and to insure that bolt stresses are evenly distributed.
- M. Bolts and nuts in flanged and mechanical joints shall be tightened in accordance with the recommendations of the pipe manufacturer for a leak-free joint. The workmen shall exercise caution to prevent overstress. Torque wrenches shall be used until, in the opinion of the ENGINEER, the workmen have become accustomed to the proper amount of pressure to apply on standard wrenches.
- N. Cutting of ductile iron pipe for inserting valves, fittings, etc., shall be done by the CONTRACTOR in a neat and workmanlike manner without damage to the pipe, the lining, or the coating. Pipe, shall be cut with a mechanical pipe saw. After cutting the pipe, the plain end shall be filed to remove all sharp edges and burrs.
- O. The pipe shall be restrained at reaction points as specified and shown on the Plans. The pipe manufacturer shall instruct the CONTRACTOR in the making of such joints. In addition, concrete thrust blocks shall be placed at all bends, tees, plugs and other fittings. Encasement-type thrust anchors and collars shall be placed where indicated on the Drawings.
- P. Taps into ductile iron pipe for corporation stops shall be AWWA tapered thread only, and the CONTRACTOR shall provide suitable equipment for this purpose as approved by the CITY. After the tap has been made, coat the inside of the pipe around the tap with Carboguard 891 White 1898, by Somay Products, or

approved equal. Also, after the installation of corporation stop, heavily coat the exposed exterior surfaces of the stop with Carboguard 891 White 1898, by Somay Products, or approved equal.

- Q. Any work within the pipe shall be performed with care to prevent damage to the lining. Damaged lining shall be repaired as recommended by the pipe manufacturer or the pipe section replaced as required by the ENGINEER. No cables, lifting arms or other devices shall be inserted into the pipe. All lifting, pulling, or pushing mechanisms shall be applied to the exterior of the pipe barrel.
- R. Unless otherwise approved by the ENGINEER, the pipeline shall be cleaned by pigging at intervals not to exceed 30 lengths of pipe. Cleaning methods shall meet the ENGINEER's approval, and must be sufficient to remove silt, rocks, or other debris which may have entered the pipeline during its installation.
- S. Polyethylene encasement of cast/ductile iron pipe and fittings, riser pipe and valves, if required by the CITY, shall be installed in accordance with ANSI/AWWA C105/A21.5, "Polyethylene Encasement for Ductile-Iron Piping for Water and Other Liquids" Method A or B.
- T. Polyethylene encasement of valves and ductile iron riser pipes, if required by the Encasement for Ductile-Iron Piping for Water and Other Liquids" Method A, B or C.
- U. Lines shall be laid straight and depth of cover shall be maintained as shown on the Plans.
- V. Grades or pipe centerline elevations are shown on the Drawings. The CONTRACTOR shall be permitted to use surveying instruments to maintain alignment and grade. At least one elevation shot shall be taken on each length of pipe and recorded. No abrupt changes in direction or grade will be allowed.

### 3.05 CLEANING, TESTING AND DISINFECTION

See Section 15995, "Pipeline Testing and Disinfection"

### 3.06 PAINTING

See Section 09940, "Painting (Short)"

### 3.07 SYSTEM IDENTIFICATION

- A. All pipe and fittings shall be clearly identified as water mains. The standard color is Cyanine Blue (Carboline, Color No. 2127) for all above ground water system piping and appurtenances.
- B. Buried pipes shall be color coded with a blue paint as stated in the Florida Administration Code, Subparagraph 62-555.320(21) (B)3 and as required by the Florida Department of Environmental Protection. If paint is applied during installation of the pipe, the paint shall be applied in a continuous line that runs parallel to the axis pipe and that is located on the top of the pipe. For pipes with

an internal diameter of 24-inches or greater, paint shall be applied in continuous lines along each side of the pipe as well as along the top of the pipe.

### 3.08 FINAL ACCEPTANCE BY THE CITY

The following conditions must be met prior to acceptance of the Project by the CITY:

- A. Where the mains fall within a pavement area, the area shall have the road rock base course placed and compacted prior to testing the mains. Final pavement installation shall be completed prior to acceptance. All castings within a pavement area shall be set with the top surface flush with the new pavement.
- B. All mains and appurtenances shall be flushed, pressure tested and disinfected in accordance with Section 15995, "Pipeline Testing and Disinfection". All mains and appurtenances must be approved for service by the Broward County Health Department prior to activation.
- C. All fire hydrants shall be installed within concrete slabs to the dimensions shown in the Standard Details.
- D. Acceptance by any other governing agency, if any.
- E. Final field inspection and completion of punch list items, if any, to the CITY's satisfaction.
- F. Final cleanup of work site in accordance with Section 01700, "Project Closeout".
- G. Delivery and approval of "As Built" record drawings in accordance with Section 01700, "Project Closeout".
- H. Final acceptance by the CITY.

- END OF SECTION -

**SECTION 02071****UNDERGROUND STORM DRAINAGE STRUCTURES****Part 1 - GENERAL**

## 1.01 SCOPE OF WORK

- A. The work specified in this Section includes all labor, materials, accessories, equipment, and tools required for the construction, installation and testing of precast reinforced concrete underground storm drainage structures, including cast iron grates/frames for catch basins or solid covers/frames for manholes, pollutant retardant baffles (PRBs) and other incidentals related to these. Drainage structures shall be located along storm sewer or exfiltration trench ("French drain") systems or at the intersection of storm sewer systems as shown on the Plans. Work in this section also includes frame/rim leveling and adjustment, connections to new and existing systems.

## 1.02 RELATED WORK

- A. Section 01300 – Submittals  
B. Section 01570 - Traffic Regulation and Maintenance of Traffic  
C. Section 02222 - Excavation and Backfill for Utilities

## 1.03 REFERENCES

- A. American Society for Testing and Materials/Latest Edition
1. ASTM A-48 - Specification for Gray Iron Casting
  2. ASTM C-62 - Specification for leveling course Brick
  3. ASTM C-139 - Specification for Concrete Masonry Units for Construction
  4. ASTM C-443 - Specification for Joints for Circular Concrete, Sewer and Culvert
  5. ASTM C-478 - Specification for Pre-Cast Reinforced Concrete Structure Sections
  6. ASTM C-923 - Specification for Resilient Connections Between Reinforced Concrete Manhole Structures, Pipes and Laterals
  7. ASTM C-1244 - Air Testing

## 1.04 SUBMITTALS

- A. The CONTRACTOR shall submit Shop Drawings and other information for review in accordance with Section 01300 - Submittals, including: dimensions; elevations; dewatering, sheeting and bracing plans; cement type; concrete strength; reinforcement; lifting hooks; joint material; openings; castings; and other applicable information.
- B. Qualification

1. The Qualifications of the Underground Structure Installation Contractor (CONTRACTOR) shall be submitted prior to contract award. These qualifications shall include detailed description of the following:
  - (a) Name, business address and telephone number of the CONTRACTOR.
  - (b) Names of all supervisory personnel to be directly involved with Underground Structure Installation for the project.
  - (c) The CONTRACTOR shall sign and date the information provided and certify that to the extent of his/her knowledge, the information is true and accurate, and that supervisory personnel will be directly involved in this project. Substitutions of personnel and/or methods will not be allowed without written authorization of the OWNER.
  - (d) The CONTRACTOR shall provide his references of previous project lists going back five years including his customers' name, address, and telephone number.
  - (e) Five years of previous related experience shall be required to be qualified in bidding this project.

#### 1.05 UPLIFT

- A. All precast concrete structures placed below grade shall have adequate safety factors against uplift (excluding weight of soil and associated skin friction) as follows:

<u>Water Elevation</u>	<u>Safety Factor</u>
High water level (H.W.L) -	1.5
100 year flood elevation -	1.2

## **Part 2 - PRODUCTS**

### 2.01 PRECAST CONCRETE DRAINAGE STRUCTURES

- A. Precast concrete drainage structures shall be furnished with waterstops, sleeves and openings as noted on the Plans. Precast wall openings for pipes shall conform accurately to the sizes and elevations of the adjoining pipes. Precast concrete drainage structures shall be reinforced with steel in accordance with the design requirements specified in ASTM C-478, and shall comply with FDOT Specification Sections 425 and 449, with the following modifications:
  1. The minimum wall thickness for drainage structures under road pavement or driveways shall be 8 inches. Structures with 6-inch minimum wall thickness will be allowed only for swale or ditch inlets.
  2. Cement to be used in precast structures and grout shall be ASTM C 150, Type II.



3. The date and name of manufacturer shall be marked inside each precast sections.
  4. No more than 2 lift holes may be cast or drilled in each section.
  5. Minimum 28-day concrete strength shall be 4,000 psi.
- B. Taller structure walls shall be fabricated in sections with precast tongue-in-groove or keyed joints. Sections shall be joined with a mastic compound set into the joints to form a watertight seal. Sealing compound shall be of either bituminous or butyl rubber. Material shall be in strip or rope form, supplied with a two-piece cover to preclude adhesion until use. Walls of structures shall be constructed of reinforced concrete with minimum inside dimensions/diameters as called out on the Plans. Riser sections where required shall have keyed or tongue and groove ends (tongue on top of section).
- C. Top sections of manholes shall be of eccentric cone or flat slab top design as required by the Plans. Eccentric cones shall have the same minimum wall thickness and area of circumferential steel reinforcement as the round riser sections. Flat slab tops shall have a minimum thickness of eight (8) inches and shall be reinforced with steel in accordance with the design requirements specified in ASTM C-478. Top sections of cones or flat top slabs shall have a top width of such design and dimensions as to properly support the required inlet/manhole frame and cover and the lower joint shall be of tongue and groove design or other approved anchorage to prevent displacement. Top sections of cones or flat top slabs shall be precast with opening dimensions/diameters to accommodate the specified frames/covers.

## 2.02 REINFORCED CONCRETE FLOOR SLABS

- A. Pre-cast reinforced concrete shall normally be used in lieu of cast-in-place concrete bases.
- B. Floor slabs shall extend six (6) inches beyond the outside face of the structure walls and shall be at least eight (8) inches thick.
- C. Structure walls and floor slabs shall be fully doweled together and monolithically cast to a minimum height of three feet (3') from the bottom of the floor slab.

## 2.03 FRAMES AND COVERS

- A. All workmanship and materials shall be of the highest quality. The metal covers/grates and frames shall be produced by a manufacturer actively engaged in research, development, and manufacturing of watertight metal structure access/opening castings.
- B. Castings for frames and grates or covers for drainage structures shall be composed of best quality, tough, gray iron, free from cold shuts, blow holes, and other imperfections, and shall meet the requirements of ASTM A-48 for Class No. 30B, designed for AASHTO Highway Loading Class H-20.

- C. All bearing surfaces shall be machined to fit true and shall be watertight. No plugging or filling will be allowed.
- D. The combined weight of the frame and cover shall not be less than 410 pounds and cover shall weigh a minimum of 165 pounds.
- E. All storm drainage manhole covers shall bear the words "Storm Sewer" and contain two non-penetrating pick holes.
- F. Frames and covers shall be set on brick and mortar leveling courses consisting of a minimum of two (2) courses and a maximum of four (4) courses of brick, to facilitate adjustments and conform to changes in the finished grade. All exposed brick shall be coated with one-half ( $\frac{1}{2}$ ) inch, minimum thickness of cement mortar.
- G. Lid adapters or adjustment rings shall not be used on new construction.
- H. Frames and covers shall be as called out on the Plans and as manufactured by U.S. Foundry or approved equal.

#### 2.04 POLLUTANT RETARDANT BAFFLES (PRBs)

- A. Pollutant retardant baffles (PRBs) shall be installed inside drainage structures on pipe connections immediately preceding French drains, or where shown on the Plans. The minimum clearance between the outer face of the PRB and the opposing interior wall of the drainage structure shall be a minimum of two (2) feet.
- B. The minimum clearance between the inner face of the PRB and the adjacent wall shall be a minimum of one (1) foot, or three-fourths ( $\frac{3}{4}$ ) of the radius of the baffle, whichever is greater.
- C. PRBs shall be designed in accordance with FDOT Standard Plans for Road and Bridge Construction Index 443-002.

#### 2.05 MANUFACTURER

- A. Drainage structures shall be manufactured by U.S. Concrete Products Corporation or approved equal.

#### 2.06 PIPE-TO-STRUCTURE CONNECTIONS

- A. Pipe openings shall be pre-cast to allow between two (2") and three (3") inches of clear space around the outside diameter of the connecting pipe, and set at the correct elevation and orientation.
- B. Pipe connections to drainage structures shall be made in accordance with the pipe manufacturer's recommendations.

### **Part 3 - EXECUTION**

#### 3.01 PREPARATION

- A. Traffic Control - The CONTRACTOR is required to obtain all permits, use appropriate traffic regulating devices, notify all appropriate governmental agencies and conform to all traffic control requirements during construction.
- B. Plugging and Blocking of Flow – Temporary line plugs shall be inserted where new storm lines interconnect with existing drainage structures or existing storm lines to prevent silt and debris from construction to enter into the existing storm drainage system. The connecting structures shall be constantly monitored for control of silt and debris. After construction, inspection, testing, and system cleaning are complete, all temporary plugs shall be removed.

### 3.02 EXCAVATION AND BACKFILL

- A. The CONTRACTOR shall excavate, backfill, and compact in accordance with Section 02222 - Excavation and Backfill for Utilities. Under no circumstances shall the CONTRACTOR be allowed to remove concrete or asphalt without prior cutting. The saw cutting shall be deep enough to produce an even, straight cut. Backfilling shall occur in MAX 12-inch lifts with compaction by an engine driven hand tamp or other mechanical means as acceptable to the OWNER.

### 3.03 DEWATERING, SHEETING AND BRACING

- A. The CONTRACTOR shall dewater, sheet and/or brace all excavations in accordance with Section 02222 - Excavation and Backfill for Utilities, and Section 02160 - Temporary Excavation Support System. Well points, pumps, sheeting, bracing and/or sock drain shall be used to provide a safe, dry, open hole for all repairs or replacements specified herein.

### 3.04 NEW DRAINAGE STRUCTURE CONSTRUCTION

- A. General:
  - 1. At the points of connection with the existing drainage system shown on the Plans, the CONTRACTOR shall locate and inspect the existing structure and/or piping in order to obtain the relative elevations of existing storm sewer pipes with respect to ground surface elevation. Excavation shall be non-disruptive and non-destructive. After all measurements have been obtained, any small excavations shall be backfilled, and surface shall be restored to its original condition. Excavation and measurements shall be witnessed by the OWNER. Inside measurement shall be used when replacing existing manholes.
  - 2. Existing storm sewer pipes to connect to new structures shall be cut far enough outside the existing manhole exterior wall to accommodate the installation of a new storm sewer pipe and coupling, if needed. Proper dewatering sheeting

and bracing of the hole is critical; no structure shall be allowed to be installed in an unsafe excavation.

- B. Bedding Requirements: The CONTRACTOR shall excavate an additional 18 inches below the base of the drainage structure and fill with "Crushed Stone" as defined in Section 02222 - Excavation and Backfill for Utilities. The CONTRACTOR shall also use this crushed stone for bedding of storm sewer pipe. No excavated fill shall be allowed in the hole until all connections are complete and proper bedding requirements have been met.
- C. Setting Precast Sections
1. Precast reinforced concrete structures shall be set so as to be vertical and with sections in true alignment. After the sections are assembled, the remaining space in the joint shall be pointed up and filled with a dense cement mortar and finished so as to make a smooth, continuous surface inside and outside the wall sections.
  2. All holes in sections, used for their handling, shall be thoroughly plugged with mortar. All seams, keyways, and pipe connections shall be thoroughly plugged with brick and mortar inside and out as needed. The mortar shall be hammered into the holes until it is dense and an excess of paste appears on the surface; then finished smooth and flush with the adjoining surfaces.
  3. The Invert Elevations that were surveyed by the CONTRACTOR prior to drainage structure construction shall be used to install the inverts in the new structure. The inverts shall be resurveyed and submitted to the OWNER for as-built purposes.
- D. Frames and covers
1. Install a minimum of two (2) and a maximum of four (4) brick and mortar leveling courses at the tops of the structure top slabs to make sure the grates/covers will be flush with finished grades.
  2. Set structure frames to proper elevation and to cross-section slope where required. Set in two strips of sealing compound and cover with a bed of Portland cement and silica sand. Set frame in cement bedding and bring mortar up over frame. Recheck elevation due to possible sealant compression.
  3. Contractor shall be responsible for adjusting the tops of all frames and grates/covers to match the finished grade elevations and providing a smooth even transition from pavement to surface of metal castings.
  4. Coat the inside of the brick leveling courses between the top slab and access frame with mortar to create a smooth seal and finish.
- E. Backfill: The backfill shall be compacted; road subgrade (if in paved area) shall be replaced with acceptable material and compacted as specified in Section 02222 – Excavation and Backfill for Utilities. Prior to backfilling, ensure that all concrete

cradles and encasements are dry; all spalls, scars, etc. are repaired; and all coatings have been applied.

### 3.05 DISPOSAL

- A. All excavated material such as pipe sections, concrete, debris or any other items excavated shall become property of the CONTRACTOR. The CONTRACTOR shall take full responsibility for proper disposal and include the cost in the appropriate bid items.

### 3.06 SURFACE RESTORATION

- A. All surface restoration shall be in accordance with Section 02222 – Excavation and Backfill for Utilities. Concrete curbs/sidewalks, driveways, sod, landscaping, asphalt pavement or any other surface items shall be replaced in equal or better condition than prior to construction in accordance with the Contract.

### 3.07 COVER ADJUSTMENT

- A. Adjustment of existing (old) work requiring raising shall be performed in accordance with Sub-Section 3.04 herein.
- B. Rises in excess of twelve (12) inches shall be made by removing the top section of the structure and inserting pre-cast riser sections required to meet the required elevation.
- C. When elevation changes require removal of an existing structure section(s), the OWNER shall be consulted in advance of the work to determine the best method to accomplish the work. The OWNER will inspect all work.
- D. Methods and materials for lowering manhole frames shall comply with Sub-Sections 3.04 and 3.08.

### 3.08 CONNECTIONS TO EXISTING DRAINAGE STRUCTURE

- A. Contractor shall inspect the interior of the existing drainage structure to be connected to ensure that the dimensions, elevations, orientation, and other existing pipe connections can accommodate the new pipe connection.
- B. Contractor shall cut an opening (core-bore) in the existing structure wall at the elevation and orientation shown on the Plans to a size that would accommodate the connecting pipe plus two (2) to three (3) inches of clearance on all sides.
- C. Cut last length of connecting pipe such that it will protrude no more than three (3) inches into the interior of the structure. Install last length of pipe through the wall opening and connect to new storm sewer. Ensure that pipe does not exceed the maximum protrusion length into the structure. Seal the pipe to the structure wall per the pipe manufacturer's recommendations.

### 3.09 CONNECTIONS TO EXISTING SEWERS

- A. For proposed sewers of a diameter equal to the existing sewer, a new manhole shall be constructed over the existing sewer to the proper invert elevation.
- B. The existing storm sewer system shall not be interrupted during rainfall events, or for more than a few hours during no rainfall. The system shall be returned to service before end of each workday.
- C. When broken or damaged pipe results from this operation, replace with new pipe to meet current standards. Saw any piping to be removed to preclude cracking or irregular edges caused by breaking out with a hammer or using other methods.
- D. Proposed sewer pipe shall match the diameter of the existing pipe to be connected to.

### 3.10 PLANNED PIPE OPENINGS

- A. When future pipe connections are planned for proposed drainage structures, pipe stub-outs shall be installed and plugged to preclude exfiltration and infiltration.

## **Part 4 - TESTING**

### 4.01 TESTING

- A. After construction has been completed, the new structures shall be tested for excess infiltration by the CONTRACTOR in the presence of the OWNER. The maximum allowable rate of infiltration for drainage structures is 0.0 gallon per hour per vertical foot of depth of the structure. THERE SHALL BE NO VISIBLE INFILTRATION. All drainage structures must meet this requirement before acceptance by the OWNER.

- END OF SECTION -

**SECTION 02100**  
**CLEARING AND GRUBBING**

**Part 1 - GENERAL**

1.01 THE REQUIREMENT

- A. The CONTRACTOR shall furnish all materials, equipment and labor necessary to complete all clearing and grubbing as specified herein and in accordance with the Drawings.
- B. The CONTRACTOR shall box and protect all trees, shrubs, lawns, and the like where to be preserved.

1.02 STANDARDS AND REGULATIONS

- A. The CONTRACTOR shall comply with all state, county and local regulations regarding disposal of debris resulting from the clearing and grubbing operation.
- B. The CONTRACTOR shall dispose of debris resulting from the clearing and grubbing operation at off-site locations in a lawful manner.

1.03 PROTECTION OF PERSONS AND PROPERTY

- A. All work shall be performed in such a manner to protect all personnel, workmen, pedestrians, and adjacent property and structures from possible injury or damage.
- B. Required wind load calculation for equipment mounted outside. CONTRACTOR to submit equipment support detail for approval.

**Part 2 - PRODUCTS (Not Used)**

**Part 3 - EXECUTION**

3.01 GENERAL

- A. The Work specified in this section consists of clearing and grubbing within the areas required in the easements and right-of-ways to install the pipeline and appurtenances. The Work shall include the disposal of the resultant products and debris in areas provided by the CONTRACTOR unless noted otherwise.
- B. Property obstructions which are to remain in place, such as buildings, sewers, drains, pipelines, conduits, poles, walls, posts, bridges, etc., are to be carefully protected from injury and are not to be displaced, except for unusual cases when so specified by the ENGINEER.

- C. Standard clearing and grubbing shall consist of the complete removal and disposal of all trees, shrubs, timber, brush, stumps, roots, grass, weeds, rubbish and other obstructions resting on or protruding through the surface of the existing ground and the surface of excavated areas.
- D. Excavation resulting from the removal of trees, roots, and the like shall be filled with suitable material, as approved by the ENGINEER, and thoroughly compacted per the requirements contained in Section 02222 – Excavation and Backfill for Utilities.

### 3.02 DISPOSAL OF MATERIALS

- A. Timber, stumps, muck, brush, roots, rubbish and other objectionable material resulting from clearing and grubbing shall be disposed of in a lawful manner, off site by the CONTRACTOR.
- B. Burning of any debris resulting from the clearing and grubbing work will not be permitted at the site.

- END OF SECTION -



**SECTION 02140****DEWATERING****Part 1 - GENERAL**

## 1.01 DESCRIPTION

- A. Design, furnish, operate, maintain, and remove temporary dewatering systems to control groundwater and surface water to maintain stable, undisturbed subgrades, and permit work to be performed under dry and stable conditions. Work to be done as part of dewatering includes, but is not limited to:
  - 1. Lower the groundwater level.
  - 2. Lower hydrostatic pressure.
  - 3. Prevent surface water from entering the excavation during construction.
  - 4. Implement erosion control measures for disposing of discharge water.
- B. Groundwater within the excavation area shall be lowered to at least 1 foot below the lowest excavation levels as specified and as indicated.
- C. Common groundwater recharge methods include, but are not limited to, deep wells, large sumps or any combination thereof.
- D. The CONTRACTOR shall obtain the required permits for discharge from the CONTRACTOR's dewatering systems in accordance with Broward County Water Management Division and South Florida Water Management District (SFWMD) requirements. The CONTRACTOR shall conform with all permit requirements.

## 1.02 RELATED WORK

- A. Section 01560 - Special Controls
- B. Section 02160 - Temporary Excavation Support Systems
- C. Section 02210 - Earth Excavation, Backfill, Fill and Grading
- D. Section 02222 - Excavation and Backfill for Utilities.

## 1.03 SUBMITTALS

- A. Submit the following in accordance with Section 01300, "Submittals":
  - 1. Qualification of the Contractor's dewatering specialist's or firm's qualifications a minimum of four (4) weeks prior to execution of any dewatering. The submittal shall include, but not be limited to:

- (a) Qualifications of specialist's or firm's Registered Professional Engineer as specified in Paragraph 1.04 B.
  - (b) Qualifications of specialist's or firm's field representative, as specified in paragraph 1.04 B, who shall oversee the installation, operation and maintenance of the dewatering system.
2. Submit a dewatering plan at least two weeks prior to start of any dewatering operation. Do not submit design calculations. The review will be only for the information of the Owner and third parties for an overall understanding of the project relating to access, maintenance of existing facilities and proper utilization of the site. The CONTRACTOR shall remain responsible for the adequacy and safety of the means, methods and sequencing of construction. The plan shall include the following items as a minimum:
  - (a) Dewatering plan and details stamped and signed by a Registered Professional Engineer.
  - (b) Certificate of Design: Refer to Section 01300, "Submittals"
  - (c) A list of equipment including, but not limited to, pumps, prime movers, and standby equipment.
  - (d) Detailed description of dewatering, maintenance, and system removal procedures.
  - (e) Monitoring plan and details, including, but not limited to, number and locations of observation wells, and geotechnical instruments such as settlement markers and piezometers, and frequency of reading the monitoring devices.
  - (f) Erosion/sedimentation control measures, and methods of disposal of pumped water.
  - (g) List of all applicable laws, regulations, rules, and codes to which dewatering design conforms.
  - (h) List of assumptions made for design of dewatering and for groundwater recharge systems, including but not limited to groundwater levels, soil profile, permeability, and duration of pumping and or recharge.
  - (i) Turbidity measurements in receiving waters as required by the permit. A turbidity control and monitoring where discharge is to a body of water.
3. Measurement records consisting of observation well groundwater records and the geotechnical instrumentation readings within one day of monitoring.
4. A modified dewatering plan within 24 hours, if open pumping from sumps and ditches results in boils, loss of fines, sinkholes or softening of the ground.

#### 1.04 QUALITY ASSURANCE

- A. Provide in accordance with Section 01400 (Testing and Inspection) and as specified.
- B. Employ the services of a dewatering specialist or firm having the following qualifications:
  - 1. Have completed at least five (5) successful dewatering projects of equal size and complexity and with equal systems within the last five (5) years.
  - 2. Retain the services of a Florida Registered Professional Engineer having a minimum of five (5) years of experience in the design of well points, deep wells, or equal systems.
  - 3. Retain the services of a field representative having a minimum of five (5) years of experience in installation of well points, deep wells, or equal systems.
- C. If subgrade soils are disturbed or become unstable due to dewatering operation or an inadequate dewatering system, notify the Owner's representative, stabilize the subgrade, and modify system to perform as specified at no additional cost to the Owner.
- D. Notify the Owner's representative immediately if any settlement or movement is detected on structures. If the settlement or movement is deemed by the Owner's representative to be related to the dewatering, take actions to protect the adjacent structures and submit a modified dewatering plan to the Owner's representative within 24 hours. Implement the modified plan and repair any damage incurred to the adjacent structures at no additional cost to the Owner.
- E. If oil and/or other hazardous materials are encountered after dewatering begins, immediately notify the Owner's representative.

#### 1.05 PROJECT/SITE CONDITIONS

- A. Subsurface Conditions: Refer to Geotechnical Report provided specifically for the project. The CONTRACTOR is responsible for investigating existing soil conditions as the Geotechnical Report does not assure all subsurface site conditions are represented.

### **Part 2 - PRODUCTS**

#### 2.01 MATERIALS

- A. Provide settlement markers, observation wells, piezometers and/or any other geotechnical instruments in accordance with the submitted dewatering plan.
- B. Provide casings, well screens, piping, fittings, pumps, power and other items required for dewatering system.

- C. Provide sand and gravel filter around the well screen. Wrapping geotextile fabric directly around the well screen shall not be allowed.
- D. When deep wells, well points, or vacuum well points are used, provide pumping units capable of maintaining high vacuum and handling large volumes of air and water at the same time.
- E. Provide and store auxiliary dewatering equipment, consisting of pumps and hoses on the site in the event of breakdown, at least one (1) pump for every five (5) used.
- F. Provide and maintain erosion/sedimentation control devices as indicated or specified and in accordance with the dewatering plan.
- G. Provide temporary pipes, hoses, flumes, or channels for the transport of discharge water to the discharge location.
- H. Provide cement grout having a water cement ratio of 1 to 1 by volume.

### **Part 3 - EXECUTION**

#### 3.01 EXECUTION

- A. Execution of any earth excavation, installing earth retention systems, and dewatering shall not commence until the related submittals have been reviewed by the Owner' representative with all Owner's representative comments satisfactorily addressed and the geotechnical instrumentation has been installed.
- B. Furnish, install and maintain dewatering system in accordance with the dewatering plan.
- C. Carry out dewatering program in such a manner as to prevent undermining or disturbing foundations of existing structures or of work ongoing or previously completed.
- D. Do not excavate until the dewatering system is operational.
- E. Unless otherwise specified, continue dewatering uninterrupted until all structures, pipes, and appurtenances below groundwater level have been completed such that they will not be floated or otherwise damaged by an increase in groundwater elevation.
- F. Discontinue open pumping from sumps and ditches, if such pumping is resulting in boils, loss of fines, softening of the ground, or instability of the slopes. Modify

dewatering plan and submit to the Owner's representative at no additional cost to the Owner.

- G. Where subgrade materials are disturbed or become unstable due to dewatering operations, remove and replace the materials in accordance with Section 02210 – Earth Excavation, Backfill, Fill and Grading at no additional cost to the Owner.

H. Dewatering Discharge:

1. Install and monitor recharge systems when specified and/or indicated and in accordance with the submitted dewatering plan.
2. Install sand and gravel filters in conjunction with well points and deep wells to prevent the migration of fines from the existing soil during the dewatering operation.
3. Transport pumped or drained water to discharge location without interference to other work, damage to pavement, other surfaces, or property.
4. Provide separately controllable pumping lines.
5. The Owner's representative reserves the right to sample discharge water at any time.
6. Immediately notify the Owner's representative if suspected contaminated groundwater is encountered. Do not pump water found to be contaminated with oil or other hazardous material to the discharge locations.

I. Monitoring Devices and Records:

1. Install, maintain, monitor and take readings from the observation wells and geotechnical instruments in accordance with the dewatering plan.
2. Install settlement markers on structures within the zone of influence for dewatering a distance equal to twice the depth of the excavation, from the closest edge of the excavation. Conduct and report settlement surveys to 0.01 feet.
3. For large rectangular, square or circular mass excavations the zone of influence shall be defined by the actual cone of watering influence corresponding to a 10% increase in effective vertical stress.

- J. Install and maintain erosion/sedimentation control devices at the point of discharge as indicated or specified during the pre-construction meeting and in accordance with the dewatering plan.

K. Removal:

1. Do not remove dewatering system without written approval from the ENGINEER.
2. Backfill and compact sumps or ditches with clean fill in accordance with Section 02210 – Earth Excavation, Backfill, Fill and Grading.
3. All dewatering wells shall be abandoned upon completion of the work, and completely backfilled with cement grout.

3.02 CONTRACT CLOSEOUT:

- A. Provide in accordance with Section 01700.

- END OF SECTION -

**SECTION 02160****TEMPORARY EXCAVATION SUPPORT SYSTEMS****Part 1 - GENERAL**

## 1.01 DESCRIPTION

- A. Design, furnish and install temporary excavation support systems as required to maintain lateral support, prevent loss of ground, limit soil movements to acceptable limits and protect from damage existing and proposed improvements including, but not limited to, pipelines, utilities, structures, roadways, railroads and other facilities.
- B. Common types of excavation support system include, but are not limited to, singular or multiple stages comprised of cantilevered or internally braced soldier piles and lagging, steel sheet pile wall, timber sheet pile wall, trench box, or combinations thereof. Trench box temporary excavation support system is only acceptable for pipe or utility trench excavations. Temporary unsupported open cut excavation with stable sloping sides is allowed where applicable.
- C. Wherever the word "sheeting" is used in this section or on the contract drawings, it shall be in reference to any type of excavation support system specified except trench box.
- D. Construction of the temporary excavation support systems shall not disturb the existing structures or the completed proposed structures. Damage to such structures shall be repaired by the CONTRACTOR at no additional cost to the CITY.
- E. Adjacent structures are those that bear upon soils above the proposed excavation depth and within a distance equal to twice the total depth of the excavation away from the closest edge of the excavation. Monitor and protect adjacent structures as specified and indicated.
- F. Vibration monitoring for excavation support systems will be performed by CONTRACTOR's vibration consultant and monitoring firm. Vibration due to CONTRACTOR's operations shall not exceed specified limits 1.05 E.
- G. Construction operations not to exceed specified noise limits in accordance with the City of Hollywood Noise Ordinances.
- H. The CONTRACTOR shall bear the entire cost and responsibility of correcting any failure, damages, subsidence, upheaval or cave-ins as a result of improper installation, maintenance or design of the temporary excavation support systems.

The CONTRACTOR shall pay for all claims, costs and damages that arise as a result of the work performed at no additional cost to the CITY.

- I. All excavation support systems are to be designed and installed in conformance with the latest OSHA requirements.

#### 1.02 RELATED WORK

- A. Section 02210 - Earth Excavation, Backfill, Fill and Grading
- B. Section 03300 - Cast-in-Place Concrete, Reinforcing and Formwork

#### 1.03 REFERENCES

- A. American Society for Testing and Materials (ASTM):
  1. A36: Standard Specification for Structural Steel
  2. A328: Standard Specification for Steel Sheet Piling
  3. A416: Standard Specification for Strand Steel, Uncoated Seven-Wire for Prestressed Concrete
  4. A722: Specification for Uncoated High-Strength Steel Bar for Prestressing Concrete
  5. A615: Standard Specifications for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement
- B. American Wood-Preserves Association (AWPA) Standards.
- C. American Welding Society (AWS) Code: D1.1.
- D. Federal Standard, FS TT-W-571: Wood Preservation and Treating Practices.
- E. Occupational Safety and Health Administration (OSHA) Standards and Regulations contained in Title 29: Subpart P - Excavations, Trenching and Shoring.
- F. American Concrete Institute (ACI)
  1. ACI 304: Recommended Practice for Measuring, Mixing, Transporting and Placing Concrete.

#### 1.04 SUBMITTALS:

- A. Submit the following in accordance with Section 01300:
  1. Submit the following qualifications four (4) weeks prior to the construction:



- (a) Qualifications of independent vibration consulting and monitoring firm as specified in Paragraph 1.05 D.
  - (b) Qualifications of CONTRACTOR's temporary excavation support system designer as specified in Paragraph 1.05 G.
  - (c) Qualifications of CONTRACTOR's temporary excavation support system installer as specified in Paragraph 1.05 H.
  - (d) Qualifications of CONTRACTOR's independent tieback testing laboratory as specified in Paragraph 1.05 I, if a tieback system is utilized.
  - (e) Qualifications of CONTRACTOR's temporary excavation support system installation supervisor as specified in Paragraph 1.05 J.
  - (f) Qualifications of vacuum excavation subcontractor as specified in Paragraph 1.05 F, if DMPs for utilities are utilized.
2. Submit a temporary excavation support plan stamped and signed by a Registered Professional Engineer at least two weeks prior to start of the construction. Do not submit design calculations. The review will be only for the information of the CITY and third parties for an overall understanding of the project relating to access, maintenance of existing facilities and proper utilization of the site. The CONTRACTOR shall remain responsible for the adequacy and safety of the means, methods and sequencing of construction. The plan shall include the following items as a minimum
- (a) Proposed temporary excavation support system(s), details, location, layout, depths, extent of different types of support relative to existing features and the permanent structures to be constructed, and methods and sequence of installation and removal.
  - (b) Certificate of Design: Refer to Section 01300.
  - (c) A list of all design assumptions, including safety factors used for the temporary excavation support system(s) and all lateral pressures used for each system.
  - (d) If utilizing a tieback system, include tieback installation procedures and criteria for acceptance of tiebacks for performance and proof tests. Submit the tieback testing results to the ENGINEER for information only.
  - (e) Requirements of dewatering during the construction.
  - (f) Minimum lateral distance from the edge of the excavation support system for use for vehicles, construction equipment, and stockpiled construction and excavated materials.
  - (g) List of equipment used for installing the excavation support systems.

- (h) Monitoring schedule, installation procedures and location plans for vibration/noise monitoring, geotechnical instrumentation (deformation monitoring points, inclinometers, etc.) and observation wells/piezometers to monitor ground, excavation support system, adjacent structures and groundwater fluctuation during the entire construction period.
3. Submit a Construction Contingency Plan specifying the methods and procedures to maintain temporary excavation support system stability if the allowable movement of the adjacent ground and adjacent structures is exceeded.
  4. Monitoring data within one (1) day of data collection from vibration and noise recording equipment, observation wells, deformation monitoring points and offset lines. Data shall include:
    - (a) Horizontal and vertical movements of geotechnical instruments and groundwater readings.
    - (b) New movements since the initial readings of the geotechnical instruments.
    - (c) Weekly summary in tabular and graphic form at the end of each week.
    - (d) A schematic plan of excavation and/or relevant construction activities at the time of monitoring.
  5. For excavation support systems left in place, submit the following as-built information prior to backfilling and covering the excavation support systems:
    - (a) Survey locations of the temporary excavation support systems, including coordinates of the ends and points of change in direction.
    - (b) Type of the temporary excavation support system.
    - (c) Elevations (NGVD 1929) of top and bottom of the excavation support systems left in place.

#### 1.05 QUALITY ASSURANCE:

- A. Provide in accordance with Section 01400 and as specified.
- B. Conform to the requirements of the OSHA Standards and Interpretations: "Part 1926 Subpart P - Excavation, Trenching, and Shoring", and all other applicable laws, regulations, rules, and codes.
- C. Construction operations to conform to noise regulations provided in the Noise Control Plan and this Section.
- D. Retain the services of an independent vibration consulting firm with the following in-house personnel to conduct the following vibration monitoring requirements:

1. Preparing, reviewing and signing of monitoring plans and daily reports, and overseeing of the monitoring and interpretation of the vibration data shall be performed by personnel with the following qualifications:
  - (a) Be a Florida Registered Professional Engineer.
  - (b) Have a minimum of five (5) years' experience in the vibration consulting field.
  - (c) Have successfully completed at least five (5) projects with vibration-inducing construction operations, pile driving, and noise levels equal to or more severe than those to be encountered.
2. Assist CONTRACTOR in selecting pile driving equipment which will generate the lowest vibration and noise levels.
3. Installation, monitoring and interpretation of monitoring equipment shall be performed by personnel with the following qualifications:
  - (a) Have at least three (3) years of experience in the operation of monitoring equipment proposed for use and interpretation of records produced by such equipment.
  - (b) Have installed, operated, monitored and interpreted equipment and records on at least three (3) projects with vibration-inducing construction operations, pile driving, and noise levels equal to or more severe than those to be encountered.

E. The peak particle velocity for pile driving, or other vibration-inducing operations, shall not exceed the following:

Type of Concrete	Age of Concrete, hrs	Peak Particle Velocity in/sec
Mass Concrete (footings, mats, Slab-on-grade, fill concrete, etc.)	0-11	1.0
	11 and over	2.0
Concrete Structures (walls, columns, elevated slabs, etc.)	0-11	0.5
	11-24	1.0
	24 and over	2.0
Existing Structures, residences or utilities	-	0.5

F. If utilizing deformation monitoring points (DMPs) for utilities, vacuum excavation shall be performed by subcontractor having five (5) years of experience in non-

destructive vacuum excavation methods for utilities.

- G. Prepare design, including calculations and drawings, under the direction of a Professional Engineer registered in the state where the project is located and having the following qualifications
1. Not less than ten (10) years' experience in the design of specific temporary excavation support systems to be used.
  2. Completed not less than five (5) successful temporary excavation support system projects of equal type, size, and complexity within the last five (5) years.
- H. Temporary Excavation Support System Installer's Qualifications:
1. Not less than three (3) year experience in the installation of similar types and equal complexity as the proposed system.
  2. Completed not less than three (3) successful excavation support systems of similar type and equal complexity as the proposed system.
- I. If utilizing a tieback system, employ an independent testing laboratory to test the tieback system with the following qualifications:
1. Be accredited by the American Association of State Highway and Transportation Officials (AASHTO) Accreditation Program.
  2. Employ personnel conducting testing who are trained in the methods and procedures to test and monitor tieback systems of similar type and equal complexity, as the proposed system.
  3. Have not less than five (5) years of experience in testing of tieback systems of similar type and equal complexity as the proposed system.
  4. Have successfully tested at least three (3) tieback systems of similar type and equal complexity as the proposed system.
- J. Install all temporary excavation support systems under the supervision of a supervisor having the following qualifications:
1. Not less than five (5) years of experience in installation of systems of similar type and equal complexity as the proposed system.
  2. Completed at least five (5) successful temporary excavation support systems of similar type and equal complexity as the proposed system.
- K. All welding shall be performed in accordance with AWS D1.1.

## 1.06 DESIGN CRITERIA

- A. Design of temporary excavation support systems shall meet the following minimum requirements:
1. Support systems shall be designed for earth pressures, hydrostatic pressure, equipment, temporary stockpiles, construction loads, roadways, railroads, and other surcharge loads.
  2. Design a bracing system to provide sufficient reaction to maintain stability.
  3. Limit movement of ground adjacent to the excavation support system to be within the allowable ground deformation as specified.
  4. Design the embedment depth below bottom of excavation to minimize lateral and vertical earth movements and provide bottom stability. Toe of braced temporary excavation support systems shall not be less than 5 feet below the bottom of the excavation.
  5. Design temporary excavation support systems to withstand an additional 2 feet of excavation below proposed bottom of excavation without redesign except for the addition of lagging and/or bracing.

#### 1.07 DELIVERY, STORAGE AND HANDLING:

- A. Provide in accordance with Sections 01600 and as specified.
- B. Store sheeting and bracing materials to prevent sagging which would produce permanent deformation. Keep concentrated loads which occur during stacking or lifting below the level which would produce permanent deformation of the material

#### 1.08 PROJECT/SITE CONDITIONS:

- A. Subsurface Conditions: Refer to Sections 01500, 02222, and the project Geotechnical Report.
- B. Concrete: Section 03300 – Cast-in-Place Concrete, Reinforcing and Formwork

## **Part 2 - PRODUCTS**

### 2.01 MATERIALS

- A. Structural Steel: All soldier piles, wales, rakers, struts, wedges, plates, waterstop and accessory steel shapes shall conform to ASTM A36.
- B. Steel Sheet Piling: ASTM A328, continuous interlocking type.
- C. Timber Lagging Left in Place: Pressured treated per appropriate AWPA standards.
- D. Tieback Tendons: Tieback tendons shall be high strength steel wire strand cables conforming to ASTM A416, or bars conforming to ASTM A722. Splicing of individual cables shall not be permitted.

- E. Raker Ties: ASTM A615 Grade 60.
- F. Cement Grout Materials And Admixtures For Tieback Anchorages: Grout cube strength shall be a minimum 3500 psi at 7 days and 5000 psi at 28 days.
- G. Tamping tools adapted for backfilling voids after removal of the excavation support system.
- H. Provide specific trench box sizes for each pipe and utility excavation with structural capacity of retaining soil types as described in OSHA's 29 CFR Part 1926 Subpart P.

## 2.02 EQUIPMENT

- A. A vibratory hammer shall be utilized for driving the temporary sheet piling providing that such operations do not exceed vibration/noise requirements of the specifications. Impact hammer shall be utilized when vibratory hammer is unable to drive temporary sheet piling to required depth and/or unable to meet vibration requirements. Impact hammer shall also meet noise and vibration requirement.

## **Part 3 - EXECUTION**

### 3.01 INSTALLATION

- A. Installation of the temporary excavation support systems shall not commence until the related earth excavation and dewatering submittals have been reviewed by the ENGINEER with all ENGINEER's comments satisfactorily addressed.
- B. Install excavation support systems in accordance with the temporary excavation support plan.
- C. If utilizing a tieback system, all performance and proof tests shall be conducted in the presence of the ENGINEER. Testing performed without the ENGINEER present will not be accepted. Repeat testing in the ENGINEER's presence at no additional cost to the CITY.
- D. Do not drive sheeting within 100 feet of concrete less than seven (7) days old.
- E. Carry out program of temporary excavation support in such a manner as to prevent undermining or disturbing foundations of existing structures of work ongoing or previously completed.
- F. Bottom of the trench box excavation support system shall be above the pipe invert prior to installing the pipe.
- G. Install and read geotechnical instrumentation in accordance with the temporary excavation support plan. Notify the ENGINEER immediately if any geotechnical instrumentation is damaged. Repair or replace damaged geotechnical

instrumentation at the sole option of the ENGINEER and at no additional cost to the CITY.

- H. Continuously monitor movements of the ground adjacent to excavation support systems and adjacent structures. If the measured movements approach or exceed the allowable movements, take immediate steps to arrest further movement by revising procedures such as providing supplementary bracing, filling voids behind the trench box, supporting utilities or other measures (Construction Contingency Plan) as required.
- I. Notify utility CITYs if existing utilities interfere with the temporary excavation support system. Modify the existing utility with the utility owners' permission or have the utility owner make the modifications at no additional cost to CITY.

### 3.02 GROUND DEFORMATION ADJACENT TO EXCAVATION SUPPORT SYSTEMS:

- A. Allowable Vertical (heave/settlement) and Lateral Movements: 2 inches [5 cm] maximum for the trench box excavation support system, and 1 inch [2.5 cm] maximum for other types of excavation support systems at any location behind the excavation support system.
- B. Monitoring personnel shall use a procedure for reading and recording geotechnical instrumentation data which compares the current reading to the last reading during data collection to eliminate spurious readings.
- C. Plot the observed ground deformation readings versus time. Annotate the plots with construction loading and excavation events having an impact on the readings. Evaluate plots by means of secondary rate-of-change plots to provide early warning of accelerating ground movements.
- D. Notify the ENGINEER when the allowable ground deformation is exceeded.
- E. Implement Construction Contingency Plan under direction of the temporary excavation support system designer and the ENGINEER.

### 3.03 REMOVAL OF EARTH RETENTION SYSTEM:

- A. Sheeting shall not be left in place.
- B. Remove the temporary excavation support system without endangering the constructed or adjacent structures, utilities, or property. Immediately backfill all voids left or caused by withdrawal of temporary excavation support systems with bank-run gravel, screened gravel or select borrow by tamping with tools specifically adapted for that purpose.

- C. When tiebacks are used, release tension in tiebacks as the excavation is backfilled. Do not leave tensioned tieback in place at the completion of the work.
- D. The excavation support system left-in-place shall be cut-off a minimum of 2 feet below the bottom of the next higher foundation level or a minimum of 5 feet below finished grade.

3.04 CONTRACT CLOSEOUT

- A. Provide in accordance with Section 01700.

- END OF SECTION -



**SECTION 02210****EARTH EXCAVATION, BACKFILL, FILL AND GRADING****Part 1 - GENERAL**

## 1.01 DESCRIPTION

- A. Perform the following earth excavation, backfill, fill and grading as indicated or specified:
1. Make excavations to accommodate piping, conduits, foundations and other structures.
  2. Provide materials for backfilling excavations and constructing embankments and fills as indicated and specified.
  3. Construct embankments of compacted materials.
  4. Grade surfaces to meet finished grades indicated.
  5. Immediately notify the ENGINEER if suspected hazardous materials are encountered and cease operations in that part of work.
  6. Immediately stop work and notify the ENGINEER if historical artifacts or human remains are encountered.
  7. Remove boulders within the excavation limits.

## 1.02 RELATED WORK

- A. Section 01560 - Special Controls
- B. Section 02100 - Clearing and Grubbing
- C. Section 03300 - Cast-in-Place Concrete, Reinforcing and Formwork

## 1.03 REFERENCES

- A. American Society for Testing and Materials (ASTM) Publications:
1. C33: Specification for Concrete Aggregates.
  2. C136: Sieve Analysis of Fine and Coarse Aggregates.
  3. D421: Practice for Dry Preparation of Soil Samples for Particle Size Analysis and Determination of Soil Constants.
  4. D422: Test Method for Particle-Size Analysis of Soils.
  5. D1140: Test Method for Amount of Material in Soils Finer than the No. 200 (75 Fm) Sieve.

6. D1556: Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method.
  7. D1557: Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lb/ft<sup>3</sup> (600 kN-m/m<sup>3</sup>)).
  8. D2167: Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method.
  9. D2922: Test Method for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).
  10. D3017: Test Method for Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth).
  11. D4318: Test Method for Liquid Limit, Plastic Limit and Plasticity Index of Soils.
  12. D4718: Practice for Correction of Unit Weight and Water Content for Soils Containing Oversized Particles.
  13. D4944: Test Method for Field Determination of Water (Moisture) Content of Soil by the Calcium Carbide Pressure Tester Method.
  14. D4959: Test Method for Field Determination of Water (Moisture) Content of Soil by Direct Heating Method.
  15. D5080: Test Method for Rapid Determination of Percent Compaction.
- B. Occupational Safety and Health Administration (OSHA) Standards and Regulations contained in Title 29: Subpart P - Excavations, Trenching and Shoring

#### 1.04 DEFINITIONS

- A. Percentage of compaction is defined as the ratio of the field dry density, as determined by ASTM D1556 to the maximum dry density determined by ASTM D1557 Procedure C, multiplied by 100.
- B. Proof Roll: Compaction with a minimum of 4 passes of a vibratory steel drum or rubber tire roller. Vibratory plate compactors shall be used in small areas where vibratory steel drum or rubber tire roller cannot be used.
- C. Acceptable Material: Material which does not contain organic silt or organic clay, peat, vegetation, wood or roots, stones or rock fragments over 6-inch [15 cm] in diameter, porous biodegradable matter, loose or soft fill, excavated pavement, construction debris, or refuse. Stones or rock fragments shall not exceed 40 percent by weight of the backfill material.

- D. Unacceptable Materials: Materials that do not comply with the requirements for the acceptable material or which cannot be compacted to the specified or indicated density.

#### 1.05 SUBMITTALS

- A. Submit the following in accordance with Section 01300 - Submittals:

1. Qualifications of the CONTRACTOR's Independent Testing Laboratory as specified in Paragraph 1.06 I, four (4) weeks prior to the execution of any earth excavation, backfilling, filling, or compaction process.
2. Submit an excavation, backfilling, and filling plan at least two weeks prior to start of any earth moving activities. The review will be only for the information of the CITY and third parties for an overall understanding of the project relating to access, maintenance of existing facilities and proper utilization of the site. The CONTRACTOR shall remain responsible for the adequacy and safety of the means, methods and sequencing of construction. The plan shall include, but not be limited to the following items:
  - (a) Detailed sequence of work.
  - (b) General description of construction methods.
  - (c) Numbers, types, and sizes of equipment proposed to perform excavation and compaction.
  - (d) Details of dust control measures.
  - (e) Proposed locations of stockpiled excavation and/or backfill materials.
  - (f) Proposed surplus excavated material off-site disposal areas and required permits.
  - (g) Details of erosion and sedimentation control measures which will prevent erosion and sedimentation during the earth moving activities.
3. Laboratory testing results of gradation and moisture-density relationship. Submittal shall include specific location of the source and the date when sample was taken.
4. During Construction, submit written confirmation of fill lift thickness, in-place soil moisture content, and percentage of compaction to the ENGINEER before placing the next lift or constructing foundations.

#### 1.06 QUALITY ASSURANCE AND CONTROL

- A. Provide in accordance with Section 01400 and as specified.

- B. The CONTRACTOR shall be solely responsible for making all excavations in a safe manner. All excavation, trenching, and related sheeting, bracing, etc. shall comply with the requirements of OSHA excavation safety standards (29 CFR Part 1926 Subpart P) and State requirements. Where conflict between OSHA and State regulations exists, the more stringent requirements shall apply.
- C. Do not excavate, construct embankments, or fill until all the required submittals have been reviewed by the ENGINEER.
- D. Formulate excavation, backfilling, and filling schedule and procedures to eliminate possibility of undermining or disturbing foundations of partially and completed structures, pipelines and embankments or existing structures and pipelines.
- E. Field Testing and Inspections:
1. By CONTRACTOR's independent testing laboratory, acceptable to the ENGINEER, at CONTRACTOR's expense as specified in Paragraph 1.06 G.
  2. Location of tests mutually acceptable to testing laboratory and the ENGINEER or as directed by the ENGINEER.
  3. In the event compacted material does not meet specified in-place density, recompact material and retest this area until specified results are obtained at no additional cost to the CITY.
  4. CONTRACTOR's testing laboratory to perform inspection at least once daily to confirm lift thickness and compaction effort for entire fill area.
  5. CITY will retain the services of an independent testing laboratory to conduct confirmatory testing and inspection.
- F. Methods of Field Testing
1. In-Place Density: ASTM D1556, ASTM D2167, or ASTM D2922.
  2. In-Place Moisture Content: ASTM D3017, ASTM D4944, or ASTM D4959.
- G. Material Testing Frequency: The following testing frequencies are minimum required for all structural and non-structural fill, grading and embankment.
1. Field In-Place Density and Moisture Content - Screened gravel and crushed stone shall be compacted as specified and indicated. For other backfill and fill materials, minimum test frequency shall be as follows, and no less than one test per:
    - (a) Trenches under structures, foundation preparation, or roadways subbase: Every 500' lin. ft. [150 m.] per lift.

- (b) Trenches in areas without structures or roadways: Every 1000 lin. ft. [300 m.] per alternate lift.
  - (c) Paved Roadways: Every 200 in. ft. [60 m.] per lift.
  - (d) Paved Areas: 3,500 sq. ft. [350 sq. m.] per lift.
  - (e) Under each structure: 1,000 sq. ft. [100 sq. m.] per lift.
  - (f) Around each structure: 1,500 sq. ft. [150 sq. m.] per lift.
  - (g) Embankment Fills: 10,000 sq. ft. [1000 sq. m.] per lift.
2. Moisture Density - One per source, except for screened gravel and crushed stone. Repeat the moisture density test for every 5,000 cubic yard of material use, and whenever visual inspection indicates a change in material gradation as determined by the ENGINEER.
  3. Gradation Analysis - A minimum of one per source and for each moisture density test and whenever visual inspection indicates a change in material gradation.
  4. CITY's testing laboratory to conduct confirmatory testing at a minimum frequency of 25% of the specified frequencies in paragraph 1.06.H, or as directed by CITY's ENGINEER.

#### H. Construction Tolerances

1. Construct finished surfaces to plus or minus 1 inch [2.5 cm] of the elevations indicated.
  2. Grade cut and fill areas to plus or minus 0.20 foot [6.0 cm] of the grades indicated.
  3. Complete embankment edges to plus or minus 6 inches [15 cm] of the slope lines indicated.
  4. Provide the ENGINEER with adequate survey information to verify compliance with above tolerances.
- I. Cut pavement with a saw or pneumatic tools to prevent damage to remaining pavement without extra compensation. Where pavement is removed in large pieces, dispose of pieces before proceeding with excavation.
  - J. Pipes, drains, and other utilities may exist in certain locations not indicated on drawings. No attempt has been made to show all services. Completeness or accuracy of information given is not guaranteed. CONTRACTOR is to conform with all Sunshine One Call (811) requirements.
  - K. Dig test pits considered as incidental to the normal excavation as indicated and specified in this Section, at no additional compensation.

- L. Carefully support and protect from damage, existing pipes, poles, wires, fences, curbing, property line markers, and other structures, which the ENGINEER determines must be preserved in place without being temporarily or permanently relocated. Should such items be damaged, restore without compensation therefore, to at least as good condition as that in which they were found immediately before the work was begun.
- M. Whenever certain existing structures, as described below, are encountered, and the ENGINEER so directs, change the location, remove and later restore, or replace such structures, or assist the CITY in doing so.
- N. In removing existing pipes or other structures, include for payment only those new materials which are necessary to replace those unavoidably damaged as determined by the ENGINEER.
- O. The preceding two paragraphs apply to pipes, wires, and other structures which meet the following: (a) are not indicated on the drawings or otherwise provided for, (b) encroach upon or are encountered near and substantially parallel to the edge of the excavation, and (c) in the opinion of the ENGINEER, will impede progress to such an extent that satisfactory construction cannot proceed until they have been changed in location, removed (to be later restored), or replaced.
- P. Restore existing property or structures as promptly as practicable.
- Q. If material unacceptable for foundation (in the opinion of the ENGINEER) is found at or below the grade to which excavation would normally be carried in accordance with the drawings and/or specifications, remove such material to the required width and depth as directed by the ENGINEER and replace it with screened gravel, select borrow, or concrete.
- R. Do not remove excavation materials from the site of the work or dispose of except as directed or permitted by the ENGINEER.
- S. Haul away and dispose of surplus excavated materials at locations directed by the ENGINEER at no additional cost to the CITY.
- T. During progress of work, conduct earth moving operations and maintain work site so as to minimize the creation and dispersion of dust. Furnish and spread calcium chloride if the ENGINEER decides that it is necessary for more effective dust control.
- U. Provide suitable and safe bridges and other crossings where required for accommodation of travel, and to provide access to private property during construction, and remove said structures thereafter.

### 1.07 SITE CONDITIONS:

- A. Subsurface Conditions: Refer to Front End documents and Geotechnical Report.

## **Part 2 - PRODUCTS**

### 2.01 GENERAL

- A. Use only acceptable materials from excavations or borrows.
- B. Provide 2,000 psi [13.8 MPa] concrete.
- C. Provide Fine Aggregate conforming to ASTM C33.

### 2.02 EQUIPMENT

- A. The compaction equipment shall be selected by the CONTRACTOR, and shall be capable of consistently achieving the specified compaction requirements. The selected compaction equipment shall meet the following minimum requirements:
  1. Manually operated vibratory plate compactors weighing no less than 200 pounds [90 kg] with vibration frequency no less than 1600 cycles per minute.
  2. Vibratory steel drum or rubber tire roller weighing at least 12,000 pounds [5450 kg].

## **Part 3 - EXECUTION**

### 3.01 SITE MAINTENANCE

- A. Roadway and Site Leveling: Grade roadway and site as to maintain them in a level unrutted condition and to eliminate puddling of surface and subsurface water.

### 3.02 EXCAVATION

- A. Execution of any earth excavation shall not commence until the related excavation support systems, and backfill and fill materials submittals are reviewed by the ENGINEER and all ENGINEER's comments satisfactorily addressed.
- B. Carry out program of excavation, and excavation support systems to eliminate possibility of undermining or disturbing foundations of existing structures or of work previously completed under this contract.
- C. Excavate to widths that give suitable room for building structures or laying and jointing piping.

- D. Do not plow, scrape or dig by machinery near to finished subgrade in a manner that would result in disturbance of subgrade.
- E. Excavate to lines and grades indicated in an orderly and continuous program.
- F. Establish limits of excavation to allow adequate working space for installing forms and for safety of personnel.
- G. Excavate to elevations indicated, or deeper, as directed by the ENGINEER, to remove unacceptable material.
- H. Exercise care to preserve material below and beyond the lines of excavations.
- I. Place excavated material at the approved stockpile locations and in no case closer than 3 feet [90 cm] from edge of excavations to prevent cave-ins of bank slides.
- J. Regard small, less than one cubic yard, boulders, rock fragments, and concrete encountered during excavation as a normal part of in-place soils and not included for payment as rock.

### 3.03 SEPARATION OF EXCAVATED MATERIALS FOR REUSE

- A. Remove only existing pavement that is necessary for prosecution of work.
- B. Carefully remove loam and topsoil from excavated areas. Store separately for further use or furnish equivalent loam and topsoil as directed.
- C. Carefully remove acceptable material from excavated areas and store separately for further use as backfill material.

### 3.04 TRENCH EXCAVATION

- A. When pipe is to be laid in gravel bedding or concrete cradle, excavate trench by machinery to, or just below designated subgrade. If material remaining at bottom of trench is disturbed, recompaction shall be required.
- B. When pipe is to be laid directly on bottom of trench, do not excavate lower part of trenches by machinery to subgrade. Remove remainder of material to be excavated just before placing of pipe by use of hand tools. Form a flat or shaped bottom, true to grade, so pipe will have a uniform and continuous bearing. Support on firm and undisturbed material between joints, except for limited areas where use of pipe slings have disturbed bottom.
- C. Depth and width of trench are to conform with OSHA and Florida Trench Safety Act requirements, whichever are more stringent.



### 3.05 TRENCH EXCAVATION IN FILL

- A. Place and compact material to top of fill or to a minimum height of 1 ft. [30 cm] above top of pipe, whichever is less, when pipe is to be laid in embankment or other recently filled material. Take particular care to ensure maximum consolidation of material under pipe location. Excavate pipe trench as though in undisturbed material.

### 3.06 EXCAVATION NEAR EXISTING STRUCTURES

- A. Discontinue digging by machinery when excavation approaches pipes, conduits, or other underground structures. Continue excavation by use of hand tools. Include such manual excavation in work to be done when incidental to normal excavation and under items involving normal excavation.
- B. Excavate test pits when determination of exact location of pipe or other underground structure is necessary for doing work properly.

### 3.07 REMOVAL OF SUBSURFACE OBSTRUCTIONS

- A. Remove indicated subsurface structures and related obstructions to extent shown.
- B. Promptly notify the ENGINEER when any unexpected subsurface facilities are encountered during excavation such as utility lines and appurtenances, walls and foundations.

### 3.08 UNAUTHORIZED EXCAVATION

- A. When the bottom of any excavation for structures is taken out beyond limits indicated or specified, backfill, with screened gravel and crushed stone wrapped with non-woven geotextile fabric or with 1,500 psi (10 Mpa) concrete.

### 3.09 REUSE AND DISPOSAL OF SURPLUS EXCAVATED MATERIALS

- A. Reuse surplus acceptable excavated materials for backfill; deposit neatly and grade so as to make or widen fills, flatten side slopes, or fill depressions; or legally dispose off-site; all as directed or permitted and without additional compensation.

### 3.10 SUBGRADE PREPARATION AND PROTECTION

- A. Remove loam and topsoil, loose vegetable matter, stumps and large roots from areas upon which embankments will be built or material will be placed for grading. Shape subgrade as indicated on drawings, and prepare by forking, furrowing, or plowing so that the first layer of new material placed thereon will be well bonded to it.

- B. As directed by the ENGINEER, over excavate unacceptable materials below the foundation subgrade. Backfill the over excavation with compacted screened gravel or crushed stone wrapped with nonwoven geotextile fabric. In no case shall the screened gravel be placed directly on the exposed subgrade prior to placing the geotextile fabric.
- C. Proof roll the foundation subgrade prior to backfilling and filling operation, or placing foundation concrete.
- D. Proof roll the pipe trench foundation subgrade prior to backfilling and filling operation, or placing soil-supported pipeline.
- E. Utilize excavating equipment equipped with a toothless or smooth edged, excavating bucket to expose the pipe trench foundation subgrade to avoid disturbance of the bearing surface. Tamp the exposed subgrade with the excavating bucket prior to backfilling and filling operation, or placing soil-supported pipeline.

### 3.11 CARE AND RESTORATION OF PROPERTY

- A. Enclose uncut tree trunks adjacent to work in wooden boxes of such height as may be necessary for protection from injury from piled material, equipment, operations, or otherwise due to work. Operate excavating machinery and cranes of suitable type with care to prevent injury to trees not to be cut and particularly to overhanging branches and limbs.
- B. Cut all branches, limbs, and roots smoothly and neatly without splitting or crushing. Neatly trim, cut the injured portions and cover with an application of grafting wax or tree healing paint as directed.
- C. Protect cultivated hedges, shrubs, and plants which might be injured by the CONTRACTOR's operations by suitable means or dig up and temporarily replant and maintain. After construction operations have been substantially completed, replant in original positions and care for until growth is reestablished. If cultivated hedges, shrubs, and plants are injured to such a degree as to effect their growth or diminish in their beauty or usefulness, replace by items of equal kind and quality existing at the start of the work.
- D. Do not use or operate tractors, bulldozers, or other power-operated equipment on paved surfaces when their treads or wheels of which are so shaped as to cut or otherwise damage such surfaces.
- E. Restore surfaces damaged by the CONTRACTOR's operations to a condition at least equal to that in which they were found immediately before work commenced. Use suitable materials and methods for such restoration.

### 3.12 BACKFILLING - GENERAL

- A. Do not place, spread, roll or compact fill material during unfavorable weather conditions. If interrupted by heavy rain or other unfavorable conditions, do not resume until ascertaining that the moisture content and density of the previously placed soil are as specified.
- B. Do not use puddling, ponding or flooding as a means of compaction.

### 3.13 MATERIAL PLACEMENT AND COMPACTION REQUIREMENTS

#### A. Select Borrow, and Fine Aggregate

- 1. Dump and spread in layers not to exceed 8-in. [20 cm] uncompacted thickness.
- 2. Compact, fill and backfill under structure and bedding for pipes (from below pipe to spring line) as indicated but to not less than 95 percent. Compact to not less than 90 percent in other areas unless otherwise indicated.

#### B. Screened Gravel and Crushed Stone

- 1. Dump and spread in layers not to exceed 8-in. [20 cm] uncompacted thickness.
- 2. Compact using self-propelled vibratory steel drum or rubber tire rollers with a minimum of 4 passes in directions perpendicular to one another in open areas. In small areas, use manually operated vibratory plate compactors with a minimum of 4 passes.

#### C. Bank-run Gravel and Acceptable materials for use as non-structural fill

- 1. Dump and spread in layers not to exceed 12-in. [30 cm] uncompacted thickness.
- 2. Compact to not less than 90 percent unless otherwise indicated.

- D. Backfilling and filling operation shall be suspended in areas where tests are being made until tests are completed and the testing laboratory has advised the ENGINEER that adequate densities are obtained.

### 3.14 STRUCTURAL FILL AND BACKFILL UNDER STRUCTURES

- A. Compact fill and backfill under structures and pavements with screened gravel, crushed stone, select borrow, or fine aggregate as specified and indicated.

### 3.15 NON-STRUCTURAL BACKFILL AROUND STRUCTURES

- A. Use acceptable materials for non-structural backfill around structures and compacted as specified and indicated.
- B. Conduct hydraulic testing as soon as practicable after structures are constructed and other necessary work has been done. Start backfilling promptly after completion of tests.
- C. Deposit material evenly around structure to avoid unequal soil pressure.
- D. Do not place backfill against or on structures until they have attained sufficient strength to support the loads (including construction loads) to which they will be subjected, without distortion, cracking, or other damage.

### 3.16 BACKFILLING PIPE TRENCHES

#### A. General

- 1. Begin backfilling and proceed until completed after: the pipes and conduits have been laid, joints have acquired maximum degree of hardness, pipelines and conduits have successfully passed tests and inspections as required in the Specifications, and concrete or masonry structures within the trench have reached their design strength to support all loads.
- 2. Backfill and compact indicated material under, around, and above pipes, conduits, and other structures to the indicated or specified compaction density requirement. Utilize compaction devices which will not damage the pipe, conduit, or structure within the trench.
- 3. Do not drop backfill material into trench from a height of more than 5 ft. [150 cm], or in a manner which will damage the pipe, conduit, or other structure within trench.

#### B. Pipe Trenches

- 1. Materials
  - (a) From below pipe to 1 ft. [30 cm] above top of pipe: Use screened gravel, or crushed stone, unless otherwise indicated.
  - (b) One foot [30 cm] above top of pipe to finished grade or to pavement subbase: Use clean well graded fill or acceptable materials, unless otherwise indicated.
- 2. Compacting Around Pipes: Compact material around circumference of pipe and the area between the trench wall and the pipe by hand tamping in 6 inches [15 cm] layers.

3. Compacting Above Pipe: Compact material by hand tamping. If trench width is wide enough to accommodate power tools and the compacted material over the pipe will support the load of the power tools without damage to the pipe, use rollers or other powered compaction equipment able to more readily achieve compaction requirements.

### 3.17 MATERIAL FOR FILLING AND EMBANKMENTS

- A. Use acceptable materials for filling and building embankments unless otherwise indicated.

### 3.18 PLACING AND COMPACTING EMBANKMENT MATERIAL

- A. Compact fill material as specified and indicated.
- B. Perform fill operation in an orderly and systematic manner using equipment in proper sequence to meet the specified compaction requirements.
- C. Place fill on surfaces which are free of unacceptable materials.
- D. Begin filling in lowest section of work area. Grade surface of fill approximately horizontal but provide with sufficient longitudinal and transverse slope to allow for runoff of surface water from every point.
- E. Conduct filling so that no obstruction to drainage from other sections of fill area is created at any time.
- F. Reduce moisture content of fill material, if necessary, in source area by working it over under warm and dry atmospheric conditions. A large disc harrow with two to three foot diameter disks may be required for working soil in a drying operation.
- G. Compact uniformly throughout. Keep surfaces of fill reasonably smooth and free from humps and hollows which would prevent proper and uniform compaction. Do not permit hauling equipment to follow a single track on the same layer but direct equipment to spread out to prevent overcompaction in localized areas. Take care in obtaining thorough compaction at edges of fill.
- H. Slightly slope surface of fill to ensure drainage during periods of wet weather. Do not place fill while rain is falling or after a rain-storm until the ENGINEER considers conditions satisfactory. During such periods and upon suspension of filling operations for any period in excess of 12 hours, roll smooth the surface of fill using a smooth wheel static roller to prevent excessive absorption of rainfall and surface moisture. Prior to resuming compaction operations, remove muddy material off surface to expose firm, compacted material, as determined by the ENGINEER.

- I. When fill is placed against an earlier fill or against in-situ material under and around structures, including around piping beneath structures or embankments, slope junction between two sections of fill, 1 vertical to 1.5 horizontal. Bench edge of existing fill 24-in. [60 cm] to form a serrated edge of compact stable material against which to place the new fill. Ensure that rolling extends over junction between fills.
- J. When fill is placed directly upon another older fill, clean surface thoroughly of debris and remove any loose material. Then proof roll the entire old surface.
- K. After spreading each loose lift to the required thickness and adjusting its moisture content as necessary, roll with sufficient number of passes to obtain the required compaction. One pass is defined as the required number of successive trips which by means of sufficient overlap will insure complete coverage and uniform compaction of an entire lift. Do not make additional passes until previous pass has been completed.
- L. In case material of any fill sinks and weaves under roller or under hauling units and other equipment, required degree of compaction is not being obtained. Reduce the moisture content. If such sinking and weaving produces surface cracks, suspend operations on that part of the embankment until it becomes sufficiently stabilized. Ideal condition in fill is that attained when the entire fill below the surface being rolled is so firm and hard as to show only the slightest weaving and deflection as roller passes. Spread out rolling operations over the maximum practicable area to minimize condition of sinking and weaving.
- M. If because of defective workmanship, compaction obtained over any area is less than that required, remedy condition at no cost to CITY. If additional rolling or other means fail to produce satisfactory results, remove material in that area down to a level of satisfactory density. Perform removal, replacement, and rerolling without additional compensation

### 3.19 COMPACTION CONTROL OF BACKFILL, FILL, AND EMBANKMENT

- A. Compact to density specified and indicated for various types of material. Control moisture content of material being placed as specified or if not specified, at a level slightly lower than optimum.
- B. The soil testing laboratory shall provide inspection during filling or backfilling operations to ensure compaction of screened gravel or crushed stone and record compaction equipment in use.
- C. Moisture control may be required either at the stockpile area, pits, or on embankment or backfill. Increase moisture content when material is too dry by

sprinkling or other means of wetting uniformly. Reduce moisture content when material is too wet by using ditches, pumps, drainage wells, or other devices and by exposing the greatest possible area to sun and air in conjunction with harrowing, plowing, spreading of material or any other effective methods.

### 3.20 ALLOWANCE FOR SHRINKAGE

- A. Build embankments or backfill to a height above finished grade which will, in the opinion of the ENGINEER, allow for the shrinkage or consolidation of material. Initially, provide at all points, an excess of at least one percent of total height of backfill measured from stripped surface to top of finished surface.
- B. Supply specified materials and build up low places as directed, without additional cost if embankment or backfilling settles so as to be below the indicated level for proposed finished surface at any time before final acceptance of the work.

### 3.21 CONTRACT CLOSEOUT

- A. Provide in accordance with Section 01700.

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## SECTION 02222

### EXCAVATION AND BACKFILL FOR UTILITIES

#### Part 1 - GENERAL

##### 1.01 THE REQUIREMENT

- A. Excavate, grade and backfill as required for underground piping systems and appurtenances as shown on the Drawings and specified herein.
- B. Backfill from off-site sources shall be provided for raw water transmission piping. Well development disposal piping may be backfilled with their respective excavated materials after replacement in the median area.

##### 1.02 RELATED WORK SPECIFIED ELSEWHERE

- A. Section 02500 - Landscaping
- B. Division 3 - Concrete

##### 1.03 REFERENCE SPECIFICATIONS, CODES, AND STANDARDS

- A. Codes: All codes, as referenced herein, are specified in Section 01090, "Applicable Standards and Codes".

##### B. Commercial Standards:

ASTM C33	Standard Specification for Concrete Aggregates
ASTM D 422	Method for Particle-Size Analysis of Soils.
ASTM D 698	Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures, Using 5.5-lb (2.49-kg) Rammer and 12-in (304.8-mm) Drop.
ASTM D 1556	Test Method for Density of Soil in Place by the Sand-Cone Method.
ASTM D 1557	Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using 10-lb (4.54-kg) Rammer and 18-in (457-mm) Drop.
ASTM D 2419	Test Method for Sand Equivalent Value of Soils and Fine Aggregate.
ASTM D 2922	Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).

#### 1.04 SUBMITTALS

- A. General: Submit information and samples to the ENGINEER for review as specified herein in accordance with Section 01300, "Submittals".
- B. Dewatering: The CONTRACTOR shall submit to the ENGINEER its proposed methods of handling trench water and the locations at which the water will be disposed of. Methods shall be acceptable to the ENGINEER before starting the excavation.
- C. Bedding and Backfill Materials: The CONTRACTOR shall notify the ENGINEER of the off-site sources of bedding and backfill materials, and submit to the ENGINEER a representative sample weighing approximately 50 lbs. The sample shall be delivered to a location on site determined by the ENGINEER.
- D. Sheeting System: Drawings of the sheeting system and design computations shall be submitted to the ENGINEER; however, the review of these drawings shall in no way relieve the CONTRACTOR of the responsibility to provide a safe and satisfactory sheeting and shoring system. Sheeting and shoring shall be designed by the CONTRACTOR, and the proposed design shall be sealed by a Professional ENGINEER registered in the State of Florida. If the ENGINEER is of the opinion that at any point sufficient or proper supports have not been provided, it may order additional supports put in at the CONTRACTOR's expense.
- E. Dewatering Permits: If the quantity or nature of water withdrawn requires approval/permits from regulatory agencies, the CONTRACTOR shall procure such permits at its expense and submit copies to the ENGINEER before commencing the work. The CONTRACTOR will not be granted contract time extensions due to dewatering permit processing delays.

#### 1.05 QUALITY CONTROL

- A. An independent testing laboratory will be retained by the CITY to do appropriate testing as described in Section 01400, "Testing and Inspection". The CONTRACTOR shall schedule its work so as to permit a reasonable time for testing before placing succeeding lifts and shall keep the laboratory informed of CONTRACTOR'S progress. A minimum of 48 hours of notice shall be provided to the testing laboratory to mobilize its activities.

#### 1.06 SUBSURFACE INFORMATION

- A. The CONTRACTOR shall be responsible for anticipating groundwater conditions and shall provide positive control measures as required. Such measures shall ensure stability of excavations, groundwater pressure control, prevention of tanks,

pipes, and other structures from being lifted by hydrostatic pressures, and avoiding the disturbance of subgrade bearing materials.

#### 1.07 TRENCH SAFETY ACT COMPLIANCE

- A. The CONTRACTOR by signing and executing the contract is, in writing, assuring that it will perform any trench excavation in accordance with the Florida Trench Safety Act, Section 553.60 et. seq.. The CONTRACTOR has further identified the separate item(s) of cost of compliance with the applicable trench safety standards as well as the method of compliance as noted in the "Proposal Bid Form" Section of the Contract front-end documents.
- B. The CONTRACTOR acknowledges that this cost is included in the applicable items of the Proposal and Contract and in the Grand Total Bid and Contract Price.
- C. The CONTRACTOR is, and the CITY and ENGINEER are not, responsible to review or assess the CONTRACTOR's safety precautions, programs or costs, or the means, methods, techniques or technique adequacy, reasonableness of cost, sequences or procedures of any safety precaution, program or cost, including but not limited to, compliance with any and all requirements of Florida Statute Section 553.60 et. seq. cited as the "Trench Safety Act". The CONTRACTOR is, and the CITY and ENGINEER are not, responsible to determine if any safety or safety related standards apply to the project, including but not limited to, the "Trench Safety Act".

#### 1.08 PROTECTION OF PROPERTY AND STRUCTURES

- A. The CONTRACTOR shall, at its own expense, sustain in place and protect from direct or indirect injury, all pipes, poles, conduits, walls, buildings, and all other structures, utilities, and property in the vicinity of its Work. Such sustaining shall be done by the CONTRACTOR. The CONTRACTOR shall take all risks attending the presence or proximity of pipes, poles, conduits, walls, buildings, and all other structures, utilities, and its Work. It shall be responsible for all damage, and assume all expenses, for direct or indirect injury and damage, caused by its Work, to any such pipe, structures, etc., or to any person or property, by reason of injury to them, whether or not such structures, etc., are shown on the Drawings.
- B. Barriers shall be placed at each end of all excavations and at such places as may be necessary along excavations to warn all pedestrian and vehicular traffic of such excavations. Barricades with flashing lights shall also be placed along excavation from sunset each day to sunrise of the next day until such excavation is entirely refilled, compacted, and paved. All excavations shall be barricaded where required to meet OSHA, local and Federal Code requirements, in such a

manner to prevent persons from falling or walking into any excavation within the site fenced property limits.

#### 1.09 DEWATERING PERMITS

- A. The CONTRACTOR shall be responsible for obtaining all permits required for the dewatering operation.

### **Part 2 - PRODUCTS**

#### 2.01 BEDDING MATERIAL

- A. Bedding materials shall be furnished from acceptable off-site sources. The CONTRACTOR shall submit to the ENGINEER the sources of each material for review in accordance with Section 01300, "Submittals".

- B. Crushed stone (or drainfield limerock) shall be used as bedding material for piping (except for copper pipe) and/or manholes as shown on the Standard Details when the installation is below the ground water table elevation. Crushed stone shall consist of hard, durable, sub-angular particles of proper size and gradation, and shall be free from organic material, wood, trash, sand, loam, clay, excess fines, and other deleterious materials.

1. For pipe diameters less than 24 inches, the stone shall conform to the requirements of ASTM C 33, Size No. 57 (3/4-inch rock) and be graded within the following limits:

<u>Sieve Size</u>	<u>Percent Finer by Weight</u>
1-½ inch	100
1 inch	95 - 100
½ inch	25 - 60
No. 4	0 - 10
No. 8	0 - 5

2. For bedding of 24 inch and larger diameter pipe, the stone shall conform to the requirements of ASTM C 33 and be graded within the following limits:

<u>Sieve Size</u>	<u>Percent Finer by Weight</u>
5/8 inch	100
1/2 inch	40 - 100
3/8 inch	15 - 45
No. 10	0 - 5

- C. Sand shall be used for bedding pipe when installed under dry trench conditions, or above the ground water table. Sand shall also be used for bedding copper pipe

under all conditions. Sand shall be dry, screened, graded sand with 100 percent passing a 3/8-inch sieve and not more than 5 percent passing a No. 200 sieve.

- D. Limerock screenings, sand or other fine material shall not be used for bedding.
- E. All pipe bedding material shall be new, unless otherwise approved by the Engineer. Existing pipe bedding material may not be used.

## 2.02 SELECT BACKFILL

- A. Select Backfill: Select backfill shall be clean sandy material passing through a 3/4-inch sieve as select backfill material.

## 2.03 GENERAL BACKFILL

- A. All other backfill (general backfill) placed above the select backfill shall pass through a 6-inch ring. General backfill shall contain no more than 10 percent organics. General backfill used under roadways shall be compatible with the materials and compaction specified under Section 02510 – Asphaltic Concrete Pavement and 02526 – Concrete Pavement, Curb and Walkway.

# **Part 3 - EXECUTION**

## 3.01 EXCAVATION

- A. The CONTRACTOR shall perform all excavation of every description and of whatever substance encountered, to the dimensions, grades and depths shown on the Drawings, or as required for a proper installation. All excavations shall be made by open cut and in accordance with the Trench Safety Act. All existing utilities such as pipes, poles and structures shall be carefully located, supported and protected from injury; in case of damage, they shall be restored at the CONTRACTOR's expense.
- B. Pipe trenches for piping shall be excavated to a width within the limits of the top of the pipe and the trench bottom so as to provide a clearance on each side of the pipe barrel, measured to the face of the excavation, or sheeting if used, of 8 inches to 18 inches as defined on the Drawings. Where the pipe size exceeds 12 inches, the clearance shall be from 12 inches-to-18 inches. All pipe trenches shall be excavated to a level where suitable material is reached, a minimum of 8 inches below the pipe barrel or that will allow for a minimum of 36 inches of covering unless otherwise indicated on the Drawings.
- C. Ladders or steps shall be provided for and used by workmen to enter and leave trenches.

- D. Excavated unsuitable material shall be removed from the site and disposed of by the CONTRACTOR. Materials removed from the trenches shall be stored and in such a manner that will not interfere unduly with traffic on public roadways and sidewalks and shall not be placed on private property. In congested areas, such materials that cannot be stored adjacent to the trench or used immediately as backfill shall be removed to other convenient places of storage acceptable to the CITY at the CONTRACTOR's expense.
- E. Excavated material that is suitable for use as backfill shall be used in areas where sufficient material is not available from the excavation. Suitable material in excess of backfill requirements shall be disposed off-site at the CONTRACTOR's expense.

### 3.02 SHEETING AND BRACING

- A. The CONTRACTOR shall furnish, place and maintain sheeting and bracing to support sides of the excavation as necessary to provide safe working conditions in accordance with OSHA requirements, and to protect pipes, structures and other Work from possible damage. Where wood sheeting or certain designs of steel sheeting are used, the sheeting shall be cut off at a level of 2 feet above the top of the installed pipe and that portion below the level shall be left in place. If interlocking steel sheeting is used, it may be removed providing removal can be accomplished without disturbing the bedding, pipe or alignment of the pipe. Any damage to the pipe bedding, pipe or alignment of the constructed utility caused by the removal of sheeting shall be cause for rejection of the affected portion of the work. The CITY may permit sheeting to be left in place at the request and expense of the CONTRACTOR, or the CITY may order him in writing to leave in place, for the preventing of damage to structures or property. Payment for sheeting ordered to remain in place shall be paid for at a negotiated price.
- B. If the ENGINEER is of the opinion that at any point sufficient or proper supports, have not be provided, he may order additional supports put in at the CONTRACTOR's expense. The CONTRACTOR shall be responsible for the adequacy of all sheeting used and for all damage resulting from sheeting and bracing failure or from placing, maintaining and removing it.

### 3.03 REMOVAL OF WATER

- A. General: It is a basic requirement of these Specifications unless otherwise authorized per Article 3.09 that excavations shall be free from water before pipe or structures are installed.
- B. The CONTRACTOR shall provide pumps, and other appurtenant equipment necessary to remove and maintain water at such a level as to permit construction

in a dry condition. The CONTRACTOR shall continue dewatering operations until backfilling has progressed to a sufficient depth over the pipe to prevent flotation or movement of the pipe in the trench or so that it is above the water table. If at any point during the dewatering operation it is determined that fine material is being removed from the excavation sidewalls, the dewatering operation shall be stopped. If any of the subgrade or underlying material is disturbed by movement of groundwater, surface water, or any other reason, it shall be replaced at the CONTRACTOR's expense with crushed stone or gravel.

- C. The CONTRACTOR shall use dewatering systems that include automatic starting devices, and standby pumps that will ensure continuous dewatering in the event of an outage of one or more pumps.
- D. Disposal: Water from the trenches and excavation shall be disposed of in such a manner as will not cause injury to public health, to public or private property, to the Work completed or in progress, to the surface of the streets, cause any interference with the use of the same by the public, or cause pollution of any waterway or stream. The CONTRACTOR shall submit CONTRACTOR'S proposed methods of handling trench water and locations at which the water will be disposed of to the ENGINEER for review and shall receive acceptance before starting the excavation. Disposal to any surface water body will require silt screens to prevent any degradation in the water body. The CONTRACTOR shall have responsibility for acquiring all necessary permits for disposal.

#### 3.04 TRENCH STABILIZATION

- A. No claim for extras, or additional payment will be considered for cost incurred in the stabilization of trench bottoms which are rendered soft or unstable as a result of construction methods, such as improper or inadequate sheeting, dewatering or other causes. In no event shall pipe be installed when such conditions exist and the CONTRACTOR shall correct such conditions so as to provide proper bedding or foundations for the proposed installation at no additional cost to the CITY before placing the pipe or structures.

#### 3.05 PIPE BEDDING IN DRY TRENCHES

- A. Pipe trenches shall be excavated as described in Article 3.01. The resulting excavation shall be backfilled with acceptable pipe bedding material, up to the level of the centerline of the proposed pipe barrel. This backfill shall be tamped and compacted to provide a proper bedding for the pipe and shall then be shaped to receive the pipe. Bedding shall be provided under the branch of all fittings to furnish adequate support and bearing under the fitting.

- B. Any over excavation below the levels required for installation of the pipe shall be backfilled with acceptable bedding material, tamped, compacted and shaped to provide proper support for the proposed pipe, at the CONTRACTOR's expense.

### 3.06 BACKFILL

- A. The CONTRACTOR shall not backfill trenches until the piping has been inspected and tested in accordance with Section 15995 - Pipeline Testing and Disinfection.
- B. Pipelines: Pipeline trenches shall be backfilled to a level 12 inches above the top of the pipe with select backfill. When placed in the dry, such material shall be placed in 9-inch layers, each compacted to the densities specified in Article 3.07. Only hand operated mechanical compacting equipment shall be used within six inches of the installed pipe.
- C. After the select backfill has been placed as specified above, and after all excess water has completely drained from the trench, general backfilling of the remainder of the trench may proceed. General backfill shall be placed in horizontal layers, the depth of which shall not exceed the ability of the compaction equipment employed, and in no event shall exceed a depth of 12 inches. Each layer shall be moistened, tamped, puddled, rolled or compacted to the densities specified in Article 3.07.
- D. Manholes and Vaults: Any excavation below the levels required for the proper construction of manholes or vaults shall be filled with Class B concrete. The use of earth, rock, sand or other materials for this purpose will not be permitted.

### 3.07 COMPACTION AND DENSITIES

- A. Compaction of backfill shall be 98 percent of the maximum density where the trench is located under structures or paved areas, and 95 percent of the maximum density elsewhere. Methods of control and testing of backfill construction are:
  - 1. Maximum density of the material in trenches shall be determined by ASTM D 1557.
  - 2. Field density of the backfill material in place shall be determined by ASTM D 1556 or D 2922.
- B. Density Test Locations for Pipelines: The compacted backfill/fill shall be tested for in-place density at the rate of one test location per 200 lineal feet (or fraction thereof) of trench, or as shown on the Drawings or as directed by the ENGINEER. The density tests shall be taken at the trench bottom and at each location in one foot intervals beginning from the top of the piping and ending at the final grade. At existing road or pavement crossings, a minimum of two (2) density tests per crossing per lift is required.



- C. Trench backfill which does not comply with the specified densities, as indicated by such tests, shall be reworked and recompact until the required compaction is secured, at no additional cost to the CITY. The costs for retesting such Work shall be paid for by the CONTRACTOR.

### 3.08 ADDITIONAL EXCAVATION AND BACKFILL

- A. Where organic material, such as roots, muck, or other vegetable matter, or other material which, in the opinion of the ENGINEER, will result in unsatisfactory foundation conditions, is encountered below the level of the proposed pipe bedding material, it shall be removed to a depth of two feet below the outside bottom of the pipe or to a greater depths as directed by the ENGINEER and removed from the site. Sheeting shall be installed if necessary to maintain pipe trenches within the limits identified by the ENGINEER. The resulting excavation shall be backfilled with suitable backfill material, placed in 12-inch layers, tamped and compacted up to the level of the bottom of the proposed pipe bedding material. Sufficient compaction of this material shall be performed to protect the proposed pipe against settlement. Lean concrete may be used in lieu of backfill when pipe installation is in the wet or at the CONTRACTOR's option. Construction shall then proceed in accordance with the provisions of Article 3.05.
- B. Additional excavation (more than two feet below the pipe) shall be performed when ordered by the ENGINEER. Where organic or other material is encountered in the excavation, the CONTRACTOR shall bring the condition to the attention of the ENGINEER and obtain CONTRACTOR'S determination as to whether or not the material will require removal, prior to preparing the pipe bedding. The excavation of material up to a depth of two feet below the outside bottom incidental items of construction and the Work shall be done at no additional cost to the CITY. Where ordered by the ENGINEER, excavation greater than two feet below the pipe, backfill and additional sheeting, will be compensated by the CITY.

### 3.09 ALTERNATE METHOD OF CONSTRUCTION

- A. Use of This Method: A combination of conditions in the substrate, water table, or method of disposal may be encountered during the course of the work which makes dewatering impossible. When such conditions are encountered, but only after all reasonable means (pumps, well points, etc.) to dewater the excavation have been employed without success, the CONTRACTOR, may request to employ the following Alternate Method of Construction. The concurrence of the ENGINEER shall be obtained in writing and shall limit the use of the alternate method of construction to such specific portions of the Work as the ENGINEER shall determine.

- B. The requirements set forth in other sections of these Specifications shall establish the required standards of construction quality for this work. Use of the alternate method of construction described hereinafter shall in no way be construed as relieving the CONTRACTOR of the work. No additional payment will be made to the CONTRACTOR for excavation, backfill, sheeting or any cost incurred for Work or materials, or any other costs incurred as a result of the use of this alternate method of construction. The prices established in the Proposal shall be for full payment for the various items of work.
- C. Subject to all the requirements stated herein, including written acceptance of the ENGINEER, construction will be permitted in accordance with the following specifications. All requirements of these Specifications shall apply to this construction unless otherwise specifically modified herein.
- D. Removal of Water: The installation of pipe and appurtenances under water will be permitted and the requirements of Article 3.03 will be waived.
- E. Excavation shall be performed in accordance with Article 3.01 to the specified limits. The excavation shall be completely cleaned of silt and other fines.
- F. Pipe Bedding: Pipe bedding shall be placed from the bottom of the excavation to six inches above the top of the pipe. The bedding material shall be screened gravel or crushed stone as specified in Article 2.01. Limerock screenings, sand or other fine organic material shall not be used.
- G. The bedding material shall be placed to the lower third of the pipe barrel and then be shaped to receive the pipe at the intended elevation. Bedding shall be provided under the branch of all fittings to furnish adequate support and bearing under the fitting. After the pipe section is installed and tested if required, the remaining bedding shall be placed to the top of the pipe.
- H. Select backfill material shall be used to backfill from 6 inches above the top of the pipe to a level one foot above standing ground water. The lift shall then be compacted per Article 3.07. General backfill shall then be placed in 8-inch lifts and compacted per Article 3.07.
- I. If the Alternate Method of Construction is used, all backfill material, including specified pipe bedding material, shall be carefully lifted into the trench and not released to fall freely therein until the bucket or container is at or just above water level. Under no circumstances shall backfill material be dumped or pushed into the trenches containing water. Below water level, the bedding and backfill material shall be carefully rammed into place in uniform layers, of equal depth on each side of the pipe, up to one foot above the water level. Above the water level,

backfill material shall be placed and compacted for normal backfill as previously specified.

3.10 RESTORATION OF EXISTING SURFACES

- A. Restore all grassed areas disturbed by the trenching operations by resodding in accordance with Section 02500 – Landscaping.

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**SECTION 02260****FINISH GRADING****Part 1 - GENERAL**

## 1.01 WORK INCLUDED

- A. The CONTRACTOR shall, under this Section, supply, place, compact and roll finish grade materials prior to landscaping work.
- B. Finish grade sub-soil.
- C. Cut out areas to receive stabilizing base course materials for paving and sidewalks.
- D. Place, finish grade and compact topsoil.

## 1.02 RELATED WORK

- A. Section 02210 - Earth Excavation, Backfill, Fill and Grading
- B. Section 02222 - Excavation and Backfill for Utilities
- C. Section 02930 - Sodding

## 1.03 PROTECTION

- A. The CONTRACTOR shall prevent damage to existing fencing, trees, landscaping, natural features, bench marks, pavement, utility lines, and sprinkler system. Correct damage at no cost to the CITY.

**Part 2 - PRODUCTS**

## 2.01 MATERIALS

- A. Topsoil shall be friable loam free from subsoil, roots, grass, excessive amount of weeds, stones and foreign matter; acidity range (pH) of 5.5 to 7.5; containing a minimum of 4% and a maximum of 25% organic matter.

## 2.02 CRUSHED STONE

- A. Crushed stone for general grading purposes shall be hard, durable, subangular particles of proper size and gradation, and shall be free from organic materials, wood, trash, sand, loam, chalk, excess fines and other deleterious materials. Maximum aggregate size shall be  $\frac{3}{4}$  inches.

**Part 3 - EXECUTION****3.01 SUBSOIL PREPARATION**

- A. Rough grade subsoil systematically to allow for a maximum amount of natural settlement and compaction. Eliminate uneven areas and low spots. Remove debris, roots, branches, stones, etc., in excess of 2 inches in size. Remove sub-soil which has been contaminated with petroleum products.
- B. Cut out areas, to subgrade elevation, which are to receive stabilizing base for paving and sidewalks.
- C. Bring subsoil to required levels, profiles and contours. Make changes in grade gradual. Blend slopes in to level areas.
- D. Slope grade away from building minimum 4 inches in 10 feet (unless indicated otherwise on Drawings).

**3.02 PLACING TOPSOIL**

- A. Place topsoil in area where seeding, sodding and planting is to be performed. Place to the following minimum depths, up to finished grade elevations:
  - 1. 6-inches for seeded areas.
  - 2. 4 1/2-inches for sodded areas.
  - 3. 24-inches for shrub beds.
  - 4. 18-inches for flower beds.
- B. Use topsoil in relatively dry state. Place during dry weather.
- C. Fine grade topsoil eliminating rough and low areas to ensure positive drainage. Maintain levels, profiles and contours of subgrade.
- D. Remove stones, roots, grass, weeds, debris and other foreign material while spreading.
- E. Manually spread topsoil around trees, plants, buildings and other structures to prevent damage which may be caused by grading equipment.
- F. Lightly compact placed topsoil.

**3.03 SURPLUS MATERIAL**

- A. Remove surplus sub-soil and topsoil from site.

- B. Leave stockpile areas and entire job site clean and raked, ready to receive landscaping and or sodding.

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**SECTION 02332****LIMEROCK BASE****Part 1 - GENERAL**

## 1.01 WORK INCLUDED

- A. Furnish all labor, materials, equipment and incidentals required to provide limerock base in accordance with the grades and typical sections shown on the Drawings and as specified herein.

## 1.02 RELATED WORK:

- A. Section 02100 – Clearing and Grubbing.
- B. Section 02260 – Finish Grading
- C. Section 02510 – Asphaltic Concrete Pavement.

**Part 2 - PRODUCTS**

## 2.01 MATERIALS

- A. Source: The material used in limerock base courses shall be material classified as either Miami Oolite Formation or Ocala Formation at the CONTRACTOR'S option; however, only one formation may be used.
- B. Limerock material shall contain not less than 70 percent of carbonates of calcium and magnesium. The maximum percentage of water sensitive clay material shall be 3.
- C. Graduation: At least 97 percent (by weight) of the material shall pass a 3-1/2-inch sieve and the material shall be grades uniformly down to dust. The fine material shall consist entirely of dust of fracture. All crushing or breaking up which might be necessary in order to meet such size requirements shall be done before the material is placed on the road.
- D. Quality:
  - 1. The limerock material shall be uniform in quality and shall not contain cherty or other extremely hard pieces or lumps, balls or pockets of sand or clay size material in sufficient quantity as to be detrimental to prevent proper bonding, finishing or strength of limerock base. Limerock material shall be non-plastic, and the liquid amount shall not exceed 35.

2. Compacted limerock material shall have an average LBR value of not less than 100.

### **Part 3 - EXECUTION**

#### 3.01 PREPARATION

- A. For new limerock base construction, or areas where pavement is to be replaced, CONTRACTOR shall remove existing subgrade as required to provide the minimum thickness of new limerock base course as indicated on plans.
- B. Compact subgrade to a density of no less than 98% of maximum density as determined by AASHTO T-180.
- C. No separate bid item is provided in the proposal for evacuating, grading and compacting subgrade. The cost thereof shall be included in the BID schedule items.

#### 3.02 PERFORMANCE

- A. Transporting Limerock: The limerock shall be transported to the point where it is to be used, over rock previously placed if practicable, and dumped on the end of the preceding spread. No hauling over the subgrade or dumping on the subgrade shall be done.
- B. Spreading Limerock:
  1. The limerock shall be spread uniformly, and all segregated areas of fine or coarse rock shall be removed and replaced with well-graded rock.
  2. When the specified compacted thickness of the base is greater than 6-inches, the base shall be constructed in two courses. The thickness of the first course shall be approximately one-half the total thickness of the finished base, or enough additional to bear the weight of the construction equipment without disturbing the subgrade.
- C. Establish grades and cross-sections conforming to plans
  1. Provide a minimum of 8" inches of limerock as required to provide grades, elevations and cross sections or as indicated on plans.
  2. The CONTRACTOR must determine for himself the volume of material required for the site.
- D. Compacting and Finishing Base:
  1. Work shall comply with Sections 200 of the FDOT Standard Specifications for Road and Bridge Construction.

2. Proposed limerock base shall be compacted to a minimum of ninety-eight percent (98%) of maximum density as determined by ASHTO T-180. Properly compact areas adjacent to curbs, catch basins, manholes and other areas not accessible to rollers with mechanical or hand tamping devices.
3. Correction of Defects:
  - (a) If at any time the subgrade material should become mixed with the base course material, the CONTRACTOR shall dig out and remove the mixture, which shall be shaped and compacted as specified above.
  - (b) If cracks or checks appear in the base, either before or after priming, which in the opinion of the ENGINEER would impair the structural efficiency of the base course or checks by rescarifying, reshaping, adding base material where necessary and recompacting.
4. The CITY shall pay for all passing density tests. All tests which fail to meet minimum compaction requirements shall be paid by the CONTRACTOR.

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**SECTION 02500****LANDSCAPING****Part 1 - GENERAL**

## 1.01 THE REQUIREMENT

- A. Items specified in this Section include the installation of new landscaping, or repairs to existing landscaped and grassed areas that may be damaged or disturbed by CONTRACTOR activities.

## 1.02 RELATED WORK SPECIFIED ELSEWHERE

- A. Section 02510 - Asphaltic Concrete Pavement
- B. Section 02210 - Earth Excavation, Backfill, Fill and Grading

## 1.03 SUBMITTALS

- A. The CONTRACTOR shall submit submittals for review in accordance with the Section 01300 - Submittals.

## 1.04 DEFINITIONS

- A. The phrase "DOT Specifications" shall refer to the Florida Department of Transportation Standard Specifications for Road and Bridge Construction. The DOT Specifications are referred to herein and are hereby made a part of this Contract to the extent of such references, and shall be as binding upon the Contract as though reproduced herein in their entirety.

## 1.05 PROTECTION OF EXISTING IMPROVEMENTS

- A. The CONTRACTOR shall be responsible for the protection of all pavements and other improvements within the work area. All damage to such improvements, as a result of the CONTRACTOR'S operations, beyond the limits of the work of pavement replacement shall be repaired by the CONTRACTOR at CONTRACTOR'S expense.

## 1.06 GUARANTEE

- A. The CONTRACTOR shall guarantee all trees, ground cover or shrubs planted or replanted under this Contract for a period of one year beyond closeout of the project. In the event that any new tree, plant or shrub dies within the guarantee period, the CONTRACTOR shall be responsible for replacement in kind. In the event that a transplanted (reused) tree dies within the guarantee period, the CONTRACTOR shall be responsible for replacement in kind, except that the

maximum height of any new tree shall be eight feet as measured from the ground surface, once planted, to the top of the tree.

## **Part 2 - PRODUCTS**

### 2.01 REPLACEMENT TREES, GROUND COVER AND SHRUBS

- A. Replacement trees, ground cover and shrubs shall be of the same type and size and sound, healthy and vigorous, well branched and densely foliated when in leaf. They shall have healthy, well developed root systems and shall be free of disease and insect pests, eggs or larvae.

### 2.02 MULCH

- A. Mulch shall be windproof shredded eucalyptus, mulch shall be clean, fresh, free of branches and other foreign matter. Mulch shall be used around all shrubs, ground covers and tree trunks, and placed to a minimum depth of 2 inches extending from the tree trunk outward two feet.

### 2.03 GRAVEL BEDS

- A. Filter Fabric: Filter fabric shall be nonwoven polyester material Trevia Type 1120 as manufactured by Hoechst Fibers Industries, or equal. Fabric weight shall be 6 ounces per square yard, puncture strength maximum 40 pounds, minimum Flux 240 gallons per minute per square foot. Fabric shall be installed in accordance with the manufacturer's recommendations, with precautions taken to avoid tearing the fabric. Fabric shall be laid in strips with a minimum overlap of one foot.
- B. Limerock: Limerock shall meet ASTM A57 standards and shall be prewashed. Maximum size shall be 3/4 inches. Limerock shall be carefully placed and spread on the fabric to a minimum depth of 6 inches. Final grades and locations shall be as designated on the Drawings.

## **Part 3 - EXECUTION**

### 3.01 GRADING AND SODDING

- A. The CONTRACTOR shall regrade the work areas disturbed by CONTRACTOR'S construction activities to the existing grade prior to commencement of construction.
- B. Sod shall be placed on all grassed areas disturbed by construction activities, unless otherwise indicated on the Drawings. Sodding shall be in accordance with Sections 575 and 981 of the DOT Specifications.

- C. Maintenance: Sufficient watering shall be done by the CONTRACTOR to maintain adequate moisture for optimum development of the sodded areas. Sodded areas shall receive no less than 1.5 inches of water per week.
- D. Repairs to Lawn Areas Disturbed by CONTRACTOR's Operations: Lawn areas damaged by CONTRACTOR's operations shall be repaired at once by proper sod bed preparation, fertilization and re-sodding, in accordance with these specifications. Regardless of the condition of the lawn area (weed content etc.) prior to the CONTRACTOR working in the area, all repairs shall be made with sod.

### 3.02 TREES, GROUND COVER AND SHRUBS

- A. Excavation and Plant Holes: Plant hole excavations shall be roughly cylindrical in shape, with the side approximately vertical. Plants shall be centered in the hole. Bottoms of the holes shall be loosened at least six inches deeper than the required depth of excavation.
- B. Holes for balled and burlaped plants shall be large enough to allow at least eight inches of backfill around the earth ball. For root balls over 18 inches in diameter, this dimension shall be increased to 12 inches. Where excess material has been excavated from the plant hole, the excavated material shall be disposed of as and where directed by the ENGINEER.
- C. Setting of Plants: The CONTRACTOR, when setting plants in holes, shall make sure that when lowered into the hole, the plant shall rest on a prepared hole bottom such that the roots are level with, or slightly above, the level of their previous growth and so oriented such as to present the best appearance.
- D. Palms of the Sabal species may be set deeper than the depth of their original growth, provided that the specified clear trunk height is attained.
- E. The backfill shall be made with planting mixture and shall be firmly rodded and watered-in, so that no air pockets remain. The quantity of water applied immediately upon planting shall be sufficient to thoroughly moisten all of the backfilled earth. Plants shall be kept in a moistened condition for the duration of the Contract.
- F. Staking and Guying: Plants shall be staked in accordance with the following provisions:
  - 1. Small Trees: For trees and shrubs of less than one-inch caliper, the size of stakes and the method of tying shall be such as to rigidly support the staked plant against damage caused by wind action or other effects.

Trees larger than one inch and smaller than one and one-half inch caliper shall be staked with a two-inch stake, set at least 24 inches in the ground and extending to the crown of the plant. The plant shall be firmly fastened to the stake with two strands of 14 gauge soft wire, enclosed in rubber hose, or other approved covering. The wire shall then be nailed or stapled to the stake to prevent slippage.

2. Medium Trees: All trees, other than palm trees, larger than one and one-half inch caliper and smaller than two and one-half inch caliper shall be staked with two or more, two-inch by two-inch stakes, eight feet long, set two feet in the ground. The tree shall be midway between the stakes and held firmly in place by two strands of 12-gauge wire, applied as specified above for single stakes. The wires shall be tightened and kept tight by twisting.
  3. Large Trees: All trees, other than palm trees, larger than two and one-half inch caliper, shall be braced with three or more two-inch by four-inch wood braces, toenailed to cleats which are securely banded at two pints to the palm, at a point at least six feet above the ground. The trunk shall be padded with five layers of burlap under the cleats. Braces shall be approximately equidistantly spaced and secured underground with two-inch by four-inch by 24-inch stake pads. In firm rock soils, Number 4 steel reinforcing rods or one-half inch pipe is acceptable.
  4. Palm Trees: Palm trees shall be braced with three or more two-inch by four-inch wood braces, toenailed to cleats which are securely banded at two points to the palm, at a point at least six feet above the ground. The trunk shall be padded with five layers of burlap under the cleats. Braces shall be approximately equidistantly spaced and secured underground with two-inch by four-inch by 24-inch stake pads. In firm rock soils, Number 4 steel reinforcing rods or one-half inch pipe is acceptable.
- G. Pruning: All broken or damaged roots shall be cut off smoothly, and the tops of all trees shall be pruned in a manner complying with standard horticultural practice. At the time pruning is completed, all remaining wood shall be alive. All cut surfaces of one inch or more in diameter, above the ground, shall be treated with approved commercial tree paint.
- H. Maintenance: Maintenance shall begin immediately after each plant is planted and shall continue until all work under this Contract has been completed and accepted by the CITY. Plants shall be watered, mulched, weeded, pruned, sprayed, fertilized, cultivated and otherwise maintained and protected. Settled plants shall be reset to proper grade position, planting saucer restored and dead material removed. Guys shall be tightened and repaired.
- I. Defective work shall be corrected as soon as possible after it becomes apparent. Upon completion of planting, the CONTRACTOR shall remove excess soil and



debris, and repair any damage to structures, etc., resulting from planting operations.

### 3.03 GRAVEL BEDS

- A. Clean, grade and place geotextile prior to placing gravel in gravel beds.

- END OF SECTION -

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**SECTION 02507****PRIME AND TACK COATS****Part 1 - GENERAL**

## 1.01 WORK INCLUDED

- A. The work specified in this section consists of an application of bituminous material on previously prepared base in accordance with these specifications and in conformity with the line, grades, dimensions and notes shown on the Drawings.
- B. Tack coat will be required prior to overlaying existing pavement.

## 1.02 RELATED WORK

- A. Section 02510 - Asphaltic Concrete Pavement

**Part 2 - PRODUCTS**

## 2.01 MATERIALS

- A. Prime Coat: Unless otherwise indicated, the material used for the prime coat shall be cut back asphalt, Grade RC-70 or RC-250 and shall conform with the requirements specified in AASHTO Designated M 81-75 (1982). Unless otherwise indicated, the use of either RC-70 or RC-250 shall be at the CONTRACTOR'S option.
- B. Tack Coat: The material used for the tack coat shall be emulsified asphalt, Grade RS-2 and shall conform with the requirements specified in AASHTO Designation M 140-82.

## 2.02 EQUIPMENT

- A. The pressure distributor used for placing the tack or prime coat shall be equipped with pneumatic tires having sufficient width of rubber in contact with the road surface to avoid breaking the bond of or forming a rut in the surface. The distance between the centers of openings of the outside nozzles of the spray bar shall be equal to width of the application required, within an allowable variation of 2-inches. The outside nozzle at each end of the spray bar shall have an area of opening of not less than 25 percent, nor more than 75 percent in excess of other nozzles which shall have uniform openings.  
When the application covers less than the full width, the normal opening of the end nozzle at the junction line may remain the same as those of the interior nozzle.

### **Part 3 - EXECUTION**

#### 3.01 PREPARATION

- A. Before applying any bituminous material, all loose material, dust, dirt, and foreign material, which might prevent proper bond with the existing surface, shall be removed. Particular care shall be taken to clean the outer edges of the strip to be treated in order to insure that the prime or tack coat will adhere.
- B. When the prime or tack coat is applied adjacent to curb and gutter, or another concrete surface (except where they are to be covered with a bituminous wearing coarse) such concrete surfaces shall be protected by heavy paper or other protective material while the primer or tack coat is being applied. Any bituminous material deposited on such concrete surfaces shall be removed immediately.

#### 3.02 WEATHER LIMITATIONS

- A. No bituminous material shall be applied when the air temperature is less than 50 degrees Fahrenheit in the shade, or when the weather conditions or the condition of the existing surface is unsuitable. In no case shall bituminous material be applied while rain is falling or when there is water on the surface to be covered.

#### 3.03 APPLICATION OF PRIME COAT

- A. After the base has been finished the full width of surface shall be swept with a power broom supplemented with hand brooms and mechanical blowers prior to the application of prime coat. Care shall be taken to remove all loose dust, dirt and objectionable matter. If deemed necessary, the base shall be lightly sprinkled with water immediately in advance of the prime coat. The prime coat shall be applied to the full width of the base.
- B. The temperature of the prime material shall be such as to insure uniform distribution. The material shall be applied with a pressure distributor as specified above. The amount to be applied shall be sufficient to coat the surface thoroughly and uniformly without any excess to form pools or to flow off the base. For limerock base, the rate of application shall not be less than 0.10 gallons per square yard; for shell base, the rate of application shall not less than 0.15 gallons per square yard.
- C. If the roadway is to be opened for use following the application of the prime material, a light uniform application of clean sand shall be applied and rolled. The sand shall be nonplastic, shall be free from slit and rock particles and shall not contain any sticks, vegetation, grass roots, or organic matter. After the sand covering has been applied, the surface may be opened to traffic.

### 3.04 APPLICATION OF TACK COAT

- A. In general, a tack coat will not be used on primed bases except in areas which have become excessively dirty and cannot be cleaned or where the prime has cured and lost all of its bonding effect.
- B. No tack coat shall be applied until the primed base or leveling course has been cleaned and is free from sand, dust or other objectionable material.
- C. The tack coat shall be applied with a pressure distributor as specified above. It shall be heated to a suitable consistency and applied in a thin uniform layer at the rate of between .02 gallons and .08 gallons per square yard.
- D. The tack coat shall be applied sufficiently in advance of the laying of the wearing surface to permit drying, but shall not be applied so far in advance or over such an area as to lose its adhesiveness as a result of being covered with dust or other foreign material. Suitable precautions shall be taken by the CONTRACTOR to protect the surface while the tack coat is drying and until the wearing surface is applied.

- END OF SECTION -

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**SECTION 02510****ASPHALTIC CONCRETE PAVEMENT****Part 1 - GENERAL**

## 1.01 WORK INCLUDED

A. The work specified in this section consists of the construction of asphaltic concrete surface course composed of a mixture of aggregates, mineral filler and asphalt cement properly laid upon a prepared base or a newly constructed and compacted, primed and tacked roadway base course, in accordance with these specifications and in conformity with the lines, grades, thickness and typical cross-section shown on the Drawings. The existing pavement and asphalt in all alleys receiving new water mains shall be removed and disposed of properly off-site by the CONTRACTOR. New sub base material and asphalt pavement shall be installed for these alleys for the full width and length of the impacted alleys. For all roadways (streets and avenues) other than alleys, receiving new water mains, the full lane width in which the water main is installed shall be milled and resurfaced to match the previously existing width and grades. The CONTRACTOR shall furnish asphaltic concrete surface course in the locations and to the extent indicated on the Drawings. Minimum required thickness shall be as listed below.

1. For new asphalt roadway pavement construction or reconstruction, provide asphaltic concrete structural surface course consisting of one of the following:
  - (a) "Superpave Asphalt Concrete" per Section 334 of FDOT Standard Specifications for Road and Bridge Construction
  - (b) Type S-III asphaltic concrete surface course
  - (c) Or as otherwise required by the roadway jurisdiction and/or as indicated on the plans.

Thickness of the asphalt course shall be one and a half (1.5") inch thick minimum, or as specified on the Drawings.

## 1.02 QUALITY ASSURANCE

A. Construction of asphaltic concrete surface courses shall be in accordance with the Standard Specifications for Road and Bridge Construction (current edition), of the Florida Department of Transportation, and supplements thereto, hereinafter referred to as FDOT Specifications, except as amended herein. The FDOT Specifications are hereby made a part of this contract to the extent they are applicable thereto and shall be as binding upon the CONTRACTOR as though reproduced herein.

## 1.03 RELATED SECTIONS

- A. Section 02332 - Limerock Base.
- B. Section 02507 - Prime and Tack Coats.

**Part 2 - PRODUCTS**

## 2.01 MATERIALS

- A. Bituminous Material: Asphalt cement, Viscosity Gard AC-20 or AC-30, shall conform to the requirements of FDOT Specifications, Section 916-1.
- B. Coarse Material: Coarse aggregate, stone or slag shall conform to the requirements of FDOT Specifications, Section 901.
- C. Fine Aggregate Material: Fine aggregate shall conform to the requirements of FDOT Specifications Section 902.
- D. Mineral Filler: Mineral filler shall conform to the requirements of FDOT Specifications, Sections 917-1 and 917-2.

## 2.02 GENERAL COMPOSITIONS OF MIXTURE:

- A. The bituminous mixture shall be composed of a combination of aggregate (coarse, fine, or mixture thereof), mineral filler, if required, and bituminous material. The several aggregate fractions shall be sized, uniformly graded and combined in such proportion that the resulting mixture will meet the grading and physical properties of the approved job mix formula.
- B. In all cases, the job mix formula shall be within the design ranges specified in the following table.

Gradation Design Range

<u>Sieve Size</u>	<u>% by Weight Passing</u> <u>Type S-III</u>
¾-inch	
½-inch	100
3/8-inch	88-100
No. 4	60-90
No. 10	40-70
No. 40	20-45
No. 80	10-30
No. 200	2-6



### 2.03 JOB MIX FORMULA

- A. No work shall be started on the specific project until the ENGINEER has approved the job mix formula.
- B. The job mix formula shall conform to the requirements of FDOT Specifications, Section 334. In addition, the job mix formula shall include test data showing that the material as produced meets the requirements of the following table:

Mix Type	Minimum Marshall Stability (%)	Flow (0.01 in)	Minimum VMA (%)	Air Voids (%)	Min Effective Asphalt Content (%)
SP-9.5	1,500	8 – 14	15	3 – 7	5.5

## **Part 3 - EXECUTION**

### 3.01 TRANSPORTATION

- A. The mixture shall be transported in tight vehicles previously cleaned of all foreign material and, if necessary, each load shall be covered with a waterproof canvas cover of sufficient dimensions to protect it from weather conditions. The inside surface of the truck bodies may be thinly coated with soapy water, or a mixture of water with not more than five percent of lubricating oil, but no excess of either shall be used. After the truck bodies are coated and before any mixture is placed therein, they shall be raised so that all excess water will drain out. Kerosene, gasoline or similar products shall not be used to prevent adhesion.

### 3.02 LIMITATION FOR SPREADING

- A. The mixture shall be spread only when the surface is properly prepared and is intact, firm, cured and dry. No mixture shall be spread when the air temperature is less than 40 degree Fahrenheit, nor when the spreading cannot be finished and compacted during the daylight hours. The temperature of the mix at the time of spreading shall not be less than 230 degree Fahrenheit.

### 3.03 PLACING

- A. The mixture shall be placed in accordance with the requirements of FDOT Specifications, Section 330-9. The new asphalt pavement shall be placed in two lifts. The second lift shall match the elevation of the adjacent pavement.

### 3.04 COMPACTING

- A. The mixture shall be compacted in accordance with the requirements of FDOT Specifications 330-10.

### 3.05 JOINTS

- A. Joints shall conform with the requirements of FDOT Specifications, Section 330-11.

### 3.06 FIELD QUALITY CONTROL

- A. Surface Requirements: Depressions which may develop after initial rolling shall be remedied by loosening or removing the mixture and adding new material to bring the areas to a true surface. No skin patching shall be done. Such portions of the completed pavement which are defective in surface compaction or in composition, or that do not comply with all other requirements of these specifications, shall be taken up and replaced with suitable mixture, properly laid in accordance with these specifications and at the expense of the CONTRACTOR.
- B. Thickness Requirements: The thickness of the compacted asphaltic concrete surface course shall be no less than that shown on the Drawings as determined by coring. Thickness testing and correction of defective work shall be as specified in FDOT Specifications, Section 330-14 and 330-15.
- C. "As-Built" limerock elevations shall be signed and sealed by a registered land surveyor and submitted to the Project Engineer for approval prior to placement of asphalt. Elevation shall be taken at high and low points, midpoint, intersections and breaks in grade at intervals not to exceed 50 feet. No separate pay item is included in bid form for this work. Include limerock as-built cost in asphalt section.
- D. Protection of Pavement: After the completion of the pavement, no vehicular traffic of any kind shall be permitted on the pavement until it has set sufficiently to prevent rutting or other distortion.

- END OF SECTION -

**SECTION 02515****WATER SERVICE CONNECTIONS AND TRANSFERS****Part 1 - GENERAL**

## 1.01 RELATED DOCUMENTS

- A. All applicable provisions of the Contract Requirements shall govern the work under this Section.

## 1.02 WORK INCLUDED

- A. This section covers the work necessary for installing water service connections, water service line tubing, casing pipe, making connections to the new water main, testing and flushing, and all incidental work necessary to accomplish the construction.
- B. The work includes trench excavation, backfill and compaction, furnishing and installing service clamps, corporation stops or valves, service connection tubing, fittings, and appurtenances within the designated limits, testing, flushing, and other incidental work as required for a complete installation. Included is the installation, of one-inch (1") diameter polyethylene tubing connections to the existing water meters within the limits shown on the Drawings.
- C. The approximate location of service connections to be installed or transferred will be suggested by the CONTRACTOR and approved by the CITY.
- D. All new domestic services shall be polyethylene tubing per the CITY Standard Details.
- E. Contractor shall coordinate all work with the CITY.

## 1.03 RELATED WORK

- A. Division 2 as applicable
- B. Section 02000 - Water Distribution System.
- C. Section 02222 - Excavation and Backfill for Utilities
- D. Section 15000 - Piping General
- E. Section 15001 - Water Services and Miscellaneous Fittings
- F. Section 15100 - Valves, General

**Part 2 - PRODUCTS**

## 2.01 EXCAVATION

- A. Excavation shall conform to the requirements of Section 02222 - Excavation and Backfill for Utilities.

## 2.02 BACKFILL

- A. Acceptable material excavated from the trench shall be used for trench backfill. Select backfill material for use in the pipe zone,
- B. shall contain no material larger than one (1) inch in diameter.

## 2.03 MISCELLANEOUS FITTINGS

- A. Refer to Section 15001 – Water Services and Miscellaneous Fittings

## 2.04 SERVICE CONNECTION SIZE

- A. The location of the water service connection to be installed on the new water main will be as determined in the field by CONTRACTOR. The water meter and meter box are existing and the CONTRACTOR shall be responsible, at the coordinated time, to disconnect the existing water service line from the street-side of the existing water meter in a rapid fashion, so the resident is only without water service for a short duration, This water service line switchover activity can only be commenced after receipt of the approved clearance authorization from the Broward County Health Department. Tap size on the new water main for the water service lines shall be one-inch (1") diameter.

**Part 3 - EXECUTION**

## 3.01 TRENCH EXCAVATION AND BACKFILL

- A. Conform to the requirements of Section 02222 - Excavation and Backfill for Utilities. Place only select backfill material in the trench within six (6) inches of the service connection pipe or line. Cover around pipe shall be eight (8) inches or as indicated on the plans. Backfill and compact remainder of trench with excavated material as specified in the referenced section.

## 3.02 CONNECTION OF NEW WATER SERVICE TO NEW WATER MAIN

- A. Clean exterior of main of dirt or other foreign matter that may impair the quality of the completed connection. Then place service clamp at the desired location and clamp tight by tightening alternate nuts progressively. Do not place service clamp within one (1) foot of a pipe joint or other clamp.

- B. Taps shall be made in the pipe by experienced workmen using tools in good repair with the proper adapters for the size main being tapped.

### 3.03 PREPARATION OF TRENCH

- A. Grade the bottom of the trench by hand to the line and grade to which the pipe is to be laid, with proper allowance for special bedding. All other conditions and operations as specified in Section 02222, Excavation and Backfill for Utilities must be adhered to. The trench bottom shall form a continuous and uniform bearing support for the pipe. A six (6) inch layer of imported earth or other specified material will be required over and under pipe in areas where suitable trench side material is not available.

### 3.04 POLYETHYLENE PLASTIC TUBING

- A. Refer to Section 15001 – Water Services and Miscellaneous Fittings

### 3.05 CONNECTION OF EXISTING WATER METERS

The work involves the installation of new water services lines and connection to the existing water meters. In addition, the work involves removal of the existing water service line from the street side of the existing water meters and capping the existing water service line that is being taken out of service.

- A. There shall be no water service interruptions without prior notice to the property owner/occupant, and without the authorization of the CITY.
- B. Existing water service lines shall not be disconnected from existing water mains until the new replacement water mains have been completely installed, successfully tested, accepted by the CITY, and released for service/use by the Broward County Health Department.
- C. Existing water mains serving active potable water service lines, irrigation systems, fire sprinkler services, fire hydrants, etc., shall remain in service until all existing services and fire hydrants have been successfully reconnected to the new replacement water mains.

### 3.06 HYDROSTATIC TEST AND LEAKAGE

- A. Test water service connections and service line tubing by either testing in conjunction with the new water main at the test pressure required for the water main, or by testing at the normal hydrostatic main pressure after the main has been completely installed and tested. Inspect visually for leaks and repair any leaks before backfilling. Sufficient sampling points shall be taken from water service line connections to ensure uniform results throughout the water

distribution system being tested. Duration of the test shall be at least fifteen (15) minutes.

### 3.07 DISINFECTION

A. Water Service lines shall be disinfected as follows:

1. Make connection to the new water main pipeline, which shall have been previously hydrostatically tested and disinfected.
2. Prior to connecting polyethylene tubing to meter stop, flush new tubing by fully opening corporation stop and allowing water to run for 2 minutes.
3. Close corporation stop and meter stop; connect new polyethylene tubing to existing meter stop. Open corporation stop and allow to stand for a minimum of 30 minutes retention period, and then open meter stop.

B. The CITY may put extra chlorine in the water system during the time of service connection transfers to provide sufficient chlorine residual to adequately disinfect water service line connections when the above procedure is followed.

- END OF SECTION -

**SECTION 02526****CONCRETE PAVEMENT, CURB AND WALKWAY****Part 1 - GENERAL**

## 1.01 THE REQUIREMENT

- A. Concrete pavement, curbs and sidewalk shall be constructed to the lines and grades and dimensions required for a complete installation as shown on the Drawings and specified herein.

## 1.02 SUBMITTALS

- A. Shop drawings for reinforcing, joint material and mix designs shall be submitted for review in accordance with Section - 01300 - Submittals.

**Part 2 - PRODUCTS**

## 2.01 CONCRETE

- A. Concrete shall be Class B, conforming to Section 03300 – Cast-in-place Concrete, Reinforcing and Formwork”, unless noted or specified otherwise.

## 2.02 REINFORCING AND WELDED WIRE FABRIC

- A. Joint reinforcing and welded wire fabric shall conform to Section 03300 – Cast-in-place Concrete, Reinforcing and Formwork”

## 2.03 JOINT SEALER FOR PAVEMENT

- A. Joint sealer shall be a one or two part polysulfide base self leveling sealant for horizontal surfaces that has been developed for foot and vehicular traffic. The sealant shall conform to the requirements of Section 07920 - Sealants and Caulking.

## 2.04 PREFORMED JOINT FILLER

- A. Preformed joint filler shall be sponge rubber and conform to the requirements of AASHTO Designated M148, Type 1.

**Part 3 - EXECUTION**

## 3.01 SUBGRADE CONDITION

- A. The finished subgrade shall be maintained in a smooth, compact condition and any areas which are disturbed prior to placing of the concrete shall be restored at

the CONTRACTOR'S expense. The subgrade shall be moist at the time the concrete is placed. Water shall be uniformly applied ahead of the paving operations as directed by the ENGINEER. If the CONTRACTOR does not maintain the subgrade in the required moist condition, a vapor barrier sheet will be required between the subgrade and the concrete.

- B. The subgrade shall be accurately trimmed to the required elevation with a 1/4-inch tolerance. High areas shall be trimmed to proper elevation. Low areas may be filled with suitable material and compacted to the specified density or filled with concrete integrally with the placing of the pavement.

### 3.02 SETTING FORMS

- A. The forms shall be accurately set to line and grade and such that they rest firmly, throughout their entire length, upon the compacted subgrade surface. Forms shall be joined neatly and tightly and braces to test the pressure of the concrete and the finishing operations. The alignment and grade of all forms shall be approved before and immediately prior to the placing of concrete.

### 3.03 MIXING CONCRETE

- A. Concrete shall be mixed in accordance with Section 03300, "Cast-in-place Concrete, Reinforcing and Formwork".

### 3.04 PLACING CONCRETE

- A. The concrete shall be distributed on the subgrade to such depth, that, when it is consolidated and finished, the slab thickness required by the Drawings will be obtained at all points and the surface will at no point be below the grade specified for the finished surface, after application of the allowable tolerance. The concrete shall be deposited on the subgrade in a manner which will require as little rehandling as possible.
- B. Fabric reinforcement shall be placed at mid slab depth, and the fabric shall be maintained at this location during the placing and finishing operations.
- C. Concrete shall be thoroughly consolidated against and along the faces of all forms, by means of hand-operated, spud-type vibrators. Vibrators shall not be permitted to come in contact with the subgrade or a side form. Vibration at any one location shall not continue so long as to produce puddling or the accumulation of excessive grout on the surface. In no case shall the vibrator be operated longer than 15 seconds in any one location.



### 3.05 STRIKING-OFF, CONSOLIDATING AND FINISHING CONCRETE

- A. Immediately after the placing, the concrete shall be struck off, consolidated and finished, to produce a finished pavement conforming to the cross section, width and surface. Sequence of operations shall be as follows: strike-off; vibratory consolidation; screeding; floating; removal of laitance; straightedging; and final surface finish.

### 3.06 STRAIGHTEDGING AND SURFACE CORRECTIONS

- A. After floating has been completed and the excess water removed, but while the concrete is still in a plastic state, the surface of the concrete shall be tested for trueness with an accurate 10 foot straightedge. The straightedge shall be furnished by the CONTRACTOR. The straightedge shall be held in successive positions parallel to the road center line, in contact with the surface, and the whole area tested from one side of the slab to the other as necessary. any depressions shall be immediately filled with freshly mixed concrete and struck-off; consolidated and refinished. High areas shall be cut down and refinished. Straightedge testing and surface correction shall continue until the entire surface appears to conform to the required grade and cross section.

### 3.07 FINAL FINISH

- A. As soon as the water sheen has disappeared from the surface of the pavement and just before the concrete becomes nonplastic, a light broom finish shall be given to the surface.

### 3.08 EDGING

- A. After the final finish has been applied, but before the concrete has become nonplastic, the edges of the pavement along each side of the strip being placed, on each side of construction joints and along any structure extending into the pavement, shall be carefully rounded to a 1/4 inch radius except as otherwise indicated. A well-defined and continuous radius shall be produced and a smoother, dense mortar finish obtained. All concrete shall be completely removed from the top of the joint filler.
- B. All joints shall be checked with a straightedge before the concrete has become nonplastic and, if one side of the joint is higher than the other or the entire joint is higher or lower than the adjacent slabs, corrections shall be made as necessary.

### 3.09 JOINTS

- A. Construction Joints

1. Construction joints shall be located as shown on the Drawings and/or as directed by the ENGINEER.

#### B. Expansion Joints Around Structures

1. Expansion joints shall be formed by placing premolded expansion joint material about all structures and features projecting through, into or against the pavement. Unless otherwise indicated, such joints shall be 1/2 inch in width.

#### C. Transverse Expansion Joints

1. Open type transverse expansion joints shall be provided at all sidewalk returns and at 50 foot intervals and wherever indicated on the Drawings. Open type joints shall be formed by staking a 1/4 inch thick metal bulkhead in place and placing concrete on both sides. After the concrete has set sufficiently to preserve the width and shape of the joint, the bulkhead shall be removed. After the sidewalk has been finished over the joint, the slot shall be opened and edged with a tool having a 1/2 inch radius. Transverse expansion joints shall be cleaned and filled with joint filler strips 1/4 inch thick conforming to the requirements of AASHTO M-153.

#### D. Scored Joints

1. Scored joints shall be either formed or sawed at 5 foot intervals and shall extend to a depth of at least one fourth of the sidewalk slab thickness.

### 3.10 CURING

- A. After the finishing operations have been completed and as soon as the concrete has hardened sufficiently that marring of the surface will not occur, the entire surface and the edges of the newly placed concrete shall be covered and cured with membrane curing compound.
- B. Curing compound shall be uniformly applied to the surfaces to be cured, in a single coat, continuous film, at the rate of one gallon to not more than 200 square feet, by a mechanical sprayer.
- C. Curing compound shall not be applied during periods of rainfall. Curing compound shall not be applied to the inside faces of joints to be sealed. Should the film become damaged from any cause within the required curing period, the damaged portions shall be repaired immediately with additional compound. Upon removal of side forms, the sides of the slabs exposed shall immediately be coated to provide a curing treatment equal to that provided for the surface.

### 3.11 CURB AND SIDEWALK CONSTRUCTION

- A. The concrete curbs and sidewalks shall be constructed on a prepared smooth subgrade of uniform density. Large boulders and other obstructions shall be removed to a minimum depth of 6 inches below the finished subgrade elevation and the space shall be backfilled with sand, base course material or other suitable material which shall be thoroughly compacted by rolling or tamping. The CONTRACTOR shall furnish a template and shall thoroughly check the subgrade prior to depositing concrete.
- B. Concrete for curbs, and sidewalks shall be formed, mixed, placed and finished in conformance with the requirements of Division 3, except as modified herein. Concrete shall be cured with a clear membrane curing compound which shall be applied at a uniform rate of one gallon per 200 square feet in accordance with the requirements specified herein. Sidewalks shall be given a light broom finish.

### 3.12 CURBS

- A. Curbs shall be constructed in uniform sections ten feet in length except where shorter sections are necessary for closures or arcs. The sections shall be separated by sheet metal templates set perpendicular to the face and tip of the curve and not less than 2 inches longer than the depth of the curb. The templates shall be held firmly during the placing of the concrete and shall be allowed to remain in place until the concrete has set sufficiently to hold its shape, but shall be removed while the forms are still in place.
- B. After the concrete has sufficiently set for a minimum of 12 hours, the CONTRACTOR shall remove the forms and backfill the spaces on each side. The earth shall be compacted in satisfactory manner without damage to the concrete Work. Minor defects shall be filled with a mortar composed of one part Portland cement and two parts fine aggregate.

### 3.13 PAVEMENT CURB AND SIDEWALK REPAIR

- A. All damage to pavement, curb or sidewalk as a result of work under this Contract shall be repaired in a manner satisfactory to the ENGINEER and at no additional cost to the CITY. The repair shall include all work as specified herein.
- B. The width of all repairs shall extend at least 12 inches beyond the limit of the damage. The edge of the pavement curb or sidewalk to be left in place shall be cut to a true edge with a saw or other approved method so as to provide a clean edge to abut the repair. The line of the repair shall be reasonably uniform with no unnecessary irregularities.

- END OF SECTION -

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**SECTION 02580****PAVEMENT MARKING****Part 1 - GENERAL**

## 1.01 REQUIREMENT

- A. This section consists of striping pavement and parking stall wheel stops as indicated on the Drawings, specified herein and as required for a complete installation.

## 1.02 SUBMITTALS

- A. The CONTRACTOR shall submit shop drawings and other information to the ENGINEER for review in accordance with Section 01300, "Submittals".

## 1.03 QUALITY CONTROL

- A. The phrase "DOT Specifications" shall refer to the Florida Department of Transportation Standard Specifications for Road and Bridge Construction. The DOT Specifications, are referred to herein and are hereby made a part of this Contract to the extent of such references, and shall be as binding upon the Contract as though reproduced herein in their entirety.  
"BCTED" shall refer to Broward County Traffic Engineering Division.

**Part 2 - PRODUCTS**

## 2.01 PAVEMENT MARKING

- A. Pavement stripes shall be thermoplastic.

**Part 3 - EXECUTION**

## 3.01 PAVEMENT MARKING

- A. The surface which is to be painted shall be cleaned, by compressed air or other effective means, immediately before the start of painting, and shall be clean and dry when the paint is applied. Any vegetation or soil shall be removed from the pavement before edge striping is begun.
- B. The traffic stripe shall be of the specified width, with clean, true edges and without sharp breaks in the alignment. A uniform coating of paint shall be obtained and the finished stripe shall contain no light spots or paint skips. Any stripes which do not have a uniform, satisfactory appearance, both day and night, shall be corrected.

- C. All newly painted stripes, including edge stripes, shall be protected until the paint is sufficiently dry to permit vehicles to cross the stripe without damage from the tires. While the center line stripes are being painted, all traffic shall be routed away from the painting operations and the newly painted stripe. When necessary, a pilot car shall be used to protect the painting operations from traffic interference.
- D. Any portions of the stripes damaged by passing traffic or from other cause shall be repainted at the CONTRACTOR's expense.
1. Thermoplastic Traffic Stripes and Markings: Thermoplastic pavement markings, including stripes, pavement messages, stop bars, directional arrows, reflective pavement markers and other miscellaneous items, will be replaced to match preconstruction conditions. The thermoplastic compound shall be as specified in Section 711 of the D.O.T. Specifications. The thermoplastic compound shall be extruded or sprayed onto the pavement surface in a molten state by mechanical means, with surface application of glass spheres, when required, and upon cooling to ambient pavement temperature shall produce an adherent pavement marking of specified thickness and width and capable of resisting deformation.
- E. The portion of the pavement surface or thermoplastic marking to which the marker is attached by the adhesive shall be cleaned of dirt, curing compound, grease, oil, moisture, loose or unsound pavement and any other material which would adversely affect the adhesive. Reflective markers shall be installed in such a manner that the reflective face of the marker is perpendicular to a line parallel to the roadway centerline. No markers shall be installed over longitudinal or transverse joints of the pavement surface. The adhesive shall be spread on the bonding surface (not the marker) so that 100 percent of the bonding area of the marker will be covered.

The adhesive application shall be of sufficient thickness so that when the marker is pressed into the adhesive, excess adhesive shall be forced out around the entire perimeter of the marker. All excessive adhesive shall be removed from in front of the reflective faces. If any adhesive or foreign matter adheres to the reflective face of the marker, the marker shall be replaced. The ENGINEER shall determine the minimum time necessary to cure the adhesive for sufficient set to bear traffic.

- END OF SECTION -

**SECTION 02581****TRAFFIC SIGNS****Part 1 - GENERAL**

## 1.01 REQUIREMENT

- A. This section consists of traffic signs as indicated on the Drawings, specified herein and as required for a complete installation.

## 1.02 SUBMITTALS

- A. The CONTRACTOR shall submit shop drawings and other information to the ENGINEER for review in accordance with Section 01300, "Submittals".

## 1.03 CERTIFICATION

The CONTRACTOR shall furnish the manufacturer's certification that all signs furnished conform to these specifications and shall replace or repair at its expense all signs that fail to meet this requirement.

## 1.04 QUALITY CONTROL

- A. The phrase "DOT Specifications" shall refer to the Florida Department of Transportation Standard Specifications for Road and Bridge Construction. The DOT Specifications, are referred to herein and are hereby made a part of this Contract to the extent of such references, and shall be as binding upon the Contract as though reproduced herein in their entirety.  
"BCTED" shall refer to Broward County Traffic Engineering Division.

**Part 2 - PRODUCTS**

## 2.01 TRAFFIC SIGNS

- A. General: Traffic regulating signs shall conform to the colors, dimensions and requirements of the Manual on Uniform Traffic Control Devices (ANSI) and displaying the lettering and symbols indicated on the Drawings.
- B. Sign Panels and Support Members: Sign panels and support members shall conform to Aluminum Association Alloy 6061-T6.
- C. Bolts: Bolts shall conform to Aluminum Association Alloy 2024-T4 with an anodic coating 0.0002-inches thick minimum and chromate sealed.
- D. Nuts: Nuts shall conform to Aluminum Association Alloy 6269-T9.

- E. Reflective Sheeting: Reflective sheeting shall conform to DOT Type A requirements.
- F. Construction Warning Signs: The CONTRACTOR shall install traffic and warning signs during construction in accordance with OSHA, DOT and Broward County Public Works requirements.

**Part 3 - EXECUTION (not used)**

- END OF SECTION -



**SECTION 02582****RAISED RETRO-REFLECTIVE PAVEMENT  
MARKERS AND BITUMINOUS ADHESIVE****Part 1 - GENERAL**

Place raised retro-reflective pavement markers (RPMs) and adhesive, which upon installation produces a positive guidance system to supplement other reflective pavement markings.

**Part 2 - MATERIALS**

Use only Class B markers unless otherwise shown in the Plans. Meet the requirements of Section 970 (Florida Department of Transportation) Product Acceptance on the Project. Use only reflective pavement markers and bituminous adhesive that are listed on the Department's Qualified Products List (QPL). Provide to the ENGINEER a manufacturer's certification conforming to the requirements of Section 6, which confirms that each product meets the requirements of this Section.

**Part 3 - EQUIPMENT**

Use equipment having either thermostatically controlled double boiler type units utilizing heat transfer oil or thermostatically controlled electric heating pots to install hot applied bituminous adhesive. Do not use direct flame melting units with flexible adhesives; however, this type of unit may be used with standard adhesive in accordance with manufacturer's recommendations. Use a melter/applicator unit suited for both melting and pumping the adhesive through heated applicator hoses.

Heat the adhesive to between 375°F and 425°F and apply directly to the bonding surface from the melter/applicator by either pumping or pouring. Maintain the application temperature between 375°F and 425°F. The adhesive may be reheated. However, do not exceed the manufacturer's recommendations for pot life at application temperatures.

**Part 4 - APPLICATION**

Apply RPMs to the bonding surface using bituminous adhesives only. The ENGINEER will conduct field testing in accordance with FM 5-566. Correct RPMs not applied in accordance with these requirements at no cost to the Department.

Prior to application of adhesive, clean the portion of the bonding surface of any material which would adversely affect the adhesive.

Apply the adhesive to the bonding surface (not the marker) so that 100% of the bonding area of the marker will be covered, in accordance with adhesive manufacturer's recommendations. Apply sufficient adhesive to ensure, that when the marker is pressed downward into the adhesive, adhesive will be forced out around the entire perimeter of the marker.

Immediately remove excess adhesive from the bonding surface and exposed surfaces of the RPMs. Soft rags moistened with mineral spirits meeting Federal Specifications TT-T-291 or kerosene may be used to remove adhesive from exposed faces of the RPMs. Do not use any

other solvent. If any adhesive, pavement marking materials or other foreign matter adheres to the reflective face of the marker, replace the marker at no cost to the Department.

Install RPMs with the reflective face of the RPM perpendicular to a line parallel to the roadway centerline.

Ensure that all final RPMs are in place prior to opening the road to traffic. If more than 2% of the RPMs fail in adhesion or alignment within the first 45 days under traffic, replace all failed markers at no expense to the Department. If more than 5% of the markers fail in adhesion and or alignment during the initial 45-day period, the ENGINEER will extend the replacement period an additional 45 days from the date that all replacement markers have been installed. If, at the end of the additional 45-day period, more than 2% of all markers (initial installation and 45-day replacements combined) fail in adhesion or alignment, replace all failed markers at no expense to the Department.

#### CONTRACTOR'S RESPONSIBILITY FOR NOTIFICATION

Notify the ENGINEER prior to the placement of RPMs. At the time of notification, indicate the manufacturer and the LOT numbers of RPMs and bituminous adhesive that are intended for use. Verify that the approved LOT numbers appear on the material packages. Furnish a test report to the ENGINEER certifying that the materials meet all requirements specified.

#### METHOD OF MEASUREMENT

The quantities to be paid for will be the number of RPMs, furnished and installed, completed and accepted.

- END OF SECTION -

**SECTION 02930****SODDING****Part 1 - GENERAL**

## 1.01 SCOPE

- A. Provide all labor, materials and equipment necessary for complete sodding of areas affected by construction. This shall include, but not be limited to: liming, fertilizing, sodding, necessary barriers, tests and all incidentals to make the work complete.

## 1.02 WORK INCLUDED

- A. Testing of topsoil.
- B. Raking and leveling topsoil as required for sodding.
- C. Liming and fertilizing of topsoil.
- D. Laying and rolling of sod.
- E. Maintaining.

## 1.03 SUBMITTALS

- 1. Submit product source and information sheets in accordance with Section 01300, "Submittals".

**Part 2 - PRODUCTS**

## 2.01 MATERIALS

## A. Fertilizer

- 1. Fertilizer shall be commercial fertilizer, as manufactured by International Chemical Company or equal.
- 2. Said fertilizer shall have a 10-20-6 N.P.K. content and contain a minimum of 60% of organic material.
- 3. It shall be delivered at the site in the original sealed containers.

## B. Sod

- 1. Sod from right-of-way swales within the work area shall be Bahia sod or replaced in-kind, whichever is finer quality.

2. Sod shall be first quality Bahia sod of firm texture having a compacted growth and good root development.
3. Sod shall be absolutely true to varietal type, live, fresh and free from weeds or objectionable vegetation, fungus, insects and disease of any kind. Sod shall be kept moist from the time it is field cut until it is laid at the proposed site.
4. The sod shall be as grown by a certified turf nursery and CONTRACTOR shall inform ENGINEER as to the source of the sod to be utilized prior to ordering and delivery of sod.
5. Sod shall be furnished and installed in rectangular sod strips measuring 12 to 16-inches in width of standard lengths of not less than 2 feet and delivered on pallets.

### **Part 3 - EXECUTION**

#### 3.01 INSTALLATION

- A. These areas shall be fine graded to achieve the finished subgrade after compaction which shall be obtained by rolling, dragging or by an approved method which obtains an equivalent compaction to that produced by a hand roller weighing from 75 to 100 pounds per foot of width. All depressions caused by settlement or rolling shall be filled with additional existing or furnished topsoil and regraded and prepared as specified above until it presents a reasonably smooth and even finish at the required sod sub-grade.
- B. All sod furnished shall be living sod containing at least 70% of thickly matter grasses as specified and free from noxious weeds. All sod shall be certified free of fire ants.
- C. No broken pads or torn or uneven ends will be accepted. Standard size sections of sod shall be strong enough to support own weight and retain their size and shape when suspended vertically with a firm grasp on the upper 10% of the section. Sod shall not be harvested when its moisture content (excessively wet or dry) may adversely affect its survival.
- D. Sod shall be harvested, delivered, and installed within a period of 24 hours. Sod not installed within this time period shall be subject to inspection and rejection by ENGINEER, and shall be removed from the site and a fresh sod supply shall be furnished at no extra cost to CITY.
- E. The topsoil shall not be moist at time of installation; however, it shall contain sufficient moisture so as not be powdery or dusty, both as determined by the supplier's representative.

- F. The overlapping of existing lawn with new sod along limit of work lines will not be permitted. Sod shall be laid in strips, edge to edge, with the lateral joints staggered. All minor or unavoidable openings in the sod shall be closed with sod plugs or with topsoil, as directed by ENGINEER. However, sod laid with joints determined to be too large shall be lifted and re-laid as specified herein at no extra cost to CITY.
- G. Immediately after the sod is laid, the sod shall be watered thoroughly by hand or mechanical sprinkling until the sod and at least 2-inch of the top soil bed have been thoroughly moistened.
- H. CONTRACTOR shall be responsible to furnish his own supply of water to the site at no extra cost. If possible, CITY shall furnish CONTRACTOR, upon request, with a source and supply of water. CONTRACTOR shall apply for temporary meter and pay CITY for water used at current utility billing rates. However, if CITY's water supply is not available or not functioning, CONTRACTOR shall be responsible to furnish adequate supplies at CONTRACTOR'S own cost. All work injured or damaged due to the lack of, or the use of too much water, shall be CONTRACTOR's responsibility to correct.

### 3.02 MAINTENANCE

- A. Maintain the entire sodded areas at least a 30-day period or until final acceptance at the completion of the Contract, whichever is longer. Maintenance shall include watering as specified, weeding and removal of stones which may appear. All bare or dead spots which become apparent shall be properly prepared, limed and fertilized, and resodded at CONTRACTOR's expense as many times as necessary to secure a good growth. In the event that the sod installation is not accepted by ENGINEER, the entire area shall be maintained and cut by CONTRACTOR until final acceptance of the sod installation.
- B. Take whatever measures are necessary to protect the sod while it is developing. These measures shall include furnishing of warning signs, barriers, or any other necessary measures of protection.

- END OF SECTION -

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**SECTION 03300****CAST-IN-PLACE CONCRETE, REINFORCING AND FORMWORK****Part 1 - GENERAL**

## 1.01 DESCRIPTION

- A. Work included: Provide all labor, materials, equipment, fabrication, incidentals, transportation, placing and supervision necessary to complete all cast-in-place concrete work, its finishing, and all related work called for by the Contract Drawings and/or Specifications, or reasonably inferable from either or both, as needed for a complete and proper installation.
- B. Related work: Work affecting this Section includes, but is not limited to:
1. Shop Drawings-Per General Conditions and as specified herein.
  2. Materials and storage thereof
  3. Reinforcing-Bar and fabric
  4. Accessories of every nature, including form tie system.
  5. Formwork and removal thereof, including shoring and reshoring
  6. Concrete proportions and mixes
  7. Placing of concrete
  8. Admixtures
  9. Joints, metal joint screeds and joint fillers
  10. Finishes of all types
  11. Protection and curing
  12. Patching
  13. Laboratory Testing

## 1.02 QUALITY ASSURANCE

- A. Unless otherwise indicated, all materials, workmanship and practices shall conform to the requirements of ACI 301-96 "Specifications for Structural Concrete for Buildings", except as modified by supplemental requirements hereinafter.

## 1.03 STANDARDS

- A. ACI 301-96 Specifications for Structural Concrete
- B. ACI 318-95 Building Code Requirements for Reinforced Concrete

- C. Florida Building Code, latest edition.
- D. ACI 117-90 Standard Specifications for Tolerances for Concrete Construction and Materials

## **Part 2 - PRODUCTS**

### 2.01 MATERIALS

#### A. Materials for Concrete:

1. Cement shall conform to the following: Portland Cement ASTM C150, normal, type I or type II. Provide domestic cement of one type and from same source for entire project.
2. Mineral Admixtures:
  - (a) Fly Ash: Shall conform to ASTM C 618, with 20% maximum of total cementitious weight.
  - (b) Ground Blast Furnace Slag: Shall conform to ASTM C 989-93. 30% maximum of total cementitious weight.
3. Chemical Admixtures: The following admixtures are permitted, but require written approval from the ENGINEER:
  - (a) Air Entraining Admixture: Comply with ASTM C260. "Specifications for Air-Entraining Admixtures for Concrete.
  - (b) Water Reducing Admixture: Comply with ASTM C494 "Specifications for Chemical Admixtures for Concrete", Type A, and compatible with air entraining admixture.
  - (c) Water Reducing and Retarding Admixture: Comply with ASTM C494, "Specifications for Chemical Admixtures for Concrete, Type D, and compatible with air entraining admixture.
  - (d) High Range Water Reducing Admixture: Comply with ASTM C494, "Specifications for Chemical Admixtures for Concrete", Type F or G, and compatible with air entraining admixture (Including superplasticizer to reduce water content.)
  - (e) Admixtures containing added calcium chloride are not permitted.
4. Aggregates: Shall conform to ASTM C 33 and shall be quarried/mined in fresh water. Aggregates from salt water or brackish water are not permitted. Coarse aggregate size shall not exceed:



<u>Concrete member</u>	<u>Size</u>	
Walls	3/4"	67#
Beams or structural slabs not on ground	3/4"	67#
Columns and all other concrete	1"	57#
Drilling concrete pad or slabs on ground	1"	57#

5. In sanitary sewage applications, where called for in the plans and/or specifications an antimicrobial admixture as specified below shall be utilized:
- An antimicrobial agent, Con<sup>mic</sup>Shield<sup>®</sup>, or approved equal, shall be used to render the concrete uninhabitable for bacteria growth.
  - CONTRACTOR shall mix the liquid antimicrobial additive with the total water content of the concrete mix design in a proportion of 1 gallon per cubic yard. In the case of repairs to damaged concrete a proportion of 2 gallons per cubic yard shall be utilized.
  - In some instances all of the concrete in the structure in will receive the additive and in other instances only a portion of the concrete will receive the additive. Hence, the CONTRACTOR shall apply the additive only as directed in the specific instance.
  - CONTRACTOR shall submit a letter of certification to the Department, stating that the correct amount and correct mixing procedure was followed for all antimicrobial concrete.
  - Con<sup>mic</sup>Shield<sup>®</sup> antimicrobial additive shall be as manufactured by Con<sup>mic</sup>Shield<sup>®</sup> Technologies, Inc. 541 - 10<sup>th</sup> Street NW, #233, Atlanta, GA 30318. Phone: (877)543-2094.
- B. Portland cement and reinforcing steel: Comply with ACI 301-96 and, with all modifications and supplements thereto listed in Part 3 of this specification.
- C. Burlap mats: Conform to AASHTO Specification M182. (Burleen non-staining mats.)
- D. Epoxy bonding agent: A two (2) component, solvent free, moisture insensitive structural epoxy adhesive conforming to ASTM C881-90 Type II, Sikadur 32 Hi-Mod, as manufactured by Sika Corp., Concsive 1090 Liquid by Master Builders or approved equal.
- E. Anchor bolts, nuts and washers: Conform to ASTM A449-89, hot-dip galvanized.
- F. Dovetail slots: Galvanized steel, 22 gauge, 1"x 1", with 5/8" throat, fiber filled.
- G. Forms:

1. Plywood Forms: PS-1, B-B Concrete Form, Class I, exterior type, mill oiled and edge sealed. Thickness shall be as required to support concrete at the rate placed, but not less than 3/4".
2. Steel Forms: Uncoated steel, 3/16"-inch minimum thickness, fabricated to close tolerances, protected only by the specified release agent, braced so as not to dent, bend or dimple under wet concrete loads, vibrator impact and tool impact. Maintain steel forms in rust free condition by use of steel wool and light grinding, followed by coats of the specified release agent. Forms should be adjustable to be brought into true alignment without steps or ridges.

H. Form release agent:

1. For plywood forms use a natural non-petroleum base, non-staining and non-retarding release agent that will effectively prevent absorption of moisture and prevent bond with concrete, and leaves the concrete with a paintable surface.
2. For steel forms, use an approved material that will not stain, color or otherwise affect the finish of the concrete. Form coating shall not be detectable on finished surfaces.
3. Round column forms: Provide seamless fiber forms with the three plies nearest to the interior surface of the form deckled or scarfed and overlapped to minimize spiral gaps or seams on the column surface.

I. Form Ties: Steel rod type with integral waterstops and cones, and with ends or end fasteners that can be removed without spalling the concrete and which leave a hole equal in depth to the required reinforcement clearance, but not less than 2 inches from the formed face of the concrete. Wire tie, banding wire and wood spreaders will not be permitted.

J. Form Inserts:

1. Bevel or chamfer strips: Wood or non-staining plastic, 3/4" wide on each leg at exposed edges of concrete members, unless otherwise noted on plans.
2. Tongue and Groove Joint Forms: Minimum 24 gauge with steel stakes and splice plates. Forms shall be designed for joints not to receive a poured seal.
3. Pipe hangers and other utility supports: AISI Type 316 stainless steel.

K. Non-Shrink Grout: Non-shrink, non-metallic grout conforming to ASTM C 1107 Grade B or Grade C only. Grout must meet ASTM C 1107 at a temperature range of 50 F to 90 F at a flowable consistency.

L. Grout for Surface Repair and Bond Coat:

1. For repair, one part Portland cement to two parts fine sand, and a 50% of water and 50% Acryl 60 or equal (Thoroseal or Acryl Set Bonding Agent by Master Builders) to produce a stiff mortar.
  2. For bond coat, one-part Portland cement to one-part sand, and a 50% of water and 50% Acryl 60 or equal (Thoroseal or Acryl Set Bonding Agent) to produce a slurry mix.
- M. Moisture Barrier: Kraft paper and glass reinforcing fibers sandwiched between 2 layers of polyethylene film with a permeance rating of maximum 0.1 as per ASTM E-96, Procedure A.
- N. Preformed Expansion Joint Filler: Non-extruding type, self expanding cork, 3/4", 1", and 1½" cork (not to be used for sidewalks), conforming to plans or as otherwise noted on drawings, conforming to the requirements of ASTM D1752, Type II, and compatible with joint sealant compound.
- O. Joint Sealant Compound: Non-sag, 2 component, solvent free, moisture insensitive, flexible, epoxy resin conforming to the requirements ASTM C920-87 Type M, Grade NS. Additionally, the sealant must be recommended by the manufacturer to perform under continuous immersion in water.
- P. Polyurethane Elastomeric Sealant: Sikaflex-2c, NS/SL or approved equal. Provide a 2 - component, premium-grade, polyurethane-based, elastomeric sealant. It is principally a chemical cure in a non-sag and self-leveling consistency. Sealant shall meet ASTM C-920 and Federal Specifications TT-S-00227E.
1. Joint Movement: +50%.
- Q. Waterstops:
1. Volclay Waterstop-RX or approved equal. Flexible strip of bentonite waterproofing compound in coiled form.
    - (a) Chemical Composition:
      - (1) Butyl Rubber-Hydrocarbon: 24.9% by weight; ASTM D-297.
      - (2) Bentonite: 75 % by weight; SS-S-210-A.
      - (3) Volatile Matter: Below 1 %; ASTM D-6.
      - (4) Waterstop shall not contain any asbestos fibers or asphaltics.
    - (b) Physical Properties:
      - (1) Specific Gravity: 1.57; ASTM D-71.
      - (2) Application Temperature Range: 5-125 F.

- (3) Flash Point: 365; ASTM D 93-97.
  - (4) Accelerated Aging: Maintained 99% solids.
  - (5) Dimensions: 1" x 3/4" x 16'-6"
2. Polyvinyl chloride (PVC): Conforming to the requirements of U.S. Army Corps of Engineers Specification CRD-C-572 and of the following type:
- (a) Expansion Joints: 9-inches by 3/8-inch, ribbed center bulb.
  - (b) Construction Joint: 9-inches by 3/8-inch, flat ribbed.
  - (c) Only where specified on Plans at construction and expansion joints: 9-inches by 3/8-inch, split ribbed.
  - (d) Install waterstops as shown as manufactured structures.
- R. Fiber Reinforcement: Fiber reinforcement shall not be used in the concrete unless ordered buy the ENGINEER in writing. It shall consist of 100% virgin polypropylene fibrillated fiber- dosage of 2 lbs. per cubic foot.
- 1. Compressive Strength: 1 psi (.006895 M Pa), ASTM C-39.
  - 2. Flexural Strength: 288 psi (2.0 M Pa) after 7 days, 390 psi (2.7 M Pa) after 28 days; ASTM C-78.
  - 3. Splitting Tensile Strength: 194 psi (1.3 M Pa) after 7 days, and 290 psi (2.0 M Pa) after 28 days; ASTM C-496.
  - 4. Source: Fibermesh Micro-Reinforcement System by Fibermesh Company, Division of Synthetic Industries, Inc., or approved equal.
- S. Provide other materials, not specifically described but required for a complete and proper installation, as selected by the CONTRACTOR subject to the approval of the ENGINEER.
- T. A shrinkage reducing admixture (Teraguard) or equivalent at the rate of 2.2% by weight of cement may be used in the concrete to meet the shrinkage limitations.
- U. To protect the concrete slab against the elements, the ENGINEER may direct the CONTRACTOR to spray an evaporation retarder on the finished concrete slab immediately behind the cement finishing process at no additional cost to the Department. This is not a curing compound.

### **Part 3 - EXECUTION**

#### 3.01 SURFACE CONDITIONS

- A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work.

### 3.02 SUPPLEMENTAL REQUIREMENTS

- A. All phases of concrete construction, including materials formwork, and all other related procedures shall comply with the most stringent allowed tolerances of ACI-301 and ACI-117 Standards (Latest Edition) - Non compliance with these standards will cause full rejection of any work done.
- B. Comply with ACI 301-96 and with all modifications and supplements thereto listed herein. In addition to the ACI Standards on finished concrete, the ENGINEER will only approve quality finished concrete which in ENGINEER'S opinion is ready to receive a grout finish, paint or liquid membrane.
- C. The following modifications and supplements to ACI 301-96 shall also apply to the work.
  - 1. General
    - (a) These specifications cover cast-in-place structural concrete for use in buildings and appurtenances, including foundations, curbs, sidewalks, concrete pavements and utility structures, water containment tanks, and piles.
    - (b) Keep minimum two (2) copies of ACI 301-96 "Specifications for Structural Concrete" in field office at all times.
  - 2. Proportioning and Design of Mixes:
    - (a) General: Proportion concrete to meet properties as specified. Prepare mix designs for each type and strength of concrete. Submit with mix design the chemical admixture manufacturer's statement that the admixture proposed complies with the requirements of this specification. Where concrete of different strengths are specified for the same location, the higher strength concrete shall be used. Concrete proportions shall be established on the basis of previous field experience, or laboratory trial batches as specified in ACI 301-96 Sections 4.2.2 & 4.2.3.
    - (b) Classes of Concrete:
      - (1) Structural concrete of normal weight for portions of the structure that are required to be watertight containments or tremie concrete, the water/cementitious ratio shall not exceed 0.45 if exposure is to be to fresh water.

- (2) If the concrete is exposed to salt or brackish water, or if exposed to injurious concentrations of sulfate-containing solutions (1500 ppm or more of Sulfate in water) or other chemically aggressive solutions, use Type II cement with Rheobuild 1000 admixture by Master Builders, or approved equal; water/cementitious ratio shall not exceed 0.34.
  - (3) Other Concrete: (This would be slabs-on-grade, concrete thrust blocks, and miscellaneous concrete). The water cementitious ratio shall not exceed 0.50 to 0.55.
  - (4) Minimum  $f'c$  @ 28 days shall be 4000 KSI with a Water/Cement ratio of 0.45.
  - (5) Minimum  $f'c$  @ 28 days shall be 7000 KSI with a Water/Cement ratio of 0.34.
- (c) Slumps:
- (1) All structural concrete, pumped concrete and tremie concrete shall contain a High Range Water Reducing Admixture and be designed with a maximum water content of 270 pounds per cubic yard. The initial water slump prior to addition of the High Range Water Reducing Admixture shall be 2-inch maximum. Concrete at point of placement shall not exceed 10-inches. Concrete shall be non-segregating.
  - (2) Slabs including slabs-on-grade, and all other concrete shall have a maximum water content of 287 pounds per cubic yard and have a 5-inch maximum slump with a water reducer, or water reducer and retarder admixture added.

### 3. Formwork

- (a) Earth cuts are not permitted for forms for vertical surfaces. Footings, grade beams and slab edges shall be formed. Provide moisture barrier under all slabs on grade. Lap 6-inches and tape punctures.
- (b) The CONTRACTOR is responsible for the adequacy of forms and shoring including placing, fill and equipment on roof, and for safe practice in their use and removal. Submit formwork calculations, and shop drawings including shoring and reshoring. In addition, the calculations and shop drawings for formwork, shoring, and reshoring, if required by the ENGINEER or Building Department, shall be signed and sealed by a Professional Engineer registered in the State of Florida.
- (c) Design forms for the loads and lateral pressures resulting from the placement and vibration of concrete and for design considerations, wind

loads, allowable stresses, and other applicable requirements of the South Florida Building Code.

- (d) Provide form facing materials as required by the specified finish of the formed surface. Do not use facing material with raised grain, torn surfaces, worn edges, patches, dents or other defects. No form may be reused more than three times without the Department's approval. The maximum deflection permitted of facing materials reflected in concrete surfaces exposed to view is 1/240 of the span between structural members.
  - (1) Forms shall be free from surface defects, tight to prevent leakage and braced to keep its position and shape when filled with concrete. Adjacent edges and end panels and sections shall be held together to provide accurate alignment and prevent forming ridges, fins, offsets or similar type defects in finished concrete. It shall be tight to prevent loss of water, cement or fines during placing and vibrating concrete. The bottom of the forms placed in continuous straight even footings or slabs shall be watertight to prevent loss of water, cement and fines during placement and vibration of concrete, a gasket may be required by the ENGINEER under the forms to provide water tightness at the CONTRACTOR expense. The CONTRACTOR shall not proceed to place forms for concrete work adjacent to or on top of previous placed concrete without the ENGINEER's approval, if the stripped forms reveals columns, walls or beams are out of level or plumb or there are cold joints or other objectionable work in the opinion of the ENGINEER. CONTRACTOR shall submit to the ENGINEER for approval, how he intends to correct or remove the defective work promptly at CONTRACTOR'S expense. CONTRACTOR shall perform such corrections prior to proceeding to place concrete in the next Section.
- (e) Provide positive means of adjustment (wedges or jacks) of shores and struts, and all settlement shall be taken up during concrete placing operation. Brace forms securely against lateral deflection. Do not anchor form bracing to poured concrete floors, or make holes in floor.
- (f) Provide temporary openings in columns and wall forms to limit the free fall of concrete to five (5) feet. Place such openings at no more than eight (8) feet apart to facilitate placing and consolidation of concrete. Elephant trunks may be used to vertical heights of fifteen (15) feet for tremie and other purposes, if approved by the ENGINEER. Provide temporary openings at the bottom of wall and column forms and elsewhere as necessary to facilitate cleaning and observation

immediately before concrete is placed. Blow formwork entirely clean of all saw dust, dirt, or other items not specifically intended to be a part of the final concrete. Any evidence of non-intended items in the forms is considered sufficient cause to stop concreting operation and/or require removal of concrete placed in such contaminated forms.

- (g) Provide inserts, conduits, boxes, sleeves, anchors, ties, bolts, hangers, dowels, thimbles, nailers, grounds and other devices in coordination with other trades.
- (h) Set anchor bolts and other embedded items accurately and hold securely until concrete is placed and set. Anchor bolts shall be galvanized and of size and length as indicated on the Contract Drawings. Bolts not sized shall be 3/4-inch diameter.
- (i) Install wall spools, wall flanges and wall anchors before placing concrete. Do not weld, tie or otherwise connect the wall spools to the reinforcing steel.
- (j) Do not use pinch bars, wrecking bars or other metal tools against as-cast concrete to wedge forms loose; use only wooden wedges carefully and gradually. Driving shall be accomplished by light tapping.
- (k) The CONTRACTOR is responsible for the removal of forms and shores. Do not remove forms or shores before the member has attained sufficient strength to support its weight and the loads imposed, nor sooner than listed below
  - (1) Wall forms: 24 hours
  - (2) Column forms: 24 hours.
  - (3) Beam and girder side forms only (not bottom form): 24 hours.
  - (4) Beam and Girder bottom forms: 7 days minimum unless otherwise approved by the ENGINEER.
  - (5) Slab forms: 14 days.
  - (6) Arch centers: 7 days.
  - (7) Pan joist forms: 4 days.

#### 4. Reinforcement

- (a) Prior to fabrication, submit for review shop drawings showing all fabrication dimensions, bar lists and location for placing of the reinforcing steel and accessories, including spacing of reinforcing, splices (lap, welded, Cadweld and/or mechanically threaded), grade of reinforcing and name of manufacturer. Note all deviations from the Contract



Drawings and use the same designation mark as shown on the Contract Drawings where possible.

- (b) Reinforcing bars: ASTM A615, Grade 60, deformed bars of USA manufacturer.
- (c) Welded wire fabric: ASTM A185, galvanized.
- (d) Metal bar supports: CRSI MSP-1, Chapter 3, Class 2, Type B stainless steel protected bar supports.
- (e) Coupler Splice Devices: Cadweld, tension couplers capable of developing the ultimate strength of the bar.
- (f) Reinforcing steel upon which unauthorized welding has been done, shall be removed and replaced at no additional cost to the Department.
- (g) Place reinforcing bars to the most stringent tolerances indicated in ACI 301 and ACI 117 (Latest Edition). Tolerances specified in those standards shall govern over any other reference code or standard.
- (h) All reinforcement at time concrete is placed, shall be free of mud, oil or other materials that may affect or reduce the bond. Reinforcing with rust or mill scale will not be accepted without cleaning and/or brushing to remove scale and rust.
- (i) Support rebar and mesh reinforcing for slabs on grade 1½ inches from top of slab on masonry blocks not less than 4 sq. in., having a compressive strength equal to or greater than the specified strength of the concrete being placed. Space blocks at no more than 4 feet apart each way for rebars, and no more than 3 feet apart for mesh reinforcement.
- (j) Support reinforcing off from formwork for columns, walls and beams with stainless steel protected bar supports. Support slab reinforcing on #5 bars, or larger, spaced at no more than 48 inches on center. Space individual high chairs no more than 48 inches apart and support bars shall not exceed 24 inches past outermost chairs.
- (k) Overlap welded wire fabric in such a manner that the overlap measured between outermost cross wires of each fabric sheet is not less than the spacing of the cross wires plus 2 inches or 6 inches, whichever is greater. Do not extend fabric through expansion and/or contraction joints, unless otherwise noted on the Contract Drawings.
- (l) The minimum clear distance between parallel bars, both vertical and horizontally, shall not be less than the nominal diameter of the bars, or less than 1½ times the maximum size of the aggregate, or 1-inch in beams, or 1½ inches in columns, whichever is greater. Where

reinforcement in beams is placed in two or more layers, the upper layer shall be placed directly above the bars in the bottom layer. Misplacement, misalignment or improper length of dowels shall be sufficient cause to require removal and reconstruction of affected work.

- (m) Unless allowed by the ENGINEER, bending of reinforcing partially embedded in concrete is not permitted. When permitted, bending shall be in accordance with CRSI Manual of Standard Practice.

5. Joints and Embedded Items.

- (a) Provide premolded expansion joint filler strips of proper width and length as specified in the Contract Drawings. Place  $\frac{1}{2}$ " expansion joint fillers every 20 feet in straight runs of walkways or sidewalks, at right angle turns and wherever concrete butts into vertical surfaces, unless otherwise noted on the Contract Drawings.
- (b) Provide waterstops in all construction joints, unless otherwise indicated on the Contract Drawings.
- (c) Join all waterstops at all intersections so that a continuous seal is provided. Center the waterstop in the joint. Hold water stop positively in correct position. In the event of damage to the waterstop, repair the water stop in an acceptable manner. Vibrate concrete to obtain impervious concrete in the vicinity of all joints.
- (d) Install waterstop in accordance with instructions of the manufacturer. Prior to use of the waterstop material in the field, submit to the ENGINEER for approval a sample of each size and shape to be used. Fabricate sample so that the material and workmanship represent in all respects the fittings to be furnished under this Specification.
- (e) Place all sleeves, inserts, anchors, and other embedded items prior to placing concrete. Anchors and bolts cast in concrete shall be hot dip galvanized or stainless steel. Where permitted by the ENGINEER, concrete expansion bolts shall be stainless steel and of the wedge anchor type. Take all necessary precautions to prevent embedded items from being displaced, broken or deformed during concreting operation. Protect drains from intrusion of concrete.

6. Placing:

- (a) Equipment for mixing and transporting concrete must be clean. Forms shall be thoroughly clean and damp, and reinforcing shall be secured in place. Runways for transporting concrete shall not rest on reinforcing. When concrete is placed against earth, sprinkle sufficiently before placing.

- (b) Deposit of concrete in forms no longer than ninety (90) minutes after the initial design water has been added to the cement and aggregates. Concrete which cannot be so placed shall not be used and shall be wasted. **No additional water shall be added.** No retempering with water is permitted.
- (c) In addition to the requirements of ASTM C94, the concrete delivery tickets shall indicate the cement content and water/cement ratio.
- (d) During hot weather, proper attention shall be given to ingredients, production methods, handling, placing, protection and curing. Comply with ACI 305R "Hot Weather Concreting" recommendations.
- (e) Do not place concrete in forms unless the water level is below the concrete to be placed, even if it is necessary to maintain the dewatering, or under rain.
- (f) Do not place concrete under water except for tremie concrete as called for on the Contract Drawings. Submit for approval plan and details of means and methods for installation of seal tremie concrete prior to commencement of work. Seal concrete which subsequently fails to perform, shall be repaired or replaced at no additional cost to the Department.
- (g) Place seal concrete under water in the space in which it is to remain, by means of a tremie, a closed-bottom dump bucket of not less than one cubic yard capacity, or other approved method, and do not disturb after it is deposited. Deposit all seal concrete in one continuous pour. Do not place concrete in running water. Design all formwork, to retain concrete under water, to be watertight. Submit shop drawings for the design of formwork and excavation sheeting signed and sealed by a Florida Registered Professional Engineer.
- (h) The tremie shall consist of a tube having a minimum inside diameter of ten (10) inches, and shall be constructed of sections having tight joints. No aluminum parts which have contact with the concrete will be permitted. The discharge end shall be entirely seated at all times and the tremie tube kept full to the bottom of the hopper. When a batch is dumped into the hopper, the tremie shall be slightly raised (but not out of the concrete at the bottom) until the batch discharges to the bottom of the hopper, after which the flow shall be stopped by lowering the tremie. The means of supporting the tremie shall be such as to permit the free movement of the discharge end over the entire top surface of the work, and shall permit it being lowered rapidly when necessary to choke off or retard the flow. The flow shall preferably be continuous and in no case

shall be interrupted until the work is completed. Exercise special care to maintain still water at the point of deposit.

- (i) When the concrete is placed by means of a bottom dump bucket, the bucket shall be lowered gradually and carefully until it rests upon the concrete already placed. The bucket shall then be raised very slowly during the discharge travel; the intent being to maintain, as nearly as possible, still water at the point of discharge and to avoid agitating the mixture. Aluminum buckets will not be permitted.
- (j) Do not commence pumping, to dewater a sealed cofferdam, until the seal has set sufficiently to withstand the hydrostatic pressure, and in no case earlier than 72 hours after placement of concrete.
- (k) Notify ENGINEER a minimum of 24 hours prior to concreting and request a specific time for observation of reinforcing and formwork for portions of concrete work to be placed. No observation will be made by the ENGINEER until rebar installation for all work to be done and all formwork has been completed and approved by the CONTRACTOR's field superintendent. Do not order concrete until all corrections and additions indicated by the ENGINEER have been made. Should the ENGINEER's observation reveal that work is improperly prepared and an additional observation will be required, he will so inform the CONTRACTOR and all above requirements shall also govern.

7. Repair of Surface Defects:

- (a) Repair all concrete surface defects, which includes, but not limited to cracks, tie holes (no plastic cones), uneven holes, honeycombs, rough frame work and other objectionable conditions deemed unacceptable to the ENGINEER immediately after form removal. This repair work is to be done for all concrete exposed surfaces, liquid applied surface or painted surfaces in or out of the water. Repair all cracks and defects in the concrete floors, beams, joists, columns, and other structural members, roof and walls, to the satisfaction of the ENGINEER, that may occur up to one year after acceptance of work regardless of the cause. Test unformed surfaces such as monolithic slabs, for smoothness and verify placement tolerances specified for each surface and finish. Test unformed surfaces sloped to drain for trueness of slope, in addition to smoothness. Repair unformed surfaces that contain surface defects which affect durability of concrete. Surface defects, as such, include cracking, cracks which penetrate to reinforcement or completely through non-reinforced sections regardless of width, spalling, pop-outs, honeycomb, rock pockets and other objectionable and rough conditions.

- (b) Proprietary compounds for adhesion or as patching ingredients may be used, if approved by the ENGINEER. All structural repair of surface defects to be made require the approval of the ENGINEER, as to the method and procedure. Approval of the completed work must be obtained from the ENGINEER.
8. Finishing of Formed Surfaces.
- (a) Apply rough form finish to exterior walls below grade not exposed to water.
  - (b) Apply smooth form finish to exterior and interior walls and columns exposed to water.
  - (c) Apply smooth form finish to interior walls and underside of floors, stairs and slabs.
  - (d) In addition to the smooth form finish, apply a grout cleaned finish to concrete walls and surfaces exposed to public view and underside of formed floors, stairs or slabs.
  - (e) Apply a rubber float grout mix to properly prepared concrete surface, only when approved by the ENGINEER. Mix shall have one part Portland cement to two parts fine sand in a 50% water and 50% Acryl #60 (Thoroseal or Acryl Set) mix or Acryl Set by Master Builders. Make a 10' by 10' sample on the concrete wall for the approval of the ENGINEER. Finished surface shall be a non dusting hard finish, when scratched with a ¼" metal edge.
  - (f) Finish concrete surface, interior or exterior, below or above water shall include all:
    - (1) Exposed concrete.
    - (2) Grout finished concrete.
    - (3) Painted surface concrete.
    - (4) Liquid membrane finished concrete shall comply with manufacturer's requirements.
    - (5) The entire surface of finished concrete shall have a smooth uniform surface, there shall be no offsets, visually bulges, or wavering in the finished surfaces. The joints must be accurately aligned, they cannot be uneven or in or out, a higher and lower, there shall be no fins, projection or unevenness between forms.
    - (6) If after stripping the forms the ENGINEER determines that the finished concrete does not comply with any or all of the above requirements, the CONTRACTOR shall submit CONTRACTOR'S proposal in writing to the ENGINEER as to CONTRACTOR'S

methods of correcting the work at no added cost to the Department, which shall include, but not limited to all grinding of fins, projections, unevenness between joints, form high spots and uneven spots.

- (7) In addition to all other requirements, concrete surfaces exposed to public view, irrespective of size, area or location shall be completely clean and free of: (1) Stains of any nature, (2) Parts of forms or other wood of any nature, (3) laitance, (4) "Run-downs" of leaked water from secondary pours, (5) Nails, (6) Strips, (7) Ties and (8) all other extraneous, deleterious materials and/or substances which may affect the finished appearance and condition of exposed concrete. Surfaces not meeting the above requirements are to be repaired and treated at no additional cost to the Department.

#### 9. Slabs

- (a) Unless otherwise noted on the Contract Drawings, place strips alternately at maximum 20 feet center-to-center and to align with column centerline. Do not place adjacent strips until elapse of twenty four hours after first strip is placed. Place slabs on grade by the "strip-cast" method. Method to be reviewed by the ENGINEER. Provide saw-cut joints at maximum 20 feet center-to-center and to align with column center lines within four hours of final finishing.
- (b) Provide doweled construction joints where shown on the Contract Drawings.
- (c) Provide a hard steel troweled finish, free from trowel marks and irregularities, to slabs and floors.
- (d) Provide a light hair-broom finish to exterior slabs and floors exposed to public view. Leave hair-broom lines parallel to direction of the slab drainage.
- (e) Provide a stiff bristle broom finish to slabs and floors with slopes greater than 10 percent. Leave broom lines parallel to slope drainage.
- (f) Finish exposed edges of slabs, floors and tops of walls with a ¼-inch radius edge unless a chamfer is called for on the Contract Drawings.

#### 10. Curing and Protection

- (a) Comply with ACI 305 "Hot Weather Concreting", Chapter 4, with the supplements and modifications to ACI 301 listed herein.
- (b) Only concrete water curing for not less than 7 days (24 hours/day continuously) will not be accepted; Burlen mats shall be used in curing.

Water cure by ponding or continuous sprinkling covering complete surface with minimum runoff. The application of water to wall may be interrupted for grout cleaning only over the areas being cleaned at the time, and the concrete surfaces shall not be permitted to become dry during such interruption.

- (c) Begin all water curing as soon as concrete is set and concrete will not be damaged. Keep concrete and wall forms wet the first 24 hours. Remove forms as indicated in Formwork, Section 3.02-C.4, and continue with 7 day water curing. Recoat damaged surfaces subject to heavy or surfaces damaged by construction procedures within 3 hours of damage. Method of repair shall be approved by the ENGINEER.

#### 11. Testing

- (a) Testing laboratory will be selected and paid for by the Department. Send results of all tests to the Department and to the CONTRACTOR. The CONTRACTOR shall notify the Testing laboratory at least 24 hours before each concrete placing.
- (b) Obtain and mold 3 specimens for each fifty (50) cu. yds., or fraction thereof, of each class of concrete placed each day or as directed by the ENGINEER.
- (c) Cure specimens from each sample in accordance with ASTM C31. Record in test report any deviations from this Standard.
- (d) Test specimens in accordance with ASTM C39. Test one specimen at twenty eight (28) days for acceptance and, one specimen at three (3) days and seven (7) days respectively, for information. If one specimen in a test manifests evidence of improper sampling, molding or testing, it shall be discarded and the strength of the remaining cylinders shall be considered the test result.
- (e) CONTRACTORs Superintendent shall color code on a set of structural drawings the extent of days work and date to conform to cylinders test.
- (f) Perform slump test at discharge of mixer, one for each strength test in accordance with ASTM C143. In the event slump is excessive, testing laboratory will immediately notify the CONTRACTOR's superintendent and the ENGINEER's representative on site. The CONTRACTOR shall then reject all concrete with excessive slump and/or deposit time.
- (g) Drying Shrinkage Test: A drying shrinkage test shall be conducted on the preliminary trial batch with the maximum water-cementitious materials ratio used to qualify each proposed concrete mix design using the concrete materials, including admixtures, that are proposed for the project. Three test specimens shall be prepared for each test.

Drying shrinkage specimens shall be 4 x 4 x 11 inch prisms with an effective gauge length of 10 inches fabricated, cured, dried, and measured in accordance with ASTM C 157 except with the following modifications:

- (1) Specimens shall be removed from the molds at an age of 23 hours  $\pm$  1 hour after trial batching, shall be placed immediately in water at  $73^{\circ}$  F  $\pm$   $3^{\circ}$ F for at least 30 minutes, and shall be measured within 30 minutes thereafter to determine original length and then submerged in lime-saturated water as specified in ASTM C157. Measurement to determine expansion expressed as a percentage of original length shall be taken at age 7 days. The length at 7 days shall be the base length for drying shrinkage calculations ("0" days drying age). Specimens then shall be stored immediately in a humidity controlled room maintained at  $73^{\circ}$  F  $\pm$   $3^{\circ}$ F and 50%  $\pm$  4% relative humidity for the remainder of the test. Measurements to determine shrinkage expressed as percentage of base length shall be reported separately for 7, 14, and 21 days  $\pm$ 4 hours of drying from "0" day after 7 days of moist curing.
- (2) Drying shrinkage deformation for each specimen shall be computed as the difference between the base length (at "0" days drying age) and the length after drying at each test age. Results of the shrinkage test shall be reported to the nearest 0.001 percent. If drying shrinkage of any specimen deviates from the average for that test age more than 0.004 percent, the results for that specimen shall be disregarded.
- (3) The average drying shrinkage of each set of test specimens cast in the laboratory from a trial batch as measured at the 21 days drying age shall not exceed 0.036 percent and 0.042 percent at the 28-day drying stage for all concrete.
- (4) The maximum concrete shrinkage for specimens cast in the field shall not exceed the trial batch maximum shrinkage requirement by more than 25 percent.
- (5) If the required shrinkage limitation is not met during construction, the CONTRACTOR shall take any or all of the following actions at no additional cost to the CITY, for securing the specified shrinkage requirements. These actions may include changing the source or aggregates, cement and/or admixtures, including Tetra Guard AS 20 or approved equal; reducing water content; washing of aggregate to reduce fines; increasing the number of construction joints; modifying the curing requirements; or other actions designed to minimize shrinkage or the effects of shrinkage.



- (6) Alkali-aggregate reactivity potential shall be determined in accordance with Appendix XI of ASTM C 33. Aggregates shall be tested in accordance with ASTM C 289 and C295 to determine potential reactivity. Aggregates which do not indicate a potential for alkali reactivity or reactive constituents may be used without further testing. Aggregates which indicate a potential for alkali reactivity shall be further tested in accordance with ASTM C227 or C1105, as appropriate, using a cement containing less than 0.6 percent alkalis. At the discretion of the ENGINEER, testing in addition to that indicated in Appendix XI of ASTM C33 may be performed on potentially reactive aggregates. Nonreactive aggregates shall be imported if, in the opinion of the ENGINEER, local aggregates exhibit unacceptable potential reactivity.

## 12. Evaluation and Acceptance of Concrete

- (a) If tests are insufficient or inadequate, test and evaluate by core tests. Failure of any concrete cylinder to meet specified requirements shall be deemed as non-complying and costs of additional tests to determine the adequacy or inadequacy shall be borne by the CONTRACTOR. Concrete rejected for any reason is to be removed and replaced, including labor, forms and reinforcing, to meet specifications at no additional cost to the Department and no additional time extension.

## 13. Additional Requirements

- (a) Submit shop drawings as required per General Conditions and elsewhere in these specifications. Prime CONTRACTOR shall check and approve all shop drawings prior to submission. Do not fabricate any item requiring shop drawings until approval of shop drawings has been granted by the Department. Partial shop drawings are not accepted, submit drawings for complete submittal.
- (b) Provide precast or cast-in-place reinforced concrete lintels at all masonry openings and sills at all windows. Reinforce to suit loads and span. Provide minimum 8" bearing at each end and, pour integral with columns where opening abuts columns.
- (c) Sidewalks in R.O.W.: Provide poured-in-place 4" thick concrete slab, 3000 psi concrete, with continuous 8" deep thickened slab edges. Isolate walks from vertical surfaces with ½" expansion joint material. Provide ½" expansion bituminous joint material flush with top of concrete slabs at 20 feet on center and tooled joints at 5 feet on center. Tool all open edges to a smooth radius and all edges adjacent to the forms.

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## SECTION 03315

### GROUT

#### Part 1 - GENERAL

##### 1.01 THE REQUIREMENT

- A. The CONTRACTOR shall furnish all materials for grout in accordance with the provisions of this Section and shall form, mix, place, cure, repair, finish, and do all other work as required to produce finished grout, in accordance with the requirements of the Contract Documents.
- B. The following types of grout shall be covered in this Section
1. Non-Shrink Grout: This type of grout is to be used wherever grout is shown in the Contract Documents, unless another type is specifically referenced.
  2. Cement Grout
  3. Epoxy Grout
  4. Topping Grout and Concrete Fill

##### 1.02 REFERENCE SPECIFICATIONS, CODES, AND STANDARDS

- A. Specifications, codes, and standards shall be as specified in Section 03300 - Cast-In-Place Concrete, Reinforcing and Formwork and as referred to herein.
- B. Commercial Standards:
- |            |  |
|------------|--|
| CRD-C 621  | Corps of Engineers Specification for Non-shrink Grout  |
| ASTM C 109 | Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2-in or 50-mm Cube Specimens)                                  |
| ASTM C 531 | Test Method for Linear Shrinkage and Coefficient of Thermal Expansion of Chemical- Resistant Mortars, Grouts, and Monolithic Surfacing |
| ASTM C 579 | Test Methods for Compressive Strength of Chemical-Resistant Mortars and Monolithic Surfacing   |
| ASTM C 827 | Test Method for Early Volume Change of Cementitious Mixtures   |
| ASTM D 696 | Test Method for Coefficient of Linear Thermal Expansion of Plastics  |

##### 1.03 CONTRACTOR SUBMITTALS

- A. The CONTRACTOR shall submit certified test results verifying the compressive strength, shrinkage, and expansion requirements specified herein; and

manufacturer's literature containing instructions and recommendations on the mixing, handling, placement and appropriate uses for each type of non-shrink and epoxy grout used in the work.

#### 1.04 QUALITY ASSURANCE

##### A. Field Tests:

1. Compression test specimens will be taken during construction from the first placement of each type of grout, and at intervals thereafter as selected by the ENGINEER to insure continued compliance with these specifications. The specimens will be made by the ENGINEER or its representative.
2. Compression tests and fabrication of specimens for cement grout and non-shrink grout will be performed as specified in ASTM C 109 at intervals during construction as selected by the ENGINEER. A set of three specimens will be made for testing at 7 days, 28 days, and each additional time period as appropriate.
3. Compression tests and fabrication of specimens for epoxy grout will be performed as specified in ASTM C 579, Method B, at intervals during construction as selected by the ENGINEER. A set of three specimens will be made for testing at 7 days, and each earlier time period as appropriate.
4. All grout, already placed, which fails to meet the requirements of these specifications, is subject to removal and replacement at the cost of the CONTRACTOR.
5. The cost of all laboratory tests on grout will be borne by the CITY, but the CONTRACTOR shall assist the ENGINEER in obtaining specimens for testing. However, the CONTRACTOR shall be charged for the cost of any additional tests and investigation on work performed which does not meet the specifications. The CONTRACTOR shall supply all materials necessary for fabricating the test specimens.

- B. Construction Tolerances: Construction tolerances shall be as specified in the Section 03300 - Cast-in-Place Concrete, Reinforcing and Formwork, except as modified herein and elsewhere in the Contract Documents.

## **Part 2 - PRODUCTS**

### 2.01 CEMENT GROUT

- A. Cement Grout: Cement grout shall be composed of one part cement, three parts sand, and the minimum amount of water necessary to obtain the desired consistency. Where needed to match the color of adjacent concrete, white

Portland cement shall be blended with regular cement as needed. The minimum compressive strength at 28 days shall be 4000 psi.

- B. Cement grout materials shall be as specified in Section 03300 - Cast-in-Place Concrete, Reinforcing and Formwork.

## 2.02 PREPACKAGED GROUTS

### A. Non-Shrink Grout:

1. Non-shrink grout shall be a prepackaged, inorganic, non-gas-liberating, non-metallic, cement-based grout requiring only the addition of water. Manufacturer's instructions shall be printed on each bag or other container in which the materials are packaged. The specific formulation for each class of non-shrink grout specified herein shall be that recommended by the manufacturer for the particular application.
2. Class A non-shrink grouts shall have a minimum 28 day compressive strength of 5000 psi; shall have no shrinkage (0.0 percent) and a maximum 4.0 percent expansion in the plastic state when tested in accordance with ASTM C-827; and shall have no shrinkage (0.0 percent) and a maximum of 0.2 percent expansion in the hardened state when tested in accordance with CRD C 621.
3. Class B non-shrink grouts shall have a minimum 28 day compressive strength of 5000 psi and shall meet the requirements of CRD C 621.
4. Application:
  - (a) Class A non-shrink grout shall be used for the repair of all holes and defects in concrete members which are water bearing or in contact with soil or other fill material, grouting under all equipment base plates, and at all locations where grout is specified in the contract documents; except, for those applications for Class B non-shrink grout and epoxy grout specified herein. Class A non-shrink grout may be used in place of Class B non-shrink grout for all applications.
  - (b) Class B non-shrink grout shall be used for the repair of all holes and defects in concrete members which are not water-bearing and not in contact with soil or other fill material, grouting under all base plates for structural steel members, and grouting railing posts in place

### B. Epoxy Grout:

1. Epoxy grout shall be a pourable, non-shrink, 100 percent solids system. The epoxy grout system shall have three components: resin, hardener, and specially blended aggregate, all premeasured and prepackaged. The resin

component shall not contain any non-reactive diluents. Resins containing butyl glycidyl ether (BGE) or other highly volatile and hazardous reactive diluents are not acceptable. Variation of component ratios is not permitted unless specifically recommended by the manufacturer. Manufacturer's instructions shall be printed on each container in which the materials are packaged. Epoxy grout shall be BurkEpoxy Anchoring Grout by The Burke Company.

2. The chemical formulation of the epoxy grout shall be that recommended by the manufacturer for the particular application.
3. The mixed epoxy grout system shall have a minimum working life of 45 minutes at 75 degrees F.
4. The epoxy grout shall develop a compressive strength of 5000 psi in 24 hours and 10,000 psi in seven days when tested in accordance with ASTM C 579, Method B. There shall be no shrinkage (0.0 percent) and a maximum 4.0 percent expansion when tested in accordance with ASTM C 827.
5. The epoxy grout shall exhibit a minimum effective bearing area of 95 percent. This shall be determined by a test consisting of filling a 2-inch diameter by 4-inch high metal cylinder mold covered with a glass plate coated with a release agent. A weight shall be placed on the glass plate. At 24 hours after casting, the weight and plate shall be removed and the area in plan of all voids measured. The surface of the grout shall be probed with a sharp instrument to locate all voids.
6. The peak exotherm of a 2-inch diameter by 4-inch high cylinder shall not exceed 95 degrees F when tested with 75 degree F material at laboratory temperature. The epoxy grout shall exhibit a maximum thermal coefficient of  $30 \times 10^{-6}$  inches/inch/degree F when tested according to ASTM C 531 or ASTM D 696.
7. Application: Epoxy grout shall be used to embed all anchor bolts and reinforcing steel required to be set in grout, and for all other applications required in the Contract Documents.

### 2.03 TOPPING GROUT AND CONCRETE FILL

- A. Grout for topping of slabs and concrete fill for built-up surfaces of tank, channel, and basin bottoms shall be composed of cement, fine aggregate, coarse aggregate, water, and admixtures proportioned and mixed as specified herein. All materials and procedures specified for normal concrete in Section 03300 - Cast-in-Place Concrete, Reinforcing and Formwork shall apply except as noted otherwise herein.

- B. Topping grout and concrete fill shall contain a minimum of 564 pound of cement per cubic yard with a maximum water cement ratio of 0.45. Where concrete fill is thicker than 3 inches, "Cast-in-Place Concrete," may be used when accepted by the ENGINEER.
- C. Coarse aggregate shall be graded as follows:

<u>U.S. STANDARD SIEVE SIZE</u>	<u>PERCENT BY WEIGHT PASSING</u>
1/2"	100
3/8"	90-100
No. 4	20-55
No. 8	5-30
No. 16	0-10
No. 30	0

- D. Final mix design shall be as determined by trial mix design under supervision of the approved testing laboratory.
- E. Strength: Minimum compressive strength of topping grout and concrete fill at the end of 28 days shall be 3000 psi.

#### 2.04 CURING MATERIALS

- A. Curing materials shall be as specified in Section 03300 - Cast-in-Place Concrete, Reinforcing and Formwork for cement grout and as recommended by the manufacturer of prepackaged grouts.

#### 2.05 CONSISTENCY

- A. The consistency of grouts shall be that necessary to completely fill the space to be grouted for the particular application. Dry pack consistency is such that the grout is plastic and moldable but will not flow. Where "dry pack" is called for in the Contract Documents, it shall mean a grout of that consistency; the type of grout to be used shall be as specified herein for the particular application.
- B. The slump for topping grout and concrete fill shall be adjusted to match placement and finishing conditions but shall not exceed 4 inches.

#### 2.06 MEASUREMENT OF INGREDIENTS

- A. Measurements for cement grout shall be made accurately by volume using containers. Shovel measurement shall not be allowed.
- B. Prepackaged grouts shall have ingredients measured by means recommended by the manufacturer.

### **Part 3 - EXECUTION**

#### 3.01 GENERAL

- A. All surface preparation, curing, and protection of cement grout shall be as specified in Section 03300 - Cast-in-Place Concrete, Reinforcing and Formwork. The finish of the grout surface shall match that of the adjacent concrete.
- B. The manufacturer of Class A non-shrink grout and epoxy grout shall provide on-site technical assistance upon request.
- C. Base concrete or masonry must have attained its design strength before grout is placed, unless authorized by the ENGINEER.

#### 3.02 GROUTING PROCEDURES

- A. Prepackage Grouts: All mixing, surface preparation, handling, placing, consolidation, curing, and other means of execution for prepackaged grouts shall be done according to the instructions and recommendations of the manufacturer.
- B. Base Plate Grouting
  - 1. For base plates, the original concrete shall be blocked out or finished off a sufficient distance below the plate to provide for a one-inch thickness of grout or a thickness as shown on the Drawings.
  - 2. After the base plate has been set in position at the proper elevation by steel wedges or double nuts on the anchor bolts, the space between the bottom of the plate and the original pour of concrete shall be filled with non-shrink-type grout. The mixture shall be of a trowelable consistency and tamped or rodded solidly into the space between the plate and the base concrete. A backing board or stop shall be provided at the back side of the space to be filled with grout. Where this method of placement is not practical or where required by the ENGINEER, alternate grouting methods shall be submitted for acceptance by the ENGINEER.
- C. Topping Grout:
  - 1. All mechanical, electrical, and finish work shall be completed prior to placement of topping or concrete fill. The base slab shall be given a roughened textured surface by sandblasting or hydroblasting exposing the aggregates to ensure bonding to the base slab.
  - 2. The minimum thickness of grout topping and concrete fill shall be one inch. Where the finished surface of concrete fill is to form an intersecting angle of less than 45 degrees with the concrete surface it is to be placed against, a



key shall be formed in the concrete surface at the intersection point. The key shall be a minimum of 3-1/2-inches wide by 1-1/2-inches deep.

3. The base slab shall be thoroughly cleaned and wetted prior to placing topping and fill. No topping concrete shall be placed until the slab is complete free from standing pools or ponds of water. A thin coat of neat Type II cement grout shall be broomed into the surface of the slab just before topping of fill placement. The topping and fill shall be compacted by rolling or tamping, brought to established grade, and floated. Grouted fill for tank and basin bottoms where scraping mechanisms are to be installed shall be screeded by blades attached to the revolving mechanism of the equipment in accordance with the procedures outlined by the equipment manufacturer after the grout is brought to the established grade.
4. Topping grout placed on sloping slabs shall proceed uniformly from the bottom of the slab to the top, for the full width of the placement.
5. The surface shall be tested with a straight edge to detect high and low spots which shall be immediately eliminated. When the topping and fill has hardened sufficiently, it shall be steel troweled to a smooth surface free from pinholes and other imperfections. An approved type of mechanical trowel may be used as an assist in this operation, but the last pass over the surface shall be by hand-troweling. During finishing, no water, dry cement or mixture of dry cement and sand shall be applied to the surface.

### 3.03 CONSOLIDATION

- A. Grout shall be placed in such a manner, for the consistency necessary for each application, so as to assure that the space to be grouted is completely filled.

- END OF SECTION -

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**SECTION 03375**  
**FLOWABLE FILL**

**Part 1 - GENERAL**

1.01 SCOPE OF WORK

- A. This Section specifies the requirements for flowable fill used for trenches, support for pipe structures, culverts, utility cuts and other works where cavities exist and where firm support is needed for pavements and structural elements. Flowable fill may also be used to fill water and sewer lines, and fuel tanks placed out of service, and at other locations approved by the ENGINEER of Record.

**Part 2 - PRODUCTS**

2.01 MATERIALS

The materials used shall conform with the requirements specified in Division III of the F.D.O.T. Standard Specifications for Road and Bridge Construction, latest edition, and herein. Specific references are as follows:

- A. Portland Cement (Types I, II or II).....Section 921
- B. Fly Ash, Slag and other Pozzolanic  
Materials for Portland Cement Concrete.....Section 929
- C. Fine Aggregate (Sand)\* .....Section 902
- D. Water.....Section 923

\*Any clean sand with 100% passing 3/8" sieve and not more than 10% passing with 200 mesh may be used.

2.02 MIX PROPORTIONS

- A. The CONTRACTOR shall be responsible for producing a flowable mixture using these guidelines and by adjusting CONTRACTOR'S mixture design as called for by circumstances or as may be directed by the ENGINEER of Record.
- B. Excavatable flowable fill material shall be proportioned to produce a 28-day compressive strength of 100 psi.
- C. General mix quantities are as follows:

<b>Components</b>	<b>Pounds per Cubic Yard</b>
Cement	50-100*
Fly Ash or Granulated Blast Furnace Slag	0-600
Fine Sand	2,750 (adjust to yield one CY)
Water	500 (Maximum)

\*The percentage of cement may be increased above these limits only when early strength is required and future removal is unlikely.

- D. Weights for fine aggregate and water shall be adjusted according to cementitious content. The mix proportions shall be adjusted for removability, pumpability and flowability. If required, strength test data shall be provided prior to batching.
- E. If required by the ENGINEER of Record, the flowability can be measured by afflux time determined in accordance with ASTM C 939 and shall be 30 seconds  $\pm$  5 seconds as measured on mortar passing the No. 4 sieve. The equipment required to perform this test shall be provided by the CONTRACTOR.

## 2.03 APPROVED MIXES OF "EXCAVATABLE FLOWABLE FILL"

FDOT - Approved Design Mixes:

Plant	Mix Number
Tarmac	04-FF-65
Rinker Materials Corp.	04-FF-52
Central Concrete Supermix Inc.	06-FF-41
Cemex	06-FF-48

## **Part 3 - EXECUTION**

### 3.01 PRODUCTION AND PLACING

Flowable fill shall be produced and delivered using concrete construction equipment. Placing flowable fill shall be done by chute, pumping or other methods approved by the ENGINEER of Record.

### 3.02 CONSTRUCTION REQUIREMENTS

The flowable fill shall be placed to the designated fill line without vibration or other means of compaction. Placement shall be avoided during inclement weather, e.g. rain or ambient temperatures below 40 degrees F. The CONTRACTOR shall take all necessary precautions to prevent any damages caused by the hydraulic pressure of the fill during placement prior to hardening. Also, necessary means to confine the material within the designated space shall be provided by the CONTRACTOR.

### 3.03 ACCEPTANCE

- A. The flowable fill shall be proportioned and placed as specified herein. In general, the strength desired is the maximum hardness that can be excavated at a later date using conventional excavating equipment. No curing protection is required.
- B. The fill shall be left undisturbed until material obtains sufficient strength. Sufficient strength is 250 psi penetration resistance as measured using a hand held penetrometer. The penetrometer shall be provided by the CONTRACTOR.

- C. All flowable fill areas subject to traffic loads must have a durable riding surface.
- D. An approved type of accelerator may be approved for the placement of "Flowable Fill" in traffic areas when submitted to the Department for D.O.T. approval.

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**SECTION 03400****PRECAST CONCRETE****Part 1 - GENERAL**

## 1.01 THE REQUIREMENT

- A. The CONTRACTOR shall furnish all tools, equipment, materials, and supplies and shall perform all labor required to complete the precast concrete work in accordance with the Contract Documents.
- B. This Section covers the design, fabrication, delivery and installation of all precast concrete units, including connections, complete, in place, as shown and specified.
- C. Precast concrete units shall be designed and fabricated by an experienced and acceptable precast concrete manufacturer. The manufacturer shall have been regularly and continuously engaged in the manufacture of precast concrete units similar to that indicated in the project specifications or drawings for at least 5 years.

## 1.02 CONTRACTOR SUBMITTALS

- A. Shop Drawings:
  - 1. Shop drawings shall show details in accordance with ACI 315 and ACI 318 including installation details and design computations.
  - 2. Shop drawings, including design computations, shall be stamped and signed by a structural engineer registered in the State and shall be approved by the ENGINEER.
  - 3. Shop Drawings: Showing all elevations, dimensions, horizontal and vertical sections, openings, inserts, reinforcing, anchorage devices, details, design computations, and other requirements for each different type of panel to be incorporated into the portion of the project covered by the submittal. Drawings shall be 24 inches x 36 inches maximum.
- B. Test Reports: Tests for compressive strength of concrete shall be performed by an independent commercial testing laboratory. Copies of test reports including all test data and all test results shall be submitted.
- C. Certificates of Compliance: Certificates of compliance shall be submitted attesting that materials and products meet or exceed specified requirements.
- D. Manufacturer's Qualifications: Prior to commencing operations, a statement shall be submitted giving the qualifications of the precast concrete Manufacturer, and evidence that the Manufacturer and plant are PCI certified.

#### 1.04 QUALITY ASSURANCE

- A. General Requirements: Design members under direct supervision of a professional structural engineer experienced in design of precast concrete units, registered in the State and conforming to requirements of PCI MNL-121 and to ACI 318.
  - 1. Precast Manufacturer and erectors shall be qualified in accordance with PCI MNL-117 and MNL-116.
  - 2. Welding shall be in accordance with AWS D1.1, AWS D12.1, AWS B2.1, and AWS A5.4.

#### 1.05 DESIGN REQUIREMENTS

- A. General: The precast structure and connection design shall conform to all applicable codes and Specification for the Design, Fabrication and Erection of civil concrete structures
- B. Connections: Prior to submitting shop drawings, the CONTRACTOR shall verify the precast connection designs shown against the aforementioned and following design criteria and provide any additional materials necessary to meet the design conditions if applicable.
- C. Concrete Mix: The concrete mix shall be as stated on Section 03300, "Cast-in-Place Concrete, Reinforcing and Formwork".

#### 1.06 DELIVERY, STORAGE AND HANDLING

- A. General: Precast members shall be handled to position consistent with their shape and design; they shall be lifted and supported from design incorporated support points and provided with strong backs and other devices as required. Lifting or handling equipment shall be capable of maintaining units during manufacture, storage, transportation, erection, and in position for fastening.
- B. Blocking and supports, lateral restraints and protective materials during transport and storage shall be clean, non-staining, without causing harm to exposed surfaces, including temporary support to prevent bowing and warping. Lateral restraints shall be provided to prevent undesirable horizontal movement. Edges and exposed faces of members shall be protected to prevent straining, chipping, or spalling of concrete.
- C. Units shall be marked with date of production and final position in structure in location not visible after erection.
- D. Precast units shall be stored off the ground in a manner to prevent warpage and they shall be protected from weather, marring, and overload.

### **Part 2 - EXECUTION**

#### 2.01 INSTALLATION



- A. Examination: The CONTRACTOR shall verify that building structure, anchors, devices, and openings are ready to receive work of this Section. Beginning of installation means acceptance of existing condition.
- B. Preparation: The CONTRACTOR shall provide for erection procedures and induced loads, during erection, maintain temporary bracing in place until final support is provided, provide necessary hoisting equipment and safety and protective devices.

## 2.02 CLEANING

- A. Not sooner than 72 hours after joints are sealed, faces and other exposed surfaces of precast units shall be cleaned using a cleaning detergent recommended by the sealer manufacturer and water applied with a soft bristle brush, and thoroughly rinsed using clean water or other approved procedures.
- B. Units shall be cleaned when temperature and humidity conditions are such that surfaces dry rapidly (e.g., 70 degrees F and rising, 50 percent RH or less).
- C. Discolorations which cannot be removed by these procedures shall be considered defective work, and repaired or replaced as directed by ENGINEER.

## 2.03 PROTECTION

- A. Adjacent surfaces shall be protected from damage during sealing and cleaning operations and against damage, disfiguration or discoloration from subsequent operations. Noncombustible shielding shall be used during welding operations.

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**SECTION 09900**  
**COATING SYSTEMS**

**PART 1 - GENERAL**

1.01 DESCRIPTION

A. SCOPE:

This Section 09900 specifies coating systems, surface preparations, and application requirements for coating systems.

B. DEFINITIONS:

Specific coating terminology used in this Section 09900 is in accordance with definitions contained in ASTM D16, ASTM D3960, and the following definitions:

1. Abrasive: Material used for blast cleaning, such as sand, grit or shot.
2. Abrasive Blast Cleaning: Cleaning/surface preparation by abrasive propelled at high speed.
3. Anchor Pattern: Profile or texture of prepared surface(s).
4. ANSI: American National Standards Institute.
5. Bug Holes: Small cavities, usually not exceeding 15 mm in diameter, resulting from entrapment of air bubbles in the surface of formed concrete during placement and compaction.
6. Coating/Paint/Lining Thickness: The total thickness of primer, intermediate and/or finish coats.
7. Coating System Applicator (CSA): A generic reference to the specialty subcontractor or subcontractors retained by the Contractor to install the coating systems specified in this Section 09900.
8. Coating System Manufacturer (CSM): Refers to the acceptable coating system manufacturer, abbreviated as the CSM.
9. Coating System Manufacturer's Technical Representative(s) (CTR): Refers to the technical representative(s) of the acceptable Coating System Manufacturer and is abbreviated as CTR.
10. Dew point: Temperature of a given air/water vapor mixture at which condensation starts.
11. Dry Film Thickness (DFT): Depth of cured film, usually expressed in mils (0.001 inch). Use this definition as opposed to existing definition.

12. Drying Time: Time interval between application and curing of material.
13. Dry to Recoat: Time interval between application of material and ability to receive next coat.
14. Dry to Touch: Time interval between application of material and ability to touch lightly without damage.
15. Feather Edging: Reducing the thickness of the edge of paint.
16. Feathering: Operation of tapering off the edge of a point with a comparatively dry brush.
17. Field Coat: The application or the completion of application of the coating system after installation of the surface at the site of the work.
18. Hold Point: A defined point, specified in this Section 09900, at which work shall be halted for inspection.
19. Holiday: a discontinuity, skip, or void in coating or coating system film that exposes the substrate.
20. Honeycomb: Segregated condition of hardened concrete due to non-consolidation.
21. ICRI: International Concrete Repair Institute.
22. Incompatibility: Inability of a coating to perform well over another coating because of bleeding, poor bonding, or lifting of old coating; inability of a coating to perform well on a substrate.
23. Laitance: A layer of weak, non-durable concrete containing cement fines that is brought to the surface through bleed water because of concrete finishing and/or over-finishing.
24. Mil: 0.001 inch.
25. NACE: National Association of Corrosion Engineers.
26. Overspray: Dry spray, particularly such paint that failed to strike the intended surface.
27. Pinhole: A small diameter discontinuity in a coating or coating system film that is typically created by outgassing of air from a void in a concrete substrate resulting in exposure of the substrate or a void between coats.
28. Pot Life: Time interval after mixing of components during which the coating can be satisfactorily applied.

29. Resurfacer/Resurfacing Material: A layer of cementitious and/or resin-base material used to fill or otherwise restore surface continuity to worn or damaged concrete surfaces.
30. Shelf Life: Maximum storage time for which a material may be stored without losing its usefulness.
31. Shop Coat: One or more coats applied in a shop or plant prior to shipment to the site of the work, where the field or finishing coat is applied.
32. Spreading Rate: Area covered by a unit volume of paint at a specific thickness.
33. SSPC: The Society for Protective Coatings.
34. Stripe Coat: A separate coat of paint applied to all weld seams, pits, nuts/bolts/washers and edges by brush. This coat shall not be applied until any previous coat(s) have cured and, once applied, shall be allowed to cure prior to the application of the subsequent coat(s).
35. Surface Saturated Dry (SSD): Refers to concrete surface condition where the surface is saturated (damp) without the presence of standing water.
36. Tie Coat: An intermediate coat used to bond different types of paint coats. Coatings used to improve the adhesion of a succeeding coat.
37. Touch-Up Painting: The application of paint on areas of painted surfaces to repair marks, scratches, and areas where the coating has deteriorated to restore the coating film to an unbroken condition.
38. TPC: Technical Practice Committee.
39. Volatile Organic Compound (VOC) Content: The portion of the coating that is a compound of carbon, is photochemically reactive, and evaporates during drying or curing, expressed in grams per liter (g/l) or pounds per gallon (lb/gal).
40. Immersion: Refers to a service condition in which the substrate is below the waterline or submerged in water or wastewater at least intermittently if not constantly.
41. Weld Splatter: Beads of metal scattered near seam during welding.
42. Wet Film Thickness (WFT): The primer or coating film's thickness immediately following application. Wet film thickness is measured in mils or thousandths of an inch (0.001 inch) and is abbreviated WFT.

## 1.02 QUALITY ASSURANCE

A. REFERENCES:

This section contains references to the following documents. They are a part of this section as specified and modified. Where a referenced document contains references to other standards, those documents are included as references under this section as if referenced directly. In the event of conflict between the requirements of this section and those of the listed documents, the requirements of this section shall prevail.

Unless otherwise specified, references to documents shall mean the documents in effect at the time of Advertisement for Bids or Invitation to Bid (or on the effective date of the Agreement if there were no Bids). If referenced documents have been discontinued by the issuing organization, references to those documents shall mean the replacement documents issued or otherwise identified by that organization or, if there are no replacement documents, the last version of the document before it was discontinued. Where document dates are given in the following listing, references to those documents shall mean the specific document version associated with that date, regardless of whether the document has been superseded by a version with a later date, discontinued, or replaced.

Reference	Title
ANSI/ASC 29.4 Exhaust Systems	Abrasive Blasting Operations – Ventilation and Safe Practice
ANSI/NSF 61	Drinking Water System Components Health Effects
ANSI B74.18	Grading of Certain Abrasive Grain on Coated Abrasive Material
ASTM D16	Standard Terminology for Paint, Related Coatings, Materials, and Applications
ASTM D2200 (SSPC-VIS1)	Pictorial Surface Preparation Standards for Painting Steel Surfaces
ASTM D3960	Standard Practice for Determining Volatile Organic Compound (VOC) Content of Paints and Related Coatings
ASTM D4262	Standard Test Method for pH of Chemically Cleaned or Etched Concrete Surfaces
ASTM D4263	Standard Test Method for Indicating Moisture in Concrete by the Plastic Sheet Method
ASTM D4414	Standard Practice for Measurement of Wet Film Thickness by Notch Gages
ASTM D4417	Standard Test Methods for Field Measurement of Surface Profile of Blast Cleaned Steel
ASTM D4541	Standard Test Methods for Pull-Off Strength of Coatings On Metal Substrates Using Portable Adhesion Testers
ASTM D4787	Standard Practice for Continuity Verification of Liquid or Sheet Linings Applied to Concrete Substrates
ASTM D5162	Standard Practice for Discontinuity (Holiday) Testing of Nonconductive Protective Coating on Metallic Substrates

Reference	Title
ASTM D7234	Standard Test Method for Pull-Off Adhesion Strength of Coatings on Concrete Using Portable Adhesion Testers.
ASTM E337	Standard Test Method for Measuring Humidity With a Psychrometer
ASTM F1869	Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride
FS 595b	Federal Standard Colors
ICRI 03732	Guideline for Selecting and Specifying Concrete Surface Preparation for Sealers, Coatings, and Polymer Overlays
NACE Publication 6D-163	A Manual for Painter Safety
NACE Publication 6F-163	Surface Preparation of Steel or Concrete Tank/Interiors
NACE Publication 6G-164 A	Surface Preparation Abrasives for Industrial Maintenance Painting
NACE Standards	January 1988 Edition of the National Association of Corrosion Engineers, TPC.
NACE Standard RP0188	Standard Recommended Practice – Discontinuity (Holiday) Testing of New Protective Coatings on Conductive Substrates
NACE Standard RP0288	Standard Recommended Practice, Inspection of Linings on Steel and Concrete
NACE Standard RP0892	Standard Recommended Practice, Linings Over Concrete in Immersion Service
NACE Publication TPC2	Coatings and Linings for Immersion Service
NAPF 500-03	Surface Preparation Standard for Ductile Iron Pipe and Fittings in Exposed Locations Receiving Special External Coatings and/or Special Internal Linings
NAPF 500-03-04	Abrasive Blast Cleaning for Ductile Iron Pipe
NAPF 500-03-05	Abrasive Blast Cleaning for Cast Ductile Iron Fittings
OSHA 1910.144	Safety Color Code for Marking Physical Hazards
OSHA 1915.35	Standards – 29CFR - Painting
SSPC	Paint Application Specification No. 1.
SSPC-AB 1	Mineral and Slag Abrasives
SSPC-PA 1	Shop, Field, and Maintenance Painting of Steel
SSPC-PA 2	Measurement of Dry Coating Thickness with Magnetic Gages
SSPC-PA 9	Measurement of Dry Coating Thickness on Cementitious Substrates Using Ultrasonic Gages
SSPC-PA Guide 1	Guide for Illumination of Industrial Painting Project

Reference	Title
SSPC-PA Guide 3	A Guide to Safety in Paint Application
SSPC-PA Guide 6	Guide for Containing Debris Generated During Paint Removal Operations
SSPC-PA Guide 11	Guide for Coating Concrete
SSPC SP1	Solvent Cleaning
SSPC SP2	Hand Tool Cleaning
SSPC SP3	Power Tool Cleaning
SSPC SP5	White Metal Blast Cleaning
SSPC SP6	Commercial Blast Cleaning
SSPC SP7	Brush-Off Blast Cleaning
SSPC SP10	Near-White Blast Cleaning
SSPC SP11	Power Tool Cleaning to Bare Metal
SSPC SP12	Surface Preparation and Cleaning of Steel and Other Hard Materials by High and Ultra-High Pressure Water Jetting Prior to Recoating
SSPC SP13	Surface Preparation of Concrete
SSPC-TR2	Wet Abrasive Blast Cleaning
SSPC-TU-3	Overcoating
SSPC-TU-4	Field Methods for Retrieval and Analysis of Soluble Salts on Substrates.
SSPC V2	Systems and Specifications: Steel Structures Painting Manual, Volume 2
SSPC-VIS 1	Visual Standard for Abrasive Blast Cleaned Steel
SSPC-VIS 3	Visual Standard for Power and Hand – Tool Cleaned Steel
SSPC-VIS 4	Visual Standards (Waterjetting)
SSPC-VIS 5	Visual Standards (Wet Abrasive Blast Cleaning)
WPCF Manual of Practice No. 17	Paints and Protective Coatings for Wastewater Treatment Facilities. Guide and Paint Application Specifications.

**B. STANDARDIZATION:**

Materials and supplies provided shall be the standard products of CSMs. Materials in each coating system shall be the products of a single CSM.

The standard products of CSMs other than those specified may be acceptable when it is demonstrated to the City that they are equal in composition, durability, usefulness, and convenience for the purpose intended. Requests for consideration of CSMs other than those specified in this Section 09900 will be considered, provided the following minimum conditions are met. Such requests are not a substitution for submittals after the alternative CSMs have been considered and accepted.



1. The proposed coating system shall use an equal or greater number of separate coats to achieve the required total dry film thickness.
2. The proposed coating system shall use coatings of the same generic type as that specified including curing agent type.
3. Requests for consideration of products from CSMs other than those specified in this Section 09900 shall include information listed in paragraph 09900-1.04, Items 1, 2, and 3, demonstrating that the proposed CSM's product is equal to the specified coating system.
4. The Contractor and the proposed alternative CSM shall provide a list of references for the proposed product where the coating of the same generic type has been applied. The reference list shall include the project name, city, state, owner, phone number of owner; coating system reference and number from this Section 09900; type of facility in which it was used, generic type, and year coating was applied.

C. QUALITY CONTROL REQUIREMENTS:

1. The Contractor is responsible for the workmanship and quality of the coating system installation. Inspections by the City or the CTR will not relieve or limit the Contractor's responsibilities.
2. The Contractor's methods shall conform to requirements of this specification and the standards referenced in this Section 09900. Changes in the coating system installation requirements will be allowed only with the written acceptance of the City before work commences.
3. Only personnel who are trained by the CTR specifically for this contract or who are approved by the CSM specifically for this contract shall be allowed to perform the coating system installation specified in this Section 09900.
4. Contaminated, outdated, diluted materials, and/or materials from previously opened containers shall not be used.
5. For repairs, the Contractor shall provide the same products, or products recommended by the CSM, as used for the original coating.
6. The Contractor shall identify the points of access for inspection by the City. The Contractor shall provide ventilation, ingress and egress, and other means necessary for the City's personnel to access safely the work areas.
7. The Contractor shall conduct the work so that the coating system is installed as specified and shall inspect the work continually to ensure that the coating system is installed as specified. Coating system work that does not conform to the specifications or is otherwise not acceptable shall be corrected as specified.

8. The Contractor shall provide written daily reports that present, in summary form, test data, work progress, surfaces covered, ambient conditions, quality control inspection test findings, and other information pertinent to the coating system installation.

### 1.03 DELIVERY AND STORAGE

Materials shall be delivered to the job site in their original, unopened containers. Each container shall be properly labeled. Materials shall be handled and stored to prevent damage to or loss of label.

Labels on material containers shall show the following information:

1. Name or title of product.
2. CSM's batch number.
3. CSM's name.
4. Generic type of material.
5. Application and mixing instructions.
6. Hazardous material identification label.
7. Shelf life expiration date.

Materials shall be stored in enclosed structures and shall be protected from weather and excessive heat or cold in accordance with the CSM's recommendations. Flammable materials shall be stored in accordance with state and local requirements.

Containers shall be clearly marked indicating personnel safety hazards associated with the use of or exposure to the materials.

Material Safety Data Sheets (MSDS) for each material shall be provided to the Construction Manager.

The Contractor shall store and dispose of hazardous waste according to federal, state and local requirements. This requirement specifically addresses waste solvents and coatings.

### 1.04 SUBMITTALS:

Provide in accordance with Section 01300:

1. A copy of this specification section, with addendum updates included, and referenced and applicable sections, with addendum updates included, with each paragraph check-marked (✓) to indicate specification compliance or marked to indicate requested deviations from specification requirements or those parts which are to be provided by the Contractor or others. Check marks shall denote full compliance with a paragraph as a whole. If deviations from the specifications are indicated, and therefore requested by the Contractor, each deviation shall be underlined and denoted by a number in the margin to the right of the identified paragraph, referenced to a detailed written explanation of the reasons for requesting the deviation. The Construction Manager shall be the final authority for determining acceptability of requested deviations. The remaining portions

of the paragraph not underlined shall signify compliance on the part of the Contractor with the specifications. Failure to include a copy of the marked-up specification sections, along with justification(s) for requested deviations to the specification requirements shall be cause for rejection of the entire submittal and no further submittal material will be reviewed.

2. CSM's current printed recommendations and product data sheets for coating systems including:
  - a. Volatile organic compound (VOC) data
  - b. Surface preparation recommendations.
  - c. Primer type, where required.
  - d. Maximum dry and wet-mil thickness per coat.
  - e. Minimum and maximum curing time between coats, including atmospheric conditions for each.
  - f. Curing time before submergence in liquid.
  - g. Thinner to be used with each coating.
  - h. Ventilation requirements.
  - i. Minimum atmospheric conditions during which the paint shall be applied.
  - j. Allowable application methods.
  - k. Maximum allowable moisture content.
  - l. Maximum shelf life.
3. Affidavits signed and sealed by an officer of the CSM's corporation, attesting to full compliance of each coating system component with current and promulgated federal, state, and local air pollution control regulations and requirements.
4. Material Safety Data Sheets (MSDS) for materials to be delivered to the job site, including coating system materials, solvents, and abrasive blast media.
5. List of cleaning and thinner solutions allowed by the CSMs.
6. Storage requirements including temperature, humidity, and ventilation for Coating System Materials as recommended by the CSMs.
7. CSM's detailed, written instructions for coating system treatment and graphic details for coating system terminations in the structures to be coated including pipe penetrations, metal embedments, gate frames, and other terminations to be determined from the contract drawings. This information shall also include detail treatment for coating system at joints in concrete.
8. The Contractor and CSA shall provide a minimum of five project references each including contact name, address, and telephone number where similar coating work has been performed by their companies in the past five years.

**PART 2 - PRODUCTS**

## 2.01 MATERIALS

Notwithstanding the listing of product names in this Section 09900, the Contractor shall provide affidavits, signed and sealed by an officer of the CSM's corporation, attesting to full compliance of each coating system component with current and promulgated federal, state, and local air pollution control regulations and requirements. No coatings shall be applied to a surface until the specified affidavits have been submitted and have been reviewed and accepted. Failure to comply with this requirement shall be cause for rejection and removal of such materials from the site.

The following list specifies the material requirements for coating systems. Coating systems are categorized by generic name followed by an identifying abbreviation. If an abbreviation has a suffix number, it is for identifying subgroups within the coating system. Coating Systems E-5 and E-6 shall be NSF 61 certified.

**All of U.S. Except California**

<b>Coating System</b>	<b>CSM</b>	<b>First Coat(s)</b>		<b>Finish Coat(s)</b>
<b>Epoxy Polyurethane</b>				
		Primer Coat(s)	Intermediate Coat(s)	
EU-1	PPG PMC Carboline  International Paint/ICI Sherwin Williams Tnemec	Amercoat Carbozinc 859 Cathacoat 313 Zinc Clad IV Series 90-97	Amercoat 385 Carboguard 890 Devran 233 or 224HS Macropoxy 646 Series V69	Amercoat 450H Carbothane 134 VOC Devthane 379 Hi Solids Polyurethane Series 1075
<b>Miscellaneous</b>				
M-1	Carboline Denso Trenton	Carbowrap Priming Paste Denso Paste Waxtape Primer		Tape A, B, or C (temp. dependent) Densyl Tape #1 Wax Tape
M-2	Carboline International Paint/ICI Sherwin Williams Tnemec	Carbomastic 15 Bar-Rust 231 (231K 9100) Epoxy Mastic Aluminum II Series 135 (1243)		Carbomastic 15 Bar-Rust 231 (231K 9100) Epoxy Mastic Aluminum II Series 135 (1243)

### **PART 3 - EXECUTION**

#### 3.01 COATINGS

##### A. GENERAL:

Coating products shall not be used until the City has accepted the affidavits specified in paragraph 09900-1.04 and 2.01, the Construction Manager has inspected the materials, and the CTR has trained the Contractor and CSA in the surface preparation, mixing and application of each coating system.

##### B. SHOP AND FIELD COATS:

1. SHOP APPLIED PRIME COAT: Except as otherwise specified, prime coats may be shop-applied or field-applied. Shop-applied primer shall be compatible with the

specified coating system and shall be applied at the minimum dry film thickness recommended by the CSM. Data sheets identifying the shop primer used shall be provided to the on-site coating application personnel. Adhesion tests shall be performed on the shop primer as specified in paragraph 09900-3.01B.3. Damaged, deteriorated and poorly applied shop coatings that do not meet the requirements of this Section 09900 shall be removed and the surfaces recoated. If the shop primer coat meets the requirements of this Section 09900, the field coating may consist of touching up the shop prime coat and then applying the finish coats to achieve the specified film thickness and continuity.

2. FIELD COATS: Field coats shall consist of one or more prime coats and one or more finish coats to build up the coating to the specified dry film thickness. Unless otherwise specified, finish coats shall not be applied until other work in the area is complete and until previous coats have been inspected.

3. ADHESION CONFIRMATION: The Contractor shall perform an adhesion test after proper cure in accordance with ASTM D3359 to demonstrate that (1) the shop applied prime coat adheres to the substrate, and (2) the specified field coatings adhere to the shop coat. Test results showing an adhesion rating of 5A on immersed surfaces and 4A or better on other surfaces shall be considered acceptable for coatings 5 mils or more in thickness (Method A). Test results showing an adhesion rating of 5B on immersed surfaces and 4B or better on other surfaces shall be considered acceptable for coating thicknesses less than 5 mils.

### 3.02 PREPARATION

#### A. GENERAL:

Surface preparations for each type of surface shall be in accordance with the specific requirements of each coating specification sheet (COATSPEC) and the following. In the event of a conflict, the COATSPEC sheets shall take precedence.

Surfaces to be coated shall be clean and dry. Before applying coating or surface treatments, oil, grease, dirt, rust, loose mill scale, old weathered coatings, and other foreign substances shall be removed. Oil and grease shall be removed before mechanical cleaning is started. Where mechanical cleaning is accomplished by blast cleaning, the abrasive used shall be washed, graded and free from contaminants that might interfere with the adhesion of the coatings. The air used for blast cleaning shall be sufficiently free of oil and moisture so as not to cause detrimental contamination of the surfaces to be coated.

Where deemed necessary by the City's representative, a NACE International certified coatings inspector, provided by the City, will inspect and approve surfaces to be coated before application of a coating. Surface defects identified by the inspector shall be corrected by the Contractor at no additional cost to the City.

Cleaning and painting shall be scheduled so that dust and spray from the cleaning process shall not fall on wet, newly coated surfaces. Hardware, hardware accessories, nameplates, data tags, machined surfaces, sprinkler heads, electrical fixtures, and similar uncoated items which are in contact with coated surfaces shall be removed or masked prior to surface preparation and painting operations. Following completion of coating, removed items shall be reinstalled. Equipment adjacent to walls shall be disconnected and moved to permit cleaning and painting of equipment and walls and, following painting, shall be replaced and reconnected.

**B. BLAST CLEANING:**

When abrasive blast cleaning is required to achieve the specified surface preparation the following requirements for blast cleaning materials and equipment shall be met:

1. Used or spent blast abrasive shall not be reused on this project.
2. The compressed air used for blast cleaning shall be filtered and shall contain no condensed water and no oil. Moisture traps shall be cleaned at least once every four hours or more frequently as required to prevent moisture from entering the supply air to the abrasive blasting equipment.
3. Oil separators shall be installed just downstream of compressor discharge valves and at the discharge of the blast pot discharges. These shall be checked on the same frequency as the moisture traps as defined in item 2 above.
4. Regulators, gauges, filters, and separators shall be in use on compressor air lines to blasting nozzles times during this work.
5. An air dryer or desiccant filter drying unit shall be installed which dries the compressed air prior to blast pot connections. This dryer shall be used and maintained for the duration of surface preparation work.
6. The abrasive blast nozzles used shall be of the venturi or other high velocity type supplied with a minimum of 100 psig air pressure and sufficient volume to obtain the blast cleaning production rates and cleanliness/specified.
7. The Contractor shall provide ventilation for airborne particulate evacuation (meeting pertinent safety standards) to optimize visibility for both blast cleaning and inspection of the substrate during surface preparation work.
8. If, between final surface preparation work and coating system application, contamination of prepared and cleaned metallic substrates occurs, or if the prepared substrates' appearance darkens or changes color, recleaning by water blasting, reblasting and abrasive blast cleaning shall be required until the specified degree of cleanliness is reclaimed.
9. The Contractor is responsible for dust control and for protection of mechanical, electrical, and other equipment adjacent to and surrounding the work area.

**C. SOLVENT CLEANING:**

Any solvent wash, solvent wipe, or cleaner used, including but not limited to those used for surface preparation in accordance with SSPC SP-1 Solvent Cleaning and shall be of the emulsifying type which emits no more than 340 g/l VOCs for AIM regions, 250 g/l for CARB

regions and 100 g/l for SCAQMD regions, contains no phosphates, is biodegradable, removes no zinc, and is compatible with the specified primer.

Clean white cloths and clean fluids shall be used in solvent cleaning.

#### D. METALLIC SURFACES:

Metallic surfaces shall be prepared in accordance with applicable portions of surface preparation specifications of the Society for Protective Coatings (SSPC) specified for each coating system. See Coat Spec for each coating system in this Section 09900. The profile depth of the surface to be coated shall be in accordance with the COATSPEC requirements in this Section measured by Method C of ASTM D4417. Blast particle size shall be selected by the Contractor to produce the specified surface profile. The solvent in solvent cleaning operations shall be as recommended by the CSM.

Preparation of metallic surfaces shall be based upon comparison with SSPC-VIS1-89 (ASTM D2200), and as described in the Coat Spec for each coating system. If dry abrasive blast cleaning is selected and to facilitate inspection, the Contractor shall, on the first day of cleaning operations, abrasive blast metal panels to the standards specified. Plates shall measure a minimum of 8-1/2 inches by 11 inches. Panels meeting the requirements of the specifications shall be initialed by the Contractor and the Construction Manager and coated with a clear non-yellowing finish. One of these panels shall be prepared for each type of abrasive blasting and shall be used as the comparison standard throughout the project.

Blast cleaning requirements for steel, ductile iron and stainless steel substrates are as follows:

1. Steel piping shall be prepared in accordance with SSPC SP-6 (Commercial Blast Cleaning) and primed before installation. Ductile iron piping surfaces including fittings shall be prepared in accordance with NAPF 500-03, NAPF 500-03-04, and NAPF 500-03-05.
2. Stainless steel surfaces shall be abrasive blast cleaned to leave a clean uniform appearance with a minimum surface profile of 1.5 to 2.5 mils that is uniform.
3. Remove traces of grit, dust, dirt, rust scale, friable material, loose corrosion products or embedded abrasive from substrate by vacuum cleaning prior to coating application.
4. Care must be taken to prevent contamination of the surface after blasting from worker's fingerprints, deleterious substances on workers' clothing, or from atmospheric conditions.
5. Ambient environmental conditions in the enclosure must be constantly monitored and maintained to ensure the degree of cleanliness is held and no "rust back" occurs prior to coating material application.

### 3.03 APPLICATION

#### A. WORKMANSHIP:



1. Coated surfaces shall be free from runs, drips, ridges, waves, laps, and brush marks. Coats shall be applied to produce an even film of uniform thickness completely coating corners and crevices.
2. The Contractor's equipment shall be designed for application of the materials specified. Compressors shall have suitable traps and filters to remove water and oils from the air. A paper blotter test shall be performed by the Contractor when requested by the Construction Manager to determine if the air is sufficiently free of oil and moisture so as not to produce deteriorating effects on the coating system. The amount of oil and moisture in spray air shall be less than the amount recommended by the CSM. Spray equipment shall be equipped with mechanical agitators, pressure gages, and pressure regulators, and spray nozzles of the proper sizes.
3. Each coat of coating material shall be applied evenly and sharply cut to line. Care shall be exercised to avoid overspraying or spattering paint on surfaces not to be coated. Glass, hardware, floors, roofs, and other adjacent areas and installations shall be protected by taping, drop cloths, or other suitable measures.
4. Coating applications method shall be conventional or airless spray, brush or roller, or trowel as recommended by CSM.
5. Allow each coat to cure or dry thoroughly, according to CSM's printed instructions, prior to recoating.
6. Vary color for each successive coat for coating systems when possible.
7. When coating complex steel shapes, prior to overall coating system application, stripe coat welds, edges of structural steel shapes, metal cut-outs, pits in steel surfaces, or rough surfaces with the primer coat. This involves applying a separate coat using brushes or rollers to ensure proper coverage. Stripe coat via spray application is not permitted.

**B. COATING PROPERTIES, MIXING AND THINNING:**

Coatings, when applied, shall provide a satisfactory film and smooth even surface. Glossy undercoats shall be lightly sanded to provide a surface suitable for the proper application and adhesion of subsequent coats. Coating materials shall be thoroughly stirred, strained, and kept at a uniform consistency during application. Coatings consisting of two or more components shall be mixed in accordance with the CSM's instructions. Where necessary to suit the conditions of the surface, temperature, weather and method of application, the coating may be thinned as recommended by the CSM immediately prior to use. The volatile organic content (VOC) of the coating as applied shall comply with prevailing air pollution control regulations. Unless otherwise specified, coatings shall not be reduced more than necessary to obtain the proper application characteristics. Thinner shall be as recommended by the CSM.

**C. ATMOSPHERIC CONDITIONS:**

Coatings shall be applied only to surfaces that are dry, and only under conditions of evaporation rather than condensation. Coatings systems shall not be applied during rainy, misty weather, or to surfaces upon which there is frost or moisture condensation. During damp weather, when the temperature of the surface to be coated is within 10 degrees F of the dew point, forced dehumidification equipment may be used to maintain a temperature of minimum 40 degrees F and 10 degrees F above the dew point for the surfaces to be coated, the coated surface, and the atmosphere in contact with the surface. These conditions shall be maintained for a period of at least 8 hours or as recommended by the CSM. Where conditions causing condensation are severe, dehumidification equipment, fans, and/or heaters shall be used inside enclosed areas to maintain the required atmospheric and surface temperature requirements for proper coating application and cure.

D. CONCRETE SUBSTRATE TEMPERATURES AND DETAIL TREATMENT:

1. When the surface temperatures of the concrete substrates to be coated are rising or when these substrates are in direct sunlight, outgassing of air from the concrete may result in bubbling, pinhole formations, and/or blistering in the coating system. The application of the filler/surface and the coating system will only be allowed during periods of falling temperature. This will require that application of the filler/surface and coating system shall only occur during the cooler evening hours. Contractor shall include any cost for working outside of normal hours in the bid.

Should bubbles, pinholes, or discontinuities form in the applied coating system material, they shall be repaired as recommended by the CSM. Should pinholes develop in the filler/surfacer material or in the first coat of the coating material, the pinholes shall be repaired in accordance with the CSM's recommendations prior to application of the next coat of material. Whenever pinholes occur, the air void behind or beneath the pinhole shall be opened up completely and then completely filled with the specified filler/surfacer material. Next, the coated area around the pinhole repair shall be abraded and the coating reapplied over that area.

2. Perform application detail work per CSM's current written recommendations and/or drawings.

E. PROTECTION OF COATED SURFACES:

Items that have been coated shall not be handled, worked on, or otherwise disturbed, until the coating is completely dry and hard. After delivery at the site, and upon permanent erection or installation, shop-coated metalwork shall be recoated or retouched with specified coating when it is necessary to maintain the integrity of the film.

F. METHOD OF COATING APPLICATION:

1. Where two or more coats are required, alternate coats shall contain sufficient compatible color additive to act as indicator of coverage, or the alternate coats shall be of contrasting colors. Color additives shall not contain lead, or lead compounds, which may be destroyed or affected by hydrogen sulfide or other corrosive gas, and/or chromium.

2. Mechanical equipment, on which the equipment manufacturer's coating is acceptable, shall be touch-up primed and coated with two coats of the specified coating system to match the color scheduled. Electrical and instrumentation equipment specified in Divisions 16 and 17 shall be coated as specified in paragraph 09900-3.03 I.
3. Coatings shall not be applied to a surface until it has been prepared as specified. The primer or first coat shall be applied by brush to ferrous surfaces that are not blast-cleaned. Coats for blast-cleaned ferrous surfaces and subsequent coats for nonblast-cleaned ferrous surfaces may be either brush or spray applied. After the prime coat is dry, pinholes and holidays shall be marked, repaired in accordance with CSM's recommendations and retested before succeeding coats are applied. Unless otherwise specified, coats for concrete and masonry shall be brushed, rolled, or troweled.

G. FILM THICKNESS AND CONTINUITY:

1. WFT of the first coat of the coating system and subsequent coats shall be verified by the Contractor, following application of each coat.
2. The surface area covered per gallon of coating for various types of surfaces shall not exceed those recommended by the CSM. The first coat, referred to as the prime coat, on metal surfaces refers to the first full paint coat and not to solvent wash, grease emulsifiers or other pretreatment applications. Coatings shall be applied to the thickness specified, and in accordance with these specifications. Unless otherwise specified, the average total thickness (dry) of a completed protective coating system on exposed metal surfaces shall be not less than 1.25 mils per coat. The minimum thickness at any point shall not deviate more than 25 percent from the required average. Unless otherwise specified, no less than two coats shall be applied.
3. In testing for continuity of coating about welds, projections (such as bolts and nuts), and crevices, the Construction Manager shall determine the minimum conductivity for smooth areas of like coating where the dry-mil thickness has been accepted. This conductivity shall be the minimum required for these rough or irregular areas. Pinholes and holidays shall be recoated to the required coverage.
4. The ability to obtain specified film thickness is generally compromised when brush or roller application methods are used and, therefore, more coats may need to be applied to achieve the specified dry film thickness.
5. For concrete substrates, the Contractor shall apply a complete skim coat of the specified filler/surfacer material over the entire substrate prior to application of the coating system. This material shall be applied such that all open air voids and bugholes in the concrete substrate are completely filled prior to coating application.

#### H. SPECIAL REQUIREMENTS:

Before erection, the Contractor shall apply all but the final finish coat to interior surfaces of roof plates, roof rafters and supports, pipe hangers, piping in contact with hangers, and contact surfaces that are inaccessible after assembly. The final coat shall be applied after erection. Structural friction connections and high tensile bolts and nuts shall be coated after erection. Areas damaged during erection shall be hand-cleaned or power-tool cleaned and recoated with primer coat prior to the application of subsequent coats. Touch-up of surfaces shall be performed after installation. Surfaces to be coated shall be clean and dry at the time of application. Except for those to be filled with grout, the underside of equipment bases and supports that have not been galvanized shall be coated with at least two coats of primer specified for system E-2 prior to setting the equipment in place. Provide coating system terminations at leading edges and transitions to other substrates in accordance with the CSM's recommendations or detail drawings.

#### J. SOLUBLE SALT CONTAMINATION OF METALLIC SUBSTRATES:

Contractor shall test in accordance with SSPC-TU-4 metallic substrates to be coated that have been exposed to seawater or coastal air or to industrial fallout of particulate or other sources of soluble chlorides (such as wastewater exposure). If testing indicates detrimental levels of soluble salts, those in excess of 25 ppm, the Contractor shall clean and prepare these surfaces to remove the soluble salts.

#### 3.04 CLEANUP

Upon completion of coating, the Contractor shall remove surplus materials, protective coverings, and accumulated rubbish, and thoroughly clean surfaces and repair overspray or other coating-related damage.

#### 3.05 COATING SYSTEM SPECIFICATION SHEETS (COATSPEC)

Coating systems for different types of surfaces and general service conditions for which these systems are normally applied are specified on the following COATSPEC sheets. Surfaces shall be coated in accordance with the COATSPEC to the system thickness specified. Coating systems shall be as specified in paragraph 09900-3.06, Coating System Schedule. In case of conflict between the schedule and the COATSPECS, the requirements of the schedule shall prevail.

Coating Specification Sheets included in Table 09900A are included this paragraph 09900-3.05.

**Table 09900A Coating Specification Sheets**

Coating System ID	Coating Material	Surface	Service Condition
M-1	Petrolatum based mastic or wax based wrapping tapes	Metal	Below grade (buried) or where little to no surface preparation can be performed on piping or structural steel.
M-2	Epoxy mastic or equal	Ferrous Metal	Interior, corrosive environment, confined enclosures, where minimal surface preparation is possible.
EU-1	Zinc-epoxy-polyurethane system	Ferrous Metal	Exterior, exposed to direct sunlight, moderately corrosive non-immersed.

## 3.05A COATING SYSTEM SPECIFICATION SHEETS (COATSPEC)

Coating System Identification: EU-1

Coating Material: Zinc-Epoxy-Polyurethane System

Surface: Ferrous Metal

Service Condition: Exterior, exposed to direct sunlight, moderately corrosive, non-immersed.

## Surface Preparation:

General: Shop primed surfaces which are to be incorporated in the work shall be prepared in the field by cleaning surfaces in accordance with SSPC SP-2 (Hand Tool Cleaning). Damaged shop coated areas shall be cleaned in accordance with SSPC SP-3 (Power Tool Cleaning) and recoated with the primer specified.

Ferrous Metal: Bare ferrous metal surfaces shall be prepared in accordance with SSPC SP-6 (Commercial Blast Cleaning) 2.5 – 3.0. Ductile iron surfaces to be coated shall be abrasive blast cleaned in accordance with paragraph 09900-3.02 D.

Ferrous metal with rust bleeding shall be cleaned in accordance with SSPC-SP-11 (Power Tool Cleaning to Bare Metal). Areas of rust penetration shall be spot blasted to SSPC SP-10 (Near White Blast) and spot primed with the specified primer.

Galvanized Metal: Damaged galvanized steel areas with exposed ferrous metal and/or rusted shall be cleaned in accordance with SSPC SP-5 (White Metal Blast Cleaning) or Power Tool Cleaned to Bare Metal in accordance with SSPC-SP-11 to achieve a uniform 1.0- to 1.5-mil profile and spot primed with the primer specified.

Nonferrous and galvanized metal shall be prepared in accordance with SSPC SP-7 (Brush-off Blast Cleaning) to impart a 1.0- to 2.0-mil profile to the galvanized steel surfaces. Where this cannot be performed, prepare by abrading in accordance with SSPC-SP-3, Power Tool Cleaning to impart a 1.0- to 1.5-mil profile uniformly to the galvanized steel surfaces.

## 3.05A COATING SYSTEM SPECIFICATION SHEETS (COATSPEC)

Coating System Identification: EU-1 (continued)

For EU-1 over galvanized steel, delete the zinc rich primer.

Application:	Field
General:	Prime coat may be thinned and applied as recommended by the CSM, provided the coating as applied complies with prevailing air pollution control regulations.
Ferrous Metal:	Prime coats shall be a zinc rich epoxy or polyurethane primer compatible for use with urethane finish coats and applied in accordance with written instructions of the CSM or in the case of CARB or SCAQMD applications, prime with specified primer that is not zinc rich. In these cases, only a two-coat system is applied.
System Thickness:	3 to 4 mils of zinc rich primer, one intermediate or primer epoxy coat at 5 to 6 mils and one finish coat of polyurethane at 2 to 3 mils DFT.
Coatings:	
Primer:	One coat at CSM's recommended dry film thickness.
Intermediate:	One coat at CSM's recommended dry film thickness.
Finish:	One coat at CSM's recommended dry film thickness per coat to meet the specified system thickness.

## 3.05B COATING SYSTEM SPECIFICATION SHEETS (COATSPEC)

- Coating System Identification: M-1
- Coating Material: Petrolatum based mastic or wax based wrapping tapes.
- Surfaces: Metal
- Service Condition: Below grade (buried) or where little to no surface preparation can be performed on piping or structural steel.
- Surface Preparation: Remove loose scale, rust, dirt, excessive moisture, or frost from the surface in accordance with SSPC SP-2 (Hand Tool Cleaning).
- Application: All surfaces shall be hand rubbed or brushed with a priming paste recommended by the CSM. Sharp projections such as threads, irregular contours, or badly pitted areas shall receive a liberal amount of priming paste to ensure maximum protection of metal throughout.
- On irregular shaped surfaces, i.e., nuts, bolts, flanges, valves, etc., the Contractor shall use either of the following systems recommended by the CSM.
- A. Apply recommended mastic by hand in sufficient quantity to build an even contour over entire surface. The Contractor shall pay particular attention to ensure that folds and air pockets within the mastic layer are thoroughly pressed out prior to subsequent application of tape.
- OR:
- B. An extra layer of tape shall be cut and carefully molded around sharp projections, nuts, bolts, etc., before final application of tape, in order to meet specified system thickness.



## 3.05B COATING SYSTEM SPECIFICATION SHEETS (COATSPEC)

Coating System Identification: M-1 (Continued)

Tape shall be spirally wrapped with a 55 percent overlap and sufficient tension and pressure to provide continuous adhesion without stretching the tape. Edges of tape must be continuously smoothed and sealed by hand during wrapping. On vertical application, contractor shall begin at bottom and proceed upward creating a weatherboard overlap.

System Thickness: Smooth contours shall have a minimum thickness of 50 mils while nuts, bolts, and sharp projections shall be 100 mils.

Tape: Number and types of tape wraps shall be in accordance with the CSM's written instructions.

## 3.05 COATING SYSTEM SPECIFICATION SHEETS (COATSPEC)

Coating System Identification:	M-2
Coating Material:	Epoxy mastic or equal
Surface:	Ferrous Metal
Service Condition:	Interior, corrosive environment, confined enclosures, where minimal surface preparation is possible.
Surface Preparation:	
Ferrous Metal:	All uncoated ferrous metal surfaces shall be prepared in accordance with SSPC SP-3 (Power Tool Cleaning), or SSPC-SP-11 (Power to Cleaning to Bare Metal) prior to assembly. Surface preparation to achieve a uniform surface profile of 2.0 to 2.5 mils. Shop primed ferrous metal surfaces and fabricated assemblies shall be clean and dry prior to the application of field coats. Following assembly, the Contractor shall smooth welds and prominences using power tools prior to the application of the field applied coatings.
Application:	Field
General:	Prior to the application of field applied coatings, welds, back-to-back angles, sharp or rough edges and weld splatter shall be brushed with the specified prime coat and allowed to cure overnight.
System Thickness:	15 mils dry film.
Coatings:	
Prime:	One coat of the CSM's recommended dry film thickness.
Finish:	One or more coats of CSM's recommended dry film thickness per coat to the specified system thickness.

### 3.06 COATING SYSTEMS SCHEDULE (FINISH SCHEDULE)

Specific coating systems, colors, and finishes for rooms, galleries, piping, equipment, and other items that are coated or have other architectural finishes are specified in the following coating system schedule. Unless otherwise specified in the coating system schedule, the word "interior" shall mean the inside of a building or structure, and the word "exterior" shall mean outside exposure to weather elements.

Location Description	Surface	Coating System Identification	Standard Color
A. General:  Water main replacement	1. Water mains		
	1) Exposed piping (Sherman Street Bridge)	EU-1	Blue
	2) Buried piping, valves.	M-1 or M-2	Stripe pipe with 2-inch color blue
	2. Fire hydrants	EU-1	FS 21302 Red

Notes:

1. Owner will select color from coating manufacturer's list of EPA approved colors for potable water.

### 3.07 INSPECTION AND TESTING BY CITY

- A. Inspection by the City or others does not limit the Contractor's or CSA's responsibilities for quality workmanship or quality control as specified or as required by the CSM's instructions. Inspection by the City is in addition to any inspection required to be performed by the Contractor.
- B. The City may perform, or contract with an inspection agency to perform, quality control inspection and testing of the coating work covered by this Section 09900. These inspections may include the following:
  1. Inspect materials upon receipt to ensure that are supplied by the CSM.
  2. Inspect to verify that specified storage conditions for the coating system materials, solvents and abrasives are provided.
  3. Inspect and record findings for the degree of cleanliness of substrates.
  4. Inspect and record the pH of concrete and metal substrates.
  5. Inspect and record substrate profile (anchor pattern).
  6. Measure and record ambient air and substrate temperature.
  7. Measure and record relative humidity.

8. Check for the presence of substrate moisture in the concrete.
9. Inspect to verify that correct mixing of coating system materials is performed in accordance with CSM's instructions.
10. Inspect, confirm, and record that the "pot life" of coating system materials is not exceeded during installation. Inspect to verify that recoat limitations for coating materials are not exceeded.
11. Perform adhesion testing.
12. Measure and record the thickness of the coating system.
13. Inspect to verify proper curing of the coating system in accordance with the CSM's instructions.
14. Perform holiday or continuity testing for coatings that will be immersed or coatings that will be exposed to aggressively corrosive conditions.

### 3.08 FINAL INSPECTION

- A. Contractor shall conduct a final inspection to determine whether coating system work meets the requirements of the specifications.
- B. The Construction Manager will subsequently conduct a final inspection with the Contractor to determine the work is in conformance with requirements of the contract documents.
- C. Any rework required shall be marked. Such areas shall be recleaned and repaired as specified at no additional cost to the City.

- END OF SECTION -

**SECTION 13111****POLYETHYLENE ENCASEMENT FOR CAST/DUCTILE  
IRON PIPE, FITTINGS, VALVES AND RISERS****Part 1 - GENERAL**

## 1.01 DESCRIPTION

- A. As required by the ENGINEER, all cast/ductile iron pipe, fittings, valves and risers shall be encased with polyethylene film in order to prevent contact between the pipe and the surrounding soil for the purpose of corrosion protection, following all requirements of this section.

## 1.02 RELATED WORK SPECIFIED ELSEWHERE

- A. Section 01300 – Submittals
- B. Section 15000 – Piping General

## 1.03 REFERENCED SPECIFICATIONS, CODES AND STANDARDS

- A. AWWA C105-10
- B. ANSI A21.5
- C. ASTM D149
- D. ASTM D882
- E. ASTM D1248
- F. ASTM D1709-B
- G. ASTM D1922
- H. ASTM D4976
- I. NT4112-05

## 1.04 SUBMITTALS

- A. Submit following Section 01300.
  - 1. Manufacturer's product data for polyethylene tubing
  - 2. Manufacturer's product data for polyvinyl tape

**Part 2 - PRODUCTS**

2.01 MATERIALS

A. Polyethylene Tube:

1. Only virgin polyethylene material shall be approved. The material shall be 8 mil minimum, Group 2, Linear Low Density, flat tube polyethylene film meeting or exceeding the requirements of AWWA C105-10, ANSI A21.5-88, ASTM D4976 and NT4112-05, and having the following properties:

Tensile Strength	3600 psi, minimum - ASTM D882
Elongation	800%, minimum - ASTM D882
Dielectric Strength	800 V/mil, minimum - ASTM D149
Impact Resistance	600 g, minimum - ASTM D1709-B
Propagation Tear Resistance	2550 gf, minimum - ASTM D1922

The film shall be marked showing trademark, year of manufacture, type of resin, specification conformance, applicable pipe sizes and the words "warning: corrosion protection-repair any damage."

2. Tube size will be as listed below:

Nominal pipe diameter (in.)	Polyethylene flat tube width (in.)
4	16
5	20
8	24
12	30
16	37
20	45
24	54
30	67
36	81
42	95
48	108
54	121

B. Polyvinyl Tape:

1. The polyethylene encasement shall be secured to the cast/ductile iron using 6-inch, 10-mil "all weather" tape with polyvinyl film backing. On the tape shall be marked the UPC code and mil thickness designation. Pipe-wrap tape shall be moisture resistant, anti-corrosive, conform and adhere to both metal and plastic.

### **Part 3 - EXECUTION**

#### 3.01 POLYETHYLENE ENCASEMENT

- A. The polyethylene sleeve (polywrap) shall be installed in accordance with ANSI/AWWA C105/A21.5, "Polyethylene Encasement for Ductile-Iron Piping for Water and Other Liquids". The polywrap shall be placed on the cast/ductile iron pipe so that no dirt or bedding material comes in contact with the pipe. All lumps of clay, mud, cinders, etc., on the pipe surface should be removed before the pipe is covered with polyethylene. If the polyethylene is damaged, it must be repaired before the trench is backfilled.
1. Small holes or tears can be repaired with a piece of tape placed over the hole. Large holes or tears should be repaired by taping another piece of polyethylene over the hole.
  2. Overlaps, ends, and repairs can be held in place with tape or plastic tie straps until the trench is backfilled.
- B. General installation recommendations:
1. When lifting polywrapped pipe with a backhoe, use a fabric-type "sling" or padded cable to protect the polyethylene.
  2. When installing polywrap below the water table or in areas subject to tidal action, seal as thoroughly as possible both ends of each polyethylene tube with adhesive tape or plastic tie straps at the joint overlap. Also, place tape or plastic tie straps around the pipe at two (2) foot intervals.
  3. Special care shall be taken to prevent damage to wrapping when placing backfill.
  4. Quality of installation is more important than the actual sequence followed.
- C. Per AWWA C105-05, there are 3 installation methods:
1. Method "A" - The polyethylene tube should be cut to lengths that provide a one foot overlap beyond each end of a pipe section. Slip the tubing over the pipe with the printed side up, and bunch it back to clear both ends. A shallow bell hole should be made to facilitate installation of the polyethylene. Lower pipe into position and make up the joint. Pull tubing over the joint from the preceding pipe length and tape it securely to the new pipe length. Overlap the polyethylene from the new pipe length back over the same joint and tape in place on the preceding pipe barrel. Pull the polyethylene along the length of the new pipe, folding excess tubing over the top of the pipe barrel and securing it every 3 to 4 feet. Keep the excess polyethylene for the overlap of

the next joint bunched back from the joint in preparation for making the next joint. Repeat this process for each polyethylene taped into place.

2. Method "B" - Cut the polyethylene tube 1 ft. shorter than the length of pipe sections. Slip the tube around the pipe so as to allow 6 in. of bare pipe at each end. Before making a joint, slip a 3 ft. Length of polyethylene tube over the preceding pipe section. Overlap by at least 1 ft. and secure, after joint is made.
3. Method "C" - Wrap odd shaped fitting with sheet or split length of polyethylene tube by passing the sheet under the fitting and bringing it up around the body. Make seams by bringing it folding over twice, and tapping down. Tape the sheet securely in place at valve stems and other penetrations.
4. Pipe-shape fittings (bends, reducers, etc.) shall be treated according to Methods "A" and "B". Odd shaped fittings (valves, tees, etc.) shall be treated according to Method "C".

#### **Part 4 - MEASUREMENT AND PAYMENT**

- 4.01 Shall be paid for per LF of pipe wrap installed and secured in accordance with all of the above requirements, and approved by the ENGINEER for a complete installation.

-END OF SECTION-



**SECTION 15000****PIPING GENERAL****Part 1 - GENERAL**

## 1.01 THE REQUIREMENT

- A. The CONTRACTOR shall furnish and install to the required line and grade, all piping together with all fittings and appurtenances, required for a complete installation. All piping located outside the face of structures or building foundations and all piping embedded in concrete within a structure or foundation shall be considered exterior piping.
- B. The CONTRACTOR shall furnish and install fittings, couplings, connections, sleeves, adapters, harness rods and closure pieces as required to connect pipelines of dissimilar materials and/or sizes herein included under this Section and other concurrent contracts for a complete installation.
- C. The CONTRACTOR shall furnish all labor, materials, equipment, tools, and services required for the furnishing, installation and testing of all piping as shown on the Drawings, specified in this Section and required for the Work. Piping shall be furnished and installed of the material, sizes, classes, and at the locations shown on the Drawings and/or designated in this Section. Piping shall include all fittings, adapter pieces, couplings, closure pieces, joint restraints, harnessing rods, hardware, bolts, gaskets, wall sleeves, wall pipes, hangers, supports, and other associated appurtenances for required connections to equipment, valves, or structures for a complete installation.
- D. Piping assemblies under 4-inch size shall be generally supported on walls and ceilings, unless otherwise shown on the Drawings, Architectural Specifications or ordered by the ENGINEER, being kept clear of openings and positioned above "headroom" space. Where practical, such piping shall be run in neat clusters, plumb and level along walls, and parallel to overhead beams.
- E. The CONTRACTOR shall provide taps on piping where required or shown on the Drawings. Where pipe or fitting wall thicknesses are insufficient to provide the required number of threads, a boss or pipe saddle shall be installed.
- F. The work shall include, but not be limited to, the following:
  - 1. Connections to existing pipelines.
  - 2. Test excavations necessary to locate or verify existing pipe and appurtenances.

3. Installation of all new pipe and materials required for a complete installation.
4. Cleaning, testing and disinfecting as required.

#### 1.02 RELATED WORK SPECIFIED ELSEWHERE

- A. Division 1, General Requirements
- B. Division 2, Site Work
- C. Division 9, Finishes
- D. Division 15, Mechanical Construction

#### 1.03 SUBMITTALS

- A. The CONTRACTOR shall submit complete shop drawings and certificates, test reports, affidavits of compliance, of all piping systems, in accordance with the requirements in Section 01300 – Submittals and as specified in the individual piping sections.
- B. Each shop drawing submittal shall be complete in all aspects incorporating all information and data listed herein and all additional information required to evaluate the proposed piping material's compliance with the Contract Documents. Partial or incomplete submissions will be returned to the CONTRACTOR without review.
- C. Data to be submitted shall include, but not be limited to:
  1. Catalog Data consisting of specifications, illustrations, and a parts schedule that identifies the materials to be used for the various piping components and accessories. The illustrations shall be in sufficient detail to serve as a guide for assembly and disassembly.
  2. Complete layout and installation drawings with clearly marked dimensions and elevations. Piece numbers which are coordinated with the tabulated pipe layout schedule shall be clearly marked. Piping layout drawings shall provide information on the following; pipe supports, location, support type, hanger rod size, insert type and the load on the hanger in pounds.
  3. Weight of all component parts.
  4. Design calculations specified above.
  5. Tabulated pipe layout schedule which shall include the following information for all pipe and fittings, service, pipe size, working pressure, wall thickness and piece number.

- D. Certifications: Prior to installation, the CONTRACTOR shall furnish an Affidavit of Compliance certified by the pipe manufacturer that the pipe, fittings and specials furnished under this Contract comply with all applicable provisions of AWWA and these specifications.

No pipe or fittings will be accepted for use in the Work on this project until the affidavits have been submitted and accepted in accordance with Section 01300 – Submittals.

- E. All expenses incurred in making samples for certification of tests shall be borne by the CONTRACTOR.

#### 1.04 QUALITY ASSURANCE

- A. Tests: Except where otherwise specified, all materials used in the manufacture of the pipe shall be tested in accordance with the applicable Specifications and Standards.

#### 1.05 MANUFACTURER'S SERVICE REPRESENTATIVE

- A. Where the assistance of a manufacturer's service representative is advisable, in order to obtain correct pipe joints, supports, or special connections, the CONTRACTOR shall furnish such assistance at no additional cost to the CITY.

#### 1.06 MATERIAL DELIVERY, STORAGE, AND PROTECTION

- A. All piping materials, fittings, valves, and accessories shall be delivered in a clean and undamaged condition and stored off the ground, to provide protection against oxidation caused by ground contact. Any materials susceptible to UV degradation shall be protected to eliminate exposure to sunlight. All defective or damaged materials shall be replaced with new materials. Storage shall conform with Section 01550 entitled "Site Access and Storage".

#### 1.07 CLEANUP

- A. After completion of the work, all remaining pipe cuttings, joining and wrapping materials, and other scattered debris, shall be removed from the site. The entire piping system shall be handed over in a clean and functional condition.

### **Part 2 - PRODUCTS**

#### 2.01 GENERAL

- A. All specials and every length of pipe shall be marked with the manufacturer's name or trademark, size, class, and the date of manufacture. Special care in handling shall be exercised during delivery, distribution, and storage of pipe to

avoid damage and unnecessary stresses. Damaged pipe will be rejected and shall be replaced at the CONTRACTOR's expense. Pipe and specials stored prior to use shall be stored in such a manner as to keep the interior free from dirt and foreign matter.

- B. Testing of pipe before installation shall be as described in the corresponding ASTM or AWWA Specifications and in the applicable standard specifications listed in the following sections. Field testing after the pipe is installed shall be as specified in Section 15995 - Pipeline Testing and Disinfection.
- C. Joints in piping shall be of the type as specified in Section 15060, "Piping and Fittings".
- D. Unless otherwise specified or shown on the drawings, all buried exterior piping shall have restrained joints for thrust protection, and all exposed exterior piping shall have flanged joints.
- E. The Drawings indicate work affecting existing piping and appurtenances. The CONTRACTOR shall excavate test pits as required of all connections and crossings which may affect the CONTRACTOR's work prior to ordering pipe and fittings to determine sufficient information for ordering materials. The CONTRACTOR shall take whatever measurements that are required to complete the work as shown or specified.
- F. Any ferrous metal pipes are required to be polywrapped, minimum 8 mil, with polywrap and secured with polutape. Polywrap and polytape to be approved by the City.

## 2.02 SOLID SLEEVE COUPLINGS

- A. Solid sleeve couplings shall be used to connect buried service piping where shown on the Drawings. Solid sleeves shall be ductile iron, long body and shall conform to the requirements of ANSI A21.10 (AWWA C110). Unless otherwise shown or specified, solid sleeve couplings shall be Style A11760 as manufactured by American Cast Iron Pipe Co., or equal.

## 2.03 MECHANICAL COUPLINGS

- A. Construction: Mechanical couplings shall be provided where shown on the Drawings, and shall be of similar material as the pipe, without pipe stop, and shall be of sizes to fit the pipe and fittings shown. The middle ring shall be not less than 1/4-inch in thickness and shall be either 5 or 7-inches long for standard steel couplings, and 16-inches long for long-sleeve couplings. The followers shall be single-piece contoured mill section welded and cold-expanded as required for the middle rings. They shall be of sufficient strength to accommodate the number of

bolts necessary to obtain adequate gasket pressures without excessive rolling. The shape of the follower shall be of such design as to provide positive confinement of the gasket.

B. Gaskets

1. Gaskets for mechanical couplings shall be rubber-compound material that will not deteriorate from age or exposure to air under normal storage or use conditions. Gaskets for wastewater and sewerage applications shall be Buna "N", Grade 60, or equivalent suitable elastomer. The rubber in the gasket shall meet the following specifications:
  - (a) Color - Jet Black.
  - (b) Surface - Nonblooming.
  - (c) Durometer Hardness - 74 + 5.
  - (d) Tensile Strength - 1000 psi Minimum.
  - (e) Elongation - 175 percent Minimum.
2. The gaskets shall be immune to attack by the material which is being transported.
3. Where couplings are used in water containing chloramines or other fluids which attack rubber materials, gasket material shall be compatible with the piping service and fluid utilized.
4. Gasket materials used for potable water containing chloramines shall be EPDM.

C. Bolts, nuts and washers shall be ASTM A193, Grade B7 for above-ground applications. Buried applications shall use 316 stainless steel hardware.

D. Coatings: Couplings shall be shop primed with a primer compatible with the painting system specified in the Section 09940 – Painting.

E. Harnessing: Where harnesses are required for mechanical couplings, they shall be in accordance with the requirements shown on the Drawings.

F. Manufacturer shall be the following, or equal:

1. Rockwell (Smith-Blair), Style 411
2. Dresser, Style 38
3. Total Piping Solution, Inc. (TPS) -Hymax
4. Ford Meter Box Co., Inc., Style FC1 or FC3.

## 2.04 FLANGED ADAPTERS

- A. Flanged adapters shall be furnished as required and as shown on the Drawings.
- B. All flanged adapters, 12 inches in diameter and smaller, except as shown on the Drawings or directed by the ENGINEER, shall be locking type flanged adapters.
- C. Pressure and service shall be the same as connected piping.
- D. Materials shall be cast iron for pipes up to 12-inch diameter and high strength steel for pipes larger than 12 inch diameter.
- E. Flanged adapters shall be shop primed with a premium quality primer compatible with the paint system specified in Section 09940 - Painting.
- F. Bolts and nuts shall be alloy steel, corrosion-resistant and prime coated.
- G. Flanged coupling adapters shall be harnessed by tying the adapter to the nearest pipe joint flange using threaded rods and rod tabs. The threaded rods and rod tabs shall be as shown on the Drawings.
- H. Flanged adapters shall be as manufactured by Dresser Industries, Style 127 or 128, Smith Blair Corporation, or equal.

## 2.05 UNIONS

- A. For ductile iron and PVC piping, see Section 15060, "Piping and Fittings".
- B. For copper piping, unions shall have ground joints and conform to ANSI B16.18.

## 2.06 TAPPING SLEEVES AND TAPPING SADDLES

- A. Refer to Section 15102 - Tapping Sleeves and Tapping Valves.

# **Part 3 - EXECUTION**

## 3.01 INSTALLATION

- A. All piping shall be installed by skilled workmen and in accordance with the best standard practice for piping installation as shown on the Drawings, specified or recommended by the pipe manufacturer. Proper tools and appliances for the safe and convenient handling and installing of the pipe and fittings shall be used. Great care shall be taken to prevent any pipe coating from being damaged on the inside or outside of the pipe and fittings. All pieces shall be carefully examined for defects, and no piece shall be installed which is known to be cracked, damaged, or otherwise defective. If any defective pieces should be discovered after having

been installed, it shall be removed and replaced with a sound one in a satisfactory manner by the CONTRACTOR and at CONTRACTOR'S own expense. Pipe and fittings shall be thoroughly cleaned before they are installed and shall be kept clean until they are accepted in the complete work. All piping connections to equipment shall be provided with unions or coupling flanges located so that piping may be readily dismantled from the equipment. At certain applications, Dresser, Victaulic, or equal, couplings may also be used. All piping shall be installed in such a manner that it will be free to expand and contract without injury to itself or to structures and equipment to which it is connected. All piping shall be erected to accurate lines and grades with no abrupt changes in line or grade and shall be supported and braced against movement, temporary, or permanent. All exposed piping shall be installed with vertical and horizontal angles properly related to adjoining surfaces or pipes to give the appearance of good workmanship. Unless otherwise shown or approved, provided a minimum headroom clearance under all piping of 7 feet 6 inches.

- B. Unless otherwise shown or specified, all waste and vent piping shall pitch uniformly at a 1/4-inch per foot grade and accessible cleanouts shall be furnished and installed as shown and as required by local building codes. Installed length of waste and vent piping shall be determined from field measurements in lieu of the Drawings.
- C. All excavation shall be made in such a manner and to such widths as will provide ample room for properly installing the pipe and permit thorough compaction of backfill around the pipe. The minimum trench widths shall be in strict accordance with the "Trench Width Excavation Limits" as shown on the Drawings. All excavation and trenching shall be done in strict accordance with these specifications and all applicable parts of the OSHA Regulations, 29CFR 1926, Subpart P.
- D. Enlargements of the trench shall be made as needed to give ample space for operations at pipe joints. The width of the trench shall be limited to the maximum dimensions shown on the Drawings, except where a wider trench is needed for the installation of and work within sheeting and bracing. Except where otherwise specified, excavation slopes shall be flat enough to avoid slides which will cause disturbance of the subgrade, damage to adjacent areas, or endanger the lives or safety of persons in the vicinity.
- E. Hand excavation shall be employed wherever, in the opinion of the ENGINEER, it is necessary for the protection of existing utilities, poles, trees, pavements, or obstructions.
- F. No greater length of trench in any location shall be left open, in advance of pipe laying, than shall be authorized or directed by the ENGINEER and, in general,

such length shall be limited to approximately one hundred (100) feet. The CONTRACTOR shall excavate the trenches to the full depth, width and grade indicated on the Drawings including the relevant requirements for bedding. The trench bottoms shall then be examined by the ENGINEER as to the condition and bearing value before any pipe is laid or bedding is placed.

- G. No pipe trench shall be backfilled until required pressure testing has been performed. All testing shall be in accordance with Section 15995 – Pipeline Testing and Disinfection.
- H. All pipes passing through walls and/or floors shall be provided with wall pipes or sleeves in accordance with the specifications and the details shown on the Drawings. All wall pipes shall be of ductile iron and shall have a water stop located in the center of the wall. Each wall pipe shall be of the same class, thickness, and interior coating as the piping to which it is joined. All buried wall pipes shall have a coal tar outside coating on exposed surfaces.

Joint deflection shall not exceed 75 percent of the manufacturer's recommended deflection. Excavation and backfilling shall conform to the requirements of Section 02222 – Excavation and Backfill for Utilities, and as specified herein. Maximum trench widths shall conform to the Trench Width Excavation Limits shown on the Drawings and also with the latest OSHA requirements. All exposed, submerged, and buried piping shall be adequately supported and braced by means of hangers, concrete piers, pipe supports, or otherwise as may be required by the location.

- I. Following proper preparation of the trench subgrade, pipe and fittings shall be carefully lowered into the trench so as to prevent dirt and other foreign substances from gaining entrance into the pipe and fittings. Proper facilities shall be provided for lowering sections of pipe into trenches. Under no circumstances shall any of the materials be dropped or dumped into the trench.
- J. Water shall be kept out of the trench until jointing and backfilling are completed. When work is not in progress, open ends of pipe, fittings, and valves shall be securely closed so that no water, earth, or other substance will enter the pipes, fitting, or valves. Pipe ends left for future connections shall be valved, plugged, or capped, and anchored as required.
- K. All piping shall be installed in such a manner that it will be free to expand and/or contract without injury to itself or to structures and equipment to which it is connected. All piping shall be erected to accurate lines and grades with no abrupt changes in line or grade and shall be supported and braced against movement, temporary, or permanent. All exposed piping shall be installed with vertical and horizontal angles properly related to adjoining surfaces or pipes to give the



appearance of good workmanship. Pipes crossing within a vertical distance of less than or equal to one (1) foot shall be encased and supported with concrete at the point of crossing to prevent damage to the adjacent pipes as shown on the Drawings.

- L. The full length of each section of pipe shall rest solidly upon the bed of the trench, with recesses excavated to accommodate bells, couplings, joints, and fittings. Before joints are made, each pipe shall be well bedded on a solid foundation; and no pipe shall be brought into position until the preceding length has been thoroughly bedded and secured in place. Pipe that has the grade or joint disturbed after laying shall be taken up and re-laid by the CONTRACTOR at CONTRACTOR'S own expense. Pipe shall not be laid in water or when trench conditions are unsuitable for work.
- M. Proper and suitable tools and appliances for the safe convenient handling and laying of pipe shall be used and shall in general agree with manufacturer's recommendations.
- N. At the close of each work day the end of the pipeline shall be tightly sealed with a cap or plug so that no water, dirt, or other foreign substance may enter the pipeline, and this plug shall be kept in place until pipe laying is resumed.
- O. During the laying of pipe, each pipe manufacturer shall provide CONTRACTOR'S own supervisor to instruct the CONTRACTOR's pipe laying personnel in the correct procedure to be followed.
- P. All piping shall have bedding – refer to the Drawings and other Specification Sections.

### 3.02 JOINTS IN PIPING

- A. Restrained joints: shall be provided on all pipe joints as specified herein and shown on the Drawings. Restrained joints shall be made up similar to that for push-on joints.
- B. Push-on joints: include a single rubber gasket which fits into the bell end of the pipe. The gasket shall be wiped clean, flexed and then placed in the socket. Any bulges in the gasket which might interfere with the entry of the plain end of the pipe shall be removed. A thin film of lubricant shall be applied to the gasket surface which will come into contact with the spigot end of the pipe. The lubricant shall be furnished by the pipe manufacturer. The plain end of the pipe, which is tapered for ease of assembly, shall be wiped clean and a thick film of lubricant applied to the outside. The pipe shall be aligned and carefully entered into the socket until it just makes contact with the gasket. The joint assembly shall be

completed by entering the pipe past the gasket until it makes contact with the bottom of the socket. The pipe shall be pulled "home" with an approved jack assembly as recommended by the pipe manufacturer. If assembly is not accomplished by reasonable force, the plain end shall be removed and the condition corrected.

- C. Mechanical joints: shall be made up with gaskets, glands and bolts. When a joint is to be made up, the bell or socket and plain end shall be cleaned and washed with a solution or mild soap in water; the gland and gasket shall be slid onto the plain end and the end then entered into the socket until it is fully "home" on the centering ring. The gasket shall then be painted with soapy water and slid into position, followed by the gland. All bolts shall be inserted and made up hand tight and then tightened alternately to bring the gland into position evenly. Excessive tightening of the bolts shall be avoided. All nuts shall be pulled up using a torque wrench which will not permit unequal stresses in the bolts. Torque shall not exceed the recommendations of the manufacturer of the pipe and bolts for the various sizes. Care shall be taken to assure that the pipe remains fully "home" while the joint is being made. Joints shall conform to the applicable AWWA Specifications.
- D. Threaded and/or screwed joints: shall have long tapered full depth threads to be made with the appropriate paste or jointing compound, depending on the type of fluid to be processed through the pipe. All pipe up to, and including 1-1/2-inches, shall be reamed to remove burrs and stood on end and well pounded to remove scale and dirt. Wrenches on valves and fittings shall be applied directly over the joint being tightened. Not more than three pipe threads shall be exposed at each connection. Pipe, in all lines subject to temperature changes shall be cut short and cold sprung into place to compensate for expansion when hot. Joints in all piping used for chlorine gas lines shall be made up with a glycerine and litharge cement. Joints in plastic piping (PVC/CPVC) shall be laid and joints made with compounds recommended by the manufacturer.

Installation shall conform to the requirements of ASTM D2774 and ASTM D2855. Unions required adjacent to valves and equipment.

- E. Solvent or adhesive welded joints: in plastic piping shall be accomplished in strict accordance with the pipe manufacturer's recommendations, including necessary field cuttings, sanding of pipe ends, joint support during setting period, etc. Care shall be taken that no droppings or deposits of adhesive or material remain inside the assembled piping. Solvent or adhesive material shall be compatible with the pipe itself, being a product approved by the pipe manufacturer. Unions are required adjacent to valves and equipment. Sleeve-type expansion joints shall be supplied in exposed piping to permit 1-inch minimum of expansion per 100 feet of pipe length.

- F. Dielectric unions: shall be installed wherever dissimilar metals are connected except for bronze or brass valves in ferrous piping. Unions shall be provided downstream of each valve with screwed connections. The CONTRACTOR shall provide screwed or flanged unions at each piece of equipment, where shown, and where necessary to install or dismantle piping.
- G. Eccentric reducers: shall be installed where air or water pockets would otherwise occur in mains because of a reduction in pipe size.

### 3.03 TESTING

- A. All testing shall be in accordance with Section 15995 – Pipeline Testing and Disinfection

### 3.04 PAINTING

- A. All piping specified in this Section shall be painted in accordance with Section 09940 - Painting.

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**SECTION 15001****WATER SERVICES AND MISCELLANEOUS FITTINGS****Part 1 - GENERAL**

## 1.01 SCOPE

- A. This Section consists of furnishing all labor, equipment, material and appurtenances for the installation of the water service piping complete with fittings, couplings, adapters, valves, and other appurtenances required for the water service lines between the new water main and the existing water meters.

## 1.02 GENERAL INFORMATION AND DESCRIPTION

- A. The pipe and fittings shall be furnished by fully qualified manufacturers experienced in the fabrication, casting and manufacture of the pipe materials specified herein. The pipe and fittings shall be designed, fabricated and installed in accordance with the best practice of the trade and the standards specified herein.
- B. No material furnished under this specification shall be shipped to the job site until all submittals have been reviewed and approved.
- C. All new domestic water services shall be Polyethylene tubing per CITY standard details
- D. CONTRACTOR shall coordinate all work with the CITY.

## 1.03 RELATED WORK

- A. Section 02222 – Excavation and Backfill for Utilities
- B. Section 02515 – Water Services Connections and Transfers

## 1.04 SUBMITTALS

- A. The CONTRACTOR shall submit Shop Drawings in accordance with the procedures and requirements set forth in Section 01300 - Submittals.
- B. Each submittal shall be complete in all aspects incorporating all information and data listed herein and all additional information required to evaluate the proposed piping material's compliance with the Contract Documents. Partial or incomplete submissions will be returned to the CONTRACTOR without review. Data to be submitted shall include, but is not limited to: catalog data consisting of specifications, illustrations and a parts schedule that identifies the materials to be used.

- C. The CONTRACTOR shall submit to the ENGINEER certified shop tests in accordance with the Section 01300 - Submittals.
- D. The CONTRACTOR shall submit to the ENGINEER certified letters of compliance in accordance with the Section 01300 - Submittals.

## **Part 2 - PRODUCTS**

### 2.01 HIGH DENSITY POLYETHYLENE (HDPE) FOR USE IN POTABLE WATER SERVICES (1-INCH NOMINAL DIAMETER)

- A. All 1-inch high density polyethylene (HDPE) pipe used for services shall be IPS-O.D. Controlled with Standard Outside Dimension Ratio (DR) of 9, pressure rating of 200 psi, nominal outside diameter of 1.315-inches, minimum wall thickness of 0.146-inches, PE 3408, all in conformance with ASTM D3035-95 "Polyethylene (PE) Plastic Pipe (DR-PR) Based on Controlled Outside Diameter". Pipe shall be in conformance with ANSI/AWWA C901-96 "Polyethylene (PE) Pressure Pipe and Tubing, ½-inch. (13 mm) through 3-inch (76 mm), for Water Service" as modified herein. Pipe shall have a (natural) inner core with a blue colored outer shell. Pipe shall have footage marks at a maximum interval of every two feet.
- B. Polyethylene material shall have a minimum cell classification in accordance with ASTM D3350-00 "Polyethylene Plastics Pipe and Fitting Materials" of 345444D for the core, which shall be 100% virgin material, and 345444E for the outer shell. Note that both of these materials are UV stabilized as signified by the "D" for natural colored and "E" for the colored shell. Pipe shall be in conformance with NSF 61 or 14. Manufacturer shall supply certification of compliance with all of the above requirements. Certification shall ship with the pipe provided to the CITY. When required by the CITY or ENGINEER, certification shall be signed and sealed by a professional engineer licensed to practice in the State in which the manufacturer is located.
- C. All mechanical fittings utilized with HDPE pipe and tubing services shall:
  - 1. Conform with ANSI/AWWA C800-01 "Underground Service Line Valves and Fittings" as modified herein.
  - 2. Utilize AWWA Standard (Mueller) threads on tapped pipe and tapping saddles.
  - 3. Be designed and manufactured to withstand a sustained working pressure of 150 psi and to restrain the pipe against pull-out under loading beyond the tensile yield of the HDPE pipe or tubing to which it is connected.
  - 4. Be supplied by the manufacturer with a certification of these capabilities, and fittings shall not be accepted or installed without said certification. If fittings

are being supplied to the CITY, the certification shall ship with the fittings and payment will not be made without this certification. At the discretion of the ENGINEER, this certification may be required to be signed and sealed by a professional engineer licensed to practice in the State where the supplying firm is located. In all cases, fittings shall be installed in strict accordance with the manufacturer's instructions.

## 2.02 CORPORATION STOPS

- A. Corporation stops for one (1) inch water service lines shall have AWWA threaded inlet and a compressive connection outlet suitable for service pipe.
- B. Corporation Stop Manufacturers or Equal:
  - 1. Mueller
  - 2. Ford
  - 3. Hays Manufacturing Company

## 2.03 CASING PIPE

Casing pipe shall be 3-inch ID (minimum) black iron pipe.

## 2.04 TAPPING SADDLES FOR WATER SERVICE LINES

For water service lines on ductile iron pipe, double strap tapping saddles shall be constructed of 316 stainless steel, with neoprene gaskets cemented to the saddle body, and iron pipe threads designed to withstand a working pressure of five hundred (500) psi and accurately fit the pipe for which it is intended. The straps shall be forged steel with curvature accurately designed to fit pipe. All nuts and straps including threads shall be 316 stainless steel. Tapping saddles shall be Mueller K-10509, Clow F-1280, Smith Blair, or approved equal. Use a band saddle for water service lines on PVC pipe.

## 2.05 MEGATAPE

Megatape and locating metal wire to be buried 18 inches below finished grade over any PVC or HDPE water mains or water service lines (no exceptions).

## 2.06 LINE STOP FITTING

Valve cut-in on the existing water main shall be performed under pressure using line stop fittings. The body of the fittings shall be carbon steel conforming to ASTM A-36. The flange shall be steel flanges Class D, conforming to AWWA C207 with stainless steel bolts and nuts. The line stop fitting shall be manufactured by International Piping Services Company (1-407-843-2800), or equal.

## 2.07 FIRE HYDRANTS

- A. All fire hydrants shall be of the dry-barrel type and shall conform in design, material and workmanship to AWWA C502. Hydrants shall have five and one-quarter inch main valve opening and a 3-way nozzle arrangement. The connection pipe shall be ductile iron pipe conforming to AWWA C151, Class 52.
- B. The depth of bury, measured from the bottom of the connecting pipe to the ground line of the hydrant shall be 3 feet 6 inches minimum. Exact depth at each location shall be determined by depth of line to which the hydrant is connected.
- C. Inlet connection shall be six-inch mechanical joint. Typical installation detail is shown in the Contract drawing.
- D. Two - 2-1/2 inch hose nozzles and one - 4-1/2 inch pump nozzle connection threads shall conform to NFPA No. 194 (ANSI B26) Standard for Screw Threads and Gaskets for Fire Hose Couplings.
- E. Hydrants shall be furnished with accessories to include mechanical joint follower rings with set screws and at least one adjustable hydrant wrench with spanner included with every ten hydrants supplied. Barrel extension sections shall not be allowed on new fire hydrants, except by special permission from the ENGINEER.
- F. There shall be no shrubbery planted within 6 feet of any fire hydrant.
- G. All fire hydrants shall be Mueller Super Centurion Model A-423 or American Darling Model B84B, with no substitutions allowed.

## 2.08 BACTERIOLOGICAL SAMPLE POINTS

- A. Bacteriological sample points shall be provided in accordance to Broward County Health Department Standard Details, Specifications Policies and Procedures for Water Distribution.
- B. Sampling point shall not be removed until approval is obtained from Broward County Health Department.

## 2.09 FITTINGS

- A. Refer to Section 15060 - Piping and Fittings.
- B. Refer to Section 15000 - Piping General.

## **Part 3 - EXECUTION**

### 3.01 GENERAL



- A. Proper and suitable tools and appliances for the safe convenient handling and laying of pipe shall be used and, in general, conform to manufacturer's recommendations. At the time of installation, the pipe shall be examined carefully for defects, and should any pipe be discovered to be defective after being laid, it shall be removed and replaced with sound pipe by the CONTRACTOR at CONTRACTOR'S expense.
- B. Pipe and fittings shall, at all times, be handled with great care to avoid damage. In loading and unloading, they shall be lifted with cranes or hoists or slid or rolled on skidways in such manner as to avoid shock. Under no circumstances shall this material be dropped or allowed to roll or slide against obstructions. Pipe and other material shall be distributed along the right-of-way in advance of installation only to the extent approved by the ENGINEER. Such materials shall be so placed as to keep obstruction to traffic minimum.
- C. Upon satisfactory completion of the pipe bedding, a continuous trough for the pipe barrel and recesses for the pipe bells, or couplings, shall be excavated by hand digging. When the pipe is laid in the prepared trench, true to line and grade, the pipe barrel shall receive continuous, uniform support with no pressure being exerted on the pipe joints from the trench bottom.
- D. Pipe shall be installed in accordance with the manufacturer's recommendation. Before being lowered into the trench, the pipes and accessories shall be carefully examined and the interior of the pipes shall be thoroughly cleaned of all foreign matter by methods acceptable to the ENGINEER. During suspension of work, for any reason, at any time, a suitable stopper shall be placed in the end of the pipe last laid to prevent mud or other foreign material from entering the pipe. Any pipe which is disturbed or found defective shall be immediately removed and replaced with sound pipe.
- E. Lines shall be laid straight.
- F. Any work within the pipe and fittings shall be performed with care to prevent damage to the interior wall of the pipe. Damaged interior walls shall be repaired or the pipe section or fitting replaced as required by the ENGINEER. No cables, lifting arms, hooks or other devices shall be inserted into the pipe or fitting. All lifting, pulling or pushing mechanisms shall be applied to the exterior of the pipe or fitting.
- G. After pipe has been laid, reviewed and found satisfactory, sufficient backfill shall be placed along the pipe barrel to hold the pipe securely in place during the conduction of the required tests.

### 3.02 HYDRANT INSTALLATION

- A. All fire hydrants shall be installed in strict accordance with the manufacturer's published recommendations, AWWA Standards, and all applicable codes, and the applicable provisions of this Section. All installations shall be to the satisfaction of the local fire and building department.
- B. New fire hydrants and branch runs shall be installed by the Contractor where shown on the Plans and in accordance with the Standard Details herein. Installation of a new fire hydrant shall include excavation, installation of the branch run, installation of the hydrant on the branch run, the concrete anchor at the hydrant elbow, protective concrete slab in non-sidewalk areas, replacing concrete sidewalk when in sidewalk area; steel posts filled with concrete, where required; plastic warning posts where required in FDOT right of way; backfilling and compaction. Fire hydrants shall be touched up or repainted with paint, as specified, where necessary, and the same type of paint shall be used to paint the guard posts after treating the galvanized surface with a neutralizer.
- C. All hydrants isolating valves with slip joints, friction type, or caulked joint connections shall be harnessed to the main pipe by means of welded steel harness sets, or clamps and steel rods, designed for this purpose. Dry barrel fire hydrants shall be set on a bed of pea gravel not less than 18 inches deep and 3 feet square, for drainage, or as required by local regulations and conditions.
- D. All 6-inch valve additions can be performed with partial-localized system isolation with the approval of the ENGINEER and proper notifications/coordination with the City (i.e. 48 hours minimum prior notice).
- E. Existing concrete thrust blocks shall be removed.
- F. Restrained joints shall be placed at all joints of fire hydrant and pipe connections.

### 3.03 INSTALLATION OF WATER SERVICES

High Density Polyethylene (HDPE) Pipe with Standard Outside Dimension Ratio (DR) of 9 shall be used for water services  $\leq$  3-inch

- A. Up to 2-inch diameter (galvanized steel is no longer used). Water services (single and dual) are going to be provided to connect proposed water meters and also to reconnect the existing water meters that remain in place. All HDPE services require the use of a 10 gauge stranded copper blue tracer wire.
- B. 2-Inch Services: Services from the new WMs shall consist of corporation stops, 2-inch HDPE tubing, curb stops and terminal fittings as shown in the City of Hollywood Standard Details. The services shall be installed where designated in

the field by the Engineer, and will be determined as soon as possible in order that the Contractor may tap the mains as they are installed.

Each 1-inch service connection to be installed on this Project will be one of the following Short Single - Consisting of a short run of 1-inch HDPE tubing from the new water main on the same side of the street as the meter, to the existing water meter. Long Single – Consisting of 1-inch diameter HDPE tubing connected to the new water main on the opposite side of the street from the existing meter, requiring additional HDPE tubing to cross the street to the existing water meter, and requiring a 3-inch (min.) black iron casing pipe, to be installed under the pavement and 18 inches past the edge of pavement on each side.

Short Dual - Consists of a run of 1-inch HDPE tubing from the new water main on the same side of the street as the existing water meter

Long Dual - Same as above but from the new water main on the opposite side of the street from the meter, requiring additional HDPE tubing to cross the street to the existing water meter, and requiring a 3-inch (min.) black iron casing pipe, to be installed under the pavement and 18 inches past the edge of pavement on each side.

#### 3.04 TESTING AND DISINFECTION OF WATER MAIN LINES

Refer to Section 15995 - Pipeline Testing and Disinfection.

#### 3.05 TESTING AND DISINFECTION OF WATER SERVICE LINES

Refer to Section 02515 – Water Service Connections and Transfers.

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## SECTION 15010

### PVC NON-PRESSURE STORM DRAINAGE PIPE AND FITTINGS

#### Part 1 - GENERAL

##### 1.01 SCOPE

This specification includes 4" through 36" corrugated thermoplastic polyvinyl chloride (PVC) pipe and fittings with smooth interior and integral bell and spigot push-on gasket joints suitable for underground use in non-pressure applications such as sanitary sewers, storm sewers, drainage, and underdrains. The specification includes both solid and perforated pipe.

##### 1.02 RELATED WORK SPECIFIED ELSEWHERE

- A. Section 02222 - Excavation and Backfill for Utilities
- B. Section 15000 - Piping General

##### 1.03 REFERENCE SPECIFICATIONS, CODES, AND STANDARDS

###### A. Commercial Standards:

AASHTO LRFD	Bridge Design Specifications Section 12: Buried Structures and Tunnel Liners
AASHTO	Standard Specification for Highway Bridges
AASHTO	Thermoplastic Specifications
ASTM D1784	Specification for Rigid Poly (Vinyl Chloride) (PVC) Compounds and Chlorinated Poly (Vinyl Chloride) (CPVC) Compounds
ASTM D2321	Recommended Practice for Underground Installation of flexible Thermoplastic Sewer Pipe
ASTM D2412	Standard Test Method for Determination of External Loading Characteristics of Plastic Pipe by Parallel-Plate Loading
ASTM D3212	Standard Specification for Joints for Drain and Sewer Plastic Pipes using Flexible Elastomeric Seals
ASTM F949	Standard Specification for Poly (Vinyl Chloride) (PVC) Corrugated Sewer Pipe with a Smooth Interior and Fittings

#### 1.04 SUBMITTALS

- A. Samples: The CONTRACTOR shall submit to the CITY for review, samples of all the materials proposed for use on the Work. The samples shall be clearly marked to show the manufacturer's name and product identification and shall be submitted along with the manufacturer's technical data and application instructions. All sample submittals shall conform to the requirements for "Samples" in Section 01300, "Submittals".
- B. Shop Drawings: The CONTRACTOR shall submit shop drawings and laying diagrams of all Pipe, joints, fittings, and piping appurtenances in accordance with Section 01300, "Submittals".
- C. Certificates: The CONTRACTOR shall provide manufacturer's certificates for all materials indicating conformance to the Contract Documents.

#### 1.05 QUALITY ASSURANCE

- A. Testing: All materials testing will be based upon applicable ASTM Test Methods and AASHTO Standards referenced herein for the materials specified.
- B. Certificates: Manufacturer's notarized certificates of compliance shall be furnished by the CONTRACTOR.
- C. The pipe shall be subjected to the specified hydrostatic strength tests, flexure tests, and crushing tests. The crushing tests shall be made on samples taken from the center of full-length sections of pipe.

#### 1.06 CLEANUP

- A. In addition to the requirements of Section 01700, "Project Closeout", the CONTRACTOR, upon completion of backfilling and grading over trenches shall remove all excess materials and equipment from the site.

### **Part 2 - PRODUCTS**

#### 2.01 GENERAL

- A. All solid and perforated PVC pipe and fittings shall meet the requirements of ASTM F949, "Standard Specification for Poly (Vinyl Chloride) (PVC) Corrugated Sewer Pipe with a Smooth Interior and Fittings" for 4" through 36" diameter corrugated PVC with smooth interior finish. There shall be no evidence of splitting, cracking, or breaking when the pipe is tested per ASTM test method D2412 in accordance with ASTM F949 Section 7.5 and ASTM F794 section 8.5.
- B. The CONTRACTOR shall also require the manufacturer to mark the date of extrusion on the pipe. This dating shall be done in conjunction with records to be held by the manufacturer for 2 years, covering quality control tests, raw material batch number, and other information deemed necessary by the manufacturer.

- C. PVC pipe and fittings shall be homogenous throughout and free from cracks, holes, foreign inclusions or other injurious defects.
- D. PVC pipe and fittings showing signs of ultra-violet degradation will not be accepted.

## 2.02 PIPE AND FITTINGS

- A. The structural design of 4" through 36" thermoplastic PVC non-pressure pipe and fittings shall be in accordance with AASHTO LRFD titled: "Buried Structures and Tunnel Liners." To ensure long-term design strength properties, PVC pipe and fittings shall be manufactured from 12454 cell class material per ASTM D1784. Pipe and fittings shall have a minimum pipe stiffness of 46 lb./in./in. when tested in accordance with ASTM D2412.
- B. 4" through 10" diameter solid pipe shall be fabricated in 12'-6" lengths, and 12" through 36" diameter solid pipe shall be fabricated in either 14 or 22-foot lengths.
- C. 4" through 10" diameter perforated pipe shall be fabricated in 12'-6" lengths, 12" diameter perforated pipe shall be fabricated in 14' lengths, and 15" through 36" diameter perforated pipe shall be fabricated in both 14' and 22' lengths with the following perforation types:

NOMINAL DIAMETERS (IN.)	AVERAGE O.D. (SPIGOT) (IN.)	AVERAGE I.D. (IN.)	SLOT LENGTH (IN.)	SLOT WIDTH (IN.)	SLOT CENTERS (IN.)	ANGLE (DEG.)	PIPE STIFFNESS (PSI)	STANDARD PERFORATION OPEN AREA PER FOOT (IN <sup>2</sup> )	STANDARD ROUND HOLE OPEN AREA PER FOOT (IN <sup>2</sup> )	FULLY PERFORATED OPEN AREA PER FOOT (IN <sup>2</sup> )
4	4.3	3.9	1.062	0.031	0.413	152	46	1.92		
6	6.4	5.9	1.375	0.031	0.516	134	46	1.99		
8	8.6	7.9	1.800	0.031	0.689	132	46	1.90		3.80
10	10.8	9.8	2.188	0.031	0.826	114	46	1.98		3.96
12	12.8	11.7	1.688	0.051	1.033	122	46	2.00		4.00
15	15.7	14.3	2.250	0.051	1.377	124	46	2.00	1.71	4.00/3.42
18	19.2	17.6	2.250	0.051	1.377	120	46	2.00	1.71	4.00/3.42
21	22.6	20.7					46		2.70	5.40
24	25.6	23.5					46		2.70	5.40
30	32.2	29.5					46		2.20	4.40
36	38.7	35.5					46		2.00	4.00

- D. All fittings for PVC corrugated sewer pipe with a smooth interior shall conform to ASTM F949, Section 5.2.3, or F794, Section 7.2.4. To ensure compatibility, the pipe manufacturer shall provide all fittings.
- E. Pipe and fitting bells shall consist of an integral wall section with elastomeric gasket which meets the requirements of ASTM F477.
- F. All PVC pipe and fittings shall be uniform in color, opacity, density, and other physical properties.
- G. All pipe and fittings shall be continuously and permanently marked with the manufacturer's name, pipe size, the PVC cell classification and pressure rating in psi.

- H. 4" through 36" corrugated solid and perforated thermoplastic PVC non-pressure pipe and fittings with smooth interior and integral bell and spigot push-on gasket joints shall be A-2000 pipe as manufactured Contech Engineered Solutions, Inc. or approved equal.

### 2.03 Joints

- A. Joints shall be an integral bell-gasketed joint. When the joint is assembled, it shall prevent misalignment of adjacent pipes.
- B. Design joint to avoid misalignment or displacement of the gasket when installed under provisions of the manufacturer's recommendation.
- C. The manufacturer shall provide documentation showing no leakage when gasketed pipe joints are tested in accordance with ASTM test method D3212.
- D. The joint design shall meet the requirements for either of the following, as required:
  1. Soil tight joint - Tested at 2 psi hydrostatic pressure per AASHTO Standard Specification for Highway Bridges
  2. Watertight joint – Tested at 10.8 psi hydrostatic pressure per ASTM D3212 titled: "Standard Specification for Joints for Drain and Sewer Plastic Pipes using Flexible Elastomeric Seals"
- E. Use lubricants to join pipe as recommended by the manufacturer.

### 2.04 Gaskets

- A. Elastomeric seals (gaskets) shall meet the requirements of ASTM designation F477.

## **Part 3 - EXECUTION**

### 3.01 GENERAL

- A. All laying, jointing, testing for defects and for leakage shall be performed in the presence of the CITY, and shall be subject to the CITY'S approval before acceptance. All material found during the progress to have defects will be rejected and the CONTRACTOR shall promptly remove such defective materials from the work site.
- B. Installation shall conform to the requirements of ASTM D2321 and to the supplementary requirements or modifications specified herein. Wherever the provisions of this Section and the requirements of ASTM D2321 are in conflict, the more stringent provision shall apply.

### 3.02 UNLOADING AND HANDLING

- A. Never attach chains or wire rope to the pipe.



- B. Do not push pallets off the trailer or permit pipe to drop to the ground.
- C. Do not drag A-2000 Pipe across the ground.
- D. Do not stack A-2000 Pipe over two pallets high. Stacks of three or more pallets can damage bottom pipes and can become unstable.

### 3.03 TRENCHING AND BACKFILL

- A. Trench excavation and backfill shall conform to the requirements of Section 02222 - Excavation and Backfill for Utilities, and as specified herein.
- B. Unless otherwise specified or shown, trenching practice and bedding materials shall be in accordance with ASTM D2321 and OSHA rules.
- C. Foundation - When the trench bottom is soft or unstable, over-excavate and replace with compacted embedment materials, as directed by the engineer.
- D. Follow the manufacturer's recommendations for backfill and compaction materials and the pipe trench backfill detail provided on the Plans.

### 3.04 LAYING PIPE

- A. For storm sewers or exfiltration trench (French drain), pipe shall be installed in a straight line from structure to structure without deflection or fittings.
- B. The pipe shall be installed in accordance with the requirements of ASTM D 2321 and as specified herein. Sections shall be closely jointed to form a smooth flow line. Immediately before placing each section of pipe in final position for joining, the bedding for the pipe shall be checked for firmness and uniformity of surface.
- C. Proper implements, tools, and facilities as recommended by the pipe manufacturer's standard printed installation instructions shall be provided and used by the CONTRACTOR for safe and efficient execution of the Work. All pipe, fittings, valves, and accessories shall be carefully lowered into the trench by means of backhoe, ropes, or other suitable equipment in such a manner as to prevent damage to pipe and fittings. Under no circumstances shall pipe or accessories be dropped or dumped into the trench.
- D. Cutting and machining of the pipe shall be accomplished in accordance with the pipe manufacturer's standard procedures for this operation. Pipe shall not be cut with a cold chisel, standard iron pipe cutter, nor any other method that may fracture the pipe or will produce ragged, uneven edges.
- E. The pipe and accessories shall be inspected for defects prior to lowering into the trench. Any defective, damaged or unsound pipe shall be repaired or replaced. All foreign matter or dirt shall be removed from the interior of the pipe before lowering into position in the trench. Pipe shall be kept clean during and after laying. All openings in the pipe line shall be closed with water tight expandable type sewer plugs or PVC test plugs at the end of each day's operation or whenever the pipe openings are left unattended. The use of burlap, wood, or other similar temporary plugs will not be permitted.

- F. Adequate protection and maintenance of all underground and surface utility structures, drains, sewers, and other obstructions encountered in the progress of the Work shall be furnished by the CONTRACTOR.
- G. Where the grade or alignment of the pipe is obstructed by existing utility structures such as conduits, ducts, pipes, branch connections to main sewers, or main drains, the obstruction shall be permanently supported, relocated, removed, or reconstructed by the CONTRACTOR in cooperation with owners of such utility structures.

### 3.05 HANDLING

- A. Handling of the PVC pipe shall be done with care to ensure that the pipe is not damaged in any manner during storage, transit, loading, unloading, and installation, in accordance with manufacturer's recommendations.
- B. Pipe shall be inspected both prior to and after installation in the ditch and all defective lengths shall be rejected and immediately removed from the working area.

### 3.06 FIELD JOINTING

- A. Each pipe compression type joint shall be joined with a lock-in rubber ring and a ring groove that is designed to resist displacement during pipe insertion.
- B. The ring and the ring seat inside the bell shall be wiped clean before the gasket is inserted. At this time a thin film of lubricant shall be applied to the exposed surface of the ring and to the outside of the clean pipe end. Lubricant other than that furnished with the pipe shall not be used. The end of the pipe shall be then forced into the ring to complete the joint.
- C. The pipe shall not be deflected either vertically or horizontally in excess of the printed recommendations of the manufacturer of the coupling.
- D. When pipe laying is not in progress, the open ends of the pipe shall be closed to prevent trench water from entering pipe. Adequate backfill shall be deposited on pipe to prevent floating of pipe. Any pipe which has floated shall be removed from the trench, cleaned, and re-laid in an acceptable manner. No pipe shall be laid when, in the opinion of the OWNER, the trench conditions or weather are unsuitable for such Work.

### 3.07 INSTALLATION OF BENDS, TEES, AND REDUCERS

- A. For storm sewers or exfiltration trench (French drain), pipe is to be installed in a straight line from structure to structure with no fittings.
- B. PVC fittings shall be installed utilizing standard installation procedures. Fittings shall be lowered into trench by means of rope, cable, chain, or other acceptable means without damage to the fittings. Cable, rope, or other devices used for lowering fitting into trench shall be attached around exterior of fitting for handling. Under no circumstances shall the cable, rope or other device be attached through the fitting's

interior for handling. Fittings shall be carefully connected to pipe or other facility, and joint shall be checked to insure a sound and proper joint.

### 3.08 PIPE-TO-PIPE CONNECTIONS

- A. The double sealing surface A-2000 gaskets are fitted to the first two full corrugations on the spigot end of the pipe. The leading (lower) edge of the gasket is fitted into the first corrugation and is marked with the Contech logo and wording to distinguish it from the seating (higher) edge.
- B. The single sealing surface A-2000 Drainage gaskets are fitted in the first corrugation valley.
- C. Thoroughly clean the bell and spigot ends, making sure they are free of mud and grit. If the gasket has been removed, make sure the gasket seat (the first two full corrugation valleys) is clean. Reinstall the gasket by stretching it over the spigot end and nesting it into the seat.
- D. Use a Johnny mop or brush to apply a liberal amount of gasket lube to the gasket and to swab the inside of the bell. Take care to lube the chamfered (leading) edge of the bell. Keep lube and lubed surfaces free of debris.
- E. Align the joint and push the spigot to the corrugation with the home mark. The total corrugation, with the home mark, should be visible when the pipe is properly "homed." When using a bar and wood block, make sure the block protects the pipe end from the bar. It is recommended to use a nylon sling to facilitate handling and joining 21" diameter and larger A-2000. When joining, NEVER use the backhoe bucket to push against the pipe bell. When pushing the joint home, make sure the bedding material is not pulled into the bell by the spigot. Material such as small stones or sand pulled into the bell as the pipe is stabbed can impair gasket sealing and cause leaks.

### 3.09 PIPE-TO-PIPE STRUCTURE CONNECTIONS

- A. When a sound pipe stub-out exists at a structure to which connection is to be made, a pipe-to-pipe connection shall be made as described above. If a stub-out is not present or is faulty, an opening shall be cut in the structure wall and the connection made. The connection shall consist of a pipe stub-out with elastomeric waterstop grouted into the opening with non-shrink grout. A flexible band coupling, as shown on the details for new manholes, shall join the pipe stub-out to the replacement pipe.
- B. At manholes, flexible manhole connections like rubber boots, A-Loks, etc. can be used.
  - 1. Boot: With rubber boot manhole connectors, install either a standard A-2000 double gasket (8"-10") or an A-2000 manhole gasket (12"-36") on the pipe spigot under the stainless-steel strap.

2. A-Lok: Where manholes are manufactured with A-Lok connections, use a Contech PVC manhole sleeve.
3. If the manhole sleeves are not attached and the need arises in the field, follow the procedure below.
4. Place a standard gasket on the pipe about 6" from the end. Lube the gasket and the manhole sleeve and slide the manhole sleeve onto the pipe end. Restrict the coupling from sliding and push the unit (pipe and coupling) into the A-Lok connection (lube the A-Lok).
5. Waterstop-type manhole connections can be accomplished using A-2000 pipe gaskets. For cast-in-place concrete bottoms, precast bottoms with "mouse hole" or similar pipe-to-manhole entry that does not incorporate a flexible connection, use two standard A-2000 double gaskets for 8"-and 10"-diameter pipe, positioned on the pipe in the center of the manhole wall with the leading (the lower) edge of the gaskets in adjacent corrugations, then concrete grout or seal the pipe/manhole connections as required. For pipe with diameters of 12"-36" inches, use one standard A-2000 double gasket, positioned on the pipe in the center of the manhole wall, with the leading (lower) edge of the gasket closest to the inside of the manhole.

#### **Part 4 - TESTING**

- 4.01 All solid corrugated thermoplastic PVC drainage pipe shall be tested for leakage prior to backfilling. Leakage shall be tested for a minimum of two hours under a minimum hydraulic head of two (2) feet and shall not exceed five hundred (500) gal/day/inch of diameter/mile of pipe. Any portion with leakage exceeding the allowable shall be corrected and retested. This shall be repeated until all portions of the installation meet the leakage requirements.

- END OF SECTION -

## SECTION 15020

### FRENCH DRAINS

#### **Part 1 - GENERAL**

##### 1.01 SCOPE OF WORK

Construct French drains in accordance with the locations, details and cross-sections provided in the Plans, Index 443-001 of FDOT Standard Plans for Road Construction, and Section 443, "French Drains", of FDOT Standard Specifications for Road and Bridge Construction, utilizing one of the authorized types of pipe, coarse aggregate or ballast rock when specified, and filter fabric.

##### 1.02 RELATED WORK SPECIFIED ELSEWHERE

- A. Section 01300 – Submittals
- B. Section 02071 – Underground Storm Drainage Structures
- C. Section 02222 - Excavation and Backfill for Utilities
- D. Section 02160 - Temporary Excavation Support System
- E. Section 15010 - PVC Non-Pressure Storm Drainage Pipe and Fittings

##### 1.03 REFERENCE SPECIFICATIONS, CODES, AND STANDARDS

###### A. Commercial Standards:

FDOT	Standard Specifications for Road and Bridge Construction Section 443, "French Drains"
FDOT	Standard Specifications for Road and Bridge Construction Sections 514, "Filter Fabric (Geotextile)", and 985, "Geosynthetic Materials"
FDOT	Standard Plans for Road Construction Index 443-001
ASTM D2321	Recommended Practice for Underground Installation of flexible Thermoplastic Sewer Pipe
ASTM F949	Standard Specification for Poly (Vinyl Chloride) (PVC) Corrugated Sewer Pipe with a Smooth Interior and Fittings

##### 1.04 SUBMITTALS

- A. Shop Drawings: The CONTRACTOR shall submit shop drawings of all pipe and couplings, coarse aggregate or ballast rock and filter fabric in accordance with the Plans and Section 01300, "Submittals".
- B. Certificates: The CONTRACTOR shall provide manufacturer's certificates for all materials indicating conformance to the Contract Documents.

## 1.05 QUALITY ASSURANCE

- A. Testing: All materials testing will be based upon applicable ASTM Test Methods and AASHTO Standards for the materials specified.
- B. Certificates: Manufacturer's notarized certificates of compliance shall be furnished by the CONTRACTOR.

## 1.06 CLEANUP

- A. In addition to the requirements of Section 01700, "Project Closeout", the CONTRACTOR, upon completion of backfilling and grading over trenches shall remove all excess materials and equipment from the site.

## **Part 2 - PRODUCTS**

### 2.01 PIPE

- A. Unless a particular type is specified in the Plans, pipe for French drain may be any of the following types, including required couplings:
  - 1. Concrete Pipe (Bell & Spigot): Slotted or perforated concrete pipe may be used. Meet the requirements of Section 449 for concrete pipe. Do not use gaskets. Fully insert the spigot in the bell and bring home. Conform to Standard Plans, Index 443-001 for slotted pipe. Use perforated pipe having perforations equally located 360 degrees around the pipe. Use pipe having not less than 30 round perforations, 3/8 inch each, per square foot of inside pipe surface. Extend perforations to within 6 inches of the bell or spigot area. The Engineer will permit other perforations not less than 5/16 inch nor more than 3/8 inch in the least dimension if they provide an opening area not less than 3.31 in<sup>2</sup>/ft<sup>2</sup> of pipe surface.
  - 2. Corrugated High-Density Polyethylene (HDPE) Perforated Pipe: Meet the requirements of Section 948. Use perforated pipe having perforations equally located 360 degrees around the pipe. Locate perforations either on the inside crests or on the neutral axis of all corrugations except that perforations are not required within 4 inches of each end of each length of pipe or in a corrugation where seams are located. Provide pipe having not less than 30 round perforations, 3/8 inch each, per square foot of pipe surface. The Engineer will permit other perforations not less than 5/16 inch nor more than 3/8 inch in the least dimension if they provide an opening area not less than 3.31 in<sup>2</sup>/ft<sup>2</sup> of pipe surface.
  - 3. Polyvinyl Chloride (PVC) Perforated Pipe: Meet the requirements of Section 948. Meet the perforation requirements as specified in (2) above.
  - 4. Corrugated Polypropylene Perforated Pipe: Meet the requirements of Section 948. Meet the perforation requirements as specified in (2) above.

## 2.02 FILTER FABRIC

- A. Select geotextile material Type D-3 of a Class that meets the required permeability and AOS based on test results on the soil or fill adjacent to the geotextile for gradation. Materials for drainage applications must be tested in accordance with and meet the physical requirements in 985-2.2, Table 985-2.

## 2.03 COARSE AGGREGATE

- A. Meet the requirements of FDOT Standard Specifications for Road and Bridge Construction Section 901-1.4 for No. 4 stone.

## 2.04 SELECT FILL

- A. Use select fill meeting the requirements of FDOT Standard Specifications for Road and Bridge Construction Section 911.

# **Part 3 - EXECUTION**

## 3.01 EXCAVATING TRENCH

- A. Excavate the trench in accordance with Sections 02222, "Excavation and Backfill for Utilities", and Section 02160, "Temporary Excavation Support System", unless specific trench excavation procedures are described in the Plans.
- B. Carefully excavate the trench to such depths as required to permit the filter fabric, coarse aggregate, and the pipe to be placed in accordance with the details shown in the Plans.
- C. Regardless of the proposed depth of the perforated pipe shown on the plans, the top of the French drain shall be set no lower than 1 foot below proposed/existing grade.

## 3.02 LAYING PIPE

- A. Lay all pipe conforming with the lines and grades specified in the Plans and in accordance with these Specifications. Unless otherwise specified in the Plans, set the pipe with a 24-inch minimum cover and a maximum cover of 66 inches.

## 3.03 PLACING FILTER FABRIC, COARSE AGGREGATE AND BACKFILLING

- A. After excavating the French drain trench, place the filter fabric inside the trench in accordance with the Plans, Index 443-001 of FDOT Standard Plans for Road Construction, and FDOT Section 514 of FDOT Specifications for Road and Bridge Construction.
- B. Place the pipe inside the trench, and without disturbing the pipe, carefully place the coarse aggregate around the pipe to the depth shown in the Plans. Fold the filter fabric over the coarse aggregate. Backfill and compact as described below.

1. French Drains Under Pavement: Fill the area above the coarse aggregate with select fill material meeting the requirements of this Section. Place and compact the select fill according to the requirements for pipe as specified in Section 02222, "Excavation and Backfill for Utilities". The Department will allow use of additional coarse aggregate over the top of the pipe instead of select fill material. In this case, the filter fabric shall be extended to wrap the additional coarse aggregate. The top of the coarse aggregate shall not be higher than the bottom of the pavement base. The Department will not pay additional costs associated with substituting coarse aggregate for select fill.
2. French Drains not Under Pavement: Fill and compact the area above the coarse aggregate according to the requirements for pipe in Section 02222, "Excavation and Backfill for Utilities", unless specific procedures are described in the Plans.

#### **Part 4 - TESTING**

- 4.01 No less than 48 hours before placing coarse aggregate or ballast rock inside the filter fabric within the French drain excavation, the CONTRACTOR shall notify the Engineer of Record to visit the work site and measure the depth and width of the French drain excavation. The CONTRACTOR shall provide the Engineer with a measuring stick marked with the minimum required depth of the French drain. If the depth and/or width of the French drain is found to be less than that required by the Plans, the CONTRACTOR shall re-excavate the French drain trench at no additional cost until the minimum required depths/widths are achieved. The CONTRACTOR shall then notify the Engineer again to re-measure depth and width.

- END OF SECTION -



**SECTION 15060**  
**PIPING AND FITTINGS**

**Part 1 - GENERAL**

1.01 SCOPE

- A. The work included in this section consists of furnishing all material, equipment and labor, and performing all operations necessary for the complete installation of all new water main piping (PVC), fire hydrant assembly piping (DIP), fittings (ductile iron fittings for 4-inch, 6-inch, 12-inch, and 16-inch diameter water main), and accessories within the limits of work, as shown on the drawings and specified herein.
- B. Where references are made to other standards or codes, unless specific date references are indicated the latest edition of said standard or code shall govern.
- C. All new piping and fittings shall be of domestic manufacturing.

1.02 WORK NOT INCLUDED UNDER THIS SECTION

- A. Piping installation for various types of piping systems is specified within various other sections herein. Installations specified in this section are supplementary to those sections and in the case of conflict the more stringent condition shall prevail.

1.03 RELATED SECTIONS

- A. All sections specifying various types of valves.

1.04 PIPING LAYOUT

Field-verify dimensions prior to preparation of layout and shop drawings. Obtain shop drawing approval prior to fabrication of piping. All items not specifically mentioned in the Specifications or noted on the Drawings, but which are obviously necessary to make a complete working installation shall be included.

1.05 DELIVERY, STORAGE AND HANDLING

- A. During shipping, delivery and installation of pipe and accessories, handle in a manner as to ensure a sound undamaged condition.
- B. Exercise particular care not to injure pipe/fitting coatings.

## **Part 2 - PRODUCTS**

2.01 PIPE AND FITTINGS: DUCTILE IRON (pipe and fittings for fire hydrant assemblies, and ductile iron fittings for 4-inch diameter, 6-inch diameter and 8-inch diameter PVC water main pipe)

### A. GENERAL

1. As used herein, "ANSI" denotes the American National Standards Institute, "AWWA" denotes the American Water Works Association, and "ASTM" denotes the American Society for Testing and Materials.
2. All pipe and fittings to be furnished hereunder shall be manufactured in the United States, and shall conform to the referenced ANSI and/or AWWA Standard as modified herein, as appearing in the following sections.
3. All markings required on pipe and fittings, shall be clearly legible and located such that they will not be hidden or destroyed when assembled into the intended system.

### B. PIPE (for fire hydrant assemblies)

1. All pipe for fire hydrant assemblies shall be ductile iron pipe conforming to ANSI/AWWA Standard C151/A21.51, "Ductile-Iron Pipe, Centrifugally Cast, for Water". All pipe and fittings for water applications shall be in full compliance with ANSI/NSF 61, "Drinking Water System Components-Health Effects". Manufacturers shall maintain their NSF certification for the duration of the Contract and any extensions thereof.
2. The pipe thickness and outside diameter of pipe for water usage shall conform to Tables 3 and 4 (for push-on and mechanical joint pipe, respectively) of ANSI/AWWA Standard C151/A21.51 for the following sizes (The pressure class specified is the minimum permitted):

<b><u>Diameter</u></b>	<b><u>Class</u></b>
4-inch through 54-inch	Thickness Class 52

3. For restrained joint pipe, the thickness of the pipe barrel remaining after grooves are cut, if required in the design of restrained end joints, shall not be less than the nominal wall thickness of equal sized non-restrained joint pipe as shown above.
4. Each piece of pipe shall be marked as required in Subsection 4.7 of AWWA C151-02. Letters and numerals on pipe sizes 12-inch and smaller shall be not less than 3/8-inch.

5. The CITY absolutely reserves the right to require the use of higher thickness or pressure class pipe in applications where in the opinion of the ENGINEER or the CITY such use is in the best interest of the CITY. The ENGINEER's decision in this regard shall be final.
6. A sufficient quantity of non-toxic vegetable soap lubricant shall be supplied with each shipment of pipe. The soap lubricant shall be suitable for use in subaqueous trench conditions.
7. For flanged ductile-iron pipe with integrally cast flanges or threaded flanges, the nominal wall thickness of the pipe barrel shall be as specified in Section D, "Joints and Accessories", under "Flanged Joints", herein below.
8. The single gasket push-on pipe shall be shipped in standard 18-foot or 20-foot lengths, but not both. The restrained single-gasket push-on joint pipe shall be shipped in standard 18 or 20-foot lengths as specified above or fabricated lengths as noted in each order. At least two lengths of each size of single gasket push-on pipe furnished under each order shall be tested with circumferential gauges to insure that the pipe may be cut at any point along its length and have an outside diameter which will be within the manufacturer's standard design dimensions and tolerances for plain pipe. These lengths shall be identified with an easily distinguished, painted marking, longitudinally along the full length of the pipe.

### C. FITTINGS

1. Fittings Conforming with ANSI/AWWA C110/A21.10-12 (Water Use) - Restrained push-on joint fittings shall be cast ductile iron for use with ductile-iron pipe as specified above. Standard mechanical joint, push-on joint and flanged joint fittings shall also be ductile iron for use with ductile iron pipe as specified above. Cast ductile iron fittings in the 3-inch through 24-inch size range shall be pressure rated at 350 psi, minimum; (except flange-joint fittings shall be rated at 250 psi, minimum); and in the 30-inch through 48-inch size range shall be pressure rated at 250 psi, minimum. All fittings with mechanical joints, flange joints and push-on joints shall conform to ANSI/AWWA Standard C110/A21.10-98, "Ductile Iron and Gray Iron Fittings, 3-inch Through 48-inch, for Water and Other Liquids". In addition, fittings with mechanical joints and push-on joints shall conform to ANSI/AWWA Standard C111/A21.11-00, "Rubber-Gasket Joints for Ductile Iron Pipe and Fittings".

The weight of fittings shall be as given in ANSI/AWWA C110/A21.11-98 for ductile-iron fittings. The weight of mechanical joint fittings shall be as established in Tables 3 through 12.

2. Fittings Conforming with ANSI/AWWA C153/A21.53-00 (Water Use) - All fittings shall be cast ductile-iron for use with ductile-iron pipe as specified above. Fittings in the 3-inch through 24-inch size range shall be pressure

rated at 350 psi minimum; 30-inch through 48-inch size range shall be pressure rated at 250 psi minimum; and in the 54-inch through 64-inch size range shall be pressure rated at 150 psi minimum (except for those fittings such as plugs, caps and sleeves which are normally rated at a higher pressure). No flanged fittings or mixtures of flanged with other end type fittings will be allowed in the range of 3-inch through 48-inch since they are not covered in the AWWA Standard. Flanged fittings conforming with and covered by this standard are allowed in sizes 54, 60 and 64-inch. In conformance with the standard, 54, 60 and 64-inch flanged tees, crosses and reducers with outlets of smaller dimension as listed in ANSI/AWWA C153/A21.53-00 are permitted. All fittings with mechanical joints, flange joints and push-on joints shall conform to ANSI/AWWA Standard C153/A21.53-00, "Ductile-Iron Compact Fittings for Water Service". In addition, fittings with mechanical joints and push-on joints shall conform to ANSI/AWWA Standard C111/A21.11-00, "Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings" except as otherwise allowed in C153. Mechanical joint glands shall be ductile-iron only.

Since the C153 Standard provides only minimum dimensions, fully detailed drawings of all fittings proposed shall be supplied by the manufacturer with his bid. The tabulated nominal weight of each size and type of fitting shall also be supplied by the manufacturer for all items proposed. This weight shall be that of the bare casting prior to application of any lining or coating. The weight of a fitting supplied under the contract shall not be less than ninety-five (95) percent of the tabulated nominal weight supplied by the manufacturer's catalog literature for that fitting. Further, the weight of fittings supplied shall not be more than five (5) percent above the same tabulated nominal weight.

#### D. JOINTS AND ACCESSORIES

1. Push-On Type Joints (Single Gasket and Single Gasket with Gasket Restraint) - Push-on joints shall conform to ANSI/AWWA Standard C111/A21.11-12, except that the gaskets for pipe and fittings shall be neoprene where so specified.

The required number of gaskets for each push-on joint pipe plus one extra for every 50 joints or fraction thereof, shall be furnished with each order. The gaskets shall be shipped in suitable protective containers. All single-gasket pipe shall be as manufactured by United States Pipe and Foundry Company (Tyton), by the American Cast Iron Pipe Company (Fastite), by McWane, Inc. (Mix of Tyton and Fastite), Tyler/Union (Tyton) or approved equal.

Push-on joints together with both their regular and gasket-restraint gaskets shall be of the design, dimensions and tolerances of either those provided by American Cast Iron Pipe Company (Fastite/Fast-Grip) or those provided by

United States Pipe and Foundry Company (Tyton/Field Lok). No other designs shall be acceptable. If required by the CITY, the Vendor shall supply complete design drawings with dimensions, tolerances and materials of the joint and gasket being supplied within fourteen (14) calendar days of the date of receipt of the letter, fax or E-mail requiring said submission. If so required by the CITY, this submission shall be signed, sealed and dated by an ENGINEER registered to practice in the State where the manufacturer is located.

2. Mechanical Joints - Mechanical joints for fittings shall conform to ANSI/AWWA Standard C111/A21.11-12, except that the gaskets for each fitting under Groups D and D1 shall be neoprene. Bolt holes for mechanical joints shall be equally spaced, and shall straddle the vertical centerline. Tee head bolts and hexagonal nuts for all mechanical joints in fittings shall be of high strength low-alloy steel with composition, dimensions and threading as specified in ANSI/AWWA Standard C111/A21.11-00. Glands shall be of ductile-iron construction for ductile iron fittings, and cast gray iron or ductile iron for cast gray-iron fittings.

The proper number of gaskets, glands, bolts and nuts, all conforming to ANSI/AWWA Standard C111/A21.11-00, plus one extra gasket for every 10 joints or fraction thereof, shall be furnished with each order. The gaskets and joint accessories shall be shipped in suitable protective containers. Follower glands held in place with set screws will not be acceptable. Segmented glands will not be acceptable.

3. Mechanical Joint and Push-on Joint "Megalug®"-type Restraining Systems

Use of this type of restraint is restricted to underground mechanical joint or push-on joint applications,

This type of restraint may be utilized as dictated by design and/or field conditions in any mechanical joint or push-on joint underground piping system of 30-inch nominal diameter and smaller.

The CITY absolutely reserves the right to require other forms of restraint and/or thrust anchoring where, in the opinion of the ENGINEER, the use of this form of restraint is not in the best interest of the CITY. In this regard, the ENGINEER's decision shall be final.

The "Megalug®" joint-restraint systems manufactured by EBAA Iron, Inc., of Eastland Texas, will be considered the standard of quality for the purpose of evaluating substitute systems. Any entity offering a substitute system for consideration shall demonstrate to the complete satisfaction of the ENGINEER that their restraint system has been in use for a minimum of three years in the United States, and shall bear the entire burden of providing all

material, documentation and performance testing data to prove substantial equivalence of their restraint system to the "Megalug®" system.

Each thrust-resistant mechanical joint or push on joint made up with this type of restraint and the pipe and fitting of which it is a part, shall be designed to withstand an axial thrust from an internal pipeline pressure of at least 150 psi at bulkhead conditions without reduction because of its position in the pipeline nor for support from external thrust blocks.

4. Restrained Push-on Joints (Single Gasket Non-Gasket Restrained) - Restrained joints in pipe and fittings shall be of the single gasket push-on type, and shall conform to all applicable provisions of ANSI/AWWA Standard C111/A21.11-12, except that gaskets for pipe and fittings shall be neoprene, where so specified, and the following requirements:
  - (a) Thickness of the pipe barrel remaining at grooves cut, if required in the design of restrained end joints, shall not be less than the nominal wall thickness of equal sized non-restrained pipe as specified in Section B above.
  - (b) Restrained joints using field welding, set screws, or gaskets with expanding metal inserts will not be acceptable.
  - (c) The restraining components, when not cast integrally with the pipe and fittings, shall be ductile iron or a high strength non-corrosive alloy steel.
  - (d) Tee head bolts and hexagonal nuts for all restrained joints in pipe and fittings shall be of high strength low-alloy steel with composition, dimensions and threading as specified in ANSI/AWWA Standard C111/A21.11-12, except that the length of the bolts shall meet the requirements for the restrained joint design.
  - (e) The proper number of gaskets, bolts, nuts and all necessary joint material, plus one extra gasket for every 10 joints or fraction thereof, shall be furnished with each order. The gaskets and joint accessories shall be shipped in suitable protection containers.
  - (f) Each thrust-resistant joint, and the pipe and fitting of which it is a part, shall be designed to withstand the axial thrust from an internal pipeline pressure of at least 150 psi at bulkhead conditions regardless of its position in the pipeline and regardless of it being supported by external thrust blocks.
  - (g) Restrained push-on joint pipe and fittings shall be capable of being deflected after assembly. During deflection, all components in the restrained system shall be in contact to provide an equal force on all contact areas.

- (h) When restrained spigot ends are ordered for items of Group A, the corresponding bell ends of the pipe to be restrained (also within Group A), shall be furnished with the required matching restraining features at no additional cost other than the price bid per foot of pipe.
5. Flanged Joints (for connection at ground level of fire hydrant assemblies) - Connecting pieces with one end flanged and the other end either plain-end or mechanical joint, shall conform to ANSI/AWWA Standard C110/A21.10-12. Joint material for both the flanged end and the mechanical joint accessories for connecting pieces with a mechanical joint end shall be furnished as specified.

Flange adapters shall be used only on a restricted basis and shall not be used as a general substitute for regular flanged joints. Further, the CITY absolutely reserves the right to require regular flanged or other types of joints when it is considered in the CITY's best interest. The decision of the ENGINEER shall be final in such situation.

Flanges shall be made of ductile iron conforming to ASTM 536. Flange shall be restrained by a number of individual gripping wedges operated by torque-limiting actuating screws. Each flange adapter shall have a permanently cast in identification number allowing tracing of the date, foundry and pour that fabricated the unit together with all test data for the material of the pour. Records for this purpose shall be retained by the foundry for a minimum of two years after the pour date and shall be supplied to the CITY within no more than two weeks after request. Factor of safety shall be a minimum of 2 to 1.

Other types of flanged fittings and flanged-joint pipe shall conform to the following requirements unless otherwise stated in the order:

- (a) Flanged fittings shall conform to ANSI/AWWA Standard C110/A21.10-12, as specified hereinabove.
- (b) Flanged ductile-iron pipe with integrally cast flanges shall be manufactured in accordance with ANSI/AWWA Standard C151/A21.51-09, and with provisions contained hereinabove for centrifugally cast ductile iron pipe, and shall be furnished with ANSI Standard Class 125 flanges, plain-faced and drilled, conforming to ANSI Standard B16.1, "Cast Iron Pipe Flanges and Flanged Fittings", latest revision. Hollow back flanges are not acceptable.
- (c) Flanged ductile-iron pipe with threaded flanges shall be manufactured in accordance with ANSI/AWWA Standard C115/A21.15-11, "Flanged Ductile-Iron Pipe With Ductile-Iron or Gray-Iron Threaded Flanges", and shall be rated for a working pressure of 250 psi, minimum. The nominal thickness of flanged ductile-iron pipe 6-inch diameter and larger shall not



be less than those shown in Table 1 of ANSI/AWWA Standard C115/A21.15-11. The nominal thickness of 4-inch diameter flanged ductile-iron pipe shall be Class 54 (min.) conforming to Tables 3 and 4 of ANSI/AWWA Standard C151/A21.51-02. The pipe shall be furnished with ANSI Standard Class 125 flanges, plain-faced and drilled, conforming to ANSI Standard B16.1, latest revision. Hollow back flanges and grey-iron flanges shall not be acceptable for use as threaded flanges. Threaded flanges shall be individually fitted and machine tightened on the threaded pipe by the manufacturer, and shall not be interchangeable in the field. Pipe lengths shall be as ordered. Removal of flanges, cutting and re-threading the pipe, and re-installing the flanges will not be permitted in any case.

- (d) All flanges on ductile-iron pipe and fittings shall be of ductile iron. All joint materials for flanged pipe and fittings shall be supplied with all pipe or fittings ordered. Bolts and nuts shall comply with all requirements of Appendix Section A.1 of ANSI/AWWA Standard C115/A21.15-99, except that both shall be stainless steel. Unless ring gaskets are specifically called for in the order, gaskets shall be full-faced and 1/8-inch thick. Gaskets shall fully conform to the requirements of ANSI/AWWA Standard C115/A21.15-99, Appendix Section A.2, except that gaskets shall be SBR for water and neoprene for sewer usages.

#### E. LININGS AND COATINGS

##### Asphaltic Coating

All pipe and fittings shall be outside-coated with an asphaltic material applied by means of the airless spray method. The exterior coating shall meet AWWA Specifications for this type of coating, shall be smooth without pinholes, thin, bare or overly thick areas. Smoothness shall be such that when hand rubbed, no "sand paper" feeling will be experienced and such that the spigot area will readily slide through the gasket without pulling, tearing, rolling or otherwise disturbing the sealing capabilities of the gasket. Spigot ends shall be beveled prior to painting and to an extent that will permit ready insertion of the spigot through the gasket area.

##### Cement-Mortar Lining

Pipe and fittings shall be cement-lined and seal-coated in accordance with ANSI/AWWA Standard C104/A21.4-13, "Cement-Mortar Lining for Ductile-Iron Pipe and Fittings for Water".

#### 2.02 PIPE AND FITTINGS: POLYVINYL CHLORIDE (PVC)

##### A. AWWA C900 AND C905 PVC (CI) PIPE AND FITTINGS



1. TYPE C900 PVC PIPE – 4-inch through 12-inch diameter

- (a) AWWA C900 Pipe for water mains and fire hydrant assemblies shall conform to ANSI/AWWA C900, "(PVC) Pressure Pipe and Fabricated Fittings", for 4-inch through 12-inch PVC pressure pipe and fabricated fittings with cast-iron-pipe-equivalent (CI) outside diameter (OD) dimensions and with wall-thickness-dimension ratios (DR) 18.
- (b) AWWA C905 pipe for water and sewer mains and laterals shall conform to ANSI/AWWA C905, "Polyvinyl Chloride (PVC) Pressure Pipe and Fabricated Fittings, 14-inch Through 48-inch for Water Transmission and Distribution", for 14-inch through 48-inch PVC pressure pipe and fabricated fittings with cast-iron-pipe-equivalent (CI) and steel-pipe-equivalent (IPS) outside diameter (OD) dimensions and wall thickness dimension ratios (DRs) of 14, 18, 21, 25, 26, 32.5, 41, and 51, except as otherwise modified herein.
- (1) AWWA C900 and C905 pipe shall be made from PVC thermoplastic having physical and chemical properties which meet or exceed a cell classification of 12454-A or 12454-B virgin compounds as defined in ASTM Standard D 1784.
- (2) The AWWA C900 and C905 pipe shall be push-on type, with bells, spigots and elastomeric gaskets in accordance with ASTM Standard D 3139, "Standard Specification for Joints for Plastic Pressure Pipes Using Flexible Elastomeric Seals ". The gaskets shall conform to ASTM Standard F477 and shall be synthetic rubber. One gasket shall be furnished with each length of elastomeric-gasket bell-end pipe. Pipe spigots shall be beveled. Pipe bells shall be extruded integral with the pipe barrel with a thickness equal to or greater than that of the barrel.
- (3) Nominal laid length of AWWA C900 and C905 PVC (CI) pipe shall be 20 feet.
- (4) The C900 and C905 pipe shall be labeled with the following at intervals of not more than five (5) feet:
- Date of manufacture - Manufacturer's Name & Code
- Nominal size - "(CI)" - DR number – Pressure Class – Test Pressure for Hydro Tested or "NOT HYDROSTATIC PROOF TESTED" – AWWA designation number – Manufacturer's name or trade mark and production run or lot code – Seal (Mark) of the testing agency verifying suitability of material for potable water service (must be NSF).
- (5) Couplings and fabricated fittings shall be marked with:

Nominal Size – “(CI)” – Deflection angle, if applicable – “PVC” – AWWA Pressure Class – AWWA designation number of the applicable standard (C900 or C905) – Manufacturer’s name or trademark - Seal (Mark) of the testing agency verifying suitability of material for potable water service (must be NSF).

- (6) The CONTRACTOR must take special care to ensure that the pipe is not over homed during the installation process. The pipe manufacturer shall provide a home line mark on all spigots. The CONTRACTOR must install the bell of the adjacent pipe such that the edge is up to, but not over, the home line mark. The home line mark must be visible at the time of delivery and not fade during storage and installation. If the home line mark is not visible on the pipe prior to installation, the CONTRACTOR must mark the pipe with the appropriate home line marks in accordance with the guidelines provided by the manufacturer

2. TYPE C900 and C905 PVC FITTINGS (for 4-inch diameter water main piping)

- a. Fittings for AWWA C900 and C905, PVC (CI) shall conform to the requirements of ASTM Standard D1784 and the specifications for AWWA C900 and C905, PVC (CI) pipe herein, except as modified below.
- b. All fittings for C900 pipe shall be manufactured from PVC compound conforming to ASTM Standard D 1784-11. Fittings shall conform to the thickness requirements of DR18. All fittings, except wye branches, shall be Class 235 and shall be manufactured to withstand 755 psi quick burst pressure tested in accordance with ASTM Standard D 1599-99, "Standard Test Method for Resistance to Short-Time Hydraulic Pressure of Plastic Pipe, Tubing, and Fittings", and withstand 500 psi for a minimum of 1,000 hours tested in accordance with ASTM Standard D1598-02, "Test Method for Time-to-Failure of Plastic Pipe Under Constant Internal Pressure".
- c. All fittings for C905 pipe shall be manufactured from PVC compound conforming to ASTM Standard D1784-11. Fittings shall conform to the thickness requirements of DR18 for sizes 14 through 30-inch and DR25 for 36 through 48-inch. All fittings, except wye branches, shall be Class 235 for sizes 14 through 30-inch and Class 165 for 36 through 48-inch. Fittings 14 through 30-inch shall be manufactured to withstand 755 psi quick burst pressure tested in accordance with ASTM Standard D1599-99, "Test Method for Short-Time Hydraulic Failure of Plastic Pipe, Tubing, and Fittings" and withstand 500 psi for a minimum of 1,000 hours tested in accordance with ASTM Standard D1598-02, "Test Method for Time-to-Failure of Plastic Pipe Under Constant Internal Pressure". Fittings 36

through 48-inch shall be manufactured to with-stand 535 psi quick burst pressure tested in accordance with ASTM Standard D1599-99, "Test Method for Short-Time Hydraulic Failure of Plastic Pipe, Tubing, and Fittings" and withstand 350 psi for a minimum of 1,000 hours tested in accordance with ASTM Standard D 1598-02, "Test Method for Time-to-Failure of Plastic Pipe Under Constant Internal Pressure".

3. JOINT RESTRAINTS FOR C900 C905 PVC PRESSURE PIPE

For restraining C900 and C905 PVC pressure pipe and fittings, refer to Section 2.01.D.3, "Mechanical Joint and Push-on Joint "Megalug®"-type Restraining Systems", elsewhere in this specification.

B. CERTIFICATION

1. The CONTRACTOR shall provide the CITY with notarized Certifications, signed by an authorized agent of the manufacturer, that the material was manufactured, sampled, tested, and inspected in accordance with these specifications, and has been found to meet the requirements. A report of said test results shall be furnished.
2. No pipe or fitting will be accepted for use in the project until the Certifications have been sub-mitted to and approved by the CITY.

C. HANDLING AND STORING PVC PIPE AND FITTINGS

1. Pipe and fittings shall at all times be handled with great care to avoid damage. In loading or unloading operations, the manufacturer's unitized package of pipe and/or fittings shall be lifted with a forklift or other suitable equipment in such a manner as to prevent damage. Pipe may be unloaded by individual lengths. However, each length shall be slid or rolled on skidways in such a manner that the pipe is not dropped, and to avoid any shock. Under no circumstances shall pipe and/or fittings be dropped or allowed to roll or slide against obstructions.
2. Pipe and/or fittings having ultraviolet degradation, warpage, impact damage, abrasion damage, or gouges or cuts will not be accepted. Bell ends showing compression set, damage or deformation will not be acceptable.
3. Gaskets, if not prepositioned in the bell ends, shall be stored and shipped in suitable protective containers. Gaskets shall not be exposed to excessive heat, direct sunlight, oil or grease.
4. Pipe and fittings shall be stored in a manner that will prevent warpage or other damage as previously specified.
5. If the pipes are to be stored for any period in excess of six months in direct sunlight the items shall be covered with an opaque material. The cover shall

be placed in such a manner that will permit air circulation above and around the items being covered to prevent excessive heat accumulation.

6. Pipe and fittings shall be manually or mechanically lowered into the trench for installation, and shall not be thrown, dropped or pushed in the trench.

## 2.03 HIGH DENSITY POLYETHYLENE (HDPE) FOR USE IN POTABLE WATER SERVICES 1-INCH NOMINAL DIAMETER

### A. HDPE PIPE/TUBING FOR WATER SERVICES:

1. All 1-inch high density polyethylene pipe used for services shall be IPS-OD-controlled with Standard Outside Dimension Ratio (SODR) of 9, pressure rating of 200 psi, nominal outside diameter of 2.375-inches, minimum wall thickness of 0.264-inches, PE 3408, all in conformance with ASTM D3035-95 "Polyethylene (PE) Plastic Pipe (DR-PR) Based on Controlled Outside Diameter".
2. Pipe shall conform with ANSI/AWWA C901-96 "Polyethylene (PE) Pressure Pipe and Tubing, ½ In. (13 mm) Through 3 In. (76 mm), for Water Service" as modified herein.
3. Pipe shall have a (natural) inner core with a blue colored outer shell.
4. Pipe shall have footage marks at a maximum interval of every two feet.
5. Polyethylene material shall have a minimum cell classification in accordance with ASTM D3350-00 "Polyethylene Plastics Pipe and Fitting Materials" of 345444D for the core, which shall be 100% virgin material, and 345444E for the outer shell. Note that both of these materials are UV stabilized as signified by the "D" for natural colored and "E" for the colored shell.
6. Pipe shall conform with NSF 61 or 14.
7. Manufacturer shall supply certification of compliance with all of the above requirements. Certification shall ship with the pipe on material sold to the Department and shall always be submitted with shop drawings and catalogue cuts. When required by the Director of the Department of Public Utilities or his designee, certification shall be signed and sealed by a professional engineer licensed to practice in the state in which the manufacturer is located or in the State of Florida.

### B. HDPE TUBING FOR WATER SERVICES:

1. All 1-inch high density polyethylene tubing used for services shall be CTS-OD-controlled with Standard Outside Dimension Ratio (SODR) of 9, pressure rating of 200 psi, nominal outside diameter of 1.125-inches, minimum wall thickness of 0.125-inches, PE 3408, all in conformance with ASTM D2737-99 "Polyethylene (PE) Plastic Tubing".

2. Tubing shall conform with ANSI/AWWA C901 "Polyethylene (PE) Pressure Pipe and Tubing, ½ In. (13 mm) Through 3 In. (76 mm), for Water Service" as modified herein.
3. Tubing shall have a (natural) inner core with a blue colored outer shell.
4. Tubing shall have footage marks at a maximum interval of every two feet.
5. Polyethylene material shall have a minimum cell classification in accordance with ASTM D3350-00 "Polyethylene Plastics Pipe and Fitting Materials" of 345444D for the core, which shall be 100% virgin material, and 345444E for the outer shell. Note that both of these materials are UV stabilized as signified by the "D" for natural colored and "E" for the colored shell.
6. Tubing shall conform with NSF 61 or 14.
7. Manufacturer shall supply certification of compliance with all of the above requirements. Certification shall ship with the tubing on material sold to the Department and shall always be submitted with shop drawings and catalogue cuts. When required by the Director of the Department of Public Utilities or his designee, certification shall be signed and sealed by a professional engineer licensed to practice in the state in which the manufacturer is located or in the State of Florida.

#### C. MECHANICAL FITTINGS UTILIZED WITH HDPE PIPE AND TUBING WATER SERVICES

1. Mechanical fittings utilized with HDPE pipe and tubing for water services shall conform with ANSI/AWWA C800, "Underground Service Line Valves and Fittings", as modified here-in.
2. Fittings shall utilize AWWA Standard (Mueller) threads on tapped pipe and tapping saddles
3. Fittings shall be designed and manufactured to withstand a sustained working pressure of 150 psi and to restrain the pipe against pull-out under loading beyond that causing tensile yield in the HDPE pipe or tubing connected.
4. The manufacturer shall supply certification of these capabilities and fittings shall not be accepted or installed without said certification. If fittings are being supplied to the Department, the certification shall ship with the fittings and payment will not be made without this certification. At the discretion of the ENGINEER, this certification may be required to be signed and sealed by a professional engineer licensed to practice in the state where the supplying firm is located or in the State of Florida. His decision in this regard shall be final.
5. In all cases, fittings shall be installed in strict accordance with the manufacturer's instructions.

**Part 3 - EXECUTION**

## 3.01 GENERAL:

- A. The CONTRACTOR shall provide all barricades and/or flashing warning lights necessary to warn of the construction throughout the Project.
- B. Pipe and fittings shall at all times be handled with great care to avoid damage. In loading and unloading, they shall be lifted with cranes or hoists or slid or rolled on skidways in such manner as to avoid shock. Under no circumstances shall this material be dropped or allowed to roll or slide against obstructions.
- C. All work shall be performed by skilled workmen experienced in similar installations.
- D. All pipe shall be thoroughly cleaned internally before being installed. All pipes shall be flushed with water and swabbed to assure removal of all foreign matter before installation.
- E. Whenever possible, the pipe will be installed with minimum 36-inches of cover.
- F. At all horizontal or vertical pipe deviation, the CONTRACTOR shall install restrained pipe. Joints may only be opened to adjust alignment by half of the AWWA or manufacturer's recommended opening (which is smaller).

## 3.02 EXCAVATION FOR PIPING

- A. The CONTRACTOR shall make all excavation necessary for the construction of the pipelines, connections, valves and appurtenances, to the lines and grades shown on the Plans.
- B. The trench shall be excavated at least 6 inches below pipe laying grade as shown on the Plans. All sheeting and shoring shall be installed at the CONTRACTOR's expense where it is necessary for pipe installation and property protection or required by the Trench Safety Act. The cost of dewatering any excavation shall be at the CONTRACTOR's expense. The disposal of water removed from an excavation shall be in a manner which will not create a hazard, or be detrimental to the public health or to public or private property.
- C. The CONTRACTOR shall obtain all necessary permits approving the location and proposed method of disposal before discharging water from any excavation into any portion of the public right-of-way or into any existing drainage structure or facility. All construction signs required shall be provided by the CONTRACTOR.

### 3.03 INSTALLATION OF PIPE, FITTINGS AND VALVES

#### A. GENERAL:

1. The Drawings are in some cases diagrammatic. They may not show every bend, off-set, elbow or other fitting which may be required in the piping for installation in the space allotted. Careful coordination of the work of this Section with that of Division 2 is necessary to avoid conflicts.
2. The top of the pipe shall not vary by more than 2 inches from the established grade, except at points where this tolerance must be changed to clear obstructions, or make connections. Deviation from this location will be permitted only upon written instructions from the ENGINEER.

#### B. INSTALLATION OF DUCTILE IRON PIPE AND FITTINGS

1. All pipe and fittings (bends, tees, and plugs, etc.), unless otherwise specified, shall be backed with concrete to undisturbed ground. Provision shall be made to prevent concrete from adhering to plugs or bolts.
2. Bolts, nuts and rubber gaskets for use in flanged and mechanical joints shall be stored under cover. Gaskets shall not be exposed to heat, light or any petroleum products, shall be kept clean and shall not be handled with greasy or dirty hands.
3. Vegetable soap lubricant shall be applied in accordance with the pipe manufacturer's recommendations, to aid in making the joint. The workmen shall exercise caution to prevent damage to the gasket or the adherence of grease or particles of sand or dirt. Deflections shall be made only after the joint has been assembled.
4. Push-on and mechanical joints in ductile iron pipe and fittings shall be made in accordance with the manufacturer's standards except as otherwise specified herein. Joints between push-on and mechanical joint pipe and/or fittings shall be made in accordance with AWWA Standard Specification C600, "Installation of Ductile Iron Water Mains and their Appurtenances, except that deflection at joints shall not exceed one-half of the manufacturer's recommended allowable deflection, or one-half of the allowable deflection specified in AWWA C600, whichever is the lesser amount.
5. Flanged joints shall be used only where indicated on the Plans. Before making up flanged joints in the pipeline, the back of each flange under the bolt heads and the face of each flange shall have all lumps, blisters and excess bituminous coating re-moved and shall be wire brushed and wiped clean and dry. Flange faces shall be kept clean and dry when making up the joint, and the workmen shall exercise caution to prevent damage to the gasket or the adherence of grease or particles of sand or dirt. Bolts and nuts



shall be tightened by opposites in order to keep flange faces square with each other, and to insure that bolt stresses are evenly distributed.

6. Bolts and nuts in flanged and mechanical joints shall be tightened in accordance with the recommendations of the pipe manufacturer for a leak-free joint. The workmen shall exercise caution to prevent overstress. Torque wrenches shall be used until, in the opinion of the ENGINEER, the workmen have become accustomed to the proper amount of pressure to apply on standard wrenches.

#### C. INSTALLATION OF PVC PIPE:

1. PVC Pipe Joints (Push-On Joints):
2. Bevel all field-cut pipe to approximately 15 degrees for all joints except for ductile iron mechanical joints. No bevel should be placed on the pipe spigot for joining to a ductile iron mechanical joint. Remove all burrs and provide a reference mark the correct distance from the pipe end.
3. Clean the pipe end and the bell thoroughly before making the joint. Insert the O-ring gasket if required, making certain it is properly oriented. Lubricate the spigot well with an approved lubricant in accordance to manufacturer's instructions; do not lubricate the bell or O-ring unless directed otherwise by manufacturer's recommendations. Insert the spigot end of the pipe carefully into the bell until the reference mark on the spigot is flush with the entrance lip of the bell.
4. PVC pipe installation shall conform to the requirement of AWWA C605.
5. In the installation of glue joint PVC pipe, the pipe shall first be cut square and smooth. Wipe all surfaces to be connected with a cloth moistened with an appropriate solvent and remove any foreign matter from socket of fitting. Using an ordinary paint brush of width about equal to the nominal pipe size, apply a generous coat of cement to inside and shoulder of socket, flowing on but not brushing out. A similar coat shall then be applied to the end of the pipe for at least the same distance on the pipe as the depth of socket, and to the cut end. Pipe and fittings shall then be pressed firmly together and the pipe turned a quarter to a half turn to evenly distribute the cement. The cementing and joining operation must not exceed one minute. Allow 24 hours setup time before applying pressure. Sand shall be used as backfill material around pipe installed underground.
6. Thread Sealant: Teflon tape.
7. All rigid PVC pipe shall be cut, made up, and installed in accordance with the pipe manufacturer's recommendations. Plastic pipe shall be laid by snaking the pipe from one side of the trench to the other. Offset shall be as



recommended by the manufacturer for the maximum temperature variation between time of solvent welding and during operation.

8. Schedule 80 pipe shall not be threaded. Use Schedule 80 threaded nipple where necessary to connect to threaded valve or fitting.
9. Only strap wrenches shall be used for tightening threaded plastic joints, and care shall be taken not to over tighten these fittings.
10. Provide adequate ventilation when working with pipe joint solvent cement.
11. Testing: All lines shall be hydrostatically tested at the pressures specified elsewhere herein or at the design pressures.

#### D. CLEANING AND TESTING:

All of the piping installed under this project shall be tested as follows and as directed by the ENGINEER:

1. With exceptions as noted below, all ductile iron piping installed under this Contract shall be cleaned and tested according to Section 15995, "Pipeline Testing and Disinfection", and as modified below:
  - (a) Only potable water piping shall be disinfected.
  - (b) No leakage shall be permitted for any above ground piping.
2. Unless otherwise specified elsewhere herein, all PVC pressure system bushings shall be tested at 150 psig. No leakage will be permitted.

#### E. INSTALLATION OF HDPE SERVICES

All HDPE services require the use of a 10-gauge stranded copper blue tracer wire.

### 3.04 FIELD QUALITY CONTROL

- A. All water mains shall be flushed to remove all sand, debris, rock and other foreign matter. Dispose of the flushing water without causing a nuisance or property damage.
- B. Pressure and leakage testing shall follow the requirements of Section 15995, "Pipeline Testing and Disinfection".
  1. Where infiltration or exfiltration exceeds the allowable limits specified herein, the defective pipe, joints, or other faulty construction shall be located and repaired by the CONTRACTOR at no additional cost or time impact to the Contract.
  2. The CONTRACTOR shall provide all labor, equipment and materials, and shall conduct all testing required under the direction of the ENGINEER of

Record. No separate payment will be made for this work and the cost for this work shall be included in the prices quoted in the Proposal.

3. The CONTRACTOR shall locate and repair all leaks until the leakage is reduced to the limits specified. Any observed leaks or obviously defective joints or pipes shall be repaired or replaced as directed by the ENGINEER, even though the total leakage is below that specified above.

- END OF SECTION -

## SECTION 15063

### CEMENT MORTAR-LINED WELDED STEEL PIPE

#### **PART 1 – GENERAL**

##### 1.01 SUMMARY

- A. Section Includes: Furnish and install all piping, including fittings and accessories as shown on the Drawings, described in the Specifications and as required to completely interconnect and test all piping for a complete and operable system.
- B. Pipe Description:
  - 1. Pipe Details:
    - a. Pipe shall be designed in accordance with the referenced standards in these Specifications, and as modified by these specifications.
    - b. Mortar lining shall be ¾-inch.
    - c. Dielectric coating shall be as described in these Specifications.

##### 1.02 REFERENCES

###### **Reference**

American Association of State Highway and Transportation Officials (AASHTO)
ASME Boiler and Pressure Vessel Code (ASME BPVC)
American National Standards Institute (ANSI)
American Society of Mechanical Engineers (ASME)
American Society for Testing and Materials (ASTM)
American Welding Society (AWS)
American Water Works Associations (AWWA)
NSF International (NSF)

##### 1.03 SUBMITTALS

- A. Submittals shall be in accordance with Section 01300.
- B. All utility potholing shall be completed and submitted for acceptance prior to submittal of shop drawings for this pipe material. Failure to comply with this requirement shall constitute an automatic rejection of the submittal.
- C. Submit eight (8) copies of shop drawings, for approval prior to fabrication. Shop drawings shall show the details of fabrication of fittings, and assembly of pipe and fittings for completed pipeline. Shop drawings shall show weld details for all weld types used on the pipe. Shop drawings shall show field location number of each fitting and piece of pipe. Shop drawings shall be coordinated with completed utility potholing for the segment of pipe being submitted for review.
- D. Submit welding process and procedure for approval prior to start of pipe fabrication. Submit procedure qualification record and welding procedure specification for field welding at least 60 days prior to commencement of field welding.

- E. Submit certification of welders prior to start of work.
- F. Furnish mill certificates, or certificates from approved testing laboratory or other source, for the steel used for pipe cylinders, showing conformance to appropriate ASTM Specifications including chemical and physical characteristics.
- G. Furnish certificate from approved testing laboratory or other source for cement conformance to appropriate ASTM Specifications.
- H. Furnish a list of field location numbers for each fitting and piece of pipe with the cylinder manufacturing number of all cylinders used in the fabrication of each fitting or piece of pipe prior to shipment. Fittings shall include any dished heads used for pipe hydrostatic testing.

Furnish all cylinder manufacturing test reports, hydrostatic test reports, and non-destructive welding test reports with the appropriate information to insure compliance with these specifications.

- J. Layouts and Schematics: Submit detailed installation drawings of all piping and connected equipment. The drawings shall include all pipe sections, fittings, valves, and other appurtenances. Provide as a minimum:
  1. Pipe section number with stations and invert elevation of ends of each pipe section along with lay direction.
  2. Invert elevation and station of all changes in elevation or horizontal alignment.
  3. Fabrication in details for all pipe sections, specials, elbows, nozzles, bevels, and closure joints to include cylinder thickness, lining thickness, pipe and bell diameters.
  4. Weld details for all shop and field welds.
- L. Quality Assurance: Provide quality control procedures and information on pipe manufacturer, pipe lining, pipe coating, pipe fitting and special manufacturer. Provide information on qualifications of all inspectors for each phase of pipe manufacturing.
- M. Testing Plan: Submit a testing plan that provides details associated with the hydrostatic testing of the pipeline in accordance with the length limits identified in paragraph 3.03.I. The testing plan shall include, but not be limited to, providing the details of the testing apparatus setup, pressure gauges, source of water, disposal of water, temporary dished heads, anticipated fill, stabilization, and testing durations, safety program associated with the hydrostatic tests, and all other information required for a successful test.
- N. Results of all tests required by this specification section and related standards noted in this specification section.

#### 1.04 QUALITY ASSURANCE

- A. Inspection of Fabricated Pipe Cylinders:

1. FRWA will inspect all phases of pipe fabrication work and will witness all tests.
  2. Notify FRWA to schedule the inspection, at least one week prior to start of the fabrication work.
  3. Expense of rewitnessing failed hydrostatic tests or reinspection of any phase of pipe manufacture shall be paid by the CONTRACTOR.
  4. Expense of rewitnessing or reinspection by FRWA personnel shall include the employee's wages, transportation, lodging, and incidental expenses incurred between Sacramento and the shop location, at the shop location, and return to Sacramento.
  5. Expense of rewitnessing or reinspection by the FRWA's authorized agent shall be charge to the CONTRACTOR.
- B. Pipe Manufacturer Qualifications:
1. Shall be a manufacturer who has been regularly engaged in the design and manufacture of welded steel pipe for at least five years.
  2. Provide evidence that pipe manufacturer has production capacity for the volume of work in the project and in the time frame allotted.
  3. Provide evidence of successful fabrication of similar pipe diameter or larger for at least five similar projects. Provide the following information:
    - a. Project owner.
    - b. Contract name, address and phone number.
    - c. Project descriptions of five successfully completed similar projects.
    - d. If special pipe sections of fittings are not fabricated by the pipe manufacturer, fitting and special pipe fabrication shall provide similar information as pipe manufactures.
  4. If an alternative product manufacturer is proposed, demonstrate to the satisfaction of the ENGINEER that the quality is equal to the materials and equipment made by Continental Pipe.5. Steel Pipe Fabricators Association (SPFA), Lloyd's Registry Certification, or ISO 9000 Certification.
- C. Tensile and Bend Tests for Steel Sheet:
1. Samples for test may be taken by the ENGINEER for testing.
- D. Qualification of Welding Procedures, Welders, and Welding Operators:
1. Shop Welding Procedure: Weld procedure specifications shall be qualified by testing in accordance with ASME Boiler and Pressure Vessel Code Section IX.
  2. Field Welding Procedure: Weld procedure shall be qualified by testing in accordance with AWS D.1.1.
  3. Welders:
    - a. Welders shall be qualified for the welding process and the procedure to be used under ASME Boiler and Pressure Vessel Code, Section IX, Part QW; or AWS Structural Welding Code, Section 5.

- b. Welders shall have verifiable evidence that their qualification is current and valid under the applicable code.
  - c. Welder Qualification Certification shall be witnessed and evaluated by a certified AWS QC1 welding inspector utilizing calibrated equipment.
  - d. CONTRACTOR shall test welders at its expense.
4. Notch-tough welding that requires heat input control is required for all pipe and specials with steel thickness greater than 0.375 inches.
    - a. WPS used to shop fabricate pipe shall be qualified in accordance with ASME BPVC SEC IX and shall include Supplementary Essential Variables.
    - b. WPS used to install pipe in the field shall be qualified for heat input control in accordance with AWS D1.1.
    - c. PQRs shall be qualified for notch tough welding with consideration for thickness of steel, test temperature, and Charpy V-notch CVN values. Refer to AWS D1.1, Section 4, Part D for requirements for CVN Testing, Operation A (three specimens). Using this test procedure, select test temperature and minimum average energy level for Charpy Testing, the welding position as it may relate to heat input on the heat affected zone test results, and the orientation of the test plates as these relate to the longitudinal or transverse properties of the heat affected zone. See Article 2.01.B.1.e for Charpy V-Notice Acceptance Criteria.
- E. Cylinder Fabrication Welding Tests performed by the CONTRACTOR: Tension tests, bend tests, and spot X-ray tests.
1. Cut tension test and bend test coupons from pipe cylinder for testing of welded seams. There shall be at least one set of test coupons taken from each heat of steel and at least one set of test coupons taken of each size, grade and wall thickness from each welding machine and each operator at a minimum of every 3,000 feet of pipe. Test in accordance with AWWA C200, Section 4.11. Welded seams shall develop the ultimate strength specified for adjacent steel sheet.
  2. Perform spot X-ray examination of welds and they shall conform to paragraph UW-52 of Section VIII of the ASME Boiler and Pressure Vessel Code.
  3. Location for tests will be confirmed by the ENGINEER prior to the tests occurring.
  4. Repair cylinder after tests.
  5. CONTRACTOR shall pay for all tension tests and bend tests of welded seams. All testing shall be evaluated by a certified AWS QCI welding inspector utilizing calibrated equipment.
- F. Hydrostatic Tests:
1. Shop test each steel cylinder to develop a circumferential tensile stress equal to 75% of minimum yield point stress for the specified steel used.
  2. Determine brittleness of welded cylinder by hammering, but not hard enough to deform or cause damage to the metal, on or near each side of each welded seam prior to or during hydrostatic test.

3. Maintain pressure during inspection of all seams. Cylinder surface shall be dry during inspection.
4. Repair by chipping, grinding, air-arcing, and rewelding.
5. Retest all repaired pipe.
6. Cylinders requiring more than 3% of any seam to be repaired by hand welding will not be accepted unless repairs have been made to the satisfaction of the ENGINEER.

G. Welding Tests for Fabricated Fittings:

1. Hydrostatically test all pipe sections to be used for fabricated fittings.
2. Test all welded seams not hydrostatically tested by non-destructive methods in accordance with AWWA C200, paragraph 5.2.2.1.
3. All welds shall be tested by the liquid penetrate inspection procedure conforming to ASTM E165, under Method "B."

H. Cement Mortar Lining:

1. Steel cylinder pipe fabricator shall have the capability of installing the cement mortar lining. Information on pipe manufacturer qualifications shall include experience with cement mortar linings.
2. Provide ENGINEER with all results of tests noted in AWWA C205 on cement mortar lining.

#### 1.05 DELIVERY, STORAGE, AND HANDLING

A. Prevent damage to pipe during transportation, handling, and storage:

1. Bottom saddles shall be rigid, shaped, and cushioned to provide uniform bearing.
2. Do not drag, skid, or drop pipe sections.
3. Block to prevent shifting when transporting.
4. Cover ends of each pipe section in transit and at the site to prevent drying of the lining. A cover over the entire front end of the truckload shall also be provided during transit.
5. Blocking, chains, and cables for securing the load shall be suitably padded.
6. Stulls shall be installed to maintain roundness of the pipe and shall not be removed until pipe is completely backfilled or encased in CLSM. Stulls shall prevent deflection during handling, shipping and backfill under all loading conditions.
7. Upon delivery, place off the ground on suitable supports, such as rubber tires or sandbags at quarter points, and securely block.
8. Provide appropriate marking of pipe specials or elbows to indicate proper orientation of pipe.

**PART 2 – PRODUCTS**

## 2.01 WELDED STEEL (WS) PIPE

- A. Welded steel pipe shall be a cement mortar lined and tape wrapped steel pipe designed in accordance with AWWA Manual M11, AWWA C200, AWWA C205, AWWA C208, and AWWA C214/C215 except as modified herein or as indicated elsewhere by the Drawings or Specifications.
1. Dimensions: Nominal inside diameter shall be the minimum net inside diameter. Maximum length shall be 48 feet.
  2. Minimum Steel Cylinder Thickness: The minimum cylinder thickness for pipe with welded joints shall be as shown on the drawings or if not shown in the Drawings, thickness shall be standard weight in accordance with ASME B36.10M. The pipe manufacturer shall design steel cylinder fittings, in accordance with AWWA M11. Design criteria are as follow:
    - a. Internal pressure: See hydraulic profile in Drawings.
    - b. Internal working pressure plus surge pressure: See hydraulic profile in Drawings.
    - c. Internal negative pressure: 14.7 psi.
    - d. Maximum allowable stress: 16,500 psi.
    - e. Maximum deflection permitted: 2% of OD.
    - f. For tapered sections, minimum cylinder thicknesses shall conform to the requirements for the larger pipe diameter.
- B. Pipe Cylinder:
1. Steel: Steel cylinders shall be fabricated per AWWA C200 and as modified in these specifications:
    - a. Steel shall comply with ASTM A 1018. Minimum yield strength shall be 42,000 psi. Minimum tensile strength shall be 70,000 psi. (Addendum No. 4) Minimum yield strength shall be 42,000 psi. Minimum tensile strength shall be 70,000 psi.
    - b. All steel used for fabrication shall have a maximum carbon content of 0.25%, a maximum sulfur content of 0.015%.
    - c. Minimum elongation in 2-inch gauge length: 21%.
    - d. Weld ability: Maximum carbon equivalent of 0.45, as measured using AWA D1.1, Annex XI, Guideline on Alternative Methods for Determining Preheat Formula:
 
$$CE = C + (Mn + Si) / 6 + (Cr + Mo + v) / 5 + (Ni + Cu) / 15$$
    - e. All steel used for fabrication exceeding 0.375 inches in thickness shall be tested for notch toughness using the Charpy-V-Noted Test in accordance with ASTM A370. The steel shall withstand a minimum impact of 25 feet-lbs. at a temperature of 30° F. Test outside diameter wrap of two coils minimum per heat lot.
    - f. Steel shall be fine-grained, fully killed and manufactured by the continuous casting process.



2. Cylinders shall be substantially true right cylinders formed from sheet or coil steel.
  - a. The difference between major and minor axes shall not exceed 1% of the diameter of the pipe.
  - b. Straightness of cylinders shall be such that no point on the surface of the cylinder shall deviate more than 1/8-inch in any 10-foot length as measured by a straight edge.
  - c. Circumferential welds are not acceptable.
  - d. The mill sheets or plates shall contain no welded seams.
  - e. Maximum length of pipe cylinder shall be 48 feet.
3. Type of welding shall be limited to the following methods unless approved otherwise by the ENGINEER prior to use:
  - a. Submerged arc welding (SAW).
  - b. Shielded metal arc welding (SMAW).
  - c. Flux cored arc welding (FCAW).
  - d. Resistance seam welding (RSEW).
  - e. Manual welding permitted on bends and special sections not suitable for automatic welding.
4. Welding of Longitudinal or Spiral Seams:
  - a. Butt welds shall be used.
  - b. For fabricating pipe with longitudinal seams parallel to the axis of the pipe, there shall be no more than three longitudinal seams.
  - c. Seams shall have an efficiency of at least 100% of the specified minimum strength of the adjacent sheet.
  - d. Before welding, edges shall be thoroughly cleaned and properly formed. Forming of material shall not be done by means of hammering. Surfaces shall be cleaned at least 1/2-inch from the weld joint in addition to the surface to be welded.
  - e. Weld bead shall be central to the seam and free from depressions, undercut edges, burrs, irregularities, and valleys.
  - f. Welds shall be continuous for full length of seam.
  - g. Arc welds shall be built up uniformly at the center of the weld and have complete penetration. Height of weld bead above plate surface shall not exceed 1/32-inch on the outside nor more than 3/32-inch on the inside. All ground welds shall be smooth and free of burrs. Do not grind into, or gouge, the adjacent pipe wall material.
  - h. All welds shall be thoroughly fused with base metal, uniform in appearance, free from cracks, and reasonably free from irregularities.
  - i. Scattered porosity and slag inclusions in accordance with the Standards of Section VIII of the ASME Boiler and Pressure Vessel Code will be acceptable.

- j. Unacceptable defects shall be chipped, flame-gouged, or air-arc gouged to sound metal and rewelded by either manual or automatic welding as approved.
- k. The portion of the weld that must be removed shall be as directed by the ENGINEER.
- l. Restart the welding operation on clean and sound metal.
- m. Welding technique shall ensure uniform distribution of residual stresses in the weld or adjacent metal. Undercutting will not be permitted.
- n. Weld beads on the outside of plain or spigot ends and on the inside of bells shall be ground flush for a distance of 4 inches from the ends of cylinders.
- o. Butt welds made by the resistance seam welding (RSEW) method shall have no buildup either internally or externally. Pipe made by this method shall be cleaned of all material formed during the welding process beyond the outside circumference of the cylinder.

5. Handling Steel Cylinders:

- a. Unlined or uncoated steel cylinders shall be adequately supported during all operations to ensure against development of a permanent out of round set.

C. Cement Mortar Lining:

1. Cement Mortar Lining: Cement mortar lining shall comply with AWWA C205, except as modified herein. Proportion of Portland Cement, sand, and water will be determined by the manufacturer to provide a compressive strength of 4,500 psi at 28 days.
  - a. The proportion by weight of cement to sand shall be approximately 1:3.
  - b. Cement shall be Type II.
  - c. The water-soluble chloride ion content of the mortar shall not exceed 150 milligrams in 1,000 grams of mortar.
  - d. Lining shall be NSF 61 approved for potable water.
  - e. Lining thickness shall be  $\frac{3}{4}$ -inch with a tolerance of plus  $\frac{3}{16}$ -inch (greater thickness) and minus  $\frac{1}{16}$ -inch.
2. Compressive strength shall be determined using samples made from a small spinning device with a steel cylinder dimensioned in accordance with the standard test cylinder as described in ASTM C31, and the mortar shall be spun in the cylinder with a thickness of at least  $1\frac{1}{2}$  inches. The mortar shall be removed from the mix in accordance with ASTM C172, "Sampling Fresh Concrete." Curing of test specimens shall be the same as curing the pipe. The specimens shall then be tested in accordance with ASTM C39, using the net mortar area to determine the compressive strength. If laboratory facilities are not available at the plant, then the tests shall be made by an approved testing laboratory. Results of compressive strength tests shall be submitted to the ENGINEER.
3. Pipe-Lining Equipment:
  - a. A centrifugal lining machine shall be used.

4. Application of Lining:
  - a. Line after completion of shop tests and after the interior has been cleaned of loose rust, scale, or foreign matter.
  - b. Install round-up rings at each end of pipe and install exterior ring beams before spinning the lining. Rings and beams shall remain in place until the lined pipe section is supported for curing on sand ribbons. Acceptable alternative method is to support pipe on cable slings during initial curing prior to coating.
  - c. The number and spacing of ring beams shall be adequate to maintain a rigid and round pipe section within the specified tolerance.
  - d. The mortar shall be deposited by a method, which allows a regulated and uniform quantity of material to be applied throughout the entire length of pipe. Confine lining to dimensions shown on the pipe drawings.
  - e. Finished lining shall present a smooth, hard, dense, nongritty surface free from defects.
5. Curing:
  - a. Start curing as soon as lining has set.
  - b. Moist curing:
    - 1) Cure for not less than four (4) days.
    - 2) Surface must be kept continuously wet by sealing the pipe ends airtight or by a method approved by the ENGINEER.
    - 3) Accelerated curing: Steam curing may be used to speed the curing or until it has gained sufficient strength to be handled.
      - a) Start 3 to 6 hours after lining has been applied.
      - b) Steam shall be saturated vapor at 100° F to 130° F maximum.
      - c) Steam curing chambers shall protect pipe from drafts.
      - d) Protect from rapid drops in temperature after curing.
    - 4) Each 1-hour of steam curing will reduce the required four-day water cure by 4 hours.
6. Handling Lined Cylinders:
  - a. Lined and/or coated pipe shall be supported by belt slings or shape rubber pads providing at least 90° support during all handling operations.
  - b. Rolling of lined and/or coated pipe will not be permitted at any time.
  - c. Prevent slipping or sloughing of new lining.
  - d. Damaged lining to be cut out and area relined.
7. Protection:
  - a. During water curing of the lining, protect against being heated by the atmosphere or direct sunlight to above 100° F by covering with burlap or other suitable material.
  - b. Keep cover of pipe continuously wet.

D. Joints:

1. Welded, except flanged where shown otherwise on the Drawings.
  - a. All joints on this project for the 6-inch-diameter pipeline shall be welded on both the inside and outside of the pipe as specified.
  - b. Welded joints shall be butt strap, split butt strap, or lap joint. Butt straps and swaged joint details shall be submitted to the ENGINEER for favorable review. Rolled lap joints will not be acceptable. The joint shall be designed to withstand all loads associated with installation and operating conditions. Joint configuration and welding shall conform to the requirements of AWWA C206, except Section 6-2 testing, which are modified herein.
  - c. Provide special closure lap joints at approximately 300-foot intervals in accordance with AWWA C206. Joint shall be an extended bell section of at least two additional inches to the normal bell or a butt strap.
  - d. Cement mortar lining shall be patched after joint testing and may be hand applied. Conform to AWWA C205, Section 4.7.

E. Fittings:

1. Fittings shall be made of hydrostatically tested cylinders of the same material and minimum thickness as the pipe, except that short radius elbows shall have greater thickness if necessary to compensate for stress concentrations. They shall be designed by the pipe manufacturer by the method stated in the AWWA Pipe Manual M-11 as modified herein, subject to the favorable review of the ENGINEER. Unless otherwise noted or detailed on the Drawings, fitting dimensions shall conform to AWWA C208. Adding pipe to the fittings does not change the requirement that fittings conform to AWWA C208 dimensionally, nor does it reclassify the pipe portion as part of the fitting.
  - a. Provide reinforcement for fittings (outlets, tees and wyes, etc.) in the form of collars, wrappers or crotch plates, in accordance with the current revision of AWWA M11 Table 13-2. Use 135 psi for the design pressure P.
  - b. Crotch plates shall be designed in accordance with AWWA M-11, using a minimum plate thickness of 1-inch.
  - c. Elbows:
    - 1) Minimum radius shall be 2.5 times pipe diameter:
    - 2) Mitered 60 to 90 Degrees Elbows: Five pieces minimum.
    - 3) Mitered 45 to 60 Degrees Elbows: Four pieces minimum.
    - 4) Mitered 30 to 45 Degrees Elbows: Three pieces minimum.
    - 5) Mitered 0 to 30 Degrees Elbows: Two pieces minimum.
  - d. Nozzles 3 inches and less shall be Schedule 40 weld fittings. Wheeling Pipe-O-Lets, Allied Branchlets, or equal. They may be unreinforced.
  - e. Flares: Flare diameter shall be equal to the flange O.D. for the same size pipe. Fabricate flares from two sections of truncated cones, one angled

22-1/2 degrees from pipe axis, and the other 45 degrees. Grind all interior welds and edges perfectly smooth before lining.

- f. No field fabrication will be allowed.
2. Shop Fabrication of Fittings:
    - a. Welding:
      - 1) Conform to the applicable requirements of Article 2.01.B.4.
    - b. Bends:
      - 1) Fabricate from sections of mortar lined pipe or from bare cylinders that have passed the shop hydrostatic test as detailed on shop drawings approved by the ENGINEER. If using dielectric coating pipe sections, coating shall be removed far enough from the new welds so that the coating is not affected by the heat of welding.
      - 2) Bare cylinders shall be of the same quality as specified for pipe.
      - 3) Before cutting pipe remove lining back from the line of cut approximately 2 inches.
      - 4) Use care to avoid injury to the lining beyond the area removed.
      - 5) Remove and replace loosened, damaged, or broken lining.
    - c. Tees and Wyes:
      - 1) Fabricate from steel plate or from bare cylinders, which have passed the shop hydrostatic test.
      - 2) Plate and cylinders shall be the same quality as specified for pipe.
      - 3) Stress relieve all tees and wyes having girder reinforcement plates 1-inch or greater in thickness after complete fabrication.
      - 4) Stress relieving shall conform to Paragraphs UW-40 and UCS-56 of Section VIII of the ASME Code.
  3. Tapers:
    - a. Fabricate from steel plate of same quality as specified for pipe.
  4. Nozzles:
    - a. Fabricate and attach to pipe as shown on the Drawings.
  5. Mortar Lining of Fittings:
    - a. The mortar lining and the quality, curing, handling and the protection of the finished lining shall conform to C205, paragraph 4.4.5, Linings of Specials.
    - b. Apply mortar lining by hand plastering or an approved machine method.
    - c. For fittings fabricated from steel cylinders or plate, the thickness shall be same as specified for pipe sections unless otherwise shown on the drawings.

- d. When bends are fabricated from lined pipe, line exposed cylinder at the welded girth joint with mortar the same thickness as the adjacent pipe lining, and when the strip of exposed cylinder is more than 12 inches wide, reinforce lining with welded wire fabric tack welded to the cylinder. Use an epoxy or adhesive bonding agent to bond new mortar with existing mortar.
- 6. Coating of Fittings: See specification Section 09900
- 7. Testing of Fittings:
  - a. All welds shall be reviewed by the pipe manufacturers' certified welding inspector in accordance with ASME BPVC, Section VIII, Division 1.
  - b. Butt-welds shall be radiographically examined in accordance with ASME BPVC Section VIII, Division 1, paragraph UW-52.
  - c. All other welds shall be 100% examined using magnetic particle testing in accordance with ASME BPVC, Section VIII, Division 1.
- F. Flanged Sections:
  - 1. Conform to AWWA C207 unless shown otherwise.
  - 2. Flanges fabricated from segments of plate shall be stress relieved before machining.
  - 3. Stress relieving shall conform to paragraphs UW-40 and UCS-56 of Section VIII of the ASME Code.
  - 4. Flanges shall be welded to pipe spools before machining. Spools shall be attached to the pipe after matching the flange.
  - 5. Lining and coating of flanges with attached pipe sections shall conform to Section 09900.

## 2.02 IDENTIFICATION OF PIPE AND FITTINGS

- A. Cylinders:
  - 1. Each length shall be plainly marked on the outside with a manufacturing number, metal stamped 1-inch from the bell end. This number shall be used in the cylinder manufacturing and hydrostatic tests to trace the steel used in manufacturing.
  - 2. Transfer this number, by metal stamping, to all pieces to be cut from cylinder, prior to cut.
- B. Pipe:
  - 1. Pipe designations as indicated on the drawings shall be plainly marked on the lining and coating on each length of pipe, one foot from the bell end. In addition, the date of final coating and identification to show proper location in the pipeline, by reference to layout drawings or schedules, shall be shown.
  - 2. Beveled pipe shall be marked to show degree of bevel, point of maximum pipe length at the spigot end, and the field top at each end.
  - 3. Pipe sections containing angle bends, manholes, or nozzles shall be stenciled on the lining and coating at both ends.

- C. Fittings:
  1. Mark with appropriate identifying number or symbol indicating its location in the pipeline.
  2. Mark vertical field top on each end of each pipe.

### 2.03 REPAIR OF DAMAGED PIPE

- A. Obtain approval of ENGINEER before performing repair work.
- B. Repair in presence of ENGINEER or replace all pipe sections damaged during manufacturing, handling, transporting, or storing.

## **PART 3 – EXECUTION**

### 3.01 PIPING INSTALLATION

- A. General Handling and Placing:
  1. Exercise great care to prevent injury to or scoring of the pipe lining and coating, as applicable, during handling, transportation or storage. Do not store pipe on rough ground and do not roll the pipe on the coating. Any damaged pipe sections, specials, or fittings shall be repaired or replaced at the expense of the CONTRACTOR as satisfactory to the ENGINEER.
    2. Carefully inspect each pipe, fitting, valve and accessory before installation to insure there is no defective workmanship or obstructions. Inspect the interior and exterior protective coatings and patch all damaged areas in the field or replace to the satisfaction of the ENGINEER.
    3. Place or erect all piping to accurate line and grade and backfill, support, hang, or brace against movement as specified or shown on the Drawings, or as required for proper installation. Remove all dirt and foreign matter from the pipe interior prior to installation and thoroughly clean all joints before joining.
    4. Use reducing fittings where any change in pipe size occurs. Do not use bushings unless specifically noted on the Drawings. Use eccentric reducing fittings wherever necessary to provide free drainage of lines.
    5. Cast all metallic pipes and sleeves 6-inch and larger into new concrete walls without blockout.
    6. Maintain at least ½-inch clearance between reinforcing steel and metal pipe in penetrations.
- B. General Buried Piping Installation:
  1. Trenching, bedding, and backfill for buried piping shall be as shown on the Drawings and as specified in Section 02210.
  2. Where pipe grade elevations are shown on the Drawings, install the pipe with straight grades between the indicated elevations.
  3. Where no pipe grade elevations are shown on the Drawings, install buried piping with at least 3 feet of cover (to finished grade). Where

pipings crosses under buried electrical ducts, provide at least 3 feet 6 inches of cover. Provide 12 inches minimum separation between the buried pipes and ducts.

4. Provide each pipe with a firm, uniform bearing for its full length in the trench except at field joints. Do not lay pipe in water or when trench conditions or weather are unsuitable for such work.
5. All exposed free pipe ends shall be securely braced. Cap or plug pipe ends that are left for future connections as shown on the Drawings and in a manner favorably reviewed by the ENGINEER.
6. Do not pull bell and spigot, gasketed joints more than 50% of the maximum deflection permitted by the pipe manufacturer.
7. The maximum trench width at the top of the pipe shall be the pipe outside diameter plus 3 feet unless indicated otherwise in the Drawings.

C. Closure Joints:

1. Install special closure joints at approximate 300-foot intervals.
2. Weld closure joints during the coolest part of the day and after 300 feet of pipe on both sides of the Closure Joint have been backfilled with CLSM to 1-foot over the top of the pipe. Maintain temperature of 74° F or less during the welding of the closure joint and placement of CLSM around the pipe.
3. Measure, record and maintain temperature of pipeline between the closure joints on either side of the closure joint being welded to verify temperature is at or below 74° F.
4. Do not place CLSM around closure joints until the exterior weld is complete and tape wrap is applied.

D. Pipe Welding:

1. General:
  - a. Field welding of joints shall be in accordance with AWWA C206. Acceptance of field welds will be based on visual inspection and non-destructive testing (pneumatic tests for double welds and magnetic particle testing of all butt welds) and final hydraulic testing of the pipeline. Magnetic particle testing shall be performed by an independent testing laboratory/firm certified for this type of work, which is hired by the CONTRACTOR as part of the CONTRACTOR's overall Quality Control program, see Section 01400, while the welds are being made and after they are completed. ENGINEER may require additional non-destructive tests by their own independent testing laboratory/firm to confirm the results of the CONTRACTOR's Quality Control program. Hand or power wire brush each weld thoroughly after completion to facilitate the inspection. Correct defects not complying with AWS Code D1.1, Table 6.1. Determine the cause of defects and take corrective measures to prevent a reoccurrence.
  - b. Prior to welding joints, evenly distribute the gap between the bell and the spigot. Gap between bell and spigot shall not exceed 1/8-inch.



- c. All fields welding shall be done in passes not thicker than that indicated in the approved welding procedure specifications. Size and type of electrodes, and current and voltages used, shall be in accordance with approved welding procedure specification. Give particular attention to the alignment of edges to be joined, so that complete fusion and penetration will be effected throughout the bottom of the weld. Welds shall contain no valleys or undercuts in the center or edges of the weld. Thoroughly clean each pass, including the final pass, of dirt, slag, and flux before the succeeding bead is applied.
  - d. Clean completed field welds of pipe joints of dirt, slag and flux. Completely chip out all defects in welds discovered during field inspection in a manner that will permit proper and complete repair by welding subject to the favorable review of the ENGINEER. Under no circumstances will caulking of defective welds be permitted.
  - e. All welding shall be done by experienced and skilled operators familiar with the methods and materials to be used. Hand welding will be done only by welders qualified under the standard qualification procedure of Section IX of the ASME Boiler and Pressure Vessel Code. The CONTRACTOR shall conduct tests of his welders, when required by the ENGINEER, in accordance with that code and in the presence of the ENGINEER. An independent testing laboratory, favorably reviewed by the ENGINEER, shall supervise the testing and determine the quality of the test work. Weld specimens in the same positions as those in which the welder is to qualify his work. The ENGINEER may require test specimens at any time. Any welder whose work is found unsatisfactory shall not remain employed on this Contract, regardless of the quality of his earlier work. Each hand weld specimen shall be plainly marked with the welder's identifying symbol. The CONTRACTOR shall furnish all materials required and pay all costs for qualifying welders.
  - f. Field welds shall follow as closely as possible to the laying operation. All field welds shall be complete before lining or coating of the joints in steel pipe is begun. Lining or coating of the exterior pipe joints prior to the welding of interior pipe joints shall not be permitted unless the CONTRACTOR can demonstrate such welding will not result in damage to exterior lining or coating during interior joint welding.
  - g. Double welded joints are required on all piping. Butt welds may be used on pipe installed in tunnels.
  - h. Field welds shall use E70 or E71 electrodes in accordance with approved welding process and procedures required in Paragraph 1.03.D of this section.
- E. Field Joint Coating and Linings:
- 1. Following satisfactory testing of the field weld, the interior lining and exterior coating shall be applied.
  - 2. Coating:
    - a. See Specification Section 09900.

## 3. Linings:

- a. The interior of all joints shall be cement mortar lined in accordance with AWWA C205.

## F. Controlled Low Strength Material:

1. CLSM shall comply with Section 02210.
2. CONTRACTOR shall take all measures necessary to prevent floating or displacing the pipe.
  - a. Loads placed on top of the pipe that may deflect the pipe or crack the liner shall not be allowed. Loads placed on the pipe to anchor the pipe shall provide a uniform loading. Provide sufficient stull pieces to prevent deflections and provide protection to prevent damage to the tape wrap.
  - b. CONTRACTOR may propose anchors or other means to prevent the pipe from floating in the CLSM.
3. Pipe stull pieces shall remain in place until the CLSM is set and the pipe has a uniform loading to prevent deflections of the pipe.

## 3.02 CLEANING

- A. Prior to testing, thoroughly clean the inside of each completed piping system of all dirt, loose scale, sand and other foreign material. Cleaning of the pipeline shall include the removal of all material not normally found in a water pipeline. This shall include but is not all inclusive of the removal of debris, rocks, stulls, rags, soil, weld debris, and loose mortar. The interior of the pipe shall be swept clean then pressure washed at a pressure that will not damage the interior of the pipeline. The CONTRACTOR shall install temporary strainers, temporarily disconnect equipment or take other appropriate measures to protect equipment while cleaning piping.

## 3.03 FIELD TESTING

- A. General: There shall be two types of test performed on each section of pipeline. One will be a pneumatic test on each double welded joint and the second will be a hydrostatic test of the pipeline segments as indicated in the schedule noted in Article 3.03.1.2 of this specification section. Where butt welds are used, magnetic particle testing shall replace the pneumatic test. Perform hydrostatic leakage tests on all pipe installed in this project. Furnish all equipment, material, personnel and supplies to perform the tests and make all taps and other necessary temporary connections. Water shall be furnished by the CONTRACTOR. The test pressure, allowable leakage and test medium shall be as specified and as shown in the Schedule under Testing Procedures.
  1. Test pressure shall be measured at the point noted in the Schedule. Leakage tests shall be performed on all piping at a time agreed upon and in the presence of the ENGINEER.
- B. Buried Piping: The leakage test for buried piping shall be made after all pipe is installed and backfilled. However, the CONTRACTOR may conduct preliminary tests prior to backfill. If the CONTRACTOR elects to conduct preliminary tests, provide any necessary temporary thrust restraint.

- C. Exposed Piping: All supports, anchors and blocks shall be installed prior to the leakage test. No temporary supports or blocking shall be installed for final test.
- D. Encased Piping: The leakage test for encased piping shall be made after all pipe is installed and encased, and before any structures are constructed above it. However, the CONTRACTOR will successfully complete preliminary tests prior to encasement, during which the CONTRACTOR will provide any necessary temporary thrust restraint.
  - 1. Pipe Joints: All double welded joints shall be pneumatically tested to 40 psi for ten minutes.
  - 2. Successful test shall have zero leakage in ten minutes.
- E. Accessories: It shall be the responsibility of the CONTRACTOR to block off or remove equipment, valves, gauges, etc., which are not designed to withstand the full test pressure.
- F. Testing Apparatus: Provide pipe taps, nozzles and connections as necessary in piping to permit testing including valves to isolate the new system, addition of test media, and draining lines and disposal of water, as is necessary. These openings shall be plugged in a manner favorably reviewed by the ENGINEER after use. Provide all required temporary bulkheads.
- G. Correction of Defects: If leakage exceeds the allowable, the installation shall be repaired or replaced, and leakage tests shall be repeated as necessary until conformance to the leakage test requirements specified herein have been fulfilled. All visible leaks shall be repaired even if the pipeline passes the allowable leakage test.
- H. Reports: The CONTRACTOR shall keep records of each piping test, including:
  - 1. Starting Station / Ending Station.
  - 2. Test pressure.
  - 3. Date of test.
  - 4. Witnessing by CONTRACTOR and ENGINEER.
  - 5. Test evaluation.
  - 6. Remarks, to include such items as:
    - a. Leaks (type, location).
    - b. Repairs made on leaks.
  - 7. Test reports shall be submitted to the ENGINEER.
- I. Testing Procedures:
  - 1. Testing Limits:
    - a. Pipeline shall be tested in sections as identified below. Hydrostatic testing shall be completed prior to Substantial Completion for the pipeline.
    - b. Pipeline shall be tested at each joint with pneumatic test as part of the pipeline construction and prior to backfill of the each joint to be tested.

- c. Each test shall be preceded by a written notification to the ENGINEER of the upcoming test at least five days prior to the test. All tests shall be performed in the presence of the ENGINEER.
  - d. CONTRACTOR is responsible for securing testing water for the hydraulic testing of the pipeline.
  - e. CONTRACTOR may elect to pressure test the complete pipeline segment provided he submits an acceptable plan to locate and repair any leaks with their testing plan should the hydraulic test fail. One means of detecting a leak that may be acceptable is by using a product provided by the "The Pressure Pipe Inspection Company Ltd" called the Sahara.
2. Pneumatic Testing of Double-Welded Joints:
    - a. Test at 40 psi.
    - b. Successful test shall have no loss for ten minutes.
  3. Filling the Pipe for Hydraulic Testing:
    - a. Fill the pipe at a flow rate not to exceed 15 mgd (23.21 cfs)
    - b. Allow pipe to rest and absorb water for a minimum of 24 hours prior to testing.
  4. Hydraulic Testing:
    - a. Duration: Four hours.
    - b. Pressure: 200PSI
    - c. Medium: Water.
    - d. Allowable Leakage: None.
  5. Butt Weld Testing:
    - a. Joints shall be tested by magnetic particle testing.
  6. Repairs and Retests:
    - a. CONTRACTOR shall be responsible for correcting any defective work on the Project. CONTRACTOR shall correct any leaks identified by the ENGINEER or that are identified through the testing program at no additional cost to the Project.
    - b. CONTRACTOR shall be responsible for all pipe retests associated with the Project at no additional cost to the Project.
- J. Disposal of Testing Water:
1. The pipeline shall be drained of all water at the end of each hydrostatic test. The pH of the testing water will be elevated from contact with the cement mortar lining, consequently, the CONTRACTOR shall treat the water prior to releasing it to any drainage path.
  2. CONTRACTOR shall obtain the appropriate discharge permits and shall comply with all discharge permit requirements.

-END OF SECTION -

**SECTION 15100**  
**VALVES, GENERAL**

**Part 1 - GENERAL**

1.01 WORK INCLUDED

- A. The CONTRACTOR shall provide all tools, supplies, materials, equipment, and labor necessary for furnishing, epoxy coating, installing, adjusting, and testing of all valves and appurtenant work, complete and operable, in accordance with the requirements of the Contract Documents. Where buried valves are shown, the CONTRACTOR shall furnish and install valve boxes to grade, with covers, extensions, and position indicators.
- B. The provisions of this Section shall apply to all valves and valve operators specified in the various Sections and Division 2 of these Specifications except where otherwise specified in the Contract Documents. Valves and operators in particular locations may require a combination of units, sensors, limit switches, and controls specified in other Sections of these Specifications.

1.02 RELATED WORK

- A. Section 02000 - Water Distribution System
- B. Section 02222 - Excavation and Backfill for Utilities
- C. Section 15000 - Piping General

1.03 REFERENCE STANDARDS

- A. Codes: All codes, as referenced herein, are specified in Section 01090
- B. Commercial Standards:
 

ANSI B16.5	Pipe Flanges and Flanged Fittings, Steel Nickel Alloy and Other Special Alloys
ANSI/ASME B31.1	Power Piping
ASTM A 36	Specification for Structural Steel
ASTM A 48	Specification for Gray Iron Castings
ASTM A 126	Specification for Gray Iron Castings for Valves, Flanges, and Pipe Fittings
ASTM A 536	Specification for Ductile Iron Castings
ASTM B 61	Specification for Steam or Valve Bronze Castings
ASTM B 62	Specification for Composition Bronze or Ounce Metal

	Castings		
	ASTM B 148	Specification for Aluminum-Bronze Castings	
	ASTM B 584	Specification for Copper Alloy Sand Castings for General Applications	
	ANSI/AWWA C500	Gate Valves for Water and Sewerage Systems	
	ANSI/AWWA C502	Dry-Barrel Fire Hydrants	
	ANSI/AWWA C503	Wet-Barrel Fire Hydrants	
	ANSI/AWWA C504	Rubber-Seated Butterfly Valves	
	ANSI/AWWA C507	Ball Valves 6 Inches Through 48 Inches	
	AWWA C508	Swing-Check Valves for Waterwork Service, 2 Inches Through 24 Inches NPS	
Systems	ANSI/AWWA C509	Resilient-Seated Gate Valves for Water and Sewage	
Assembly	ANSI/AWWA C511	Reduced-Pressure Principle Backflow-Prevention	
	AWWA C550	Protective Interior Coatings for Valves and Hydrants	
	SSPC-SP-2	Hand Tool Cleaning	
	SSPC-SP-5	White Metal Blast Cleaning	

#### 1.04 SUBMITTALS

- A. Shop Drawings: Shop drawings of all valves and operators including associated wiring diagrams and electrical data, shall be furnished as specified in Section 01300, "Submittals".
- B. Valve Labeling: The CONTRACTOR shall submit a schedule of valves to be labeled indicating in each case the valve location and the proposed wording for the label.

#### 1.05 QUALITY ASSURANCE

- A. In accordance with the "Reduction of Lead in Drinking Water Act" (Act) enacted by the USEPA on January 4, 2011, effective January 4, 2014 all piping, fittings, fixtures, valves, and other appurtenances used in potable water supply and distribution systems shall be "lead free" as defined in Section 1417(d) of the Safe Drinking Water Act (SDWA). All requirements of the Act as it relates to the work under this Contract shall be strictly adhered to.
- B. All valves and related appurtenances shall be manufactured in the United States.
- C. Valve Testing: Unless otherwise specified, each valve body shall be tested under a test pressure equal to twice its design water-working pressure.

- D. Bronze Parts: Unless otherwise specified, all interior bronze parts of valves shall conform to the requirements of ASTM B 62, or where not subject to dezincification, to ASTM B 584.
- E. Certification: Prior to shipment, the CONTRACTOR shall submit for all valves over 12 inches in size, certified, notarized copies of the hydrostatic factory tests, showing compliance with the applicable standards of AWWA, ANSI, ASTM, etc.

## **Part 2 - PRODUCTS**

### 2.01 GENERAL

- A. The CONTRACTOR shall furnish all valves, gates, valve operating units, stem extensions, operators and other accessories as shown or specified. All valves shall be new and of current manufacture. All valve boxes shall be Taylor and all valves shall have a minimum design pressure rating of 150 psi unless otherwise specified elsewhere herein. If two-inch (2") or smaller valves are needed, Nibco T-133 or T-136 shall be used.
- B. Ductile iron parts of valves shall meet the requirements of ASTM A126, "Standard Specifications for Gray Iron Castings for Valves, Flanges and Pipe Fittings, Class 'B'." Flanged ends shall be flat-faced and have bolt circle and bolt patterns conforming to ANSI B16.1 Class 125.
- C. All castings shall be clean and sound, without defects of any kind and no plugging, welding or repairing of defects will be permitted. All bolt heads and nuts shall be hexagonal conforming to ANSI B18.2. Gaskets shall be full-face and made of synthetic elastomers in conformance with ANSI B16.21 suitable for the service characteristics, especially chemical compatibility and temperature. Non-ferrous alloys of various types shall be used for parts of valves as specified. Where no definite specification is given, the material shall be the recognized acceptable standard for that particular application.
- D. All buried valves shall be provided with cast-iron valve boxes unless otherwise indicated. The boxes shall conform to Department Standards and be installed perpendicularly, centered around and covering the upper portions of the valve operator. The top of each valve box shall be placed flush with finish grade unless otherwise indicated on the Drawings. Valve boxes shall be as specified elsewhere in this Section.
- E. All buried valves and other valves located below a concrete operating deck or level, specified or noted to be key operated, shall have an operator to finish grade or deck level, non-rising stem, a 2-inch square AWWA nut with skirt, and cover or box and cover, as may be required.

## F. Extension Shafts:

1. A one-piece extension shaft with an AWWA 2-inch square operator nut pinned at the top end and coupling shear pin shall be furnished with valves, where applicable, as shown in the Plans or Standard Details. Extension shafts shall be designed and furnished by the valve manufacturer and shall each be complete with coupling, standard AWWA 2-inch square operating nut with skirt, shear pins and centering-identification plate, for connection to the valve operator (or input) shaft as specified herein below. Shafts shall be of solid section. Hollow shafting is not acceptable.
2. All operator components between the operating nut and the adjustable stops shall be designed to withstand, without damage, an input torque of 300 ft. lbs. The shaft shall be furnished with an AWWA 2-inch square operating nut with skirt, mounted and pinned to the top of the shaft. A coupling shall be provided for the bottom of the shaft to connect the extension to the valve operator (or input) shaft.
3. The coupling shall be welded to the bottom end of the extension shaft after the exact required length of the shaft has been determined by field measurement during the valve installation and cut to size. The weld shall be wire brushed and painted with Kop-Coat Super Hi-Gard 891 or approved equal. The sized extension shaft with welded coupling shall be installed to the valve operator shaft and pinned with the coupling shear pin. The welding of the coupling to the extension shaft shall be performed by operators who are certified. The welding shall conform to all of the applicable recommendations of the American Welding Society and the American Institute of Steel Construction.
4. The pin through the coupling and valve operator (or input) shaft shall be of a larger diameter than the pin through the top nut and extension shaft, so that if torque exceeds the designed limits, the pin through the nut will shear first. Pins shall be either force fit or mechanically locked. Mechanical locking shall be by lock washers, lock nuts, force fit or other sturdy and corrosion resistant means. No roll pins will be allowed. Riveted or welded type pins will not be allowed.
5. The extension shaft shall also be equipped with a combination centering-identification plate. The combination centering-identification plate, with a drilled or punched center hole, will be slipped onto the shaft prior to welding the shaft's bottom coupling as specified above. The center hole in the plate shall be 1/4-inch larger in diameter than the shaft, maximum. The plate shall be 1/8-inch thick AISI Type 316 stainless steel with an outside diameter of 6-3/4 inches. The top of the plate shall be buffed to remove mill scale, and the following information shall be stamped into the top of the



plate in letters and numerals not less than 3/8-inch in height; valve manufacturer; valve type, size and class; direction to open; and number of turns to fully open from a fully closed position. The valves shall open by turning the operating nuts counterclockwise.

- G. Valve Flanges: The flanges of valves shall be in accordance with Section 15000 - Piping General.
- H. Gate Valve Stems: Gate valve stems shall be of bronze conforming to ASTM B62, containing not more than 5 percent of zinc or more than 2 percent of aluminum. Gate valve stems shall have a minimum tensile strength of 60,000 psi, a minimum yield strength of 40,000 psi, and an elongation of at least 10 percent in 2 inches, as determined by a test coupon poured from the same ladle from which the valve stems to be furnished are poured. Where dezincification is not a problem, bronze conforming to ASTM B 584 may be used.
- I. Protective Coating: Except where otherwise specified, ferrous surfaces, exclusive of stainless steel surfaces, in the fluid passages of all valves 4-inch and larger shall receive an epoxy coating in accordance with AWWA C550. Flange faces of valves shall not be epoxy coated. The valve manufacturer shall certify in writing that such coating has been applied and tested in the manufacturing plant prior to shipment, in accordance with these Specifications. Exterior coating shall be asphalt varnish conforming to Federal Specification TT-C-494A.
- J. Nuts and Bolts: All nuts and bolts on valve flanges and supports shall be in accordance with manufacturer's recommendations. Where submerged or buried, all nuts and bolts on valve flanges and valve bodies shall be stainless steel. Nuts and bolts shall be of different grades of stainless steel to prevent galling.
- K. Valve Labeling: A label shall be provided on all shut-off valves exclusive of hose bibs and chlorine cylinder valves. The label shall be of 1/16-inch brass or stainless steel, minimum 2 inches by 4 inches in size, and shall be permanently attached to the valve or on the wall adjacent to the valve or as indicated by the Department.
- L. Valve Operators
  - 1. General
    - (a) All gate valves installed horizontally shall be furnished with geared operators, provided by the manufacturer. All valves of a particular size and pressure rating by a given manufacturer shall be supplied with the same operator. No variation will be permitted during the contract. All

valve operators, regardless of type, shall be installed, adjusted, and tested by the valve manufacturer at the manufacturing plant. Operator orientation shall be verified with the CITY prior to fabrication. If this requirement is not met, changes to orientation shall be made at no cost the CITY.

- (b) All operators shall turn counter-clockwise to open. Operators shall have the open direction clearly and permanently marked. Field adjustment and testing of the operators and valves to ensure proper installation and operation shall be the responsibility of the CONTRACTOR.

## 2. Manual Operators

- (a) All manual operators for buried gate valves for the water main shall be equipped with AWWA square nuts,

### 2.02 GATE VALVES THREE INCH (3") TO TWELVE INCH (12"):

- A. The valves shall be resilient seated and shall conform in design, material, and workmanship to the standards of AWWA C509. Gate valves shall open counterclockwise and shall be of iron body, non-rising stem, and mechanical cut-in joint ends. All resilient seat valves must be bi-directional.
- B. Valves shall be coated with a two-part thermosetting epoxy coating on inside of valve and on valve disc. The coating shall conform to the requirements of AWWA C-550. After the factory test and inspection, all ferrous parts of the valves except finished or bearing surfaces shall be painted with two (2) coats of asphalt varnish, Federal Specification TT-V-51A or approved equal.
- C. Gate valves four inches (4") through twelve inches (12") in diameter shall be American Flow Control Series 2500, or U.S. Pipe A-USP1 Resilient Wedge Gate Valves. No Substitutions.

### 2.03 TERMINAL BLOW-OFF VALVES:

- A. The terminal blow-off valve assemblies shall be installed in accordance with the details shown in the CITY Standard Details. The following products shall be used to construct the assemblies:
- B. Angle Valves (for terminal blow-off): 2-inch threaded valves with handwheel, bronze body and composition disc. 2-inch angle valves for terminal blow-off shall be Nibco T311 or ITT Grinnell Fig. No. 3220
- C. After the tap has been made and the corporation stop has been installed on a pipe conveying potable water, the exposed exterior surfaces of the stop shall be

heavily coated with Kop-Coat Super Hi-Gard 891 White 1898, or approved equal. Where taps are made in a pipe conveying sewerage, the Contractor shall heavily coat the inside of the pipe around the stop and the exposed exterior surfaces of the stop with Bitumastic 300M, by Kop-Coat Co., or Protector 401 for sewer applications.

- D. The installation of the terminal blow-off outlet shall include excavation; cutting, threading and installing PVC and galvanized pipe and fittings; tapping the ductile iron plug; concrete thrust block; furnishing and installing angle valve; cutting and placing cast iron riser pipe complete with valve boxes and cover, set in concrete; backfilling and compaction; and all other appurtenant items and work.

#### 2.04 CORPORATION STOPS (Ball Valve Type)

- A. Unless otherwise shown, corporation stops shall be made of brass alloy for key operation, with screwed ends with corporation thread or iron pipe thread, as required. AWWA taper thread for inlet thread and compression type fittings for outlet.
- B. Corporation Stop Manufacturer or Equal:
1. Ford Meter Box Company;
  2. James Jones Company;
  3. Mueller Company.

#### 2.05 TAPPING VALVES AND TAPPING SLEEVES:

- A. Tapping Sleeves - See Section 15102 – Tapping Sleeves and Tapping Valves.
- B. Tapping Valves – Refer to Gate Valves in Section 2.04.C above.

#### 2.06 VALVE BOXES AND COVERS

- A. Valve boxes and covers for all size valves shall be of cast iron construction and adjustable screw-on type. The lid shall have cast in the metal the word "WATER" for water lines. All valve boxes shall be six-inch (6") nominal diameter and shall be suitable for depths of the particular valve. The stem of the buried valve shall be within twenty-four inches (24") of the finished grade unless otherwise approved by the ENGINEER. Valve boxes for 3" through 20" valves shall be Tyler Union model 6860 Cast Iron screw-type valve box with 5-¼" locking lid, or approved equal.
- B. Cast iron valve box shall not rest directly upon the body of the valve or upon the pipe. The box shall be placed in proper alignment and to such an elevation that its top will be at the final grade. Backfilling around both units shall be placed and compacted to the satisfaction of the ENGINEER.

**Part 3 - EXECUTION**

## 3.01 VALVE INSTALLATION

- A. General: All work shall be performed by skilled workmen experienced in similar installations. All valves shall be adequately supported by clamps, brackets, straps, concrete supports or other devices as shown or specified.
- B. All valves shall be thoroughly cleaned internally before being installed. Installation of valves shall be done in accordance with this section.
- C. All valves, gates, operating units, stem extensions, valve boxes, and accessories shall be installed in accordance with the manufacturer's written instructions and as shown and specified. All gates shall be adequately braced to prevent warpage and bending under the intended use. Valves shall be firmly supported to avoid undue stresses on the pipe. Install valves so that they are easily accessible for operation, visual inspection and preventive maintenance.
- D. The installation of all underground valves shall include a valve box and riser in accordance with the Details shown on the Plans or in the Standard Details for the various sizes and types of valves to be installed. Riser pipes and valve boxes shall be carefully centered and set flush with the finished grade if in paving, or with the top of the ground if out of paved areas. All valve boxes shall be held in position with concrete as shown on the Plans or in the Standard Details.
- E. Upon completion of the Project, but prior to final acceptance, the CONTRACTOR in the presence of the ENGINEER, shall fully open each valve installed by him, except at connections to existing CITY mains. Valves at connections to existing CITY mains shall only be operated by City staff.
- F. Valve Accessories: Where combinations of valves, sensors, switches, and controls are specified, it shall be the responsibility of the CONTRACTOR to properly assemble and install these various items so that all systems are compatible and operating properly. The relationship between interrelated items shall be clearly noted on shop drawing submittals.
- G. Flange Ends:
  - 1. Flanged valve boltholes shall straddle vertical centerline of pipe.
  - 2. Clean flanged faces, insert gasket and bolts, and tighten nuts progressively and uniformly.
- H. Screwed Ends:
  - 1. Clean threads by wire brushing or swabbing.

2. Apply joint compound.
- I. Extension Stem for Operator: Where the depth of the valve is such that its centerline is more than 3 feet below grade, furnish an operating extension stem with 2-inch operating nut to bring the operating nut to a point 6 inches below the surface of the ground and/or box cover.

### 3.02 VALVE CUT-INS ON WATER MAINS

- A. Water system shall be maintained under pressure during entire construction. All valve additions shall be performed while the system is in service. No line shall be shut down during construction by CONTRACTOR or others unless approved by the CITY.
- B. Valve Accessories: Where combinations of valves, sensors, switches, and controls are specified, it shall be the responsibility of the CONTRACTOR to properly assemble and install these various items so that all systems are compatible and operating properly. The relationship between interrelated items shall be clearly noted on shop drawing submittals.

### 3.03 TESTS AND INSPECTION

- A. Valve may be either tested while testing pipelines, or as a separate step.
- B. Test that valves open and close smoothly with operating pressure on one side and atmospheric pressure on the other, in both directions for two-way valve and applications.
- C. Inspect air and vacuum valves as pipe is being filled to verify venting and seating is fully functional.
- D. Count and record number of turns to open and close valve; account for any discrepancies with manufacturer's data.
- E. Set, verify, and record set pressures for all relief and regulating valves.
- F. Test hydrostatic relief valve seating; record leakage. Adjust and retest to maximum leakage of 0.1 gpm per foot of seat periphery.

- END OF SECTION -

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**SECTION 15115****IN-LINE STORM DRAIN CHECK VALVES****Part 1 - GENERAL**

## 1.01 SCOPE OF WORK

- A. The City of Hollywood will procure in-line storm drainage check valves and the CONTRACTOR will install them within existing or proposed storm sewer pipe for a complete and operable installation, including all appurtenances and accessories.

## 1.02 RELATED WORK SPECIFIED ELSEWHERE

- A. Section 02071 – Underground Storm Sewer Structures
- B. Section 15010 - PVC Non-pressure Storm Drainage Pipe and Fittings

## 1.03 SUBMITTALS

- A. Section 01300 - Submittals: Requirements for submittals.
- B. Shop Drawings: Submit shop drawings for check valves.
- C. Manufacturer's Certificate: Certify products meet or exceed specified requirements.

## 1.04 PRE-CONSTRUCTION

- A. Prior to procuring the in-line check valves, CONTRACTOR shall inspect the existing storm drainage structures from where the check valves will be installed to ensure that the interiors of the structures are large enough to accommodate the insertion of the check valves, and confirm the inside diameter of the insertion pipe. If the structure sizes or pipe diameters cannot accommodate the specified check valves the CONTRACTOR shall notify the Engineer immediately.

**Part 2 - PRODUCTS**

## 2.01 IN-LINE CHECK VALVES

- A. In-line Check Valves for Storm Drainage in 6-inch, 18-inch and 24-inch diameter shall be manufactured with housings of stainless steel AISI 304 (EN1.4301), AISI 316L (EN1.4404) and PVC/PE, and membranes of either Polyurethane or Silicone depending on the diameter.
- B. All fasteners shall be fabricated from marine-grade AISI 316 stainless steel.
- C. In-line check valves shall have no moving parts.
- D. In-line Check Valves for Storm Drainage shall be WASTOP® as manufactured by WAPRO, Inc., or approved equal based on the following performance parameters:

In-line Check Valve Diameter	Max. Back Pressure (head)	Horizontal Opening Pressure (head)	Horizontal Closing Pressure (head)	Submerged Opening Pressure (in.)	Submerged Closing Pressure (in.)	Vertical Opening Pressure (in.)	Vertical Closing Pressure (in.)	Max. Flow (GPM)
6-inch	16.4 ft.	9.3 ft.	3.1 ft.	6.9 in.	1 in.	13.8 in.	4.7 in.	575
18-inch	16.4 ft.	8.7 ft.	5.7 ft.	5.7 in.	1.8 in.	15.2 in.	9.1 in.	7,580
24-inch	16.4 ft.	14 ft.	9.6 ft.	9.3 in.	3 in.	16.7 in.	10 in.	17,945

### **Part 3 - EXECUTION**

#### 3.01 GENERAL

- A. All in-line check valves shall be manufactured specifically for installation within existing or proposed storm pipes, to be accessed from within an underground concrete storm drainage structure.
- B. Follow the manufacturer's installation instructions for installing within an existing storm sewer pipe connected to the downstream invert of a storm drainage catch basin or manhole structure.

### **Part 4 - TESTING**

- A. After completion of installation, all in-line storm drainage check valves shall be inspected and tested to verify the performance parameters from the manufacturer.

- END OF SECTION -



## SECTION 15995

### PIPELINE TESTING AND DISINFECTION

#### **Part 1 - GENERAL**

##### 1.01 REQUIREMENT

- A. The CONTRACTOR shall perform flushing and testing of all pipelines and appurtenant piping, complete, including conveyance of test water from CITY-designated source to point of use and all disposal thereof, all in accordance with the requirements of the Contract Documents.

##### 1.02 REFERENCE SPECIFICATIONS, CODES, AND STANDARDS

###### A. Commercial Standards

ANSI / AWWA B300	Hypochlorites
ANSI / AWWA B301	Liquid Chlorine
ANSI / AWWA C651	Disinfecting Water Mains

##### 1.03 SUBMITTALS

- A. A testing schedule, including proposed plans for water conveyance, control, and disposal shall be submitted in writing for approval a minimum of seven (7) days before testing is to start.
- B. The CONTRACTOR shall submit disinfection test reports and hydrostatic test reports in accordance with Sections 01300 entitled "Submittals" and Section 01700 entitled "Project Closeout".

#### **Part 2 - PRODUCTS**

##### 2.01 MATERIALS REQUIREMENTS

- A. All equipment, temporary valves or bulkheads, temporary vents or drains, pumps, piping, gauges or other water control equipment and materials required for testing of mains shall be furnished, installed and operated by the CONTRACTOR subject to the CITY'S review. No materials shall be used which would be injurious to the construction or its future function.
- B. Pumps shall be of a non-pulsating type suitable for this application and gauge accuracy certification may be required at the Engineer of Record's discretion.
- C. All pressure and leakage testing shall be done in the presence of a representative of the CITY as a condition precedent to the approval and acceptance of the system.

- D. All water mains shall be flushed to remove all sand, debris, rock and other foreign matter. Dispose of the flushing water without causing a nuisance or property damage.

### **Part 3 - EXECUTION**

#### 3.01 GENERAL

- A. Notify the ENGINEER and CITY 48 hours in advance to obtain CITY'S approval to commence testing and/or disinfection of the water main.
- B. Unless otherwise provided herein, water for flushing and testing pipelines will be furnished by the CITY; however, the CONTRACTOR shall make all necessary provisions for conveying the water from the CITY-designated source to the points of use.
- C. All pressure pipelines shall be tested. All testing operations shall be performed in the presence of the CITY.

#### 3.02 FLUSHING AND CLEANING

- A. At the conclusion of the installation work, the CONTRACTOR shall thoroughly clean all new liquid conveying pipe by flushing with water or other means to remove all dirt, stones, pieces of wood, etc., which may have entered the pipe during the construction period. If after this cleaning any obstructions remain, they shall be corrected by the CONTRACTOR, at CONTRACTOR'S own expense, to the satisfaction of the CITY. Liquid conveying pipelines shall be flushed at the rate of at least 2.5 feet per second for a duration suitable to the CITY or shall be flushed by other methods approved by the CITY.
- B. After the pipelines are cleaned and if the groundwater level is above the pipe, or following a heavy rain, the ENGINEER will examine the pipe for leaks. If defective pipes or joints are discovered at this time, they shall be repaired or replaced by the CONTRACTOR.

#### 3.03 HYDROSTATIC TESTING OF PIPING (WATER AND FORCE MAINS)

- A. Following pipeline flushing, the CONTRACTOR shall hydrostatically test all pipelines either in sections or as a unit. The section of main being tested shall be limited to a maximum length of 2,000 feet. No section of the pipeline shall be tested until all field-placed concrete or mortar has attained an age of 14 days. The test shall be made by closing valves when available, or by placing temporary bulkheads in the pipe and filling the line slowly with water.

- B. The CONTRACTOR shall provide all reaction blocking and necessary plugs and caps required to test all piping installed as part of this Contract. The CONTRACTOR shall supply and install temporary air release valves for purposes of facilitating proper hydrostatic testing conditions. Location of the ARV's shall be as per the instructions given by the ENGINEER. The CONTRACTOR shall be responsible for ascertaining that all test bulkheads are suitably restrained to resist the thrust of the test pressure without damage to, or movement of, the adjacent pipe. Care shall be taken to see that all air vents are open during filling. The CONTRACTOR shall be responsible for removing temporary ARV's, reaction blocking and temporary plugs and caps upon the successful completion of the testing and shall be responsible for all associated site restorations resulting from the work.
- C. The pipeline shall be filled at a rate which will not cause any surges or exceed the rate at which the air can be released through the air valves at a reasonable velocity and all the air within the pipeline shall be properly purged. After the pipeline or section thereof has been filled, it shall be allowed to stand under a slight pressure for at least 24 hours to allow the concrete or mortar lining, as applicable, to absorb what water it will and to allow the escape of air from any air pockets. During this period, bulkheads, valves, and connections shall be examined for leaks. If leaks are found, corrective measures satisfactory to the CITY shall be taken.
- D. The hydrostatic test shall consist of holding a test pressure of 150 psi on the pipeline for a period of 2 hours and in accordance with ANSI/AWWA Standard C605-05. All visible leaks shall be repaired in a manner acceptable to the CITY.
- E. The maximum allowable leakage shall be determined by the following formula:

$$L = \frac{S \cdot D \cdot \sqrt{P}}{148,000}$$

Where:

L = Allowable leakage for system in gallons per hour

D = Pipe diameter in inches

S = Length of lines in lineal feet

P = Average test pressure in psi

- F. When testing against closed metal-seated valves, an additional leakage per closed valve of 0.0078 gallon / hour / inch of nominal valve size shall be allowed. Any questions pertaining to procedures used during the test shall be decided by the ENGINEER.

- G. The test is usually maintained for two hours, but it may be continued for one additional hour if it becomes apparent that the leakage is equal to or greater than the amount allowable. Water supplied to the main during the test to maintain the required pressure shall be measured by a 5/8-inch meter installed on the discharge side of the test pump, or by pumping from a calibrated container. A hose bib connection will be provided by the CONTRACTOR to accept the test gauge supplied by the CITY.
- H. In the case of pipelines that fail to pass the prescribed leakage test, the CONTRACTOR shall determine the cause of the leakage, shall take corrective measures necessary to repair the leaks, and shall again test the pipelines. No installation will be acceptable by the CITY until the leakage is less than the allowable for the system.
- I. The CONTRACTOR shall submit to the CITY a detailed description of the testing procedures to be utilized.

#### 3.04 DISINFECTION (POTABLE WATER LINES ONLY)

- A. After the water mains have satisfied the leakage requirements, they shall be flushed through openings of the required size as detailed in ANSI/AWWA Standard C601 latest revision. The main shall then be disinfected in accordance with the provisions of the applicable sections of the above-named specifications. On main breaks, cut-ins, etc., a liberal application of calcium hypochlorite shall be made.
- B. Mains shall not be put into domestic service until the necessary bacteriological samples have been approved by the applicable regulatory agencies.
- C. Provide list of equipment required and a disinfection plan to execute the work of this Section.
- D. Inject the required amount of disinfectant to yield a minimum chlorine content of 50 ppm into piping system.
- E. Allow solution to remain in the pipes for twenty-four hours or longer, if required, to destroy all harmful bacteria.
- F. Operate all valves and other appurtenances during disinfection to assure the sterilizing mixture is dispersed into all parts of the system.
- G. After the solution has been retained for the required time, pipes shall be flushed and filled with municipal domestic water. Sterilizing water shall be disposed of in an approved manner. Sterilizing water shall not be allowed to flow into a waterway without reducing chlorine concentrations to a safe level. The CONTRACTOR shall

be responsible for meeting all applicable requirements and acquiring all necessary permits for this work.

- H. Take one bacteriological sample and test from every segment of pipeline tested. Samples shall be taken and tested on each of two successive days. CONTRACTOR shall submit sample to a laboratory, approved by ENGINEER, for testing. The disinfection process shall be repeated if laboratory test results reflect presence of harmful bacteria in the water.
- I. The CONTRACTOR shall be responsible for coordination with Broward County Department of Health, who shall collect and test samples from the main. The CONTRACTOR shall provide assistance to the Broward County Department of Health for the collection of samples. The samples shall be taken from each main or section of main to be placed in service where designated by the Broward County Department of Health. The samples must be approved by the Department of Health before the main is placed in service.
- J. The CONTRACTOR shall be responsible for any re-chlorination and retesting that may be required until the Broward County Department of Health's approval is obtained. The CONTRACTOR shall be responsible for the disposal of all water flushed from the system and shall safeguard all adjoining properties from damage from flooding. The CONTRACTOR shall exercise due care in the protection of private property from water damage due to CONTRACTOR'S operations. In addition, the CONTRACTOR shall assume complete liability for any damage which was directly or in-directly caused by CONTRACTOR'S operations.

### 3.05 BACTERIOLOGICAL ANALYSES

- A. Provide analysis of treated water to meet standards and receive acceptance from the Broward County Health Department.
- B. Test samples in accordance with AWWA C601.
- C. Quality Assurance: Testing Laboratory: Certified for examination of drinking water in compliance with applicable legislation of the State of Florida.
- D. Regulatory Requirements: Conform to Chapter 17-22 of the Florida Administrative Code.
- E. Submittals
  - 1. Submit name of testing laboratory and evidence of qualification.
  - 2. Submit three copies of reports.
- F. Project Record Documents

1. Submit reports under provisions of Sections entitled "Submittals" and "Project Closeout".
2. Bacteriological report; accurately record:
  - (a) Date issued, project name, and testing laboratory name, address, and telephone number;
  - (b) Time and date of water sample collection;
  - (c) Name of person collecting sample;
  - (d) Test locations;
  - (e) Initial and twenty-four hour disinfectant residuals in ppm for each outlet tested;
  - (f) Coliform bacteria test results for each outlet tested;
  - (g) Certification that water conforms, or fails to conform to bacterial standards of State of Florida and;
  - (h) Bacteriologist's signature.

- END OF SECTION -

**APPENDIX A**  
**GEO TECHNICAL REPORT**

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**REPORT OF  
GEOTECHNICAL EXPLORATION**

**CITY OF HOLLYWOOD WATER MAIN REPLACEMENT  
PROJECT # 16-5133  
HOLLYWOOD, FLORIDA**

**FOR**

**BROWN AND CALDWELL  
850 TRAFALGAR COURT, STE. 300  
MAITLAND, FLORIDA 32751**

**PREPARED BY**

**NUTTING ENGINEERS OF FLORIDA, INC.  
2051 NW 112<sup>TH</sup> AVENUE, SUITE #126  
MIAMI, FLORIDA 33172**

**PROJECT NO. 1716.2**

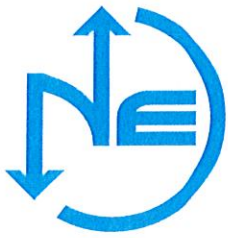
**OCTOBER 2017**



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October 4, 2017

Mr. Victor Hurlburt, P.E.  
Brown and Caldwell  
850 Trafalgar Court, Ste. 300  
Maitland, Florida 32751  
Phone: (407) 661-9536  
Email: [vhurlburt@brwncald.com](mailto:vhurlburt@brwncald.com)

Re: Report of Geotechnical Exploration  
City of Hollywood Water Main Replacement  
Project # 16-5133  
Hollywood, Florida

Dear Mr. Hurlburt:

Nutting Engineers of Florida, Inc. has performed a geotechnical exploration for the referenced project in Hollywood, Florida. The purpose of the exploration was to obtain information concerning the site and subsurface conditions at specific test locations in order to provide soil parameters for the proposed water lines. This report presents our findings and recommendations.

## PROJECT INFORMATION

Per your email dated February 23, 2017 and review of the site information, plan, and aerial photograph provided therein, we understand that plans for this project include the installation of approximately 19,000 lineal feet of water main to be installed via open trench and directional drill below the canal crossing at Sherman Street at the referenced site. The project is bounded by Sheridan Street on the north, Taft Street on the south, North 26<sup>th</sup> Street at the east, and North 28<sup>th</sup> Avenue on the west.

## GENERAL SUBSURFACE CONDITIONS

### Subsurface Soil Exploration

The exploration of subsurface conditions included site observation and sixteen (16) test borings (ASTM D-1586) to depths of 6 to 20 feet below grade, in order to evaluate the subsurface soil conditions along the proposed pipe alignment.

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Miami-Dade  
St. Lucie



We note that due to the potential for underground utilities at the test boring locations, the upper four to six feet of the soil profile at the test boring locations were manually cleared. Because of this, the relative density of the upper four to six feet was not obtained.

The test boring results may be classified into two main groupings. The first grouping, Grouping A, generally consists of fine sand to depths of four to six feet below ground surface followed by fine sand with varying amounts of limestone fragments and silt to a depth of six feet, the maximum depth explored.

Grouping B generally consists of fine sand to depths of one to seven feet below grade followed by a layer of peat varying in thickness of one to four feet. Thereafter, loose to medium dense fine sand was encountered to twenty feet, the maximum depth explored.

The boring locations that may be classified as grouping B are as follows: Test Borings B-6, B-8, B-9, B-10, B-13 and B-16. These boring locations were generally concentrated on the western half of the study area, west of NW 27<sup>th</sup> Avenue. The remainder of the borings may be classified as Grouping A.

The locations of the test borings are indicated on the attached boring location plan. The individual test boring reports are presented in the Appendix of this report. The boring locations were established in the field using approximate methods; namely, a measuring wheel and available surface controls, as such, the boring locations should be considered to be approximate.

**Laboratory Testing and Results**

Soil samples obtained from the drilling operations were preserved in jars and visually classified in the laboratory by a geotechnical engineer to confirm the field classifications. A selected soil sample of the organic peat recovered from the borings was subjected to testing to determine natural moisture and organic contents to estimate the engineering properties of these soils. The tests were performed on a selected sample believed to be representative of the materials encountered. Results of the test are tabulated below:

**LABORATORY RESULTS**

<i>Test Boring #</i>	<i>Soil Description</i>	<i>Sample Depth Interval (Feet)</i>	<i>Moisture Content (%)</i>	<i>Organic Content (%)</i>
B-8	Peat	2 – 4	221	71.6





## Groundwater Information

The immediate groundwater level was measured at the boring locations at the time of drilling. The groundwater level was encountered at approximately one and a half to ten feet below the existing ground surface.

The immediate depth to groundwater measurements presented in this report may not provide a reliable indication of stabilized or long term depth to groundwater at this site. Water table elevations can vary dramatically with time through rainfall, droughts, storm events, flood control activities, nearby surface water bodies, tidal activity, pumping and many other factors. For these reasons, this immediate depth to water data **should not** be relied upon alone for project design considerations. Further information regarding stabilized groundwater elevations at the site could be developed upon specific request.

## DISCUSSION OF RESULTS

In our opinion, pipe through the areas with mostly sand (i.e. Grouping A) will need to be laid in bedding compacted to at least 98 percent of the maximum dry density to a depth of at least 12 inches below the pipe if the bedding material is predominantly sand. Alternatively, if the excavation encounters limestone, no compaction is necessary.

Where peat is encountered (i.e. Grouping B) at the bottom of the proposed excavation level, we recommend the pipe bedding should be over-excavated to at least 12 inches or two pipe diameters below the proposed pipe, whichever is greater. Filter fabric should then be placed along the bottom and the walls of the excavation. Once the filter fabric is in place, backfilling may be performed using No. 57 ballast stone or as specified by the civil engineer. Sand and/or limestone fragments encountered above the peat layer may be stockpiled and used for backfill.

The civil engineer and project plans should be consulted for specific details concerning pipe bedding and backfill.

## GENERAL INFORMATION

Our client for this geotechnical evaluation was:

Mr. Victor Hurlburt, P.E.  
Brown and Caldwell  
850 Trafalgar Court, Ste. 300  
Maitland, Florida 32751

The contents of this report are for the exclusive use of the client, the client's design & construction team and governmental authorities for this specific project exclusively. In no event shall the contents of this report be used or relied upon by other parties or for



other projects without the expressed written consent of NE. This report discusses geotechnical considerations for this site based upon observed conditions and our understanding of proposed construction. Environmental issues including (but not limited to), soil and/or groundwater contamination are beyond our scope of service for this project. As such, this report shall not be used or relied upon for evaluation of environmental issues.

If conditions are encountered which are not consistent with the findings presented in this report, this office shall be notified in writing immediately so that the condition or change can be evaluated and appropriate action taken.

Excavations of five feet or more in depth should be sloped or shored in accordance with OSHA and State of Florida requirements.

The Geotechnical Engineer warrants that the findings, recommendations, specifications, or professional advice contained herein, have been presented after being prepared in accordance with general accepted professional practice in the field of foundation engineering, soil mechanics and engineering geology. No other warranties are implied or expressed.

We appreciate the opportunity to provide these services for you and look forward to completing this and other projects with you. If we can be of any further assistance with the design or construction services, or if you need additional information, please feel free to contact us at your convenience.

Sincerely,  
**NUTTING ENGINEERS OF FLORIDA, INC.**



Richard C. Wohlfarth, P.E.  
Director of Engineering




Stephen J. Mrachek, P.E. #70784  
Senior Engineer

Attachments: Boring Location Plans  
Test Boring Reports  
Limitations of Liability  
Soil Classification Criteria





- LEGEND -  
 APPROX. TEST LOCATION



Brown and Caldwell  
 City of Hollywood Water Main Replacement  
 Project # 16-5133  
 Hollywood, Florida

APPROXIMATE  
 TEST LOCATION PLAN  
 — Not to Scale —

**FIG. 1**

PROJECT NO. 417.6





1310 Neptune Drive  
 Boynton Beach Fl. 33426  
 Telephone: 5617364900  
 Fax: 5617379975

**BORING NUMBER B-1**

CLIENT Brown and Caldwell PROJECT NUMBER 417.6  
 PROJECT NAME City of Hollywood Water Main Replacement Project # 16  
 PROJECT LOCATION Various locations, Hollywood, FL

DATE STARTED 8/31/17 COMPLETED 8/31/17 SURFACE ELEVATION REFERENCE Same as road crown  
 DRILLING METHOD Standard Penetration Boring GROUND WATER LEVELS:  
 LOGGED BY T. Lovett CHECKED BY S. Mrachek  AT TIME OF DRILLING 3.0 ft  
 APPROXIMATE LOCATION OF BORING As located on site plan

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	Blows	N-Value	▲ SPT N VALUE ▲			
						10	20	30	40
						PL      MC      LL  ----- ----- -----  20    40    60    80			
						<input type="checkbox"/> FINES CONTENT (%) <input type="checkbox"/> 20    40    60    80			
0		TOPSOIL Lt. brown fine SAND	AU 1						
5			AU 2						
			AU 3						
		Bottom of hole at 6.0 feet.							

TEST NUTTING BOREHOLE 2-417.6 BROWN AND CALDWELL - CITY OF HOLLYWOOD WATER MAIN REPLACEMENT PROJECT #16-5133.GPJ GINT US.GDT 9/21/17



1310 Neptune Drive  
 Boynton Beach Fl. 33426  
 Telephone: 5617364900  
 Fax: 5617379975

**BORING NUMBER B-2**

PAGE 1 OF 1

CLIENT Brown and Caldwell PROJECT NUMBER 417.6  
 PROJECT NAME City of Hollywood Water Main Replacement Project # 16  
 PROJECT LOCATION Various locations, Hollywood, FL

DATE STARTED 8/25/17 COMPLETED 8/25/17 SURFACE ELEVATION REFERENCE Same as road crown  
 DRILLING METHOD Standard Penetration Boring GROUND WATER LEVELS:  
 LOGGED BY D. Tyson CHECKED BY S. Mrachek  AT TIME OF DRILLING 5.3 ft  
 APPROXIMATE LOCATION OF BORING As located on site plan

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	Blows	N-Value	▲ SPT N VALUE ▲			
						10	20	30	40
						PL      MC      LL  ----- ----- -----  20    40    60    80			
						<input type="checkbox"/> FINES CONTENT (%) <input type="checkbox"/> 20    40    60    80			
0		Gray fine SANDY TOPSOIL Gray fine SAND	AU 1						
			AU 2						
5		Lt. brown fine slightly SILTY SAND and LIMESTONE FRAGMENTS	SS 3	3-3-4-4	7				
		Bottom of hole at 6.0 feet.							

TEST NUTTING BOREHOLE 2-417.6 BROWN AND CALDWELL - CITY OF HOLLYWOOD WATER MAIN REPLACEMENT PROJECT #16-5133.GPJ GINT US.GDT 9/21/17





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**BORING NUMBER B-3**

CLIENT Brown and Caldwell PROJECT NUMBER 417.6  
 PROJECT NAME City of Hollywood Water Main Replacement Project # 16  
 PROJECT LOCATION Various locations, Hollywood, FL

DATE STARTED 8/25/17 COMPLETED 8/25/17 SURFACE ELEVATION REFERENCE Same as road crown  
 DRILLING METHOD Standard Penetration Boring GROUND WATER LEVELS:  
 LOGGED BY D. Tyson CHECKED BY S. Mrachek  AT TIME OF DRILLING 5.0 ft  
 APPROXIMATE LOCATION OF BORING As located on site plan

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	Blows	N-Value	▲ SPT N VALUE ▲			
						10	20	30	40
						PL                      MC                      LL  ----- ----- -----  20    40    60    80			
						<input type="checkbox"/> FINES CONTENT (%) <input type="checkbox"/> 20    40    60    80			
0		Dk. gray fine SANDY TOPSOIL Gray fine SAND	AU 1						
			AU 2						
5	<input checked="" type="checkbox"/>		SS 3	2-2-3-3	5				
		Bottom of hole at 6.0 feet.							

TEST NUTTING BOREHOLE 2-417.6 BROWN AND CALDWELL - CITY OF HOLLYWOOD WATER MAIN REPLACEMENT PROJECT #16-5133.GPJ GINT US.GDT 9/21/17

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**BORING NUMBER B-4**

PROJECT NUMBER 417.6

CLIENT Brown and Caldwell

PROJECT NAME City of Hollywood Water Main Replacement Project # 16

PROJECT LOCATION Various locations, Hollywood, FL

DATE STARTED 8/25/17 COMPLETED 8/25/17 SURFACE ELEVATION REFERENCE Same as road crown

DRILLING METHOD Standard Penetration Boring GROUND WATER LEVELS:

LOGGED BY D. Tyson CHECKED BY S. Mrachek  AT TIME OF DRILLING 5.3 ft

APPROXIMATE LOCATION OF BORING As located on site plan

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	Blows	N-Value	▲ SPT N VALUE ▲			
						10	20	30	40
						PL — MC — LL  ----- ----- -----  20 40 60 80			
						<input type="checkbox"/> FINES CONTENT (%) <input type="checkbox"/> 20 40 60 80			
0		Dk. gray fine SANDY TOPSOIL Lt. gray fine SAND	AU 1						
			AU 2						
5		Lt. brown fine slightly SILTY SAND and LIMESTONE FRAGMENTS	SS 3	4-4-4-5	8				
		Bottom of hole at 6.0 feet.							

TEST NUTTING BOREHOLE 2-417.6 BROWN AND CALDWELL - CITY OF HOLLYWOOD WATER MAIN REPLACEMENT PROJECT #16-5133.GPJ GINT US.GDT 9/21/17



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**BORING NUMBER B-5**

PROJECT NUMBER 417.6

CLIENT Brown and Caldwell

PROJECT NAME City of Hollywood Water Main Replacement Project # 16

PROJECT LOCATION Various locations, Hollywood, FL

DATE STARTED 8/25/17 COMPLETED 8/25/17 SURFACE ELEVATION REFERENCE Same as road crown

DRILLING METHOD Standard Penetration Boring GROUND WATER LEVELS:

LOGGED BY D. Tyson CHECKED BY S. Mrachek  AT TIME OF DRILLING 5.0 ft

APPROXIMATE LOCATION OF BORING As located on site plan

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	Blows	N-Value	▲ SPT N VALUE ▲			
						10	20	30	40
						PL	MC	LL	
						□ FINES CONTENT (%) □			
						20	40	60	80
0		Dk. gray fine SANDY TOPSOIL	AU 1						
		Brown fine SAND	AU 2						
5		Gray fine SAND and LIMESTONE FRAGMENTS	SS 3	5-6-6-7	12				
		Bottom of hole at 6.0 feet.							

TEST NUTTING BOREHOLE: 2-417.6 BROWN AND CALDWELL - CITY OF HOLLYWOOD WATER MAIN REPLACEMENT PROJECT #16-5133.GPJ GINT US.GDT 9/21/17





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**BORING NUMBER B-6**

CLIENT Brown and Caldwell

PROJECT NUMBER 417.6

PROJECT LOCATION Various locations, Hollywood, FL

PROJECT NAME City of Hollywood Water Main Replacement Project # 16

DATE STARTED 8/31/17 COMPLETED 8/31/17 SURFACE ELEVATION REFERENCE Same as road crown

DRILLING METHOD Standard Penetration Boring GROUND WATER LEVELS:

LOGGED BY T. Lovett CHECKED BY S. Mrachek  AT TIME OF DRILLING 3.0 ft

APPROXIMATE LOCATION OF BORING As located on site plan

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	Blows	N-Value	▲ SPT N VALUE ▲			
						10	20	30	40
						PL                      MC                      LL ┌───────────┬───────────┬───────────┐ 20            40            60            80			
						<input type="checkbox"/> FINES CONTENT (%) <input type="checkbox"/> 20            40            60            80			
0		Lt. brown fine SAND							
		Brown PEAT	AU 1						
		Grayish to brown fine SAND	AU 2						
5			AU 3						
		Bottom of hole at 6.0 feet.							

TEST NUTTING BOREHOLE 2-417.6 BROWN AND CALDWELL - CITY OF HOLLYWOOD WATER MAIN REPLACEMENT PROJECT #16-5133.GPJ GINT US.GDT 10/2/17



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**BORING NUMBER B-7**

CLIENT Brown and Caldwell

PROJECT NUMBER 417.6

PROJECT LOCATION Various locations, Hollywood, FL

PROJECT NAME City of Hollywood Water Main Replacement Project # 16

DATE STARTED 8/31/17 COMPLETED 8/31/17 SURFACE ELEVATION REFERENCE Same as road crown

DRILLING METHOD Standard Penetration Boring

GROUND WATER LEVELS:

LOGGED BY T. Lovett CHECKED BY S. Mrachek

AT TIME OF DRILLING 3.0 ft

APPROXIMATE LOCATION OF BORING As located on site plan

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	Blows	N-Value	▲ SPT N VALUE ▲			
						10	20	30	40
						PL	MC	LL	
						20	40	60	80
						□ FINES CONTENT (%) □			
						20	40	60	80
0		Lt. brown fine SAND	AU 1						
			AU 2						
5			AU 3						
		Bottom of hole at 6.0 feet.							

TEST NUTTING BOREHOLE 2-417.6 BROWN AND CALDWELL - CITY OF HOLLYWOOD WATER MAIN REPLACEMENT PROJECT #16-5133.GPJ\_GINT US.GDT 9/21/17



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**BORING NUMBER B-8**

PAGE 1 OF 1

CLIENT Brown and Caldwell  
 PROJECT LOCATION Various locations, Hollywood, FL

PROJECT NUMBER 417.6  
 PROJECT NAME City of Hollywood Water Main Replacement Project # 1

DATE STARTED 8/25/17 COMPLETED 8/25/17 SURFACE ELEVATION REFERENCE Same as road crown  
 DRILLING METHOD Standard Penetration Boring GROUND WATER LEVELS:  
 LOGGED BY D. Tyson CHECKED BY S. Mrachek  $\nabla$  AT TIME OF DRILLING 1.5 ft  
 APPROXIMATE LOCATION OF BORING As located on site plan

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	Blows	N-Value	▲ SPT N VALUE ▲			
						10	20	30	40
						PL	MC	LL	
						20	40	60	80
						□ FINES CONTENT (%) □			
						20	40	60	80
0		Dk. gray fine SANDY TOPSOIL							
		Gray fine SAND	AU 1						
		Brown fibrous PEAT	AU 2						
5		Gray fine SAND	SS 3	7-8-9-11	17				
		Bottom of hole at 6.0 feet.							

TEST NUTTING BOREHOLE 2-417.6 BROWN AND CALDWELL - CITY OF HOLLYWOOD WATER MAIN REPLACEMENT PROJECT #16-5133.GPJ\_GINT US.GDT 9/21/17





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CLIENT Brown and Caldwell PROJECT NUMBER 417.6  
 PROJECT NAME City of Hollywood Water Main Replacement Project # 16  
 PROJECT LOCATION Various locations, Hollywood, FL

DATE STARTED 8/31/17 COMPLETED 8/31/17 SURFACE ELEVATION REFERENCE Same as road crown  
 DRILLING METHOD Standard Penetration Boring GROUND WATER LEVELS:  
 LOGGED BY T. Lovett CHECKED BY S. Mrachek  AT TIME OF DRILLING 3.0 ft  
 APPROXIMATE LOCATION OF BORING As located on site plan

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	Blows	N-Value	▲ SPT N VALUE ▲			
						10	20	30	40
						PL      MC      LL 20    40    60    80			
						<input type="checkbox"/> FINES CONTENT (%) <input type="checkbox"/> 20    40    60    80			
0		Lt. brown fine SAND	AU 1						
			AU 2						
5		Brown PEAT	AU 3						
		Gray fine SAND							
		Bottom of hole at 6.0 feet.							

TEST NUTTING BOREHOLE 2-417.6 BROWN AND CALDWELL - CITY OF HOLLYWOOD WATER MAIN REPLACEMENT PROJECT #16-5133.GPJ GINT US.GDT 9/21/17



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**BORING NUMBER B-10**

CLIENT Brown and Caldwell

PROJECT NUMBER 417.6

PROJECT NAME City of Hollywood Water Main Replacement Project # 16

PROJECT LOCATION Various locations, Hollywood, FL

DATE STARTED 8/31/17 COMPLETED 8/31/17 SURFACE ELEVATION REFERENCE Same as road crown

DRILLING METHOD Standard Penetration Boring

GROUND WATER LEVELS:

LOGGED BY T. Lovett CHECKED BY S. Mrachek  AT TIME OF DRILLING 3.0 ft

APPROXIMATE LOCATION OF BORING As located on site plan

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	Blows	N-Value	▲ SPT N VALUE ▲			
						10	20	30	40
						PL	MC	LL	
						20	40	60	80
						□ FINES CONTENT (%) □			
						20	40	60	80
0		Lt. brown fine SAND and LIMESTONE FRAGMENTS							
		Brown PEAT	AU 1						
			AU 2						
5		Gray fine SAND	AU 3						
		Bottom of hole at 6.0 feet.							

TEST NUTTING BOREHOLE 2-417.6 BROWN AND CALDWELL - CITY OF HOLLYWOOD WATER MAIN REPLACEMENT PROJECT #16-5133.GPJ\_GINT US.GDT 9/21/17





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**BORING NUMBER B-11**

CLIENT Brown and Caldwell

PROJECT NUMBER 417.6

PROJECT LOCATION Various locations, Hollywood, FL

PROJECT NAME City of Hollywood Water Main Replacement Project # 16

DATE STARTED 8/31/17

COMPLETED 8/31/17

SURFACE ELEVATION REFERENCE Same as road crown

DRILLING METHOD Standard Penetration Boring

GROUND WATER LEVELS:

LOGGED BY T. Lovett

CHECKED BY S. Mrachek

∇ AT TIME OF DRILLING 3.0 ft

APPROXIMATE LOCATION OF BORING As located on site plan

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	Blows	N-Value	▲ SPT N VALUE ▲			
						10	20	30	40
						PL      MC      LL  ----- ----- -----  20    40    60    80			
						□ FINES CONTENT (%) □			
						20	40	60	80
0		Lt. brown fine SAND and LIMESTONE FRAGMENTS	AU 1						
		Lt. brown fine SILTY SAND	AU 2						
5		Bottom of hole at 6.0 feet.	AU 3						

TEST NUTTING BOREHOLE 2-417.6 BROWN AND CALDWELL - CITY OF HOLLYWOOD WATER MAIN REPLACEMENT PROJECT #16-5133.GPJ GINT US.GDT 10/2/17



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**BORING NUMBER B-12**

CLIENT Brown and Caldwell PROJECT NUMBER 417.6  
 PROJECT NAME City of Hollywood Water Main Replacement Project # 16  
 PROJECT LOCATION Various locations, Hollywood, FL

DATE STARTED 8/31/17 COMPLETED 8/31/17 SURFACE ELEVATION REFERENCE Same as road crown  
 DRILLING METHOD Standard Penetration Boring GROUND WATER LEVELS:  
 LOGGED BY T. Lovett CHECKED BY S. Mrachek  AT TIME OF DRILLING 3.0 ft  
 APPROXIMATE LOCATION OF BORING As located on site plan

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	Blows	N-Value	▲ SPT N VALUE ▲			
						10	20	30	40
						PL — MC — LL 20 40 60 80 <input type="checkbox"/> FINES CONTENT (%) <input type="checkbox"/> 20 40 60 80			
0		Lt. brown fine SAND and LIMESTONE FRAGMENTS	AU 1						
			AU 2						
5			AU 3						
		Bottom of hole at 6.0 feet.							

TEST NUTTING BOREHOLE 2-417.6 BROWN AND CALDWELL - CITY OF HOLLYWOOD WATER MAIN REPLACEMENT PROJECT #16-5133.GPJ GINT US.GDT 10/2/17



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**BORING NUMBER B-13**

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CLIENT Brown and Caldwell  
 PROJECT LOCATION Various locations, Hollywood, FL

PROJECT NUMBER 417.6  
 PROJECT NAME City of Hollywood Water Main Replacement Project # 16

DATE STARTED 8/31/17 COMPLETED 8/31/17 SURFACE ELEVATION REFERENCE Same as road crown  
 DRILLING METHOD Standard Penetration Boring GROUND WATER LEVELS:  
 LOGGED BY T. Lovett CHECKED BY S. Mrachek  AT TIME OF DRILLING 3.0 ft  
 APPROXIMATE LOCATION OF BORING As located on site plan

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	Blows	N-Value	▲ SPT N VALUE ▲			
						10	20	30	40
						PL      MC      LL  ----- ----- -----  20    40    60    80			
						□ FINES CONTENT (%) □			
						20	40	60	80
0		Lt. brown fine SAND and LIMESTONE FRAGMENTS	AU 1						
		Brown PEAT	AU 2						
5		Gray fine SAND	AU 3						
		Bottom of hole at 6.0 feet.							

TEST NUTTING BOREHOLE 2-417.6 BROWN AND CALDWELL - CITY OF HOLLYWOOD WATER MAIN REPLACEMENT PROJECT #16-5133.GPJ GINT US.GDT 9/21/17





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**BORING NUMBER B-14**

CLIENT Brown and Caldwell  
 PROJECT LOCATION Various locations, Hollywood, FL

PROJECT NUMBER 417.6  
 PROJECT NAME City of Hollywood Water Main Replacement Project # 16

DATE STARTED 8/31/17 COMPLETED 8/31/17 SURFACE ELEVATION REFERENCE Same as road crown  
 DRILLING METHOD Standard Penetration Boring GROUND WATER LEVELS:  
 LOGGED BY T. Lovett CHECKED BY S. Mrachek  AT TIME OF DRILLING 4.2 ft  
 APPROXIMATE LOCATION OF BORING As located on site plan

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	Blows	N-Value	▲ SPT N VALUE ▲			
						10	20	30	40
						PL      MC      LL 20      40      60      80			
						<input type="checkbox"/> FINES CONTENT (%) <input type="checkbox"/> 20      40      60      80			
0		Lt. brown fine SAND and LIMESTONE FRAGMENTS	AU 1						
		Brown PEAT	AU 2						
5		Grayish to brown fine SAND	AU 3						
		Bottom of hole at 6.0 feet.							

TEST NUTTING BOREHOLE 2-417.6 BROWN AND CALDWELL - CITY OF HOLLYWOOD WATER MAIN REPLACEMENT PROJECT #16-5133.GPJ GINT US.GDT 9/21/17



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**BORING NUMBER B-15**

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CLIENT Brown and Caldwell

PROJECT NUMBER 417.6

PROJECT LOCATION Various locations, Hollywood, FL

PROJECT NAME City of Hollywood Water Main Replacement Project # 16

DATE STARTED 8/31/17 COMPLETED 8/31/17 SURFACE ELEVATION REFERENCE Same as road crown

DRILLING METHOD Standard Penetration Boring

GROUND WATER LEVELS:

LOGGED BY T. Lovett CHECKED BY S. Mrachek  AT TIME OF DRILLING 5.8 ft

APPROXIMATE LOCATION OF BORING As located on site plan

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	Blows	N-Value	▲ SPT N VALUE ▲			
						10	20	30	40
						PL	MC	LL	
						20	40	60	80
						□ FINES CONTENT (%) □			
						20	40	60	80
0		Lt. brown fine SAND and LIMESTONE FRAGMENTS	AU 1						
		Lt. brown fine SAND	AU 2						
5	▽		SS 3	7-9-7-8	16		▲		
		Brown PEAT	SS 4	3-3-3-3	6	▲			
		Lt. gray fine SAND, trace roots	SS 5	4-5-8-10	13		▲		
			SS 6	9-10-10-10	20			▲	
			SS 7	4-5-4-4	9	▲			
			SS 8	4-5-5-6	10		▲		
20		Bottom of hole at 20.0 feet.							

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**BORING NUMBER B-16**

PAGE 1 OF 1

CLIENT Brown and Caldwell

PROJECT NUMBER 417.6

PROJECT LOCATION Various locations, Hollywood, FL

PROJECT NAME City of Hollywood Water Main Replacement Project # 16

DATE STARTED 8/31/17 COMPLETED 8/31/17 SURFACE ELEVATION REFERENCE Same as road crown

DRILLING METHOD Standard Penetration Boring GROUND WATER LEVELS:

LOGGED BY T. Lovett CHECKED BY S. Mrachek  AT TIME OF DRILLING 9.8 ft

APPROXIMATE LOCATION OF BORING As located on site plan

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	Blows	N-Value	▲ SPT N VALUE ▲			
						10	20	30	40
						PL	MC	LL	
						20	40	60	80
						□ FINES CONTENT (%) □			
						20	40	60	80
0		Gray fine SAND, trace limestone fragments	AU 1						
			AU 2						
5		Brown PEAT and SILT, some sand lenses	SS 3	5-5-8-7	13				
			SS 4	5-5-5-5	10				
			SS 5	3-3-6-14	9				
10		Gray fine SAND	SS 6	9-10-10-9	20				
			SS 7	3-2-2-4	4				
15									
			SS 8	4-5-4-4	9				
20		Bottom of hole at 20.0 feet.							

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# LIMITATIONS OF LIABILITY

## WARRANTY

We warrant that the services performed by Nutting Engineers of Florida, Inc. are conducted in a manner consistent with that level of care and skill ordinarily exercised by members of the profession in our area currently practicing under similar conditions at the time our services were performed. **No other warranties, expressed or implied, are made.** While the services of Nutting Engineers of Florida, Inc. are a valuable and integral part of the design and construction teams, we do not warrant, guarantee or insure the quality, completeness, or satisfactory performance of designs, construction plans, specifications we have not prepared, nor the ultimate performance of building site materials or assembly/construction.

## SUBSURFACE EXPLORATION

Subsurface exploration is normally accomplished by test borings; test pits are sometimes employed. The method of determining the boring location and the surface elevation at the boring is noted in the report. This information is represented in the soil boring logs and/or a drawing. The location and elevation of the borings should be considered accurate only to the degree inherent with the method used and may be approximate.

The soil boring log includes sampling information, description of the materials recovered, approximate depths of boundaries between soil and rock strata as encountered and immediate depth to water data. The log represents conditions recorded specifically at the location where and when the boring was made. Site conditions may vary through time as will subsurface conditions. The boundaries between different soil strata as encountered are indicated at specific depths; however, these depths are in fact approximate and dependent upon the frequency of sampling, nature and consistency of the respective strata. Substantial variation between soil borings may commonly exist in subsurface conditions. Water level readings are made at the time and under conditions stated on the boring logs. Water levels change with time, precipitation, canal level, local well drawdown and other factors. Water level data provided on soil boring logs shall not be relied upon for groundwater based design or construction considerations.

## LABORATORY AND FIELD TESTS

Tests are performed in *general* accordance with specific ASTM Standards unless otherwise indicated. All criteria included in a given ASTM Standard are not always required and performed. Each test boring report indicates the measurements and data developed at each specific test location.

## ANALYSIS AND RECOMMENDATIONS

The geotechnical report is prepared primarily to aid in the design of site work and structural foundations. Although the information in the report is expected to be sufficient for these purposes, it shall not be utilized to determine the cost of construction nor to stand alone as a construction specification. Contractors shall verify subsurface conditions as may be appropriate prior to undertaking subsurface work.

Report recommendations are based primarily on data from test borings made at the locations shown on the test boring reports. Soil variations commonly exist between boring locations. Such variations may not become evident until construction. Test pits sometimes provide valuable supplemental information that derived from soil borings. If variations are then noted, the geotechnical engineer shall be contacted in writing immediately so that field conditions can be examined and recommendations revised if necessary.

The geotechnical report states our understanding as to the location, dimensions and structural features proposed for the site. **Any significant changes of the site improvements or site conditions must be communicated in writing to the geotechnical engineer immediately** so that the geotechnical analysis, conclusions, and recommendations can be reviewed and appropriately adjusted as necessary.

## CONSTRUCTION OBSERVATION

Construction observation and testing is an important element of geotechnical services. The geotechnical engineer's field representative (G.E.F.R.) is the "owner's representative" observing the work of the contractor, performing tests and reporting data from such tests and observations. **The geotechnical engineer's field representative does not direct the contractor's construction means, methods, operations or personnel.** The G.E.F.R. does not interfere with the relationship between the owner and the contractor and, except as an observer, does not become a substitute owner on site. The G.E.F.R. is responsible for his/her safety, but has no responsibility for the safety of other personnel at the site. The G.E.F.R. is an important member of a team whose responsibility is to observe and test the work being done and report to the owner whether that work is being carried out in general conformance with the plans and specifications. The enclosed report may be relied upon solely by the named client.



# SOIL AND ROCK CLASSIFICATION CRITERIA

## SAND/SILT

N-VALUE (bpf)	RELATIVE DENSITY
0 – 4	Very Loose
5 – 10	Loose
11 – 29	Medium
30 – 49	Dense
>50	Very dense
100	Refusal

## CLAY/SILTY CLAY

N-VALUE (bpf)	UNCONFINED COMP. STRENGTH (tsf)	CONSISTENCY
<2	<0.25	v. Soft
2 – 4	0.25 – 0.50	Soft
5 – 8	0.50 – 1.00	Medium
9 – 15	1.00 – 2.00	Soft
16 – 30	2.00 – 4.00	v. Stiff
>30	>4.00	Hard

## ROCK

N-VALUE (bpf)	RELATIVE HARDNESS	ROCK CHARACTERISTICS
N ≥ 100	Hard to v. hard	Local rock formations vary in hardness from soft to very hard within short vertical and horizontal distances and often contain vertical solution holes of 3 to 36 inch diameter to varying depths and horizontal solution features. Rock may be brittle to split spoon impact, but more resistant to excavation.
25 ≤ N ≤ 100	Medium hard to hard	
5 ≤ N ≤ 25	Soft to medium hard	

## PARTICLE SIZE

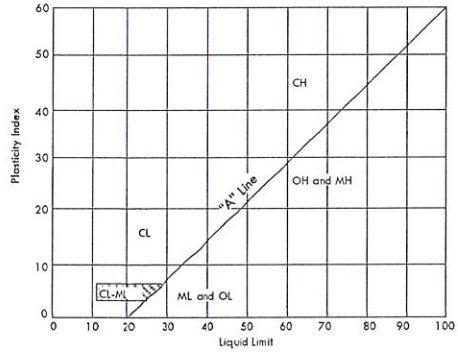
Boulder	>12 in.
Cobble	3 to 12 in.
Gravel	4.76 mm to 3 in.
Sand	0.074 mm to 4.76 mm
Silt	0.005 mm to 0.074 mm
Clay	<0.005 mm

## DESCRIPTION MODIFIERS

0 – 5%	Slight trace
6 – 10%	Trace
11 – 20%	Little
21 – 35%	Some
>35%	And

Major Divisions	Group Symbols	Typical names	Laboratory classification criteria				
Coarse-grained soils (More than half of material is larger than No. 200 sieve size)	Gravels (More than half of coarse fraction is larger than No. 4 sieve size)	GW	Well-graded gravels, gravel-sand mixtures, little or no fines	$C_u = \frac{D_{60}}{D_{10}}$ greater than 4; $C_z = \frac{(D_{30})^2}{D_{10} \times D_{60}}$ between 1 and 3  Not meeting all gradation requirements for GW  Atterberg limits below "A" line or P.I. less than 4  Atterberg limits above "A" line with P.I. greater than 7  $C_u = \frac{D_{60}}{D_{10}}$ greater than 6; $C_z = \frac{(D_{30})^2}{D_{10} \times D_{60}}$ between 1 and 3  Not meeting all gradation requirements for SW  Atterberg limits below "A" line or P.I. less than 4  Atterberg limits above "A" line with P.I. more than 7  Limits plotting in hatched zone with P.I. between 4 and 7 are borderline cases requiring use of dual system.			
		GP	Poorly graded gravels, gravel-sand mixtures, little or no fines				
		GW* d u	Silty gravels, gravel-sand-silt mixtures				
		GC	Clayey gravels, gravel-sand-clay mixtures				
	Sands (More than half of coarse fraction is smaller than No. 4 sieve size)	Clean sands (Little or no fines)	SW		Well-graded sands, gravelly sands, little or no fines		
			SP		Poorly graded sands, gravelly sands, little or no fines		
		Sands with fines (Appreciable amount of fines)	SM* d u		Silty sands, sand-silt mixtures		
			SC		Clayey sands, sand-clay mixtures		
			Fine-grained soils (More than half of material is smaller than No. 200 sieve size)		Sils and clays (Liquid limit less than 50)	ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity
						CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy, days, silty clays, lean clays
OL	Organic silts and organic silty clays of low plasticity						
Sils and clays (Liquid limit greater than 50)	MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts					
	CH	Inorganic clays or high plasticity, fat clays					
	OH	Organic clays of medium to high plasticity, organic silts					
Highly organic soils	PT	Peat and other highly organic soils					

Determine percentages of sand and gravel from grain-size curve. Depending on percentage of fines (fraction smaller than No. 200 sieve size), coarse-grained soils are classified as follows:  
 Less than five percent.....GW, GP, SW, SP  
 More than five percent.....GM, GC, SM, SC  
 5 to 12 percent.....borderline cases requiring dual systems\*\*





**APPENDIX B**

**RIGHT OF ENTRY AND TEMPORARY  
CONSTRUCTION EASEMENT FORM**

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**APPENDIX B**  
**RIGHT OF ENTRY AND TEMPORARY**  
**CONSTRUCTION EASEMENT FORM**

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**RIGHT OF ENTRY  
AND  
TEMPORARY CONSTRUCTION EASEMENT**

Property Address: \_\_\_\_\_

Owners (s): \_\_\_\_\_

Mailing Address: \_\_\_\_\_

Phone Number: \_\_\_\_\_

**RE: Project No: 16-5133 Water Main Replacement Project**

Agreement: As part of the City of Hollywood's continuing effort to provide and maintain high quality services to its Residents, the Department of Public Utilities recently installed new water mains and water services within your neighborhood.

Phase II of the Project, is relocating the existing water meters (currently located in the back of the property, to the front of the property), and re-routing the water service pipelines within your property.

The City of Hollywood has contracted with **Contractor's Name** to perform the work on behalf of the City. We are requesting your cooperation by granting consent to **Contractor's Name** to work within your property. This work will be performed at no cost to the property owner(s).

This document shall not be considered a permanent easement. Upon completion of the work, **Contractor's Name** will restore the impacted areas to the original conditions, and the portion of the improvements on private property (i.e. the new water service and related appurtenances will become the property and the sole responsibility of the property owner(s).

Therefore, the undersigned property owner(s) grant consent to the City of Hollywood and **Contractor's Name** solely for the purpose of performing the aforementioned project.

**City of Hollywood, Florida**

Signed: \_\_\_\_\_

Steve Joseph, P.E., Director of Public Utilities

**Property Owner(s)**

Signed: \_\_\_\_\_

Signed: \_\_\_\_\_

Dated: \_\_\_\_\_

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**APPENDIX C**  
**REGULATORY APPROVALS/PERMITS**

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# FLORIDA DEPARTMENT OF Environmental Protection

Southeast District Office  
3301 Gun Club Road, MSC 7210-1  
West Palm Beach, FL 33406  
561-681-6600

**Ron DeSantis**  
Governor

**Jeanette Nuñez**  
Lt. Governor

**Shawn Hamilton**  
Secretary

## NOTIFICATION OF ACCEPTANCE OF USE OF A GENERAL PERMIT

**October 19, 2021**

**Permittee:**

Vivek Galav  
Director  
City of Hollywood  
1621 N. 14<sup>th</sup> Avenue, Building A  
Hollywood, Florida 33020

[vgalav@hollywoodfl.org](mailto:vgalav@hollywoodfl.org)

**Permit Number:** 0126758-349-DSGP

**Issue Date:** October 19, 2021

**Expiration Date:** October 18, 2026

**Project Name:** Water Main Replacement Project No.  
16-5133 For N. 26th Avenue Phase 1

**Water Supplier:** City of Hollywood

**PWS ID:** 4060642

Dear Vivek Galav,

On October 18, 2021, the Florida Department of Environmental Protection (Department) received a "Notice of Intent to Use the General Permit for Construction of Water Main Extensions for PWSs" [DEP Form No. [62-555.900\(7\)](#)], under the provisions of Rule [62-4.530](#) and Chapter [62-555](#), Florida Administrative Code (F.A.C.).

The proposed project includes:

- Approximately 50 LF 2-inch PVC WM
- 300 LF 4-inch PVC WM
- 120 LF 6-inch PVC WM
- 3,150 LF 8-inch PVC WM
- Twenty-eight (28) sample points
- Nine (9) fire hydrants
- All fittings, valves, and appurtenances.

Located at: Sheridan Street to Taft Street along North 26<sup>th</sup> Avenue, Florida.

Based upon the submitted Notice and accompanying documentation, this correspondence is being sent to advise that the Department does not object to the use of such General Permit at this time. Please be advised that the permittee is required to abide by Rule [62-555.405, F.A.C.](#), all applicable rules in Chapters [62-4](#), [62-550](#), [62-555](#), F.A.C., and the General Conditions for All General Drinking Water Permits (found in [62-4.540, F.A.C.](#)).

**Permittee:**

Vivek Galav, Director  
City of Hollywood  
Page 2 of 3

**DEP Permit #:** 0126758-349-DSGP

The permittee shall comply with all sampling requirements specific to this project. These requirements are attached for review and implementation.

Pursuant to Rule [62-555.345, F.A.C.](#), the permittee shall submit a certification of construction completion [DEP Form No. [62-555.900\(9\)](#)] to the Department and obtain approval, or clearance, from the Department before placing any water main extension constructed under this general permit into operation for any purpose other than disinfection or testing for leaks.

Within 30 days after the sale or legal transfer of ownership of the permitted project that has not been cleared for service in total by the Department, both the permittee and the proposed permittee shall sign and submit an application for transfer of the permit using Form [62-555.900\(8\), F.A.C.](#), with the appropriate fee. The permitted construction is not authorized past the 30-day period unless the permit has been transferred.

When any existing asbestos cement (AC) pipes are replaced under this permit, the permittee shall do so in accordance with the applicable rules of the Federal Asbestos Regulation and Florida DEP requirements. For specific requirements applicable to AC pipes, the permittee should contact the Air and Waste Management Section Managers prior to commencing any such activities at (561) 681- 6672. Please be aware that a notification is required to be submitted to the Department for a regulated project.

This permit will expire five years from the date of issuance. If the project has been started and not completed by that time, a new permit must be obtained before the expiration date in order to continue work on the project, per Rule [62-4.030, F.A.C.](#)

Sincerely,



\_\_\_\_\_  
Christopher Weller  
Environmental Manager

October 19, 2021

Date

CW/SD

ec:

FDEP/SED – Christopher Weller, Samantha Ducasse, Greg Kennedy, Jocelyn Labbe.  
Broward County Health Department – [browardeh@flhealth.gov](mailto:browardeh@flhealth.gov)  
Broward County, Rolando Nigaglioni - [rnigaglioni@broward.org](mailto:rnigaglioni@broward.org)  
Brown and Caldwell, Diego Herrera – [dherrera@brwncald.com](mailto:dherrera@brwncald.com)

**Permittee:**  
Vivek Galav, Director  
City of Hollywood  
Page 3 of 3

**DEP Permit #:** 0126758-349-DSGP

**Civil Penalty May Be Incurred**

**If this project is placed into operation before obtaining a clearance from this office**

Requirements for clearance upon completion of projects are as follows:

**1) Clearance Form**

Submission of a fully completed Department of Environmental Protection (DEP) Form [62-555.900\(9\)](#) *Certification of Construction Completion and Request for Clearance to Place Permitted PWS Components into Operation*.

**2) Record Drawings, if deviations were made**

Submission of the portion of record drawings showing deviations from the DEP construction permit, including preliminary design report or drawings and specifications, if there are any deviations from said permit (Note that it is necessary to submit a copy of only the portion of record drawings showing deviations and not a complete set of record drawings.).

**3) Bacteriological Results**

Copies of satisfactory bacteriological analysis (a.k.a. Main Clearance), taken within sixty (60) days of completion of construction, from locations within the distribution system or water main extension to be cleared, in accordance with Rules [62-555.315\(6\)](#), [62-555.340](#), and [62-555.330](#), F.A.C. and American Water Works Association (AWWA) Standard C 651-92, as follows:

- Connection to an existing system
- The end point of the proposed addition
- Any water lines branching off a main extension
- Every 1,200 feet on straight runs of pipe

Each location shall be sampled on two consecutive days, with sample points and chlorine residual readings clearly indicated on the report. A sketch or description of all bacteriological sampling locations must also be provided.

**For further clarification contact:**

Samantha Ducasse, Environmental Specialist II  
Water Facilities Section  
SED/DEP  
3301 Gun Club Rd, MSC 7210-1  
West Palm Beach, FL 33406  
Tel: (561)-681-6737  
[samantha.ducasse@floridadep.gov](mailto:samantha.ducasse@floridadep.gov)

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**APPENDIX D**  
**PROPERTY METER INFORMATION**

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ACCOUNT	TYPE	PARCEL	STR NBR	STR PRE DIR	STR NAME	STR TYPE	STR POST DIR	STR UNIT	CUSTOMER ID	CUSTOMER NAME	SVC TYPE	SVC CODE	SVC SEQ	MTR NUMBER	MTR MANUF	MTR SIZE	COMPOUND FLAG	NBR OF DIALS	MTR MODEL	MTU ID	MTR LOC CODE	MLC DESCRIPTION	COMMENTS
159996	SF	514209060780	1707	N	26	AVE			347857	CORDOBA, ALEJANDRA	M	1000	1	84476323	NEP	58 N	6	PD	41183968	3		REAR RIGHT	305-302-9080
160634	SF	514209130390	1712	N	26	AVE			332999	CANALES, ADRIANA & FRANCISCO	M	1000	1	75598983	NEP	58 N	6	PD	2280287	7		FRONT LEFT	954-895-6448
160632	SF	514209130380	1718	N	26	AVE			379135	ROMAN, M. MIRANDA & JOSE	M	1000	1	36498977	NEP	58 N	6	PD	2280121	9		FRONT RIGHT	787-462-4925
160586	SF	514209130150	1804	N	26	AVE			411494	BENYA, ELIZABETH	M	1000	1	20110446	NEP	58 N	6	PD	41203445	1		REAR LEFT	954-925-6674
160586	SF	514209130150	1804	N	26	AVE			411494	BENYA, ELIZABETH	M	1000	1	20110446	NEP	58 N	6	PD	41203445	9		FRONT RIGHT	954-925-6674
160584	SF	514209130140	1812	N	26	AVE			323909	THE POWER OF FAITH MINISTRIES	M	1000	1	55251596	INV	58 N	6	PD	41204236	7		FRONT LEFT	954-478-5385
160582	SF	514209130130	1816	N	26	AVE			119621	SMITH, HARRY	M	1000	1	87269432	NEP	58 N	6	PD	2124886	9		FRONT RIGHT	954-925-1163
160580	SF	514209130120	1820	N	26	AVE			119623	PARDUE, ELLEN	M	1000	1	75598982	NEP	58 N	6	PD	2278912	7		FRONT LEFT	
161564	SF	514209230010	1900	N	26	AVE			250053	RODRIGUEZ, JULIO C	M	1000	1	80256928	NEP	58 N	6	PD	2281090	7		FRONT LEFT	954-929-6037
161566	SF	514209230020	1920	N	26	AVE			348049	SALA, RAYMOND A	M	1000	1	84476321	NEP	58 N	6	PD	2281089	7		FRONT LEFT	954-200-2156
161596	SF	514209230170	1940	N	26	AVE			122501	LEUNG, KWOK CHEUNG	M	1000	1	79882603	NEP	58 N	6	PD	2281215	7		FRONT LEFT	
212242	SF	514209230160	1950	N	26	AVE			304619	REYES, M CONTRERAS & CARLOS	M	1000	1	80257097	NEP	58 N	6	PD	2281144	9		FRONT RIGHT	954-342-4132
160140	SF	514209061460	2001	N	26	AVE			292039	FLANAGAN, SCOTT & BECKY	M	1000	1	87489378	NEP	58 N	6	PD	2100783	3		REAR RIGHT	619-607-7287
161536	SF	514209220010	2050	N	26	AVE			377739	SHIELL, JULIE	M	1000	1	74948828	NEP	58 N	6	PD	2279696	9		FRONT RIGHT	305-331-8651
161540	SF	514209220021	2060	N	26	AVE			400037	RAMIREZ, MARCO V.	M	1000	1	79827270	NEP	58 N	6	PD	2278626	7		FRONT LEFT	786-339-6880
160662	SF	514209140021	2110	N	26	AVE			321695	BOIKO, IOURI	M	1000	1	96953098	BAD	58 N	6	PD	40046190	9		FRONT RIGHT	754-234-5675
160190	MF	514209061710	2111	N	26	AVE			293845	VALENTINI, MASSIMO	M	1000	1	81237266	NEP	58 N	6	PD	2278531	1		REAR LEFT	305-490-0769
160238	SF	514209061941	2203	N	26	AVE			371553	CARBONERA, CHRISTIAN	M	1000	1	78846594	NEP	58 N	6	PD	2280995	1		REAR LEFT	786-468-4355
160738	SF	514209150121	2206	N	26	AVE			403456	ESTEVEZ, ALBERTO	M	1000	1	77673345	NEP	58 N	6	PD	2178918	7		FRONT LEFT	
160740	SF	514209150130	2210	N	26	AVE			405729	BACIGALUPO, DANIEL H.	M	1000	1	99007004	BAD	58 N	6	PD	40078712	9		FRONT RIGHT	305-301-9744
160236	SF	514209061940	2211	N	26	AVE			323097	TORRES, MARILYN	M	1000	1	84476524	NEP	58 N	6	PD	40080444	1		REAR LEFT	
160742	SF	514209150140	2214	N	26	AVE			275661	CUTRONE, SUZANNE	M	1000	1	77073909	NEP	58 N	6	PD	2124705	7		FRONT LEFT	954-924-6020
160790	SF	514209150380	2302	N	26	AVE			335181	BERRIOS, IRMA T	M	1000	1	99259248	BAD	58 N	6	PD	40068573	1		REAR LEFT	954-681-5811
160792	SF	514209150390	2306	N	26	AVE			339605	BOLWELL, BARBARA	M	1000	1	82643062	NEP	58 N	6	PD	24321736	9		FRONT RIGHT	954-309-7212
160794	SF	514209150400	2310	N	26	AVE			410006	LEWIS, WILBUR R. JR.	M	1000	1	96240663	BAD	58 N	6	PD	41197427	7		FRONT LEFT	813-716-8100
160796	SF	514209150410	2314	N	26	AVE			329843	ARMSTRONG, MONICA	M	1000	1	98390279	BAD	58 N	6	PD	40069362	9		FRONT RIGHT	954-865-1316
160798	SF	514209150420	2318	N	26	AVE			402060	FAYA LLC	M	1000	1	84476250	NEP	58 N	6	PD	41197954	7		FRONT LEFT	313-231-5909
160334	SF	514209062410	2401	N	26	AVE			260195	WRIGHT, KIM L.	M	1000	1	74948829	NEP	58 N	6	PD	2280484	3		REAR RIGHT	954-658-1589
160842	SF	514209150640	2406	N	26	AVE			361751	BAZILE, MARIE	M	1000	1	99101152	BAD	58 N	6	PD	40078711	7		FRONT LEFT	954-600-0445
160844	SF	514209150650	2410	N	26	AVE			122897	MITCHELL, DAVE	M	1000	1	84476363	NEP	58 N	6	PD	2281061	9		FRONT RIGHT	
160846	SF	514209150660	2414	N	26	AVE			321495	SERNA, RODRIGO	M	1000	1	99143047	BAD	58 N	6	PD	21035710	7		FRONT LEFT	
160840	SF	514209150630	2605			SHERMAN	ST		336441	PETERS, JASON C	M	1000	1	87074226	NEP	58 N	6	PD	2281269	3		REAR RIGHT	954-605-0466
160800	SF	514209150430	2610			SHERMAN	ST		290831	WATSON,CAROL RONALD & KIRK	M	1000	1	87074231	NEP	58 N	6	PD	2281080	9		FRONT LEFT	305-797-5373
160838	SF	514209150620	2611			SHERMAN	ST		122887	ROSER, RICHARD	M	1000	1	82643021	NEP	58 N	6	PD	40080713	7		FRONT LEFT	954-663-9911
160802	SF	514209150440	2614			SHERMAN	ST		122815	GARNER, KEITH	M	1000	1	83820185	NEP	58 N	6	PD	2281074	7		FRONT LEFT	954-929-4335
160836	SF	514209150610	2615			SHERMAN	ST		405160	SEMAS, TEDDY	M	1000	1	87074227	NEP	58 N	6	PD	41198110	9		FRONT RIGHT	954-850-9042
160804	SF	514209150450	2618			SHERMAN	ST		406385	KOUDY, HICHAM	M	1000	1	80370211	NEP	58 N	6	PD	2256593	9		FRONT LEFT	954-588-5238
160834	SF	514209150600	2619			SHERMAN	ST		285287	SEMAS, TEDDY G	M	1000	1	99179610	BAD	58 N	6	PD	40068568	7		FRONT LEFT	954-850-9042
160806	SF	514209150460	2622			SHERMAN	ST		323167	OLIVERO, RAUL K	M	1000	1	85450036	NEP	58 N	6	PD	2256590	7		FRONT LEFT	786-319-6973
160832	SF	514209150590	2623			SHERMAN	ST		122877	GALLOPO, EMANUEL	M	1000	1	79356529	NEP	58 N	6	PD	2281098	9		FRONT RIGHT	954-921-1299
160808	SF	514209150470	2626			SHERMAN	ST		122821	AKE, MARGARET	M	1000	1	79068757	NEP	58 N	6	PD	21415751	9		FRONT RIGHT	954-927-9006
160830	SF	514209150580	2627			SHERMAN	ST		122875	BRANDON, LARRY	M	1000	1	87074230	NEP	58 N	6	PD	2281209	7		FRONT LEFT	954-921-1299
160810	SF	514209150480	2630			SHERMAN	ST		403180	ROMAN, JUAN CARLOS	M	1000	1	82642959	NEP	58 N	6	PD	2281210	7		FRONT LEFT	786-343-9420
160828	SF	514209150570	2631			SHERMAN	ST		122873	NIXON, NADINE	M	1000	1	87074228	NEP	58 N	6	PD	2281213	9		FRONT RIGHT	954-929-5808
160812	SF	514209150490	2634			SHERMAN	ST		402052	LAGUARDIA, CARLOS A.	M	1000	1	85660808	NEP	58 N	6	PD	2256604	9		FRONT RIGHT	708-308-3026
160826	SF	514209150560	2635			SHERMAN	ST		402740	PINEIRO, SERGIO C.	M	1000	1	97142764	BAD	58 N	6	PD	40080508	7		FRONT LEFT	
160814	SF	514209150500	2638			SHERMAN	ST		256341	GOMEZ, GLORIA	M	1000	1	97589764	NEP	58 N	6	PD	41169698	7		FRONT LEFT	954-598-5128
160824	SF	514209150550	2639			SHERMAN	ST		407509	BAEZ, CHRISTOPHER H.	M	1000	1	97243836	BAD	58 N	6	PD	45991269	9		FRONT RIGHT	954-865-1850
160816	SF	514209150510	2642			SHERMAN	ST		122843	GOMEZ, EDUARDO	M	1000	1	96240661	BAD	58 N	6	PD	40068569	9		FRONT RIGHT	954-558-6688
160822	SF	514209150540	2643			SHERMAN	ST		411481	BEROES, MARY	M	1000	1	75275552	NEP	58 N	6	PD	2281244	7		FRONT LEFT	954-842-4045
160818	SF	514209150520	2646			SHERMAN	ST		122851	GUARIN, HUMBERTO	M	1000	1	84240680	NEP	58 N	6	PD	46288794	7		FRONT LEFT	954-922-6859
160820	SF	514209150530	2647			SHERMAN	ST		122855	HANDLEY, STEPHEN	M	1000	1	87074229	NEP	58 N	6	PD	2281200	9		FRONT RIGHT	
160744	SF	514209150150	2600			THOMAS	ST		260635	CAPPELLO, LAURIE	M	1000	1	82425121	NEP	58 N	6	PD	2124710	9		FRONT RIGHT	954-549-0282
160746	SF	514209150160	2610			THOMAS	ST		369715	STEVENS, JAMES & ALISA	M	1000	1	97431284	BAD	58 N	6	PD	40078705	7		FRONT LEFT	502-541-4005
160788	SF	514209150370	2611			THOMAS	ST		122789	BARCH, C ERICH	M	1000	1	75275553	NEP	58 N	6	PD	2280052	9		FRONT RIGHT	
160748	SF	514209150170	2614			THOMAS	ST		122721	MCDUGAL, CHARLES	M	1000	1	84240522	NEP	58 N	6	PD	2124702	9		FRONT LEFT	
160786	SF	514209150360	2615			THOMAS	ST		365251	DEMILES, J NAVARRO & JAMES A	M	1000	1	87074271	NEP	58 N	6	PD	2280897	7		FRONT LEFT	305-397-4012
160750	SF	514209150180	2618			THOMAS	ST		122723	HOWARD, WILLIAM	M	1000	1	85374134	NEP	58 N	6	PD	2124700	7		FRONT LEFT	954-296-8005
160784	SF	514209150350	2619			THOMAS	ST		122783	DIFEO JR., JOSE MARIA	M	1000	1	85374097	NEP	58 N	6	PD	2280901	7		FRONT LEFT	954-922-5903
160752	SF	514209150190	2622			THOMAS	ST		378737	CUNDIFF, KEVIN D.	M	1000	1	77898932	NEP	58 N	6	PD	2124701	9		FRONT RIGHT	954-383-4609
160782	SF																						

160772	SF	514209150290	2643		THOMAS	ST		409756	SMITH, MAX	M	1000	1	96240750	BAD	58	N	6	PD	41204358	9	FRONT RIGHT	954-417-9819
160764	SF	514209150250	2646		THOMAS	ST		250369	HERRERIA, ROBERTO V	M	1000	1	80256909	NEP	58	N	6	PD	2280062	9	FRONT RIGHT	954-923-6272
160770	SF	514209150280	2647		THOMAS	ST		309249	MANRESA, MIKE & ANA	M	1000	1	82642976	NEP	58	N	6	PD	2280054	7	FRONT LEFT	954-658-6585
160766	SF	514209150260	2650		THOMAS	ST		122747	NOVARO, RICK	M	1000	1	80256910	NEP	58	N	6	PD	2124711	7	FRONT LEFT	954-920-1418
160768	SF	514209150270	2651		THOMAS	ST		122749	RAY, RICHARD	M	1000	1	87027678	NEP	58	N	6	PD	40078718	9	FRONT RIGHT	954-929-2406
N/A	SF	514209150120	2601		LIBERTY	ST		N/A	MATHIEU, JEAN R & BEVERLY	M	1000	1	N/A	N/A	58	N	6	PD	N/A	N/A	REAR RIGHT	
N/A	SF	514209150110	2611		LIBERTY	ST		N/A	TORRES, JAKE & YANELIS	M	1000	1	N/A	N/A	59	N	7	PD	N/A	N/A	FRONT LEFT	
N/A	SF	514209150100	2615		LIBERTY	ST		N/A	DAVIS, JANE M	M	1000	1	N/A	N/A	60	N	8	PD	N/A	N/A	FRONT RIGHT	
N/A	SF	514209150090	2619		LIBERTY	ST		N/A	WHITE, ANASTASIA	M	1000	1	N/A	N/A	61	N	9	PD	N/A	N/A	FRONT LEFT	
N/A	SF	514209150080	2623		LIBERTY	ST		N/A	HADDAD, ADRIAN F	M	1000	1	N/A	N/A	62	N	10	PD	N/A	N/A	FRONT RIGHT	
N/A	SF	514209150070	2627		LIBERTY	ST		N/A	MEJIAS, VICTOR M JR	M	1000	1	N/A	N/A	63	N	11	PD	N/A	N/A	FRONT LEFT	
N/A	SF	514209150060	2631		LIBERTY	ST		N/A	GOODMAN, THOMAS & KATHERINE	M	1000	1	N/A	N/A	64	N	12	PD	N/A	N/A	FRONT RIGHT	
N/A	SF	514209150050	2635		LIBERTY	ST		N/A	G & T ENTERPRISES FL LLC	M	1000	1	N/A	N/A	65	N	13	PD	N/A	N/A	FRONT LEFT	
N/A	SF	514209150040	2639		LIBERTY	ST		N/A	WARGA, CHARLES J & SUSAN B	M	1000	1	N/A	N/A	66	N	14	PD	N/A	N/A	FRONT RIGHT	
N/A	SF	514209150030	2643		LIBERTY	ST		N/A	LAZUTSIN, DZMITRY	M	1000	1	N/A	N/A	67	N	15	PD	N/A	N/A	FRONT LEFT	
N/A	SF	514209150020	2647		LIBERTY	ST		N/A	SISCA, WILLIAM SISCA, LARA	M	1000	1	N/A	N/A	68	N	16	PD	N/A	N/A	FRONT RIGHT	
N/A	SF	514209150010	2651		LIBERTY	ST		N/A	CRAWFORD, MADELYN C & MCCAFFREY THOMAS J	M	1000	1	N/A	N/A	69	N	17	PD	N/A	N/A	FRONT LEFT	
N/A	SF	514209140130	2650		LIBERTY	ST		N/A	WILLIAMS, ADRIANA TANGANELLI WILLIAMS, BRIAN P	M	1000	1	N/A	N/A	70	N	18	PD	N/A	N/A	FRONT RIGHT	
N/A	SF	514209140110	2646		LIBERTY	ST		N/A	GILLEN, PHILLIP ELLIOTT	M	1000	1	N/A	N/A	71	N	19	PD	N/A	N/A	FRONT LEFT	
N/A	SF	514209140100	2642		LIBERTY	ST		N/A	LATHROP, GEOFFREY DAVID	M	1000	1	N/A	N/A	72	N	20	PD	N/A	N/A	FRONT RIGHT	
N/A	SF	514209140090	2638		LIBERTY	ST		N/A	GONYEA, GEORGE S & WENDY S	M	1000	1	N/A	N/A	73	N	21	PD	N/A	N/A	FRONT LEFT	
N/A	SF	514209140080	2634		LIBERTY	ST		N/A	WALD, WARREN & LINDA	M	1000	1	N/A	N/A	74	N	22	PD	N/A	N/A	FRONT RIGHT	
N/A	SF	514209140070	2630		LIBERTY	ST		N/A	MAYHUA, ANGEL J	M	1000	1	N/A	N/A	75	N	23	PD	N/A	N/A	FRONT LEFT	
N/A	SF	514209140060	2626		LIBERTY	ST		N/A	ENZOR, JOHN J & JUDITH R	M	1000	1	N/A	N/A	76	N	24	PD	N/A	N/A	FRONT RIGHT	
N/A	SF	514209140050	2622		LIBERTY	ST		N/A	HARRINGTON, MICHAEL V & HARRINGTON, MICHELLE	M	1000	1	N/A	N/A	77	N	25	PD	N/A	N/A	FRONT LEFT	
N/A	SF	514209140040	2618		LIBERTY	ST		N/A	ERSTAD, CORY CHHABRA, SITA	M	1000	1	N/A	N/A	78	N	26	PD	N/A	N/A	FRONT RIGHT	
N/A	SF	514209140030	2614		LIBERTY	ST		N/A	FRONGELLO, BRIAN J	M	1000	1	N/A	N/A	79	N	27	PD	N/A	N/A	FRONT LEFT	
N/A	SF	514209140020	2606		LIBERTY	ST		N/A	DANJI, MARTIN G	M	1000	1	N/A	N/A	80	N	28	PD	N/A	N/A	FRONT RIGHT	