



**CONTRACT  
FOR  
THE CONSTRUCTION OF**

*WATERLINE IMPROVEMENTS  
TO SERVE  
PRIMROSE STATION*

**IPRC Record No. IPRC23-0003  
City Project No. 104666  
FID NO. 30114-0200431-104666-E07685  
File No.  
X. No. X-27673**

Mattie Parker  
Mayor

David Cooke  
City Manager

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Director, Water Department

**Prepared for  
The City of Fort Worth**

*Funding Department: Water Department*

*Advertising Year: 2023*

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**WATER IMPROVEMENTS FOR  
PRIMROSE STATION**

**CITY PROJECT NO.: 104666**

**September 2023**

Chris Igo, P.E.  
Kimley-Horn and Associates, Inc.  
TBPE Reg # F-298  
801 Cherry Street, Unit 11  
Suite 1300  
Fort Worth, TX 76102





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<http://fortworthtexas.gov/tpw/contractors/>

or

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**Technical Specifications which have been modified by the Engineer specifically for this Project; hard copies are included in the Project’s Contract Documents**

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**SECTION 00 11 13**  
**INVITATION TO BIDDERS**  
**DEVELOPER AWARDED CONTRACTS**  
**FOR PUBLICLY BID PROJECTS ONLY**

**RECEIPT OF BIDS**

Sealed bids for the construction of **Primrose Station Waterline** will be received by the City of Fort Worth Purchasing Division.

City of Fort Worth  
Purchasing Division  
200 Texas Street  
Fort Worth, Texas 76102

Bids will be accepted by:

1. US Mail at the address above,
2. By courier, FedEx or hand delivery from 8:30-1:30 on Thursdays only at the South End Lobby of City Hall located at 200 Texas Street, Fort Worth, Texas 76102. A Purchasing Department staff person will be available to accept the bid and provide a time stamped receipt; or
3. If the bidder desires to submit the bid on a day or time other than the designated Thursday, the bidder must contact the Purchasing Department during normal working hours at 817-392-2462 to make an appointment to meet a Purchasing Department employee at the South End Lobby of City Hall located at 200 Texas Street, Fort Worth, Texas 76102, where the bid(s) will be received and time/date stamped as above.

Bids will be opened publicly and read aloud at 2:00 PM CST on October 26, 2023 in the City Council Chambers located on the second floor of 200 Texas Street. Bids will be received until 1:30 PM on October 26, 2023.

**GENERAL DESCRIPTION OF WORK**

The major work will consist of the (approximate) following:

1. Installation of approximately 2,630 LF of 24-inch water pipe by open cut with all associated appurtenances and required testing.
2. Installation of approximately 530 LF of 16-inch water pipe by open cut with all associated appurtenances and required testing.
3. Installation of approximately 985 LF of 24-inch water carrier pipe by open cut with approximately 455 LF of 42" casing by open cut and approximately 530 LF of 42" casing by other than open cut.
4. Installation of approximately 630 LF of 16-inch water carrier pipe by open cut with 30" casing by other than open cut.
5. Installation of approximately 220 LF of 12-inch water pipe by open cut with all associated appurtenances and required testing.
6. Installation of approximately 335 LF of 8-inch water pipe by open cut with all associated appurtenances and required testing.
7. Installation of approximately 95 LF of 6-inch waterline by open cut with all associated appurtenances and required testing.

## **PREQUALIFICATION**

The improvements included in this project must be performed by a contractor who is pre-qualified by the City at the time of bid opening. The procedures for qualification and pre-qualification are outlined in the Section 00 21 13 – INSTRUCTIONS TO BIDDERS.

## **DOCUMENT EXAMINATION AND PROCUREMENTS**

The Bidding and Contract Documents may be examined or obtained on-line by visiting the City of Fort Worth's Purchasing Division website at <http://www.fortworthgov.org/purchasing/> and clicking on the link to the advertised project folders on the City's electronic document management and collaboration system site. The Contract Documents may be downloaded, viewed, and printed by interested contractors and/or suppliers.

Bid plans and Specs as well as any addenda will be posted here:

<https://docs.b360.autodesk.com/projects/1da9571c-48a9-4355-9b7c-0b00df975ca0/folders/urn:adsk.wiprod:fs.folder:co.uNPYT4mbSaKZehZIDfaSSQ>

Copies of the Bidding and Contract Documents may be purchased from

Kimley-Horn and Associates, Inc.  
13455 Noel Road, Two Galleria Office Tower, Suite 700  
Dallas, TX 75240  
Attn: Peyton McGee, P.E.  
Phone Number: 469-914-8611  
E-mail Address: [peyton.mcgee@kimley-horn.com](mailto:peyton.mcgee@kimley-horn.com)

The cost of Bidding and Contract Documents is:

Set of Bidding and Contract Documents with full size drawings: \$100

Set of Bidding and Contract Documents with half size (if available) drawings: \$75

## **PREBID CONFERENCE**

A prebid conference may be held as described in Section 00 21 13 - INSTRUCTIONS TO BIDDERS at the following location, date, and time:

**DATE:** *October 19, 2023*

**TIME:** *10:00 AM*

**PLACE:** *Virtual (Teams)*

**LOCATION:**

### **[Click here to join the meeting](#)**

Use link above or paste below into web browser:

[https://teams.microsoft.com/l/meetup-join/19%3ameeting\\_ODRINTIwMDUtNjBmMS00YjJlTlMmMjAtZGRkYTY3ZDcxMzhhm%40thread.v2/0?context=%7b%22id%22%3a%227e220d30-0b59-47e5-8a81-a4a9d9afbdc4%22%2c%22oid%22%3a%221e660692-7e0c-4c6d-bee7-044539a1e091%22%7d](https://teams.microsoft.com/l/meetup-join/19%3ameeting_ODRINTIwMDUtNjBmMS00YjJlTlMmMjAtZGRkYTY3ZDcxMzhhm%40thread.v2/0?context=%7b%22id%22%3a%227e220d30-0b59-47e5-8a81-a4a9d9afbdc4%22%2c%22oid%22%3a%221e660692-7e0c-4c6d-bee7-044539a1e091%22%7d)

Meeting ID: 242 834 480 857

Passcode: BUKcUz

[Download Teams | Join on the web](#)  
**Join with a video conferencing device**  
[340760667@t.plcm.vc](mailto:340760667@t.plcm.vc)

Video Conference ID: 114 394 324 1

[Alternate VTC instructions](#)

**Or call in (audio only)**

+1 469-250-9294,,434117297# United States, Dallas

Phone Conference ID: 434 117 297#

[Find a local number | Reset PIN](#)

## **DEVELOPER/CITY'S RIGHT TO ACCEPT OR REJECT BIDS**

Developer and City reserves the right to waive irregularities and to accept or reject bids.

## **INQUIRIES**

All inquiries relative to this procurement should be addressed to the following:

Attn: Peyton McGee, P.E., Kimley-Horn and Associates, Inc.

Email: [peyton.mcgee@kimley-horn.com](mailto:peyton.mcgee@kimley-horn.com)

Phone: (469)-914-8611

AND/OR

Attn: George Marquez, City of Fort Worth

Email: [george.marquez@fortworthtexas.gov](mailto:george.marquez@fortworthtexas.gov)

Phone: (817) 392-6826

## **PLAN HOLDERS**

To ensure you are kept up to date of any new information pertinent to this project such as when an addenda is issued, download the Plan Holder Registration form to your computer, complete and email it to the City Project Manager or the design Engineer.

The City Project Manager and design Engineer are responsible to upload the Plans Holder Registration form to the Plan Holders folder in BIM360.

Mail your completed Plan Holder Registration form to those listed in INQUIRIES above, or simply post to the link on BIM360:

[https://docs.b360.autodesk.com/projects/1da9571c-48a9-4355-9b7c-0b00df975ca0/folders/urn:adsk.wipprod:fs.folder:co.e-Lj5j87QVOXOZjGOx\\_nHQ](https://docs.b360.autodesk.com/projects/1da9571c-48a9-4355-9b7c-0b00df975ca0/folders/urn:adsk.wipprod:fs.folder:co.e-Lj5j87QVOXOZjGOx_nHQ)

## **ADVERTISEMENT DATES**

*October 11, 2023*

*October 18, 2023*

**END OF SECTION**



**SECTION 00 21 13 INSTRUCTIONS TO BIDDERS  
DEVELOPER AWARDED CONTRACTS  
FOR PUBLICLY BID PROJECTS ONLY**

**1. Defined Terms**

1.1. Certain additional terms used in these INSTRUCTIONS TO BIDDERS have the meanings indicated below which are applicable to both the singular and plural thereof.

1.1.1. Bidder: Any person, firm, partnership, company, association, or corporation acting directly through a duly authorized representative, submitting a bid for performing the work contemplated under the Contract Documents.

1.1.2. Successful Bidder: The responsible and responsive Bidder to whom Developer/City (on the basis of City's evaluation as hereinafter provided) makes an award.

**2. Copies of Bidding Documents**

2.1. Neither Developer/City nor Engineer shall assume any responsibility for errors or misinterpretations resulting from the Bidders use of incomplete sets of Bidding Documents.

2.2. Developer/City and Engineer in making copies of Bidding Documents available do so only for the purpose of obtaining Bids for the Work and do not authorize or confer a license or grant for any other use.

**3. Prequalification of Bidders (Prime Contractors and Subcontractors)**

3.1. All Bidders and their subcontractors are required to be prequalified for the work types requiring prequalification at the time of bidding. Bids received from contractors who are not prequalified (even if inadvertently opened) shall not be considered. Prequalification requirement work types and documentation are available by accessing all required files through the City's website at: <https://apps.fortworthtexas.gov/ProjectResources/>

3.1.1. Paving – Requirements document located at;

Resources/Construction Documents/Contractor Prequalification/TPW Paving Contractor Prequalification Program

3.1.2. Roadway and Pedestrian Lighting – Requirements document located at;

Resources/Construction Documents/Contractor Prequalification/TPW Roadway and Pedestrian Lighting Prequalification Program

3.1.3. Water and Sanitary Sewer – Requirements document located at;

02 - Construction Documents/Contractor Prequalification/Water and Sanitary Sewer Contractor Prequalification Program

3.2. Each Bidder unless currently prequalified, must be prepared to submit to City within seven (7) calendar days prior to Bid opening, the documentation identified in Section 00 45 11, BIDDERS PREQUALIFICATIONS.

3.2.1. Submission of and/or questions related to prequalification should be addressed to the City contact as provided in Paragraph 6.1.

3.3. The City reserves the right to require any pre-qualified contractor who is the successful bidder(s) for a project to submit such additional information as the City, in its sole discretion may require, including but not limited to manpower and equipment records, information about key personnel to be assigned to the project, and construction schedule, to assist the City in evaluating and assessing the ability of the successful bidder(s) to deliver a quality product and successfully complete projects for the amount bid within the stipulated time frame. Failure to submit the additional information, if requested, may be grounds for rejecting the successful bidder as non-responsive.

3.4. In addition to prequalification, additional requirements for qualification may be required within various sections of the Contract Documents.

#### **4. Examination of Bidding and Contract Documents, Other Related Data, and Site**

4.1. Before submitting a Bid, each Bidder shall:

4.1.1. Examine and carefully study the Contract Documents and other related data identified in the Bidding Documents (including "technical data" referred to in Paragraph 4.2. below). No information given by Developer/City or any representative of the Developer/City other than that contained in the Contract Documents and officially promulgated addenda thereto, shall be binding upon the Developer/City.

4.1.2. Visit the site to become familiar with and satisfy Bidder as to the general, local and site conditions that may affect cost, progress, performance or furnishing of the Work.

4.1.3. Consider federal, state and local Laws and Regulations that may affect cost, progress, performance or furnishing of the Work.

4.1.4. Study all: (i) reports of explorations and tests of subsurface conditions at or contiguous to the Site and all drawings of physical conditions relating to existing surface or subsurface structures at the Site (except Underground Facilities) that have been identified in the Contract Documents as containing reliable "technical data" and (ii) reports and drawings of Hazardous Environmental Conditions, if any, at the Site that have been identified in the Contract Documents as containing reliable "technical data."



- 4.1.5. Be advised that the Contract Documents on file with the City shall constitute all of the information which the City will furnish. All additional information and data which the City will supply after promulgation of the formal Contract Documents shall be issued in the form of written addenda and shall become part of the Contract Documents just as though such addenda were actually written into the original Contract Documents. No information given by the City other than that contained in the Contract Documents and officially promulgated addenda thereto, shall be binding upon the City.
  - 4.1.6. Perform independent research, investigations, tests, borings, and such other means as may be necessary to gain a complete knowledge of the conditions which will be encountered during the construction of the project. Bidder must fill all holes and clean up and restore the site to its former conditions upon completion of such explorations, investigations, tests and studies.
  - 4.1.7. Determine the difficulties of the Work and all attending circumstances affecting the cost of doing the Work, time required for its completion, and obtain all information required to make a proposal. Bidders shall rely exclusively and solely upon their own estimates, investigation, research, tests, explorations, and other data which are necessary for full and complete information upon which the proposal is to be based. It is understood that the submission of a proposal is prima-facie evidence that the Bidder has made the investigation, examinations and tests herein required. Claims for additional compensation due to variations between conditions actually encountered in construction and as indicated in the Contract Documents will not be allowed.
  - 4.1.8. Promptly notify Developer of all conflicts, errors, ambiguities or discrepancies in or between the Contract Documents and such other related documents. The Contractor shall not take advantage of any gross error or omission in the Contract Documents, and the Developer shall be permitted to make such corrections or interpretations as may be deemed necessary for fulfillment of the intent of the Contract Documents.
- 4.2. Reference is made to Section 00 73 00 – Supplementary Conditions for identification of:
- 4.2.1. those reports of explorations and tests of subsurface conditions at or contiguous to the site which have been utilized by Developer in preparation of the Contract Documents. The logs of Soil Borings, if any, on the plans are for general information only. Neither the Developer nor the Engineer guarantee that the data shown is representative of conditions which actually exist.
  - 4.2.2. those drawings of physical conditions in or relating to existing surface and subsurface structures (except Underground Facilities) which are at or contiguous to the site that have been utilized by Developer in preparation of the Contract Documents.
  - 4.2.3. copies of such reports and drawings will be made available by City to any Bidder on request. Bidder is responsible for any interpretation or conclusion drawn from any "technical data" or any other data, interpretations, opinions or information.

- 4.3. The submission of a Bid will constitute an incontrovertible representation by Bidder (i) that Bidder has complied with every requirement of this Paragraph 4, (ii) that without exception the Bid is premised upon performing and furnishing the Work required by the Contract Documents and applying the specific means, methods, techniques, sequences or procedures of construction (if any) that may be shown or indicated or expressly required by the Contract Documents, (iii) that Bidder has given Developer written notice of all conflicts, errors, ambiguities and discrepancies in the Contract Documents and the written resolutions thereof by Developer are acceptable to Bidder, and when said conflicts, etc., have not been resolved through the interpretations by Developer as described in Paragraph 6., and (iv) that the Contract Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performing and furnishing the Work.
- 4.4. The provisions of this Paragraph 4, inclusive, do not apply to Asbestos, Polychlorinated biphenyls (PCBs), Petroleum, Hazardous Waste or Radioactive Material, unless specifically identified in the Contract Documents.

**5. Availability of Lands for Work, Etc.**

- 5.1. The lands upon which the Work is to be performed, rights-of-way and easements for access thereto and other lands designated for use by Contractor in performing the Work are identified in the Contract Documents. All additional lands and access thereto required for temporary construction facilities, construction equipment or storage of materials and equipment to be incorporated in the Work are to be obtained and paid for by Contractor. Easements for permanent structures or permanent changes in existing facilities are to be obtained and paid for by Developer.

## 6. Interpretations and Addenda

- 6.1. All questions about the meaning or intent of the Bidding Documents are to be directed to Developer's/City's representative. Interpretations or clarifications considered necessary by Developer in response to such questions will be issued by Addenda delivered to all parties recorded by Developer as having received the Bidding Documents. Only questions answered by formal written Addenda will be binding Oral and other interpretations or clarifications will be without legal effect

Address questions to:

Attn: Peyton McGee, P.E., Kimley-Horn and Associates, Inc.  
Email: peyton.mcgee@kimley-horn.com  
Phone: (469)-914-8611

AND/OR

Attn: George Marquez, City of Fort Worth  
Email: george.marquez@fortworthtexas.gov  
Phone: (817) 392-6826

- 6.2. Addenda may also be issued to modify the Bidding Documents as deemed advisable by Developer/City.
- 6.3. Addenda or clarifications may be posted via the City's document management and collaboration system site at <https://docs.b360.autodesk.com/projects/1da9571c-48a9-4355-9b7c-0b00df975ca0/folders/urn:adsk.wipprod:fs.folder:co.uNPYT4mbSaKZehZIDfaSSQ>
- 6.4. A prebid conference may be held at the time and place indicated in the Advertisement or INVITATION TO BIDDERS. Representatives of Developer will be present to discuss the Project. Bidders are encouraged to attend and participate in the conference. Developer's representative will transmit to all prospective Bidders of record such Addenda as Developer considers necessary in response to questions arising at the conference. Oral statements may not be relied upon and will not be binding or legally effective.

## 7. Bid Security

- 7.1. Each Bid must be accompanied by Bid Bond made payable to Developer in an amount of zero (0) percent of Bidder's maximum Bid price on form attached, issued by a surety meeting the requirements as listed in the General Conditions.
- 7.2. The Bid Bond of all Bidders will be retained until the conditions of the Notice of Award have been satisfied. If the Successful Bidder fails to execute and deliver the complete Agreement within 10 days after the Notice of Award, Developer may consider Bidder to be in default, rescind the Notice of Award, and the Bid Bond of that Bidder will be forfeited. Such forfeiture shall be Developer's exclusive remedy if Bidder defaults. The Bid Bond of all other Bidders whom Developer believes to have a reasonable chance of receiving the award will be retained by Developer until final contract execution.

## **8. Contract Times**

The number of days within which, or the dates by which, Milestones are to be achieved in accordance with the General Requirements and the Work is to be completed and ready for Final Acceptance is set forth in the Agreement or incorporated therein by reference to the attached Bid Form.

## **9. Liquidated Damages**

Provisions for liquidated damages are set forth in the Agreement.

## **10. Substitute and "Or-Equal" Items**

The Contract, if awarded, will be on the basis of materials and equipment described in the Bidding Documents without consideration of possible substitute or "or-equal" items. Whenever it is indicated or specified in the Bidding Documents that a "substitute" or "or-equal" item of material or equipment may be furnished or used by Contractor if acceptable to City, application for such acceptance will not be considered by City until after the Effective Date of the Agreement. The procedure for submission of any such application by Contractor and consideration by City is set forth in Section 01 25 00 of the General Requirements.

## **11. Bid Form**

- 11.1. All blanks on the Bid Form must be completed by printing in ink and the Bid Form signed in ink. Erasures or alterations shall be initialed in ink by the person signing the Bid Form. A Bid price shall be indicated for each Bid item, alternative, and unit price item listed therein. In the case of optional alternatives, the words "No Bid," "No Change," or "Not Applicable" may be entered legibly, in ink or type, for which the Bidder proposes to do the work contemplated or furnish materials required.
- 11.2. Bids by corporations shall be executed in the corporate name by the president or a vice-president or other corporate officer accompanied by evidence of authority to sign. The corporate seal shall be affixed. The corporate name, address and state of incorporation shall be shown below the signature.
- 11.3. Bids by partnerships shall be executed in the partnership name and signed by a partner, whose title must appear under the signature accompanied by evidence of authority to sign. The official name and address of the partnership shall be shown below the signature.
- 11.4. Bids by limited liability companies shall be executed in the name of the firm by a member and accompanied by evidence of authority to sign. The name and state of formation of the firm and the official address of the firm shall be shown.
- 11.5. Bids by individuals shall show the Bidder's name and official address.
- 11.6. Bids by joint ventures shall be executed by each joint venturer in the manner indicated on the Bid Form. The official address of the joint venture shall be shown.
- 11.7. All names shall be typed or printed in ink below the signature.

- 11.8. The Bid shall contain an acknowledgement of receipt of all Addenda, the numbers of which shall be filled in on the Bid Form.
- 11.9. Postal and e-mail addresses and telephone number for communications regarding the Bid shall be shown.
- 11.10. Evidence of authority to conduct business as a Nonresident Bidder in the state of Texas shall be provided in accordance with Section 00 43 37 – Vendor Compliance to State Law Non Resident Bidder.

## **12. Submission of Bids**

- 12.1. Bids shall be submitted on the prescribed Bid Form and proposal form, provided with the Bidding Documents, at the time and place indicated in the Advertisement or INVITATION TO BIDDERS, addressed to City of Fort Worth Project Manager, and shall be enclosed in an opaque sealed envelope, marked with the City Project Number, Project title, the name and address of Bidder, and accompanied by the Bid security, if required, and other required documents.

## **13. Modification and Withdrawal of Bids**

- 13.1. Bids cannot be withdrawn prior to the time set for bid opening. A request for withdrawal must be made in writing by an appropriate document duly executed in the manner that a Bid must be executed and delivered to the place where Bids are to be submitted at any time prior to the opening of Bids. After all Bids not requested for withdrawal are opened and publicly read aloud, the Bids for which a withdrawal request has been properly filed may, at the option of the Developer/City, be returned unopened.
- 13.2. Bidders may modify their Bid by electronic communication at any time prior to the time set for the closing of Bid receipt.

## **14. Opening of Bids**

- 14.1. Bids will be opened and read aloud publicly at the place where Bids are to be submitted. An abstract of the amounts of the base Bids and major alternates (if any) will be made available to Bidders after the opening of Bids.

## **15. Bids to Remain Subject to Acceptance**

- 15.1. All Bids will remain subject to acceptance for the time period specified for Notice of Award and execution and delivery of a complete Agreement by Successful Bidder. Developer/City may, at their sole discretion, release any Bid and nullify the Bid security, if required, prior to that date.

## 16. Evaluation of Bids and Award of Contract

- 16.1. Developer/City reserves the right to reject any or all Bids, including without limitation the rights to reject any or all nonconforming, nonresponsive, unbalanced or conditional Bids and to reject the Bid of any Bidder if Developer/City believes that it would not be in the best interest of the Project to make an award to that Bidder, whether because the Bid is not responsive or the Bidder is unqualified or of doubtful financial ability or fails to meet any other pertinent standard or criteria established by City. Developer/City also reserves the right to waive informalities not involving price, contract time or changes in the Work with the Successful Bidder. Discrepancies between the multiplication of units of Work and unit prices will be resolved in favor of the unit prices. Discrepancies between the indicated sum of any column of figures and the correct sum thereof will be resolved in favor of the correct sum.
  - 16.1.1. Any or all bids will be rejected if Developer/City has reason to believe that collusion exists among the Bidders, Bidder is an interested party to any litigation against Developer/City, Developer/City or Bidder may have a claim against the other or be engaged in litigation, Bidder is in arrears on any existing contract or has defaulted on a previous contract, Bidder has performed a prior contract in an unsatisfactory manner, or Bidder has uncompleted work which in the judgment of the Developer/City will prevent or hinder the prompt completion of additional work if awarded.
- 16.2. Developer/City may consider the qualifications and experience of Subcontractors, Suppliers, and other persons and organizations proposed for those portions of the Work as to which the identity of Subcontractors, Suppliers, and other persons and organizations must be submitted as provided in the Contract Documents or upon the request of the Developer/City. Developer/City also may consider the operating costs, maintenance requirements, performance data and guarantees of major items of materials and equipment proposed for incorporation in the Work when such data is required to be submitted prior to the Notice of Award.
- 16.3. Developer/City may conduct such investigations as Developer/City deems necessary to assist in the evaluation of any Bid and to establish the responsibility, qualifications, and financial ability of Bidders, proposed Subcontractors, Suppliers and other persons and organizations to perform and furnish the Work in accordance with the Contract Documents to Developer's/City's satisfaction within the prescribed time.
- 16.4. If the Contract is to be awarded, it will be awarded to lowest responsible and responsive Bidder whose evaluation by Developer/City indicates that the award will be in the best interests of the Developer/City.
- 16.5. Failure or refusal to comply with the requirements may result in rejection of Bid.

## **17. Signing of Agreement**

- 17.1. When Developer issues a Notice of Award to the Successful Bidder, it will be accompanied by the required number of unsigned counterparts of the Agreement. The Contractor shall sign and deliver the required number of counterparts of the Agreement to Developer's representative with the required Bonds, Certificates of Insurance, and all other required documentation.

**END OF SECTION**





**SECTION 00 41 00 BID**  
**Publicly Bid Developer Awarded Projects - BID FORM**

TO: *JPI Real Estate Acquisitions, LL*  
*600 E. Las Colinas Blvd., Suite 1800*  
*Irving, TX 75039*

FOR: *Primrose Station Waterline*

City Project No.: 104666

Units/Sections: UNIT I: WATER IMPROVEMENTS  
UNIT IB: BREWER BLVD WATER IMPROVEMENTS

### **1. Enter Into Agreement**

The undersigned Bidder proposes and agrees, if this Bid is accepted, to enter into an Agreement with Developer in the form included in the Bidding Documents to perform and furnish all Work as specified or indicated in the Contract Documents for the Bid Price and within the Contract Time indicated in this Bid and in accordance with the other terms and conditions of the Contract Documents.

### **2. BIDDER Acknowledgements and Certification**

- 2.1. In submitting this Bid, Bidder accepts all of the terms and conditions of the INVITATION TO BIDDERS and INSTRUCTIONS TO BIDDERS, including without limitation those dealing with the disposition of Bid Bond.
- 2.2. Bidder is aware of all costs to provide the required insurance, will do so pending contract award, and will provide a valid insurance certificate meeting all requirements in the construction contract.
- 2.3. Bidder certifies that this Bid is genuine and not made in the interest of or on behalf of any undisclosed individual or entity and is not submitted in conformity with any collusive agreement or rules of any group, association, organization, or corporation.
- 2.4. Bidder has not directly or indirectly induced or solicited any other Bidder to submit a false or sham Bid.
- 2.5. Bidder has not solicited or induced any individual or entity to refrain from bidding.
- 2.6. Bidder has not engaged in corrupt, fraudulent, collusive, or coercive practices in competing for the Contract. For the purposes of this Paragraph:
  - a. "corrupt practice" means the offering, giving, receiving, or soliciting of any thing of value likely to influence the action of a public official in the bidding process.
  - b. "fraudulent practice" means an intentional misrepresentation of facts made (a) to influence the bidding process to the detriment of Developer (b) to establish Bid prices at artificial non-competitive levels, or (c) to deprive Developer of the benefits of free and open competition.
  - c. "collusive practice" means a scheme or arrangement between two or more Bidders, with or without the knowledge of Developer, a purpose of which is to establish Bid prices at artificial,

non-competitive levels.

- d. "coercive practice" means harming or threatening to harm, directly or indirectly, persons or their property to influence their participation in the bidding process or affect the execution of the Contract.

### 3. Prequalification

The Bidder acknowledges that the following work types must be performed only by prequalified contractors and subcontractors:

- a. *Water Transmission, Development, 24-inches and smaller*
- b. *Water Transmission, Urban/Renewal, 24-inches and smaller*
- c. *Auger Boring - Greater than 24-inch diameter casing and greater*
- c. *Tunneling - 36-Inches – 60 –inches, and greater than 350 LF*

### 4. Time of Completion

- 4.1. Bidder agrees to complete WORK for FINAL ACCEPTANCE within **240** working days after the date when the Contract Time commences to run as provided in the General Conditions.
- 4.2. Bidder accepts the provisions of the Agreement as to liquidated damages in the event of failure to complete the Work {and/or achievement of Milestones} within the times specified in the Agreement.

### 5. Attached to this Bid

The following documents are attached to and made a part of this Bid:

- a. This Bid Form, Section 00 41 00
- b. Proposal Form, Section 00 42 43
- c. Required Bid Bond, Section 00 43 13 issued by a surety meeting the requirements of Paragraph 5.01 of the General Conditions.
- d. MBE Forms *(if applicable)*
- e. Prequalification Statement, Section 00 45 12
- f. Any additional documents that may be required by Section 12 of the Instructions to Bidders
- g. Bidder pre-qualification application *(Optional)*

**6. Total Bid Amount**

- 6.1. Bidder will complete the Work in accordance with the Contract Documents for the following bid amount. In the space provided below, please enter the total bid amount for this project. Only this figure will be read publicly by the City at the bid opening.
- 6.2. It is understood and agreed by the Bidder in signing this proposal that the total bid amount entered below is subject to verification and/or modification by multiplying the unit bid prices for each pay item by the respective estimated quantities shown in this proposal and then totaling all of the extended amounts.

6.3 **TOTAL BID**              <Final Bid Amount Here>  

**7. Bid Submittal**

This Bid is submitted on      <Month Day, Year>      by the entity named below.

Respectfully submitted,

By: \_\_\_\_\_  
  (Signature)

        <Printed Name Here>    
  (Printed Name)

Receipt is acknowledged of the following Addenda:	Initial
Addendum No. 1:	
Addendum No. 2:	
Addendum No. 3:	
Addendum No. 4:	

Title: <Title Here>

Company: <Company Name Here>

Corporate Seal:

Address: <Address Here>  
                <Address Here or Space>  
                <City, State Zip Code Here>

State of Incorporation:      <State Here>

<Seal Here>

Email: <Your Email Address Here>

Phone: <Your Phone Number Here>

**END OF SECTION**



**SECTION 00 42 43**  
Developer Awarded Projects - PROPOSAL FORM

**UNIT PRICE BID**

**Bidder's Application**

Project Item Information					Bidder's Proposal	
Bidlist Item No.	Description	Specification Section No.	Unit of Measure	Bid Quantity	Unit Price	Bid Value
<b>UNIT I: WATER IMPROVEMENTS</b>						
1	3311.0444 12" Water Pipe (Restrained Joints)	33 11 10, 33 11 12	LF	1338		
2	3311.0468 12" PVC Water Pipe, CLSM Backfill (Restrained Joints)	33 11 10, 33 11 12	LF	40		
3	3311.0241 8" Water Pipe	33 11 10, 33 11 12	LF	246		
4	3311.0244 8" Water Pipe, CLSM Backfill	33 11 10, 33 11 12	LF	55		
5	3311.0141 6" Water Pipe	34 11 10, 33 11 12	LF	76		
6	3311.0041 4" Water Pipe	34 11 10, 33 11 12	LF	8		
7	3311.0001 Ductile Iron Water Fittings w/ Restraint	33 11 11	TON	4		
8	3312.0001 Fire Hydrant	33 12 40	EA	2		
9	3312.2801 3" Water Meter and Vault	33 12 11	EA	2		
10	3312.2103 1 1/2" Water Service	33 12 11	EA	2		
11	3312.3005 12" Gate Valve	33 12 20	EA	10		
12	3312.3003 8" Gate Valve	33 12 20	EA	7		
13	3312.3002 6" Gate Valve	33 12 20	EA	2		
14	3292.0300 Seeding, Mech Drilling	32 92 13	SY	2858		
15	3305.0109 Trench Safety	33 05 10	LF	1715		
16	3305.0117 Concrete Collar for Valve	33 05 17	EA	19		
<b>TOTAL UNIT I: WATER IMPROVEMENTS</b>						
<b>UNIT IB: BREWER BLVD WATER IMPROVEMENTS (CITY COST PARTICIPATION)</b>						
1	3311.0644 24" Water Pipe (Restrained Joints)	33 11 10, 33 11 12, 33 11 13, 33 11 14	LF	2601		
2	3311.0544 16" Water Pipe (Restrained Joints)	33 11 10, 33 11 12	LF	530		
3	3311.0001 Ductile Iron Water Fittings w/ Restraint	33 11 11	TON	10		
4	3305.2007 24" Water Carrier Pipe	33 05 24	LF	1013		
5	3305.2005 16" Water Carrier Pipe	33 05 24	LF	631		
6	3305.1007 42" Casing By Open Cut	33 05 22	LF	483		
7	3305.1107 42" Casing By Other Than Open Cut	33 05 22	LF	530		
8	3305.1105 30" Casing By Other Than Open Cut	33 05 22	LF	631		
9	3312.3008 24" Gate Valve w/ Vault	33 12 20	EA	6		
10	3312.3006 16" Gate Valve w/ Vault	33 12 20	EA	2		
11	3312.6003 8" Blow Off Valve	33 12 60	EA	1		
12	3312.1002 2" Combination Air Valve Assembly for Water	33 12 30	EA	1		
13	3312.1003 3" Combination Air Valve Assembly for Water	33 12 30	EA	1		
14	3312.0108 Connection to Existing 24" Water Main	33 12 25	EA	1		
15	3304.0002 Cathodic Protection	33 04 12	LS	1		
16	9999.0001 Soil Corrosivity Investigation and Cathodic Protection Design	33 04 12	LS	1		
17	0171.0101 Construction Staking	01 71 23	LS	1		
18	0171.0102 As-Built Survey	01 71 23	LS	1		
19	3125.0101 SWPPP ≥ 1 acre	31 25 00	LS	1		
20	3471.0001 Traffic Control	34 71 13	MO	6		
21	3291.0100 Topsoil	32 91 19	CY	127		



**SECTION 00 42 43**  
Developer Awarded Projects - PROPOSAL FORM

**UNIT PRICE BID**

**Bidder's Application**

Project Item Information					Bidder's Proposal	
Bidlist Item No.	Description	Specification Section No.	Unit of Measure	Bid Quantity	Unit Price	Bid Value
22	3292.0300 Seeding, Mech Drilling	32 92 13	SY	2280		
23	3201.0203 Asphalt Pvmt Repair Beyond Defined Width, Industrial	34 01 17	SY	261		
24	3305.0103 Exploratory Excavation of Existing Utilities	33 05 30	EA	6		
25	3305.0109 Trench Safety	33 05 10	LF	3614		
26	3305.0110 Utility Markers	33 05 26	LS	1		
27	3305.0112 Concrete Collar for Manhole	33 05 17	EA	8		
28	3312.0117 Connection to Existing 4"-12" Water Main	33 12 25	EA	1		
29	9999.0002 Construction Allowance	33 05 10	LS	1	\$100,000.00	\$100,000.00
<b>TOTAL UNIT IB: BREWER BLVD WATER IMPROVEMENTS (CITY COST PARTICIPATION)</b>						\$100,000.00

Bid Summary	
UNIT I: WATER IMPROVEMENTS	
UNIT IB: BREWER BLVD WATER IMPROVEMENTS (CITY COST PARTICIPATION)	\$100,000.00
<b>Total Construction Bid</b>	<b>\$100,000.00</b>

**This Bid is submitted by the entity named below:**

**BIDDER:**  
<Company Name Here>  
<Address Here>  
<Address Here or Blank>  
<City, State Zip Code Here>

**BY:** <Name of Principal Here>

<Signature Here>

**TITLE:** <Title Here>

**DATE:** <Date Here>

Contractor agrees to complete WORK for FINAL ACCEPTANCE within 240 working days after the date when the CONTRACT commences to run as provided in the General Conditions.

**END OF SECTION**





**SECTION 00 42 15**  
**PREQUALIFICATION STATEMENT**

Each Bidder is required to complete the information below by identifying the prequalified contractors and/or subcontractors whom they intend to utilize for the major work type(s) listed. In the "Major Work Type" box provide the complete major work type and actual description as provided by the Water Department for water and sewer and TPW for paving.

<b>Major Work Type</b>	<b>Contractor/Subcontractor Company Name</b>	<b>Prequalification Expiration Date</b>
<i>Water Transmission, Development, 24-inches and smaller</i>	<i>&lt;Company Name Here or Blank&gt;</i>	<i>&lt;Date Here or Blank&gt;</i>
<i>Water Transmission, Urban/Renewal, 24-inches and smaller</i>	<i>&lt;Company Name Here or Blank&gt;</i>	<i>&lt;Date Here or Blank&gt;</i>
<i>Auger Boring - Greater than 24-inch diameter casing and greater</i>	<i>&lt;Company Name Here or Blank&gt;</i>	<i>&lt;Date Here or Blank&gt;</i>
<i>Tunneling - 36-Inches – 60 –inches, and greater than 350 LF</i>	<i>&lt;Company Name Here or Blank&gt;</i>	<i>&lt;Date Here or Blank&gt;</i>

The undersigned hereby certifies that the contractors and/or subcontractors described in the table above are currently prequalified for the work types listed.

**BIDDER:**

*<Company Name Here>*  
*<Address Here>*  
*<Address Here or Blank>*  
*<City, State, Zip Code Here>*

BY: *<Name of Principal>*

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

TITLE *<Title Here>*

DATE: *<Date Here>*



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**SECTION 00 45 11**  
**BIDDERS PREQUALIFICATIONS**

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- 1. Summary.** A Bidder or their designated subcontractors are required to be prequalified or have applied for prequalification by the City for the work types requiring prequalification prior to submitting bids. To be considered for award of contract the Bidder must submit Section 00 45 12, PREQUALIFICATION STATEMENT for the work type(s) listed with their Bid. Any contractor or subcontractor who is not prequalified for the work type(s) listed must submit Section 00 45 13, PREQUALIFICATION APPLICATION in accordance with the requirements below. **The information must be submitted seven (7) days prior to the date of the opening of bids.** Subcontractors must follow the same timelines as contractors for obtaining prequalification review. Bidders or Subcontractors who are not prequalified at the time bids are opened and reviewed may cause the bid to be rejected.

The prequalification process will establish a bid limit based on a technical evaluation and financial analysis of the contractor. For example, a contractor wishing to submit bids on projects to be opened on the 7th of April must file the information by the 31st day of March in order to eligible to work on these projects. In order to facilitate the approval of a Bidder's Prequalification Application, the following must accompany the submission.

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- a. A complete set of audited or reviewed financial statements.
    - (1) Classified Balance Sheet
    - (2) Income Statement
    - (3) Statement of Cash Flows
    - (4) Statement of Retained Earnings
    - (5) Notes to the Financial Statements, if any
  - b. A certified copy of the firm's organizational documents (Corporate Charter, Articles of Incorporation, Articles of Organization, Certificate of Formation, LLC Regulations, and Certificate of Limited Partnership Agreement).
  - c. A completed Bidder Prequalification Application.
    - (1) The firm's Texas Taxpayer Identification Number as issued by the Texas Comptroller of Public Accounts. To obtain a Texas Taxpayer Identification number visit the Texas Comptroller of Public Accounts online at the following web address [www.window.state.tx.us/taxpermit/](http://www.window.state.tx.us/taxpermit/) and fill out the application to apply for your Texas tax ID.
    - (2) The firm's e-mail address and fax number.
    - (3) The firm's DUNS number as issued by Dun & Bradstreet. This number is used by the City for required reporting on Federal Aid projects. The DUNS number may be obtained at [www.dnb.com](http://www.dnb.com).
  - d. Resumes reflecting the construction experience of the principles of the firm for firms submitting their initial prequalification. These resumes should include the size and scope of the work performed.
  - e. Other information as requested by the City.

**2. Prequalification Requirements**

- a. *Financial Statements.* Financial statement submission must be provided in accordance with the following:
  - (1) The City requires that the original Financial Statement or a certified copy be submitted for consideration.

- (2) To be satisfactory, the financial statements must be audited or reviewed by an independent, certified public accounting firm registered and in good standing in any state. Current Texas statutes also require that accounting firms performing audits or reviews on business entities within the State of Texas be properly licensed or registered with the Texas State Board of Public Accountancy.
- (3) The accounting firm should state in the audit report or review whether the contractor is an individual, corporation, or limited liability company.
- (4) Financial Statements must be presented in U.S. dollars at the current rate of exchange of the Balance Sheet date.
- (5) The City will not recognize any certified public accountant as independent who is not, in fact, independent.
- (6) The accountant's opinion on the financial statements of the contracting company should state that the audit or review has been conducted in accordance with auditing standards generally accepted in the United States of America. This must be stated in the accounting firm's opinion. It should: (1) express an unqualified opinion, or (2) express a qualified opinion on the statements taken as a whole.
- (7) The City reserves the right to require a new statement at any time.
- (8) The financial statement must be prepared as of the last day of any month, not more than one year old and must be on file with the City 16 months thereafter, in accordance with Paragraph 1.
- (9) The City will determine a contractor's bidding capacity for the purposes of awarding contracts. Bidding capacity is determined by multiplying the positive net working capital (working capital = current assets – current liabilities) by a factor of 10. Only those statements reflecting a positive net working capital position will be considered satisfactory for prequalification purposes.
- (10) In the case that a bidding date falls within the time a new financial statement is being prepared, the previous statement shall be updated with proper verification.

b. *Bidder Prequalification Application.* A Bidder Prequalification Application must be submitted along with audited or reviewed financial statements by firms wishing to be eligible to bid on all classes of construction and maintenance projects. **Incomplete Applications will be rejected.**

- (1) In those schedules where there is nothing to report, the notation of "None" or "N/A" should be inserted.
- (2) A minimum of five (5) references of related work must be provided.
- (3) Submission of an equipment schedule which indicates equipment under the control of the Contractor and which is related to the type of work for which the Contractor is seeking prequalification. The schedule must include the manufacturer, model and general common description of each piece of equipment. Abbreviations or means of describing equipment other than provided above will not be accepted.

### 3. Eligibility for Award of Contract

- a. The City shall be the sole judge as to a contractor's prequalification.
- b. The City may reject, suspend, or modify any prequalification for failure by the contractor to demonstrate acceptable financial ability or performance.
- c. The City will issue a letter as to the status of the prequalification approval.

- 1 d. If a contractor has a valid prequalification letter, the contractor will be eligible to  
2 perform the prequalified work types until the expiration date stated in the letter.  
3  
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7

8 **END OF SECTION**

9





**SECTION 00 45 13**  
**PREQUALIFICATION APPLICATION**

Date of Balance Sheet \_\_\_\_\_,

Mark only one:

- Individual
- Limited Partnership
- General Partnership
- Corporation
- Limited Liability Company

\_\_\_\_\_  
 Name under which you wish to qualify

\_\_\_\_\_  
 Post Office Box                                  City                                  State                                  Zip Code

\_\_\_\_\_  
 Street Address (required)                          City                                  State                                  Zip Code

( )    ( )  
 Telephone                                  Fax                                  Email

\_\_\_\_\_  
 Texas Taxpayer Identification No.

\_\_\_\_\_  
 Federal Employers Identification No.

\_\_\_\_\_  
 DUNS No. (if applicable)

Email/mail this questionnaire along with financial statements to the appropriate group below. A separate  
 submittal is required for water/sewer, paving, and lighting:

Work Category – Water Dept - Water/sewer <a href="mailto:john.kasavich@FortWorthTexas.gov">john.kasavich@FortWorthTexas.gov</a>	Work Category – TPW Paving <a href="mailto:TPW_Prequalification@fortworthtexas.gov">TPW_Prequalification@fortworthtexas.gov</a>	Work Category – TPW Ped/Rdwy Lighting <a href="mailto:clint.hoover@fortworthtexas.gov">clint.hoover@fortworthtexas.gov</a>
Fort Worth Water Department Engineering and Fiscal Services Division 200 Texas St. Fort Worth, TX 76102	City of Fort Worth Transportation and Public Works Dept. 3741 SW Loop 820, Fort Worth, Texas 76133 Attn: Alicia Garcia	City of Fort Worth TPW Transportation Management Attn: Clint Hoover, P.E. 5001 James Ave. Fort Worth, TX 76115

\*Financial Statements must be mailed. Mark the envelope: "Bidder Prequalification Application"

**BUSINESS CLASSIFICATION**

The following should be completed in order that we may properly classify your firm:  
(Check the block(s) which are applicable – Block 3 is to be left blank if Block 1 and/or Block 2 is checked)

- Has fewer than 100 employees  
and/or
- Has less than \$6,000,000.00 in annual gross receipts
- OR**
- Does not meet the criteria for being designated a small business as provided in Section 2006.001 of the Texas Government Code.

The classification of your firm as a small or large business is not a factor in determining eligibility to become prequalified.

Select major work categories for which you would like to be prequalified (**City may deem you are not qualified for selected category or may approve you at a lesser size/length and maximum size may not be listed specifically under a major work category**):

**MAJOR WORK CATEGORIES**

**Water Department**

- Augur Boring - 24-inch diameter casing and less
- Augur Boring - Greater than 24-inch diameter casing and greater
- Tunneling – 36-Inches – 60 –inches, and 350 LF or less
- Tunneling - 36-Inches – 60 –inches, and greater than 350 LF
- Tunneling – 66” and greater, 350 LF and greater
- Tunneling – 66” and greater, 350 LF or Less
- Cathodic Protection
- Water Distribution, Development, 8-inch diameter and smaller
- Water Distribution, Urban and Renewal, 8-inch diameter and smaller
- Water Distribution, Development, 12-inch diameter and smaller
- Water Distribution, Urban and Renewal, 12-inch diameter and smaller
- Water Transmission, Development, 24-inches and smaller
- Water Transmission, Urban/Renewal, 24-inches and smaller
- Water Transmission, Development, 42-inches and smaller
- Water Transmission, Urban/Renewal, 42-inches and smaller
- Water Transmission, Development, All Sizes
- Water Transmission, Urban/Renewal, All Sizes
- Sewer Bypass Pumping, 18-inches and smaller
- Sewer Bypass Pumping, 18-inches – 36-inches
- Sewer Bypass Pumping 42-inches and larger
- CCTV, 8-inches and smaller
- CCTV, 12-inches and smaller
- CCTV, 18-inches and smaller
- CCTV, 24-inches and smaller





**MAJOR WORK CATEGORIES, CONTINUED**

- CCTV, 42-inches and smaller
- CCTV, 48-inches and smaller
- Sewer CIPP, 12-inches and smaller
- Sewer CIPP, 24-inches and smaller
- Sewer CIPP, 42-inches and smaller
- Sewer CIPP, All Sizes
- Sewer Collection System, Development, 8-inches and smaller
- Sewer Collection System, Urban/Renewal, 8-inches and smaller
- Sewer Collection System, Development, 12-inches and smaller
- Sewer Collection System, Urban/Renewal, 12-inches and smaller
- Sewer Interceptors, Development, 24-inches and smaller
- Sewer Interceptors, Urban/Renewal, 24-inches and smaller
- Sewer Interceptors, Development, 42-inches and smaller
- Sewer Interceptors, Urban/Renewal, 42-inches and smaller
- Sewer Interceptors, Development, 48-inches and smaller
- Sewer Interceptors, Urban/Renewal, 48-inches and smaller
- Sewer Pipe Enlargement 12-inches and smaller
- Sewer Pipe Enlargement 24-inches and smaller
- Sewer Pipe Enlargement, All Sizes
- Sewer Cleaning , 24-inches and smaller
- Sewer Cleaning , 42-inches and smaller
- Sewer Cleaning , All Sizes
- Sewer Cleaning, 8-inches and smaller
- Sewer Cleaning, 12-inches and smaller
- Sewer Siphons 12-inches or less
- Sewer Siphons 24-inches or less
- Sewer Siphons 42-inches or less
- Sewer Siphons All Sizes

**Transportation Public Works**

- Asphalt Paving Construction/Reconstruction (LESS THAN 15,000 square yards)
- Asphalt Paving Construction/Reconstruction (15,000 square yards and GREATER)
- Asphalt Paving Heavy Maintenance (UNDER \$1,000,000)
- Asphalt Paving Heavy Maintenance (\$1,000,000 and OVER)
- Concrete Paving Construction/Reconstruction (LESS THAN 15,000 square yards)\*
- Concrete Paving Construction/Reconstruction (15,000 square yards and GREATER)\*
- Roadway and Pedestrian Lighting

NOTE \*There is not a prequalification requirement for installation of concrete sidewalk, curb & gutter, driveways, and panel replacement, only concrete **paving**

1. List equipment you do not own but which is available by renting

DESCRIPTION OF EQUIPMENT	NAME AND DETAILED ADDRESS OF OWNER

2. How many years has your organization been in business as a general contractor under your present name? \_\_\_\_\_

List previous business names: \_\_\_\_\_

3. How many years of experience in \_\_\_\_\_ construction work has your organization had:

(a) As a General Contractor: \_\_\_\_\_ (b) As a Sub-Contractor: \_\_\_\_\_

4. \*What projects has your organization completed in Texas and elsewhere?

CONTRACT AMOUNT	CLASS OF WORK	DATE COMPLETED	LOCATION CITY-COUNTY-STATE	NAME AND DETAILED ADDRESS OF OFFICIAL TO WHOM YOU REFER

\*If requalifying only show work performed since last statement.

5. Have you ever failed to complete any work awarded to you? \_\_\_\_\_

If so, where and why? \_\_\_\_\_

6. Has any officer or owner of your organization ever been an officer of another organization that failed to complete a contract? \_\_\_\_\_

If so, state the name of the individual, other organization and reason. \_\_\_\_\_

7. Has any officer or owner of your organization ever failed to complete a contract executed in his/her name? \_\_\_\_\_

If so, state the name of the individual, name of owner and reason. \_\_\_\_\_

8. In what other lines of business are you financially interested? \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

9. Have you ever performed any work for the City? \_\_\_\_\_  
 If so, when and to whom do you refer? \_\_\_\_\_

10. State names and detailed addresses of all producers from whom you have purchased principal materials during the last three years.

NAME OF FIRM OR COMPANY	DETAILED ADDRESS

11. Give the names of any affiliates or relatives currently debarred by the City. Indicate your relationship to this person or firm. \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

12. What is the construction experience of the principal individuals in your organization?

NAME	PRESENT POSITION OR OFFICE	YEARS OF EXPERIENCE	MAGNITUDE AND TYPE OF WORK	IN WHAT CAPACITY

13. If any owner, officer, director, or stockholder of your firm is an employee of the City, or shares the same household with a City employee, please list the name of the City employee and the relationship. In addition, list any City employee who is the spouse, child, or parent of an owner, officer, stockholder, or director who does not live in the same household but who receives care and assistance from that person as a direct result of a documented medical condition. This includes foster children or those related by adoption or marriage. \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

<b>CORPORATION BLOCK</b>	<b>PARTNERSHIP BLOCK</b>
<b>If a corporation:</b>	<b>If a partnership:</b>
Date of Incorporation _____	State of Organization _____
Charter/File No. _____	Date of organization _____
President _____	Is partnership general, limited, or registered limited liability partnership?
Vice Presidents _____	File No. (if Limited Partnership) _____
	General Partners/Officers _____
Secretary _____	Limited Partners (if applicable)
Treasurer _____	
<b>LIMITED LIABILITY COMPANY BLOCK</b>	
<b>If a corporation:</b>	
State of Incorporation _____	
Date of organization _____	
File No. _____	Individuals authorized to sign for Partnership
Officers or Managers (with titles, if any) _____	

**Except for limited partners, the individuals listed in the blocks above are presumed to have full signature authority for your firm unless otherwise advised. Should you wish to grant signature authority for additional individuals, please attach a certified copy of the corporate resolution, corporate minutes, partnership agreement, power of attorney or other legal documentation which grants this authority.**

14. Equipment

\$ \_\_\_\_\_

**TOTAL**

Similar types of equipment may be lumped together. If your firm has more than 30 types of equipment, you may show these 30 types and show the remainder as "various". The City, by allowing you to show only 30 types of equipment, reserves the right to request a complete, detailed list of all your equipment.

The equipment list is a representation of equipment under the control of the firm and which is related to the type of work for which the firm is seeking qualification. In the description include, the manufacturer, model, and general common description of each.

ITEM	QUANTITY	ITEM DESCRIPTION	BALANCE SHEET VALUE
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30			
		Various-	
		<b>TOTAL</b>	

**BIDDER PREQUALIFICATION AFFIDAVIT**

STATE OF \_\_\_\_\_  
COUNTY OF \_\_\_\_\_

The undersigned hereby declares that the foregoing is a true statement of the financial condition of the entity herein first named, as of the date herein first given; that this statement is for the express purpose of inducing the party to whom it is submitted to award the submitter a contract; and that the accountant who prepared the balance sheet accompanying this report as well as any depository, vendor or any other agency herein named is hereby authorized to supply each party with any information, while this statement is in force, necessary to verify said statement.

\_\_\_\_\_, being duly sworn, deposes and says that he/she is the \_\_\_\_\_ of \_\_\_\_\_, the entity described in and which executed the foregoing statement that he/she is familiar with the books of the said entity showing its financial condition; that the foregoing financial statement taken from the books of the said entity as of the date thereof and that the answers to the questions of the foregoing Bidder Prequalification Application are correct and true as of the date of this affidavit.

Firm Name: \_\_\_\_\_

Signature: \_\_\_\_\_

Sworn to before me this \_\_\_\_\_ day of \_\_\_\_\_, \_\_\_\_\_

\_\_\_\_\_  
Notary Public

**Notary Public must not be an officer, director, or stockholder or relative thereof.**





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**SECTION 00 45 26**

**CONTRACTOR COMPLIANCE WITH WORKER'S COMPENSATION LAW**

Pursuant to Texas Labor Code Section 406.096(a), as amended, Contractor certifies that it provides worker's compensation insurance coverage for all of its employees employed on City Project No. 104666 Contractor further certifies that, pursuant to Texas Labor Code, Section 406.096(b), as amended, it will provide to City its subcontractor's certificates of compliance with worker's compensation coverage.

**CONTRACTOR:**

\_\_\_\_\_  
Company By: \_\_\_\_\_  
(Please Print)

\_\_\_\_\_  
Address Signature: \_\_\_\_\_

\_\_\_\_\_  
City/State/Zip Title: \_\_\_\_\_  
(Please Print)

THE STATE OF TEXAS §

COUNTY OF TARRANT §

BEFORE ME, the undersigned authority, on this day personally appeared \_\_\_\_\_, known to me to be the person whose name is subscribed to the foregoing instrument, and acknowledged to me that he/she executed the same as the act and deed of \_\_\_\_\_ for the purposes and consideration therein expressed and in the capacity therein stated.

GIVEN UNDER MY HAND AND SEAL OF OFFICE this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_.

\_\_\_\_\_  
Notary Public in and for the State of Texas

**END OF SECTION**



1 [https://apps.fortworthtexas.gov/ProjectResources/ResourcesP/60 - MWBE/Letter of Intent\\_DVIN](https://apps.fortworthtexas.gov/ProjectResources/ResourcesP/60 - MWBE/Letter of Intent_DVIN)  
2 [2021.pdf](https://apps.fortworthtexas.gov/ProjectResources/ResourcesP/60 - MWBE/Letter of Intent_DVIN)

3  
4 Business Equity Good Faith Effort Form

5 <https://apps.fortworthtexas.gov/ProjectResources/ResourcesP/60 - MWBE/Good Faith Effort>  
6 [Form\\_DVIN 2022.pdf](https://apps.fortworthtexas.gov/ProjectResources/ResourcesP/60 - MWBE/Good Faith Effort)

7  
8 Business Equity Prime Contractor Waiver Form

9 <https://apps.fortworthtexas.gov/ProjectResources/ResourcesP/60 - MWBE/MWBE Prime Contractor>  
10 [Waiver-220313.pdf](https://apps.fortworthtexas.gov/ProjectResources/ResourcesP/60 - MWBE/MWBE Prime Contractor)

11  
12 Business Equity Joint Venture Form

13 <https://apps.fortworthtexas.gov/ProjectResources/ResourcesP/60 - MWBE/MWBE Joint>  
14 [Venture\\_220225.pdf](https://apps.fortworthtexas.gov/ProjectResources/ResourcesP/60 - MWBE/MWBE Joint)

15  
16  
17 **FAILURE TO ACHIEVE THE GOAL OR OTHERWISE COMPLY WITH THE ORDINANCE WILL**  
18 **RESULT IN THE BIDDER/OFFEROR BEING DECLARED NON-RESPONSIVE AND THE BID**  
19 **REJECTED.**

20  
21  
22 **FAILURE TO SUBMIT THE REQUIRED BUSINESS EQUITY DOCUMENTATION OR OTHERWISE**  
23 **COMPLY WITH THE ORDINANCE WILL RESULT IN THE BID BEING DECLARED NON-**  
24 **RESPONSIVE, THE BID REJECTED AND MAY SUBJECT THE BIDDER/OFFEROR TO SANCTIONS**  
25 **AS DESCRIBED IN SEC. 20-373 OF THE ORDINANCE.**

26  
27 **For Questions, Please Contact The Business Equity Division of the Department of Diversity and**  
28 **Inclusion at (817) 392-2674.**

29 **END OF SECTION**

30



**SECTION 00 52 43**  
**AGREEMENT**

**6.1**

**THIS AGREEMENT**, authorized on \_\_\_\_\_ is made by and between the Developer, (Insert Full Legal Name of Developer), authorized to do business in Texas (“Developer”) , and \_\_\_\_\_, authorized to do business in Texas, acting by and through its duly authorized representative, (“Contractor”).

Developer and Contractor, in consideration of the mutual covenants hereinafter set forth, agree as follows:

**Article 1. WORK**

Contractor shall complete all Work as specified or indicated in the Contract Documents for the Project identified herein.

**Article 2. PROJECT**

The project for which the Work under the Contract Documents may be the whole or only a part is generally described as follows:

- Primrose Station Waterline
- City Project No. 104666

**Article 3. CONTRACT TIME**

**3.1 Time is of the essence.**

All time limits for Milestones, if any, and Final Acceptance as stated in the Contract Documents are of the essence to this Contract.

**3.2 Final Acceptance.**

The Work will be complete for Final Acceptance within 240 calendar days after the date when the Contract Time commences to run as provided in Paragraph 12.04 of the Standard City Conditions of the Construction Contract for Developer Awarded Projects.

**3.3 Liquidated damages**

Contractor recognizes that time is of the essence of this Agreement and that Developer will suffer financial loss if the Work is not completed within the times specified in Paragraph 3.2 above, plus any extension thereof allowed in accordance with Article 10 of the Standard City Conditions of the Construction Contract for Developer Awarded Projects. The Contractor also recognizes the delays, expense and difficulties involved in proving in a legal proceeding the actual loss suffered by the Developer if the Work is not completed on time. Accordingly, instead of requiring any such proof , Contractor agrees that as liquidated damages for delay (but not as a penalty), Contractor shall pay Developer One Thousand, two hundred-fifty Dollars (\$1,250) for each day that expires after the time specified in Paragraph 3.2 for Final Acceptance until the City issues the Final Letter of Acceptance.



37 **Article 4. CONTRACT PRICE**

38 Developer agrees to pay Contractor for performance of the Work in accordance with the Contract  
39 Documents an amount in current funds of \_\_\_\_\_ Dollars  
40 (\$\_\_\_\_\_).

41 **Article 5. CONTRACT DOCUMENTS**

42 5.1 CONTENTS:

43 A.The Contract Documents which comprise the entire agreement between Developer and  
44 Contractor concerning the Work consist of the following:

- 45 1. This Agreement.
- 46 2. Attachments to this Agreement:
  - 47 a. Bid Form (As provided by Developer)
  - 48 1) Proposal Form (DAP Version)
  - 49 2) Prequalification Statement
  - 50 3) State and Federal documents (*project specific*)
  - 51 b. Insurance ACORD Form(s)
  - 52 c. Payment Bond (DAP Version)
  - 53 d. Performance Bond (DAP Version)
  - 54 e. Maintenance Bond (DAP Version)
  - 55 f. Power of Attorney for the Bonds
  - 56 g. Worker’s Compensation Affidavit
  - 57 h. MBE and/or SBE Commitment Form (If required)
- 58 3. Standard City General Conditions of the Construction Contract for Developer  
59 Awarded Projects.
- 60 4. Supplementary Conditions.
- 61 5. Specifications specifically made a part of the Contract Documents by attachment or,  
62 if not attached, as incorporated by reference and described in the Table of Contents  
63 of the Project’s Contract Documents.
- 64 6. Drawings.
- 65 7. Addenda.
- 66 8. Documentation submitted by Contractor prior to Notice of Award.
- 67 9. The following which may be delivered or issued after the Effective Date of the  
68 Agreement and, if issued, become an incorporated part of the Contract Documents:
  - 69 a. Notice to Proceed.
  - 70 b. Field Orders.
  - 71 c. Change Orders.
  - 72 d. Letter of Final Acceptance.

73  
74





75 **Article 6. INDEMNIFICATION**

76 **6.1 Contractor covenants and agrees to indemnify, hold harmless and defend, at its own**  
77 **expense, the city, its officers, servants and employees, from and against any and all**  
78 **claims arising out of, or alleged to arise out of, the work and services to be performed**  
79 **by the contractor, its officers, agents, employees, subcontractors, licenses or invitees**  
80 **under this contract. This indemnification provision is specifically intended to operate**  
81 **and be effective even if it is alleged or proven that all or some of the damages being**  
82 **sought were caused, in whole or in part, by any act, omission or negligence of the city.**  
83 **This indemnity provision is intended to include, without limitation, indemnity for costs,**  
84 **expenses and legal fees incurred by the city in defending against such claims and causes**  
85 **of actions.**

86  
87 **6.2 Contractor covenants and agrees to indemnify and hold harmless, at its own expense,**  
88 **the city, its officers, servants and employees, from and against any and all loss, damage**  
89 **or destruction of property of the city, arising out of, or alleged to arise out of, the work**  
90 **and services to be performed by the contractor, its officers, agents, employees,**  
91 **subcontractors, licenses or invitees under this contract. This indemnification provision**  
92 **is specifically intended to operate and be effective even if it is alleged or proven that all**  
93 **or some of the damages being sought were caused, in whole or in part, by any act,**  
94 **omission or negligence of the city.**

95  
96 **Article 7. MISCELLANEOUS**

97 **7.1 Terms.**

98 Terms used in this Agreement are defined in Article 1 of the Standard City Conditions of the  
99 Construction Contract for Developer Awarded Projects.

100 **7.2 Assignment of Contract.**

101 This Agreement, including all of the Contract Documents may not be assigned by the  
102 Contractor without the advanced express written consent of the Developer.

103 **7.3 Successors and Assigns.**

104 Developer and Contractor each binds itself, its partners, successors, assigns and legal  
105 representatives to the other party hereto, in respect to all covenants, agreements and  
106 obligations contained in the Contract Documents.

107 **7.4 Severability.**

108 Any provision or part of the Contract Documents held to be unconstitutional, void or  
109 unenforceable by a court of competent jurisdiction shall be deemed stricken, and all  
110 remaining provisions shall continue to be valid and binding upon DEVELOPER and  
111 CONTRACTOR.

112 **7.5 Governing Law and Venue.**

113 This Agreement, including all of the Contract Documents is performable in the State of  
114 Texas. Venue shall be Tarrant County, Texas, or the United States District Court for the  
115 Northern District of Texas, Fort Worth Division.



116

117 7.6 Authority to Sign.

118 Contractor shall attach evidence of authority to sign Agreement, if other than duly authorized  
119 signatory of the Contractor.

120

121 IN WITNESS WHEREOF, Developer and Contractor have executed this Agreement in multiple  
122 counterparts.

123

124 This Agreement is effective as of the last date signed by the Parties (“Effective Date”).

125

Contractor: \_\_\_\_\_ Developer: \_\_\_\_\_

By: \_\_\_\_\_  
(Signature)

By: \_\_\_\_\_  
(Signature)

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

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

Title: \_\_\_\_\_  
Company Name:

Title: \_\_\_\_\_  
Company name: JPI Real Estate Acquisitions,  
LLC

Address: \_\_\_\_\_  
\_\_\_\_\_

Address:600 E. Las Colinas Blvd.  
Suite 1800

City/State/Zip: \_\_\_\_\_

City/State/Zip: Irving, TX 75039

\_\_\_\_\_  
Date

\_\_\_\_\_  
Date

126



SECTION 00 62 19  
MAINTENANCE BOND

1  
2  
3  
4 **THE STATE OF TEXAS** §  
5 § **KNOW ALL BY THESE PRESENTS:**  
6 **COUNTY OF TARRANT** §  
7

8 That we \_\_\_\_\_, known as  
9 “Principal” herein and \_\_\_\_\_, a corporate surety  
10 (sureties, if more than one) duly authorized to do business in the State of Texas, known as  
11 “Surety” herein (whether one or more), are held and firmly bound unto the Developer, JPI Real  
12 Estate Acquisitions, LLC ; authorized to do business in Texas (“Developer”) and the City of Fort  
13 Worth, a Texas municipal corporation (“City”), in the sum  
14 of \_\_\_\_\_ Dollars (\$ \_\_\_\_\_),  
15 lawful money of the United States, to be paid in Fort Worth, Tarrant County, Texas, for payment  
16 of which sum well and truly be made jointly unto the Developer and the City as dual obligees and  
17 their successors, we bind ourselves, our heirs, executors, administrators, successors and assigns,  
18 jointly and severally, firmly by these presents.  
19

20 **WHEREAS**, Developer and City have entered into an Agreement for the construction of  
21 community facilities in the City of Fort Worth by and through a Community Facilities  
22 Agreement, CFA Number: CFA22-0189;and

23 **WHEREAS**, the Principal has entered into a certain written contract with the Developer  
24 awarded the \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_, which Contract is  
25 hereby referred to and a made part hereof for all purposes as if fully set forth herein, to furnish all  
26 materials, equipment labor and other accessories as defined by law, in the prosecution of the  
27 Work, including any Work resulting from a duly authorized Change Order (collectively herein,  
28 the “Work”) as provided for in said Contract and designated as **Primrose Station Waterline** and  
29

30 **WHEREAS**, Principal binds itself to use such materials and to so construct the Work in  
31 accordance with the plans, specifications and Contract Documents that the Work is and will  
32 remain free from defects in materials or workmanship for and during the period of **two (2) years**  
33 after the date of Final Acceptance of the Work by the City (“Maintenance Period”); and  
34



1           **WHEREAS**, Principal binds itself to repair or reconstruct the Work in whole or in part  
2 upon receiving notice from the Developer and/or City of the need thereof at any time within the  
3 Maintenance Period.

4  
5           **NOW THEREFORE**, the condition of this obligation is such that if Principal shall  
6 remedy any defective Work, for which timely notice was provided by Developer or City, to a  
7 completion satisfactory to the City, then this obligation shall become null and void; otherwise to  
8 remain in full force and effect.

9  
10           **PROVIDED, HOWEVER**, if Principal shall fail so to repair or reconstruct any timely  
11 noticed defective Work, it is agreed that the Developer or City may cause any and all such  
12 defective Work to be repaired and/or reconstructed with all associated costs thereof being borne  
13 by the Principal and the Surety under this Maintenance Bond; and

14  
15           **PROVIDED FURTHER**, that if any legal action be filed on this Bond, venue shall lie in  
16 Tarrant County, Texas or the United States District Court for the Northern District of Texas, Fort  
17 Worth Division; and

18  
19           **PROVIDED FURTHER**, that this obligation shall be continuous in nature and  
20 successive recoveries may be had hereon for successive breaches.

21  
22  
23





1 **IN WITNESS WHEREOF**, the Principal and the Surety have each SIGNED and SEALED this  
2 instrument by duly authorized agents and officers on this the \_\_\_\_\_ day of \_\_\_\_\_  
3 \_\_\_\_\_, 20\_\_\_\_.

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PRINCIPAL:  
\_\_\_\_\_  
\_\_\_\_\_

BY: \_\_\_\_\_  
Signature

ATTEST:  
\_\_\_\_\_  
(Principal) Secretary

\_\_\_\_\_  
Name and Title  
Address: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

\_\_\_\_\_  
Witness as to Principal

SURETY:  
\_\_\_\_\_  
\_\_\_\_\_

BY: \_\_\_\_\_  
Signature

ATTEST:  
\_\_\_\_\_  
(Surety) Secretary

\_\_\_\_\_  
Name and Title  
Address: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

\_\_\_\_\_  
Witness as to Surety

Telephone Number: \_\_\_\_\_

\*Note: If signed by an officer of the Surety Company, there must be on file a certified extract from the by-laws showing that this person has authority to sign such obligation. If Surety's physical address is different from its mailing address, both must be provided.

The date of the bond shall not be prior to the date the Contract is awarded.

**STANDARD CITY CONDITIONS  
OF THE CONSTRUCTION CONTRACT  
FOR DEVELOPER AWARDED PROJECTS**

# STANDARD CITY CONDITIONS OF THE CONSTRUCTION CONTRACT FOR DEVELOPER AWARDED PROJECTS

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## ARTICLE 1 – DEFINITIONS AND TERMINOLOGY

### 1.01 *Defined Terms*

- A. Wherever used in these General Conditions or in other Contract Documents, the terms listed below have the meanings indicated which are applicable to both the singular and plural thereof, and words denoting gender shall include the masculine, feminine and neuter. Said terms are generally capitalized or written in italics, but not always. When used in a context consistent with the definition of a listed-defined term, the term shall have a meaning as defined below whether capitalized or italicized or otherwise. In addition to terms specifically defined, terms with initial capital letters in the Contract Documents include references to identified articles and paragraphs, and the titles of other documents or forms.
1. *Agreement* - The written instrument which is evidence of the agreement between Developer and Contractor covering the Work
  2. *Asbestos*—Any material that contains more than one percent asbestos and is friable or is releasing asbestos fibers into the air above current action levels established by the United States Occupational Safety and Health Administration.
  3. *Business Day* – A business day is defined as a day that the City conducts normal business, generally Monday through Friday, except for federal or state holidays observed by the City.
  4. *Buzzsaw* – City’s on-line, electronic document management and collaboration system.
  5. *Calendar Day* – A day consisting of 24 hours measured from midnight to the next midnight.
  6. *City*— *The City of Fort Worth, Texas, a Texas home-rule municipal corporation, acting by, its governing body through its City Manager, his designee, or agents authorized pursuant to its duly authorized charter on his behalf.*
  7. *Community Facilities Agreement (CFA)* —*A Contract between the Developer and the City for the Construction of one or more following public facilities within the City public right-of-way or easement: Water, Sanitary Sewer, Street, Storm Drain, Street Light, and Street Signs. A CFA may include private facilities within the right-of-way dedicated as private right-of-way or easement on a recorded plat.*
  8. *Contract*—*The entire and integrated written document incorporating the Contract Documents between the Developer, Contractor, and/or City concerning the Work. The Contract supersedes prior negotiations, representations, or agreements, whether written or oral.*
  9. *Contract Documents*—*Those items that make up the contract and which must include the Agreement, and it’s attachments such as standard construction specifications, standard City Conditions, other general conditions of the Developer, including:*
    - a. An Agreement

- b. Attachments to the Agreement
    - i. Bid Form
    - ii. Vendor Compliance with State Law Non-Resident Bidder
    - iii. Prequalification Statement
  - c. Current Prevailing Wage Rates Table (if required by City)
  - d. Insurance Accord Form
  - e. Payment Bond
  - f. Performance Bond
  - g. Maintenance Bond
  - h. Power of Attorney for Bonds
  - i. Workers Compensation Affidavit
  - j. MWBE Commitment Form( If required by City)
  - k. General Conditions
  - l. Supplementary Conditions
  - m. The Standard City Conditions
  - n. Specifications specifically made part of the Contract Documents by attachment, if not attached, as incorporated by reference and described in the Table of Contents of the Project's Contract Documents
  - o. Drawings
  - p. Documentation submitted by contractor prior to Notice of Award.
  - q. The following which may be delivered or issued after the effective date if the Agreement and, if issued become an incorporated part of the Contract Documents
    - i. Notice to Proceed
    - ii. Field Orders
    - iii. Change Orders
    - iv. Letters of Final Acceptance
  - r. Approved Submittals, other Contractor submittals, and the reports and drawings of subsurface and physical conditions are not Contract Documents.
10. *Contractor—The individual or entity with whom Developer has entered into the Agreement.*
11. *Day or day – A day, unless otherwise defined, shall mean a Calendar Day.*
12. *Developer – An individual or entity that desires to make certain improvements within the City of Fort Worth*
13. *Drawings—That part of the Contract Documents prepared or approved by Engineer which graphically shows the scope, extent, and character of the Work to be performed by Contractor. Submittals are not Drawings as so defined.*
14. *Engineer—The licensed professional engineer or engineering firm registered in the State of Texas performing professional services for the Developer.*
15. *Final Acceptance – The written notice given by the City to the Developer and/or Contractor that the Work specified in the Contract Documents has been completed to the satisfaction of the City.*

16. *Final Inspection* – *Inspection carried out by the City to verify that the Contractor has completed the Work, and each and every part or appurtenance thereof, fully, entirely, and in conformance with the Contract Documents.*
17. *General Requirements*—*A part of the Contract Documents between the Developer and a Contractor.*
18. *Laws and Regulations*—*Any and all applicable laws, rules, regulations, ordinances, codes, and orders of any and all governmental bodies, agencies, authorities, and courts having jurisdiction.*
19. *Liens*—*Charges, security interests, or encumbrances upon Project funds, real property, or personal property.*
20. *Milestone*—*A principal event specified in the Contract Documents relating to an intermediate Contract Time prior to Final Acceptance of the Work.*
21. *Non-Participating Change Order*—*A document, which is prepared for and reviewed by the City, which is signed by Contractor, and Developer, and authorizes an addition, deletion, or revision in the Work or an adjustment in the Contract Price or the Contract Time, issued on or after the Effective Date of the Agreement.*
22. *Participating Change Order*—*A document, which is prepared for and approved by the City, which is signed by Contractor, Developer, and City and authorizes an addition, deletion, or revision in the Work or an adjustment in the Contract Price or the Contract Time, issued on or after the Effective Date of the Agreement.*
23. *Plans* – *See definition of Drawings.*
24. *Project Schedule*—*A schedule, prepared and maintained by Contractor, in accordance with the General Requirements, describing the sequence and duration of the activities comprising the Contractor’s plan to accomplish the Work within the Contract Time.*
25. *Project*—*The Work to be performed under the Contract Documents.*
26. *Project Representative*—*The authorized representative of the City who will be assigned to the Site.*
27. *Public Meeting* – *An announced meeting conducted by the Developer to facilitate public participation and to assist the public in gaining an informed view of the Project.*
28. *Regular Working Hours* – *Hours beginning at 7:00 a.m. and ending at 6:00 p.m., Monday thru Friday (excluding legal holidays).*
29. *Samples*—*Physical examples of materials, equipment, or workmanship that are representative of some portion of the Work and which establish the standards by which such portion of the Work will be judged.*



30. *Schedule of Submittals*—A schedule, prepared and maintained by Contractor, of required submittals and the time requirements to support scheduled performance of related construction activities.
31. *Site*—Lands or areas indicated in the Contract Documents as being furnished by City or Developer upon which the Work is to be performed, including rights-of-way, permits, and easements for access thereto, and such other lands furnished by City or Developer which are designated for the use of Contractor.
32. *Specifications*—That part of the Contract Documents consisting of written requirements for materials, equipment, systems, standards and workmanship as applied to the Work, and certain administrative requirements and procedural matters applicable thereto. Specifications may be specifically made a part of the Contract Documents by attachment or, if not attached, may be incorporated by reference as indicated in the Table of Contents (Division 00 00 00) of each Project.
33. *Standard City Conditions* – That part of the Contract Documents setting forth requirements of the City.
34. *Subcontractor*—An individual or entity having a direct contract with Contractor or with any other Subcontractor for the performance of a part of the Work at the Site.
35. *Submittals*—All drawings, diagrams, illustrations, schedules, and other data or information which are specifically prepared or assembled by or for Contractor and submitted by Contractor to illustrate some portion of the Work.
36. *Superintendent* – The representative of the Contractor who is available at all times and able to receive instructions from the City and/or Developer and to act for the Contractor.
37. *Supplementary Conditions*—That part of the Contract Documents which amends or supplements the General Conditions.
38. *Supplier*—A manufacturer, fabricator, supplier, distributor, materialman, or vendor having a direct contract with Contractor or with any Subcontractor to furnish materials or equipment to be incorporated in the Work by Contractor or Subcontractor.
39. *Underground Facilities*—All underground pipelines, conduits, ducts, cables, wires, manholes, vaults, tanks, tunnels, or other such facilities or attachments, and any encasements containing such facilities, including but not limited to, those that convey electricity, gases, steam, liquid petroleum products, telephone or other communications, cable television, water, wastewater, storm water, other liquids or chemicals, or traffic or other control systems.
40. *Weekend Working Hours* – Hours beginning at 9:00 a.m. and ending at 5:00 p.m., Saturday, Sunday or legal holiday, as approved in advance by the City.

41. *Work*—The entire construction or the various separately identifiable parts thereof required to be provided under the Contract Documents. Work includes and is the result of performing or providing all labor, services, and documentation necessary to produce such construction including any Participating Change Order, Non-Participating Change Order, or Field Order, and furnishing, installing, and incorporating all materials and equipment into such construction, all as required by the Contract Documents.
42. *Working Day* – A working day is defined as a day, not including Saturdays, Sundays, or legal holidays authorized by the City for contract purposes, in which weather or other conditions not under the control of the Contractor will permit the performance of the principal unit of work underway for a continuous period of not less than 7 hours between 7 a.m. and 6 p.m.

## 1.02 Terminology

- A. The words and terms discussed in Paragraph 1.02.B through D are not defined but, when used in the Bidding Requirements or Contract Documents, have the indicated meaning.
- B. *Defective*:
1. The word “defective,” when modifying the word “Work,” refers to Work that is unsatisfactory, faulty, or deficient in that it:
    - a. does not conform to the Contract Documents; or
    - b. does not meet the requirements of any applicable inspection, reference standard, test, or approval referred to in the Contract Documents; or
    - c. has been damaged prior to City’s written acceptance.
- C. *Furnish, Install, Perform, Provide*:
1. The word “Furnish” or the word “Install” or the word “Perform” or the word “Provide” or the word “Supply,” or any combination or similar directive or usage thereof, shall mean furnishing and incorporating in the Work including all necessary labor, materials, equipment, and everything necessary to perform the Work indicated, unless specifically limited in the context used.
- D. Unless stated otherwise in the Contract Documents, words or phrases that have a well-known technical or construction industry or trade meaning are used in the Contract Documents in accordance with such recognized meaning.

## **ARTICLE 2 – PRELIMINARY MATTERS**

### *2.01 Before Starting Construction*

*Baseline Schedules:* Submit to City in accordance with the Contract Documents, and prior to starting the Work. New schedules will be submitted to City when Participating Change Orders or Non-Participating Change Orders occur.

### *2.02 Preconstruction Conference*

Before any Work at the Site is started, the Contractor shall attend a Preconstruction Conference as specified in the Contract Documents.

### *2.03 Public Meeting*

Contractor may not mobilize any equipment, materials or resources to the Site prior to Contractor attending the Public Meeting as scheduled by the City.

## **ARTICLE 3 – CONTRACT DOCUMENTS AND AMENDING**

### *3.01 Reference Standards*

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

1. Reference to standards, specifications, manuals, or codes of any technical society, organization, or association, or to Laws or Regulations, whether such reference be specific or by implication, shall mean the standard, specification, manual, code, or Laws or Regulations in effect at the time of opening of Bids (or on the Effective Date of the Agreement if there were no Bids), except as may be otherwise specifically stated in the Contract Documents.
2. No provision or instruction shall be effective to assign to City, or any of its officers, directors, members, partners, employees, agents, consultants, or subcontractors, any duty or authority to supervise or direct the performance of the Work or any duty or authority to undertake responsibility inconsistent with the provisions of the Contract Documents.

### *3.02 Amending and Supplementing Contract Documents*

- A. The Contract Documents may be amended to provide for additions, deletions, and revisions in the Work or to modify the terms and conditions thereof by a Participating Change Order or a Non-Participating Change Order.
- B. The requirements of the Contract Documents may be supplemented, and minor variations and deviations in the Work not involving a change in Contract Price or Contract Time, may be authorized, by one or more of the following ways:
  1. A Field Order;

1. City's or Engineer's review of a Submittal (subject to the provisions of Paragraph 5.16.C); or
2. City's written interpretation or clarification.

## **ARTICLE 4 – BONDS AND INSURANCE**

### *4.01 Licensed Sureties and Insurers*

All bonds and insurance required by the Contract Documents to be purchased and maintained by Contractor shall be obtained from surety or insurance companies that are duly licensed or authorized in the State of Texas to issue bonds or insurance policies for the limits and coverage so required. Such surety and insurance companies shall also meet such additional requirements and qualifications as may be provided Section 4.04.

### *4.02 Performance, Payment, and Maintenance Bonds*

- A. Contractor shall furnish performance and payment bonds in the name of Developer and City, in accordance with Texas Government Code Chapter 2253 or successor statute, each in an amount equal to the Contract Price as security for the faithful performance and payment of all of Contractor's obligations under the Contract Documents.
- B. Contractor shall furnish maintenance bonds in the name of Developer and City in an amount equal to the Contract Price as security to protect the City against any defects in any portion of the Work described in the Contract Documents. Maintenance bonds shall remain in effect for two (2) years after the date of Final Acceptance by the City.
- C. All bonds shall be in the form prescribed by the Contract Documents except as provided otherwise by Laws or Regulations, and shall be executed by such sureties as are named in the list of "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies" as published in Circular 570 (amended) by the Financial Management Service, Surety Bond Branch, U.S. Department of the Treasury. All bonds signed by an agent or attorney-in-fact must be accompanied by a sealed and dated power of attorney which shall show that it is effective on the date the agent or attorney-in-fact signed each bond.
- D. If the surety on any bond furnished by Contractor is declared bankrupt or becomes insolvent or its right to do business is terminated in the State of Texas or it ceases to meet the requirements of Paragraph 4.02.C, Contractor shall promptly notify City and shall, within 30 days after the event giving rise to such notification, provide another bond and surety, both of which shall comply with the requirements of Paragraphs 4.01 and 4.02.C.

### *4.03 Certificates of Insurance*

Contractor shall deliver to Developer and City, with copies to each additional insured and loss payee identified in these Standard City Conditions certificates of insurance (and other evidence of insurance requested by City or any other additional insured) which Contractor is required to purchase and maintain.

1. The certificate of insurance shall document the City, as an “Additional Insured” on all liability policies.
2. The Contractor’s general liability insurance shall include a, “per project” or “per location”, endorsement, which shall be identified in the certificate of insurance provided to the City.
3. The certificate shall be signed by an agent authorized to bind coverage on behalf of the insured, be complete in its entirety, and show complete insurance carrier names as listed in the current A.M. Best Property & Casualty Guide
4. The insurers for all policies must be licensed and/or approved to do business in the State of Texas. Except for workers’ compensation, all insurers must have a minimum rating of A-: VII in the current A. M. Best Key Rating Guide or have reasonably equivalent financial strength and solvency to the satisfaction of Risk Management. If the rating is below that required, written approval of City is required.
5. All applicable policies shall include a Waiver of Subrogation (Rights of Recovery) in favor of the City. In addition, the Contractor agrees to waive all rights of subrogation against the Engineer (if applicable), and each additional insured identified in these Standard City Conditions. Failure of the City to demand such certificates or other evidence of full compliance with the insurance requirements or failure of the City to identify a deficiency from evidence that is provided shall not be construed as a waiver of Contractor’s obligation to maintain such lines of insurance coverage.
6. If insurance policies are not written for specified coverage limits, an Umbrella or Excess Liability insurance for any differences is required. Excess Liability shall follow form of the primary coverage.
7. Unless otherwise stated, all required insurance shall be written on the “occurrence basis”. If coverage is underwritten on a claims-made basis, the retroactive date shall be coincident with or prior to the date of the effective date of the agreement and the certificate of insurance shall state that the coverage is claims-made and the retroactive date. The insurance coverage shall be maintained for the duration of the Contract and for three (3) years following Final Acceptance provided under the Contract Documents or for the warranty period, whichever is longer. An annual certificate of insurance submitted to the City shall evidence such insurance coverage.
8. Policies shall have no exclusions by endorsements, which, neither nullify or amend, the required lines of coverage, nor decrease the limits of said coverage unless such endorsements are approved in writing by the City. In the event a Contract has been bid or executed and the exclusions are determined to be unacceptable or the City desires additional insurance coverage, and the City desires the contractor/engineer to obtain such coverage, the contract price shall be adjusted by the cost of the premium for such additional coverage plus 10%.
9. Any self-insured retention (SIR), in excess of \$25,000.00, affecting required insurance coverage shall be approved by the City in regards to asset value and stockholders' equity. In

lieu of traditional insurance, alternative coverage maintained through insurance pools or risk retention groups, must also be approved by City.

10. Any deductible in excess of \$5,000.00, for any policy that does not provide coverage on a first-dollar basis, must be acceptable to and approved by the City.
11. City, at its sole discretion, reserves the right to review the insurance requirements and to make reasonable adjustments to insurance coverage's and their limits when deemed necessary and prudent by the City based upon changes in statutory law, court decision or the claims history of the industry as well as of the contracting party to the City. The City shall be required to provide prior notice of 90 days, and the insurance adjustments shall be incorporated into the Work by Change Order.
12. City shall be entitled, upon written request and without expense, to receive copies of policies and endorsements thereto and may make any reasonable requests for deletion or revision or modifications of particular policy terms, conditions, limitations, or exclusions necessary to conform the policy and endorsements to the requirements of the Contract. Deletions, revisions, or modifications shall not be required where policy provisions are established by law or regulations binding upon either party or the underwriter on any such policies.
13. City shall not be responsible for the direct payment of insurance premium costs for Contractor's insurance.

#### 4.04 *Contractor's Insurance*

- A. *Workers Compensation and Employers' Liability.* Contractor shall purchase and maintain such insurance coverage with limits consistent with statutory benefits outlined in the Texas Workers' Compensation Act (Texas Labor Code, Ch. 406, as amended), and minimum limits for Employers' Liability as is appropriate for the Work being performed and as will provide protection from claims set forth below which may arise out of or result from Contractor's performance of the Work and Contractor's other obligations under the Contract Documents, whether it is to be performed by Contractor, any Subcontractor or Supplier, or by anyone directly or indirectly employed by any of them to perform any of the Work, or by anyone for whose acts any of them may be liable:
  1. claims under workers' compensation, disability benefits, and other similar employee benefit acts;
  2. claims for damages because of bodily injury, occupational sickness or disease, or death of Contractor's employees.
  3. The limits of liability for the insurance shall provide the following coverages for not less than the following amounts or greater where required by Laws and Regulations
    - a. Statutory limits
    - b. Employer's liability

- 1) \$100,000 each accident/occurrence
- 2) \$100,000 Disease - each employee
- 3) \$500,000 Disease - policy limit

B. **Commercial General Liability.** Coverage shall include but not be limited to covering liability (bodily injury or property damage) arising from: premises/operations, independent contractors, products/completed operations, personal injury, and liability under an insured contract. Insurance shall be provided on an occurrence basis, and as comprehensive as the current Insurance Services Office (ISO) policy. This insurance shall apply as primary insurance with respect to any other insurance or self-insurance programs afforded to the City. The Commercial General Liability policy, shall have no exclusions by endorsements that would alter or nullify premises/operations, products/completed operations, contractual, personal injury, or advertising injury, which are normally contained with the policy, unless the City approves such exclusions in writing.

1. For construction projects that present a substantial completed operation exposure, the City may require the contractor to maintain completed operations coverage for a minimum of no less than three (3) years following the completion of the project
2. Contractor's Liability Insurance under this Section which shall be on a per project basis covering the Contractor with minimum limits of:
  - a. \$1,000,000 each occurrence
  - b. \$2,000,000 aggregate limit
3. The policy must have an endorsement (Amendment – Aggregate Limits of Insurance) making the General Aggregate Limits apply separately to each job site.
4. The Commercial General Liability Insurance policies shall provide “X”, “C”, and “U” coverage’s. Verification of such coverage must be shown in the Remarks Article of the Certificate of Insurance.

C. **Automobile Liability.** A commercial business auto policy shall provide coverage on “any auto”, defined as autos owned, hired and non-owned and provide indemnity for claims for damages because bodily injury or death of any person and or property damage arising out of the work, maintenance or use of any motor vehicle by the Contractor, any Subcontractor or Supplier, or by anyone directly or indirectly employed by any of them to perform any of the Work, or by anyone for whose acts any of them may be liable.

1. Automobile Liability, Contractor’s Liability Insurance under this Section, which shall be in an amount not less than the following amounts:
  - a. **Automobile Liability** - a commercial business policy shall provide coverage on "Any Auto", defined as autos owned, hired and non-owned.

- 1) \$1,000,000 each accident on a combined single limit basis. Split limits are acceptable if limits are at least:
- 2) \$250,000 Bodily Injury per person
- 3) \$500,000 Bodily Injury per accident /
- 4) \$100,000 Property Damage

D. *Railroad Protective Liability*. If any of the work or any warranty work is within the limits of railroad right-of-way, the Contractor shall comply with the following requirements:

1. The Contractor's construction activities will require its employees, agents, subcontractors, equipment, and material deliveries to cross railroad properties and tracks owned and operated by: \_\_\_\_\_  
Write the name of the railroad company. (If none, then write none)
2. The Contractor shall conduct its operations on railroad properties in such a manner as not to interfere with, hinder, or obstruct the railroad company in any manner whatsoever in the use or operation of its/their trains or other property. Such operations on railroad properties may require that Contractor to execute a "Right of Entry Agreement" with the particular railroad company or companies involved, and to this end the Contractor should satisfy itself as to the requirements of each railroad company and be prepared to execute the right-of-entry (if any) required by a railroad company. The requirements specified herein likewise relate to the Contractor's use of private and/or construction access roads crossing said railroad company's properties.
3. The Contractual Liability coverage required by Paragraph 5.04D of the General Conditions shall provide coverage for not less than the following amounts, issued by companies satisfactory to the City and to the Railroad Company for a term that continues for so long as the Contractor's operations and work cross, occupy, or touch railroad property:
  - a. General Aggregate: \_\_\_\_\_  
Enter limits provided by Railroad Company (If none, write none)
  - b. Each Occurrence: : \_\_\_\_\_  
Enter limits provided by Railroad Company (If none, write none)
4. With respect to the above outlined insurance requirements, the following shall govern:
  - a. Where a single railroad company is involved, the Contractor shall provide one insurance policy in the name of the railroad company. However, if more than one grade separation or at-grade crossing is affected by the Project at entirely separate locations on the line or lines of the same railroad company, separate coverage may be required, each in the amount stated above.
  - b. Where more than one railroad company is operating on the same right-of-way or where several railroad companies are involved and operated on their own separate rights-of-



way, the Contractor may be required to provide separate insurance policies in the name of each railroad company.

- c. If, in addition to a grade separation or an at-grade crossing, other work or activity is proposed on a railroad company's right-of-way at a location entirely separate from the grade separation or at-grade crossing, insurance coverage for this work must be included in the policy covering the grade separation.
  - d. If no grade separation is involved but other work is proposed on a railroad company's right-of-way, all such other work may be covered in a single policy for that railroad, even though the work may be at two or more separate locations.
5. No work or activities on a railroad company's property to be performed by the Contractor shall be commenced until the Contractor has furnished the City with an original policy or policies of the insurance for each railroad company named, as required above. All such insurance must be approved by the City and each affected Railroad Company prior to the Contractor's beginning work.
  6. The insurance specified above must be carried until all Work to be performed on the railroad right-of-way has been completed and the grade crossing, if any, is no longer used by the Contractor. In addition, insurance must be carried during all maintenance and/or repair work performed in the railroad right-of-way. Such insurance must name the railroad company as the insured, together with any tenant or lessee of the railroad company operating over tracks involved in the Project.
- E. *Notification of Policy Cancellation:* Contractor shall immediately notify City upon cancellation or other loss of insurance coverage. Contractor shall stop work until replacement insurance has been procured. There shall be no time credit for days not worked pursuant to this section.

#### 4.05 *Acceptance of Bonds and Insurance; Option to Replace*

If City has any objection to the coverage afforded by or other provisions of the bonds or insurance required to be purchased and maintained by the Contractor in accordance with Article 5 on the basis of non-conformance with the Contract Documents, the Developer and City shall so notify the Contractor in writing within 10 Business Days after receipt of the certificates (or other evidence requested). Contractor shall provide to the City such additional information in respect of insurance provided as the Developer or City may reasonably request. If Contractor does not purchase or maintain all of the bonds and insurance required by the Contract Documents, the Developer or City shall notify the Contractor in writing of such failure prior to the start of the Work, or of such failure to maintain prior to any change in the required coverage.

## **ARTICLE 5 – CONTRACTOR'S RESPONSIBILITIES**

### 5.01 *Supervision and Superintendent*

- A. Contractor shall supervise, inspect, 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. Contractor shall be solely responsible for the means, methods, techniques, sequences, and procedures of construction.

- B. At all times during the progress of the Work, Contractor shall assign a competent, English-speaking, Superintendent who shall not be replaced without written notice to City. The Superintendent will be Contractor's representative at the Site and shall have authority to act on behalf of Contractor. All communication given to or received from the Superintendent shall be binding on Contractor.
- C. Contractor shall notify the City 24 hours prior to moving areas during the sequence of construction.

#### 5.02 *Labor; Working Hours*

- A. Contractor shall provide competent, suitably qualified personnel to perform construction as required by the Contract Documents. Contractor shall at all times maintain good discipline and order at the Site.
- B. Except as otherwise required for the safety or protection of persons or the Work or property at the Site or adjacent thereto, and except as otherwise stated in the Contract Documents, all Work at the Site shall be performed during Regular Working Hours. Contractor will not permit the performance of Work beyond Regular Working Hours or for Weekend Working Hours without City's written consent (which will not be unreasonably withheld). Written request (by letter or electronic communication) to perform Work:
  - 1. for beyond Regular Working Hours request must be made by noon at least two (2) Business Days prior
  - 2. for Weekend Working Hours request must be made by noon of the preceding Thursday
  - 3. for legal holidays request must be made by noon two Business Days prior to the legal holiday.

#### 5.03 *Services, Materials, and Equipment*

- A. Unless otherwise specified in the Contract Documents, Contractor shall provide and assume full responsibility for all services, materials, equipment, labor, transportation, construction equipment and machinery, tools, appliances, fuel, power, light, heat, telephone, water, sanitary facilities, temporary facilities, and all other facilities and incidentals necessary for the performance, Contractor required testing, start-up, and completion of the Work.
- B. All materials and equipment incorporated into the Work shall be as specified or, if not specified, shall be of good quality and new, except as otherwise provided in the Contract Documents. All special warranties and guarantees required by the Specifications shall expressly run to the benefit of City. If required by City, Contractor shall furnish satisfactory evidence (including reports of required tests) as to the source, kind, and quality of materials and equipment.

- C. All materials and equipment to be incorporated into the Work shall be stored, applied, installed, connected, erected, protected, used, cleaned, and conditioned in accordance with instructions of the applicable Supplier, except as otherwise may be provided in the Contract Documents.

5.04 *Project Schedule*

- A. Contractor shall adhere to the Project Schedule established in accordance with Paragraph 2.01 and the General Requirements as it may be adjusted from time to time as provided below.
1. Contractor shall submit to City for acceptance (to the extent indicated in Paragraph 2.01 and the General Requirements) proposed adjustments in the Project Schedule.
  2. Proposed adjustments in the Project Schedule that will change the Contract Time shall be submitted in accordance with the requirements of Article 9. Adjustments in Contract Time for projects with City participation shall be made by participating change orders.

5.05 *Substitutes and "Or-Equals"*

- A. Whenever an item of material or equipment is specified or described in the Contract Documents by using the name of a proprietary item or the name of a particular Supplier, the specification or description is intended to establish the type, function, appearance, and quality required. Unless the specification or description contains or is followed by words reading that no like, equivalent, or "or-equal" item or no substitution is permitted, other items of material or equipment of other Suppliers may be submitted to City for review under the circumstances described below.
1. "*Or-Equal*" Items: If in City's sole discretion an item of material or equipment proposed by Contractor is functionally equal to that named and sufficiently similar so that no change in related Work will be required, it may be considered by City as an "or-equal" item, in which case review and approval of the proposed item may, in City's sole discretion, be accomplished without compliance with some or all of the requirements for approval of proposed substitute items. For the purposes of this Paragraph 5.05.A.1, a proposed item of material or equipment will be considered functionally equal to an item so named if:
    - a. City determines that:
      - 1) it is at least equal in materials of construction, quality, durability, appearance, strength, and design characteristics;
      - 2) it will reliably perform at least equally well the function and achieve the results imposed by the design concept of the completed Project as a functioning whole; and
      - 3) it has a proven record of performance and availability of responsive service; and
    - b. Contractor certifies that, if approved and incorporated into the Work:
      - 1) there will be no increase in cost to the City or increase in Contract Time; and

- 2) it will conform substantially to the detailed requirements of the item named in the Contract Documents.

2. *Substitute Items:*

- a. If in City's sole discretion an item of material or equipment proposed by Contractor does not qualify as an "or-equal" item under Paragraph 5.05.A.1, it may be submitted as a proposed substitute item.
- b. Contractor shall submit sufficient information as provided below to allow City to determine if the item of material or equipment proposed is essentially equivalent to that named and an acceptable substitute therefor. Requests for review of proposed substitute items of material or equipment will not be accepted by City from anyone other than Contractor.
- c. Contractor shall make written application to City for review of a proposed substitute item of material or equipment that Contractor seeks to furnish or use. The application shall comply with Section 01 25 00 and:
  - 1) shall certify that the proposed substitute item will:
    - i. perform adequately the functions and achieve the results called for by the general design;
    - ii. be similar in substance to that specified;
    - iii. be suited to the same use as that specified; and
  - 2) will state:
    - i. the extent, if any, to which the use of the proposed substitute item will prejudice Contractor's achievement of final completion on time;
    - ii. whether use of the proposed substitute item in the Work will require a change in any of the Contract Documents (or in the provisions of any other direct contract with City for other work on the Project) to adapt the design to the proposed substitute item;
    - iii. whether incorporation or use of the proposed substitute item in connection with the Work is subject to payment of any license fee or royalty; and
  - 3) will identify:
    - i. all variations of the proposed substitute item from that specified;
    - ii. available engineering, sales, maintenance, repair, and replacement services; and

- 4) shall contain an itemized estimate of all costs or credits that will result directly or indirectly from use of such substitute item, including costs of redesign and Damage Claims of other contractors affected by any resulting change.
- B. *Substitute Construction Methods or Procedures:* If a specific means, method, technique, sequence, or procedure of construction is expressly required by the Contract Documents, Contractor may furnish or utilize a substitute means, method, technique, sequence, or procedure of construction approved by City. Contractor shall submit sufficient information to allow City, in City's sole discretion, to determine that the substitute proposed is equivalent to that expressly called for by the Contract Documents. Contractor shall make written application to City for review in the same manner as those provided in Paragraph 5.05.A.2.
- C. *City's Evaluation:* City will be allowed a reasonable time within which to evaluate each proposal or submittal made pursuant to Paragraphs 5.05.A and 5.05.B. City may require Contractor to furnish additional data about the proposed substitute. City will be the sole judge of acceptability. No "or-equal" or substitute will be ordered, installed or utilized until City's review is complete, which will be evidenced by a Change Order in the case of a substitute and an accepted Submittal for an "or-equal." City will advise Contractor in writing of its determination.
- D. *Special Guarantee:* City may require Contractor to furnish at Contractor's expense a special performance guarantee, warranty, or other surety with respect to any substitute. *Contractor shall indemnify and hold harmless City and anyone directly or indirectly employed by them from and against any and all claims, damages, losses and expenses (including attorneys fees) arising out of the use of substituted materials or equipment.*
- E. *City's Cost Reimbursement:* City will record City's costs in evaluating a substitute proposed or submitted by Contractor pursuant to Paragraphs 5.05.A.2 and 5.05.B. Whether or not City approves a substitute so proposed or submitted by Contractor, Contractor may be required to reimburse City for evaluating each such proposed substitute. Contractor may also be required to reimburse City for the charges for making changes in the Contract Documents.
- F. *Contractor's Expense:* Contractor shall provide all data in support of any proposed substitute or "or-equal" at Contractor's expense.
- G. *Substitute Reimbursement:* Costs (savings or charges) attributable to acceptance of a substitute shall be incorporated to the Contract by Participating Change Order.

#### 5.06 *Pre-Qualification of Bidders (Prime Contractors and Subcontractors)*

- A. The Contractor and any subcontractors are required to be prequalified for the work types requiring pre-qualification

#### 5.07 *Concerning Subcontractors, Suppliers, and Others*

- A. *Minority and Women Owned Business Enterprise Compliance:*

- Required for this Contract.  
(Check this box if there is any City Participation)
- Not Required for this Contract.

It is City policy to ensure the full and equitable participation by Minority and Women Business Enterprises (MWBE) in the procurement of goods and services on a contractual basis. If the Contract Documents provide for a MWBE goal, Contractor is required to comply with the intent of the City's MWBE Ordinance (as amended) by the following:

1. Contractor shall, upon request by City, provide complete and accurate information regarding actual work performed by a MWBE on the Contract and payment therefor.
  2. Contractor will not make additions, deletions, or substitutions of accepted MWBE without written consent of the City. Any unjustified change or deletion shall be a material breach of Contract and may result in debarment in accordance with the procedures outlined in the Ordinance.
  3. Contractor shall, upon request by City, allow an audit and/or examination of any books, records, or files in the possession of the Contractor that will substantiate the actual work performed by an MWBE. Material misrepresentation of any nature will be grounds for termination of the Contract. Any such misrepresentation may be grounds for disqualification of Contractor to bid on future contracts with the City for a period of not less than three years.
- B. Contractor shall be fully responsible to City for all acts and omissions of the Subcontractors, Suppliers, and other individuals or entities performing or furnishing any of the Work just as Contractor is responsible for Contractor's own acts and omissions. Nothing in the Contract Documents:
1. shall create for the benefit of any such Subcontractor, Supplier, or other individual or entity any contractual relationship between City and any such Subcontractor, Supplier or other individual or entity; nor
  2. shall create any obligation on the part of City to pay or to see to the payment of any moneys due any such Subcontractor, Supplier, or other individual or entity except as may otherwise be required by Laws and Regulations.
- C. Contractor shall be solely responsible for scheduling and coordinating the Work of Subcontractors, Suppliers, and other individuals or entities performing or furnishing any of the Work under a direct or indirect contract with Contractor.
- D. All Subcontractors, Suppliers, and such other individuals or entities performing or furnishing any of the Work shall communicate with City through Contractor.
- E. All Work performed for Contractor by a Subcontractor or Supplier will be pursuant to an appropriate agreement between Contractor and the Subcontractor or Supplier which specifically binds the Subcontractor or Supplier to the applicable terms and conditions of these Contract

Documents, Contractor shall provide City contract numbers and reference numbers to the Subcontractors and/or Suppliers.

5.08 *Wage Rates*

Required for this Contract.

Not Required for this Contract.

- A. *Duty to pay Prevailing Wage Rates.* The Contractor shall comply with all requirements of Chapter 2258, Texas Government Code (as amended), including the payment of not less than the rates determined by the City Council of the City of Fort Worth to be the prevailing wage rates in accordance with Chapter 2258. Such prevailing wage rates are included in these Contract Documents.
- B. *Penalty for Violation.* A Contractor or any Subcontractor who does not pay the prevailing wage shall, upon demand made by the City, pay to the City \$60 for each worker employed for each calendar day or part of the day that the worker is paid less than the prevailing wage rates stipulated in these contract documents. This penalty shall be retained by the City to offset its administrative costs, pursuant to Texas Government Code 2258.023.
- C. *Complaints of Violations and City Determination of Good Cause.* On receipt of information, including a complaint by a worker, concerning an alleged violation of 2258.023, Texas Government Code, by a Contractor or Subcontractor, the City shall make an initial determination, before the 31st day after the date the City receives the information, as to whether good cause exists to believe that the violation occurred. The City shall notify in writing the Contractor or Subcontractor and any affected worker of its initial determination. Upon the City's determination that there is good cause to believe the Contractor or Subcontractor has violated Chapter 2258, the City shall retain the full amounts claimed by the claimant or claimants as the difference between wages paid and wages due under the prevailing wage rates, such amounts being subtracted from successive progress payments pending a final determination of the violation.
- D. *Arbitration Required if Violation Not Resolved.* An issue relating to an alleged violation of Section 2258.023, Texas Government Code, including a penalty owed to the City or an affected worker, shall be submitted to binding arbitration in accordance with the Texas General Arbitration Act (Article 224 et seq., Revised Statutes) if the Contractor or Subcontractor and any affected worker does not resolve the issue by agreement before the 15th day after the date the City makes its initial determination pursuant to Paragraph C above. If the persons required to arbitrate under this section do not agree on an arbitrator before the 11th day after the date that arbitration is required, a district court shall appoint an arbitrator on the petition of any of the persons. The City is not a party in the arbitration. The decision and award of the arbitrator is final and binding on all parties and may be enforced in any court of competent jurisdiction.
- E. *Records to be Maintained.* The Contractor and each Subcontractor shall, for a period of three (3) years following the date of acceptance of the work, maintain records that show (i) the name and

occupation of each worker employed by the Contractor in the construction of the Work provided for in this Contract; and (ii) the actual per diem wages paid to each worker. The records shall be open at all reasonable hours for inspection by the City. The provisions of Paragraph 6.23, Right to Audit, shall pertain to this inspection.

- F. *Progress Payments.* With each progress payment or payroll period, whichever is less, the Contractor shall submit an affidavit stating that the Contractor has complied with the requirements of Chapter 2258, Texas Government Code.
- G. *Posting of Wage Rates.* The Contractor shall post prevailing wage rates in a conspicuous place at all times.
- H. *Subcontractor Compliance.* The Contractor shall include in its subcontracts and/or shall otherwise require all of its Subcontractors to comply with Paragraphs A through G above.

#### 5.09 *Patent Fees and Royalties*

- A. *To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless City, from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product, or device not specified in the Contract Documents.*

#### 5.10 *Laws and Regulations*

- A. Contractor shall give all notices required by and shall comply with all Laws and Regulations applicable to the performance of the Work. Except where otherwise expressly required by applicable Laws and Regulations, the City shall not be responsible for monitoring Contractor's compliance with any Laws or Regulations.
- B. If Contractor performs any Work knowing or having reason to know that it is contrary to Laws or Regulations, Contractor shall bear all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such Work. However, it shall not be Contractor's responsibility to make certain that the Specifications and Drawings are in accordance with Laws and Regulations, but this shall not relieve Contractor of Contractor's obligations under Paragraph 3.01.

#### 5.11 *Use of Site and Other Areas*

##### A. *Limitation on Use of Site and Other Areas:*

- 1. Contractor shall confine construction equipment, the storage of materials and equipment, and the operations of workers to the Site and other areas permitted by Laws and Regulations, and shall not unreasonably encumber the Site and other areas with construction equipment or



other materials or equipment. Contractor shall assume full responsibility for any damage to any such land or area, or to the owner or occupant thereof, or of any adjacent land or areas resulting from the performance of the Work.

2. At any time when, in the judgment of the City, the Contractor has obstructed or closed or is carrying on operations in a portion of a street, right-of-way, or easement greater than is necessary for proper execution of the Work, the City may require the Contractor to finish the section on which operations are in progress before work is commenced on any additional area of the Site.
  3. Should any Damage Claim be made by any such owner or occupant because of the performance of the Work, Contractor shall promptly attempt to resolve the Damage Claim.
  4. *Pursuant to Paragraph 5.18, Contractor shall indemnify and hold harmless City, from and against all claims, costs, losses, and damages arising out of or relating to any claim or action, legal or equitable, brought by any such owner or occupant against City.*
- B. *Removal of Debris During Performance of the Work:* During the progress of the Work Contractor shall keep the Site and other areas free from accumulations of waste materials, rubbish, and other debris. Removal and disposal of such waste materials, rubbish, and other debris shall conform to applicable Laws and Regulations.
- C. *Site Maintenance Cleaning:* 24 hours after written notice is given to the Contractor that the clean-up on the job site is proceeding in a manner unsatisfactory to the City or Developer, if the Contractor fails to correct the unsatisfactory procedure, the City may take such direct action as the City deems appropriate to correct the clean-up deficiencies cited to the Contractor in the written notice (by letter or electronic communication), and shall be entitled to recover its cost in doing so. The City may withhold Final Acceptance until clean-up is complete and cost are recovered.
- D. *Final Site Cleaning:* Prior to Final Acceptance of the Work Contractor shall clean the Site and the Work and make it ready for utilization by City or adjacent property owner. At the completion of the Work Contractor shall remove from the Site all tools, appliances, construction equipment and machinery, and surplus materials and shall restore to original condition or better all property disturbed by the Work.
- E. *Loading Structures:* Contractor shall not load nor permit any part of any structure to be loaded in any manner that will endanger the structure, nor shall Contractor subject any part of the Work or adjacent property to stresses or pressures that will endanger it.

#### 5.12 *Record Documents*

- A. Contractor shall maintain in a safe place at the Site or in a place designated by the Contractor and approved by the City, one (1) record copy of all Drawings, Specifications, Addenda, Change Orders, Field Orders, and written interpretations and clarifications in good order and annotated to show changes made during construction. These record documents together with all approved

Samples and a counterpart of all accepted Submittals will be available to City for reference. Upon completion of the Work, these record documents, any operation and maintenance manuals, and Submittals will be delivered to City prior to Final Inspection. Contractor shall include accurate locations for buried and imbedded items.

### 5.13 *Safety and Protection*

- A. Contractor shall be solely responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the Work. Such responsibility does not relieve Subcontractors of their responsibility for the safety of persons or property in the performance of their work, nor for compliance with applicable safety Laws and Regulations. Contractor shall take all necessary precautions for the safety of, and shall provide the necessary protection to prevent damage, injury or loss to:
1. all persons on the Site or who may be affected by the Work;
  2. all the Work and materials and equipment to be incorporated therein, whether in storage on or off the Site; and
  3. other property at the Site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures, utilities, and Underground Facilities not designated for removal, relocation, or replacement in the course of construction.
- B. Contractor shall comply with all applicable Laws and Regulations relating to the safety of persons or property, or to the protection of persons or property from damage, injury, or loss; and shall erect and maintain all necessary safeguards for such safety and protection. Contractor shall notify owners of adjacent property and of Underground Facilities and other utility owners when prosecution of the Work may affect them, and shall cooperate with them in the protection, removal, relocation, and replacement of their property.
- C. Contractor shall comply with the applicable requirements of City's safety programs, if any.
- D. Contractor shall inform City of the specific requirements of Contractor's safety program, if any, with which City's employees and representatives must comply while at the Site.
- E. All damage, injury, or loss to any property referred to in Paragraph 5.13.A.2 or 5.13.A.3 caused, directly or indirectly, in whole or in part, by Contractor, any Subcontractor, Supplier, or any other individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, shall be remedied by Contractor.
- F. Contractor's duties and responsibilities for safety and for protection of the Work shall continue until such time as all the Work is completed and City has accepted the Work.

### 5.14 *Safety Representative*

Contractor shall inform City in writing of Contractor's designated safety representative at the Site.

### 5.15 *Hazard Communication Programs*

Contractor shall be responsible for coordinating any exchange of material safety data sheets or other hazard communication information required to be made available to or exchanged between or among employers in accordance with Laws or Regulations.

### 5.16 *Submittals*

- A. Contractor shall submit required Submittals to City for review and acceptance. Each submittal will be identified as required by City.
1. Submit number of copies specified in the General Requirements.
  2. Data shown on the Submittals will be complete with respect to quantities, dimensions, specified performance and design criteria, materials, and similar data to show City the services, materials, and equipment Contractor proposes to provide and to enable City to review the information for the limited purposes required by Paragraph 5.16.C.
  3. Submittals submitted as herein provided by Contractor and reviewed by City for conformance with the design concept shall be executed in conformity with the Contract Documents unless otherwise required by City.
  4. When Submittals are submitted for the purpose of showing the installation in greater detail, their review shall not excuse Contractor from requirements shown on the Drawings and Specifications.
  5. For-Information-Only submittals upon which the City is not expected to conduct review or take responsive action may be so identified in the Contract Documents.
  6. Submit required number of Samples specified in the Specifications.
  7. Clearly identify each Sample as to material, Supplier, pertinent data such as catalog numbers, the use for which intended and other data as City may require to enable City to review the submittal for the limited purposes required by Paragraph 5.16.C.
- B. Where a Submittal is required by the Contract Documents or the Schedule of Submittals, any related Work performed prior to City's review and acceptance of the pertinent submittal will be at the sole expense and responsibility of Contractor.
- C. *City's Review:*
1. City will provide timely review of required Submittals in accordance with the Schedule of Submittals acceptable to City. City's review and acceptance will be only to determine if the items covered by the submittals will, after installation or incorporation in the Work, conform to the information given in the Contract Documents and be compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents.

2. City's review and acceptance will not extend to means, methods, techniques, sequences, or procedures of construction (except where a particular means, method, technique, sequence, or procedure of construction is specifically and expressly called for by the Contract Documents) or to safety precautions or programs incident thereto. The review and acceptance of a separate item as such will not indicate approval of the assembly in which the item functions.
3. City's review and acceptance shall not relieve Contractor from responsibility for any variation from the requirements of the Contract Documents unless Contractor has complied with the requirements of Section 01 33 00 and City has given written acceptance of each such variation by specific written notation thereof incorporated in or accompanying the Submittal. City's review and acceptance shall not relieve Contractor from responsibility for complying with the requirements of the Contract Documents.

5.17 *Contractor's General Warranty and Guarantee*

- A. Contractor warrants and guarantees to City that all Work will be in accordance with the Contract Documents and will not be defective. City and its officers, directors, members, partners, employees, agents, consultants, and subcontractors shall be entitled to rely on representation of Contractor's warranty and guarantee.
- B. Contractor's warranty and guarantee hereunder excludes defects or damage caused by:
  1. abuse, modification, or improper maintenance or operation by persons other than Contractor, Subcontractors, Suppliers, or any other individual or entity for whom Contractor is responsible; or
  2. normal wear and tear under normal usage.
- C. Contractor's obligation to perform and complete the Work in accordance with the Contract Documents shall be absolute. None of the following will constitute an acceptance of Work that is not in accordance with the Contract Documents or a release of Contractor's obligation to perform the Work in accordance with the Contract Documents:
  1. observations by City;
  2. recommendation or payment by City or Developer of any progress or final payment;
  3. the issuance of a certificate of Final Acceptance by City or any payment related thereto by City;
  4. use or occupancy of the Work or any part thereof by City;
  5. any review and acceptance of a Submittal by City;
  6. any inspection, test, or approval by others; or

7. any correction of defective Work by City.

- D. The Contractor shall remedy any defects or damages in the Work and pay for any damage to other work or property resulting therefrom which shall appear within a period of two (2) years from the date of Final Acceptance of the Work unless a longer period is specified and shall furnish a good and sufficient maintenance bond, complying with the requirements of Article 4.02.B. The City will give notice of observed defects with reasonable promptness.

#### 5.18 Indemnification

- A. Contractor covenants and agrees to indemnify, hold harmless and defend, at its own expense, the City, its officers, servants and employees, from and against any and all claims arising out of, or alleged to arise out of, the work and services to be performed by the Contractor, its officers, agents, employees, subcontractors, licenses or invitees under this Contract. **THIS INDEMNIFICATION PROVISION IS SPECIFICALLY INTENDED TO OPERATE AND BE EFFECTIVE EVEN IF IT IS ALLEGED OR PROVEN THAT ALL OR SOME OF THE DAMAGES BEING SOUGHT WERE CAUSED, IN WHOLE OR IN PART, BY ANY ACT, OMISSION OR NEGLIGENCE OF THE CITY.** This indemnity provision is intended to include, without limitation, indemnity for costs, expenses and legal fees incurred by the City in defending against such claims and causes of actions.
- B. Contractor covenants and agrees to indemnify and hold harmless, at its own expense, the City, its officers, servants and employees, from and against any and all loss, damage or destruction of property of the City, arising out of, or alleged to arise out of, the work and services to be performed by the Contractor, its officers, agents, employees, subcontractors, licensees or invitees under this Contract. **THIS INDEMNIFICATION PROVISION IS SPECIFICALLY INTENDED TO OPERATE AND BE EFFECTIVE EVEN IF IT IS ALLEGED OR PROVEN THAT ALL OR SOME OF THE DAMAGES BEING SOUGHT WERE CAUSED, IN WHOLE OR IN PART, BY ANY ACT, OMISSION OR NEGLIGENCE OF THE CITY.**

#### 5.19 Delegation of Professional Design Services

- A. Contractor will not be required to provide professional design services unless such services are specifically required by the Contract Documents for a portion of the Work or unless such services are required to carry out Contractor's responsibilities for construction means, methods, techniques, sequences and procedures.
- B. If professional design services or certifications by a design professional related to systems, materials or equipment are specifically required of Contractor by the Contract Documents, City will specify all performance and design criteria that such services must satisfy. Contractor shall cause such services or certifications to be provided by a properly licensed professional, whose signature and seal shall appear on all drawings, calculations, specifications, certifications, and Submittals prepared by such professional. Submittals related to the Work designed or certified by such professional, if prepared by others, shall bear such professional's written approval when submitted to City.

- C. City shall be entitled to rely upon the adequacy, accuracy and completeness of the services, certifications or approvals performed by such design professionals, provided City has specified to Contractor performance and design criteria that such services must satisfy.
- D. Pursuant to this Paragraph 5.19, City's review and acceptance of design calculations and design drawings will be only for the limited purpose of checking for conformance with performance and design criteria given and the design concept expressed in the Contract Documents. City's review and acceptance of Submittals (except design calculations and design drawings) will be only for the purpose stated in Paragraph 5.16.C.

5.20 *Right to Audit:*

- A. The City reserves the right to audit all projects utilizing City funds
- B. The Contractor agrees that the City shall, until the expiration of three (3) years after final payment under this Contract, have access to and the right to examine and photocopy any directly pertinent books, documents, papers, and records of the Contractor involving transactions relating to this Contract. Contractor agrees that the City shall have access during Regular Working Hours to all necessary Contractor facilities and shall be provided adequate and appropriate work space in order to conduct audits in compliance with the provisions of this Paragraph. The City shall give Contractor reasonable advance notice of intended audits.
- C. Contractor further agrees to include in all its subcontracts hereunder a provision to the effect that the subcontractor agrees that the City shall, until the expiration of three (3) years after final payment under this Contract, have access to and the right to examine and photocopy any directly pertinent books, documents, papers, and records of such Subcontractor, involving transactions to the subcontract, and further, that City shall have access during Regular Working Hours to all Subcontractor facilities, and shall be provided adequate and appropriate work space in order to conduct audits in compliance with the provisions of this Paragraph. The City shall give Subcontractor reasonable advance notice of intended audits.
- D. Contractor and Subcontractor agree to photocopy such documents as may be requested by the City. The City agrees to reimburse Contractor for the cost of the copies as follows at the rate published in the Texas Administrative Code in effect as of the time copying is performed.

5.21 *Nondiscrimination*

- A. The City is responsible for operating Public Transportation Programs and implementing transit-related projects, which are funded in part with Federal financial assistance awarded by the U.S. Department of Transportation and the Federal Transit Administration (FTA), without discriminating against any person in the United States on the basis of race, color, or national origin.
- B. *Title VI, Civil Rights Act of 1964 as amended:* Contractor shall comply with the requirements of the Act and the Regulations as further defined in the Supplementary Conditions for any project receiving Federal assistance.

## **ARTICLE 6 – OTHER WORK AT THE SITE**

### *6.01 Related Work at Site*

- A. City may perform other work related to the Project at the Site with City's employees, or other City contractors, or through other direct contracts therefor, or have other work performed by utility owners. If such other work is not noted in the Contract Documents, then written notice thereof will be given to Contractor prior to starting any such other work; and
- B. Contractor shall afford each other contractor who is a party to such a direct contract, each utility owner, and City, if City is performing other work with City's employees or other City contractors, proper and safe access to the Site, provide a reasonable opportunity for the introduction and storage of materials and equipment and the execution of such other work, and properly coordinate the Work with theirs. Contractor shall do all cutting, fitting, and patching of the Work that may be required to properly connect or otherwise make its several parts come together and properly integrate with such other work. Contractor shall not endanger any work of others by cutting, excavating, or otherwise altering such work; provided, however, that Contractor may cut or alter others' work with the written consent of City and the others whose work will be affected.
- C. If the proper execution or results of any part of Contractor's Work depends upon work performed by others under this Article 7, Contractor shall inspect such other work and promptly report to City in writing any delays, defects, or deficiencies in such other work that render it unavailable or unsuitable for the proper execution and results of Contractor's Work. Contractor's failure to so report will constitute an acceptance of such other work as fit and proper for integration with Contractor's Work except for latent defects in the work provided by others.

## **ARTICLE 7 – CITY'S RESPONSIBILITIES**

### *7.01 Inspections, Tests, and Approvals*

City's responsibility with respect to certain inspections, tests, and approvals is set forth in Paragraph 11.03.

### *7.02 Limitations on City's Responsibilities*

- A. The City shall not supervise, direct, or have control or authority over, nor be responsible for, Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work. City will not be responsible for Contractor's failure to perform the Work in accordance with the Contract Documents.
- B. City will notify the Contractor of applicable safety plans pursuant to Paragraph 5.13.

### 7.03 *Compliance with Safety Program*

While at the Site, City's employees and representatives shall comply with the specific applicable requirements of Contractor's safety programs of which City has been informed pursuant to Paragraph 5.13.

## **ARTICLE 8 – CITY'S OBSERVATION STATUS DURING CONSTRUCTION**

### 8.01 *City's Project Representative*

City will provide one or more Project Representative(s) during the construction period. The duties and responsibilities and the limitations of authority of City's representative during construction are set forth in the Contract Documents.

- A. City's Project Representative will make visits to the Site at intervals appropriate to the various stages of construction as City deems necessary in order to observe the progress that has been made and the quality of the various aspects of Contractor's executed Work. Based on information obtained during such visits and observations, City's Project Representative will determine, in general, if the Work is proceeding in accordance with the Contract Documents. City's Project Representative will not be required to make exhaustive or continuous inspections on the Site to check the quality or quantity of the Work. City's Project Representative's efforts will be directed toward providing City a greater degree of confidence that the completed Work will conform generally to the Contract Documents.
- B. City's Project Representative's visits and observations are subject to all the limitations on authority and responsibility in the Contract Documents.

### 8.02 *Authorized Variations in Work*

City's Project Representative may authorize minor variations in the Work from the requirements of the Contract Documents which do not involve an adjustment in the Contract Price or the Contract Time and are compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. These may be accomplished by a Field Order and will be binding on City Developer, and also on Contractor, who shall perform the Work involved promptly.

### 8.03 *Rejecting Defective Work*

City will have authority to reject Work which City's Project Representative believes to be defective, or will not produce a completed Project that conforms to the Contract Documents or that will prejudice the integrity of the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. City will have authority to conduct special inspection or testing of the Work as provided in Article 11, whether or not the Work is fabricated, installed, or completed.



#### 8.04 *Determinations for Work Performed*

Contractor will determine the actual quantities and classifications of Work performed. City's Project Representative will review with Contractor the preliminary determinations on such matters before rendering a written recommendation. City's written decision will be final (except as modified to reflect changed factual conditions or more accurate data).

### **ARTICLE 9 – CHANGES IN THE WORK**

#### 9.01 *Authorized Changes in the Work*

- A. Without invalidating the Contract and without notice to any surety, City may, at any time or from time to time, order Extra Work. Upon notice of such Extra Work, Contractor shall promptly proceed with the Work involved which will be performed under the applicable conditions of the Contract Documents (except as otherwise specifically provided). Extra Work shall be memorialized by a Participating Change Order which may or may not precede an order of Extra work.
- B. For minor changes of Work not requiring changes to Contract Time or Contract Price on a project with City participation, a Field Order may be issued by the City.

#### 9.02 *Notification to Surety*

If the provisions of any bond require notice to be given to a surety of any change affecting the general scope of the Work or the provisions of the Contract Documents (including, but not limited to, Contract Price or Contract Time), the giving of any such notice will be Contractor's responsibility. The amount of each applicable bond will be adjusted by the Contractor to reflect the effect of any such change.

### **ARTICLE 10 – CHANGE OF CONTRACT PRICE; CHANGE OF CONTRACT TIME**

#### 10.01 *Change of Contract Price*

- A. The Contract Price may only be changed by a Participating Change Order for projects with City participation.

#### 10.02 *Change of Contract Time*

- A. The Contract Time may only be changed by a Participating Change Order for projects with City participation.

#### 10.03 *Delays*

- A. If Contractor is delayed, City shall not be liable to Contractor for any claims, costs, losses, or damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) sustained by Contractor on or in connection with any other project or anticipated project.

## **ARTICLE 11 – TESTS AND INSPECTIONS; CORRECTION, REMOVAL OR ACCEPTANCE OF DEFECTIVE WORK**

### *11.01 Notice of Defects*

Notice of all defective Work of which City has actual knowledge will be given to Contractor. Defective Work may be rejected, corrected, or accepted as provided in this Article 13.

### *11.02 Access to Work*

City, independent testing laboratories, and governmental agencies with jurisdictional interests will have access to the Site and the Work at reasonable times for their observation, inspection, and testing. Contractor shall provide them proper and safe conditions for such access and advise them of Contractor's safety procedures and programs so that they may comply therewith as applicable.

### *11.03 Tests and Inspections*

- A. Contractor shall give City timely notice of readiness of the Work for all required inspections, tests, or approvals and shall cooperate with inspection and testing personnel to facilitate required inspections or tests.
- B. If Contract Documents, Laws or Regulations of any public body having jurisdiction require any of the Work (or part thereof) to be inspected, tested, or approved, Contractor shall assume full responsibility for arranging and obtaining such independent inspections, tests, retests or approvals, pay all costs in connection therewith, and furnish City the required certificates of inspection or approval; excepting, however, those fees specifically identified in the Supplementary Conditions or any Texas Department of Licensure and Regulation (TDLR) inspections, which shall be paid as described in the Supplementary Conditions.
- C. Contractor shall be responsible for arranging and obtaining and shall pay all costs in connection with any inspections, tests, re-tests, or approvals required for City's acceptance of materials or equipment to be incorporated in the Work; or acceptance of materials, mix designs, or equipment submitted for approval prior to Contractor's purchase thereof for incorporation in the Work. Such inspections, tests, re-tests, or approvals shall be performed by organizations approved by City.
- D. City may arrange for the services of an independent testing laboratory ("Testing Lab") to perform any inspections or tests ("Testing") for any part of the Work, as determined solely by City.
  - 1. City will coordinate such Testing to the extent possible, with Contractor;
  - 2. Should any Testing under this Section 11.03 D result in a "fail", "did not pass" or other similar negative result, the Contractor shall be responsible for paying for any and all retests. Contractor's cancellation without cause of City initiated Testing shall be deemed a negative result and require a retest.

3. Any amounts owed for any retest under this Section 11.03 D shall be paid directly to the Testing Lab by Contractor. City will forward all invoices for retests to Developer/Contractor.
  4. If Contractor fails to pay the Testing Lab, City will not issue a letter of Final Acceptance until the Testing Lab is Paid
- E. If any Work (or the work of others) that is to be inspected, tested, or approved is covered by Contractor without written concurrence of City, Contractor shall, if requested by City, uncover such Work for observation.

#### 11.04 *Uncovering Work*

- A. If any Work is covered contrary to the Contract Documents or specific instructions by the City, it must, if requested by City, be uncovered for City's observation and replaced at Contractor's expense.

#### 11.05 *City May Stop the Work*

If the Work is defective, or Contractor fails to supply sufficient skilled workers or suitable materials or equipment, or fails to perform the Work in such a way that the completed Work will conform to the Contract Documents, City may order Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, this right of City to stop the Work shall not give rise to any duty on the part of City to exercise this right for the benefit of Contractor, any Subcontractor, any Supplier, any other individual or entity, or any surety for, or employee or agent of any of them.

#### 11.06 *Correction or Removal of Defective Work*

- A. Promptly after receipt of written notice, Contractor shall correct all defective Work pursuant to an acceptable schedule, whether or not fabricated, installed, or completed, or, if the Work has been rejected by City, remove it from the Project and replace it with Work that is not defective. Contractor shall pay all claims, costs, additional testing, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such correction or removal (including but not limited to all costs of repair or replacement of work of others). Failure to require the removal of any defective Work shall not constitute acceptance of such Work.
- B. When correcting defective Work under the terms of this Paragraph 11.06 or Paragraph 11.07, Contractor shall take no action that would void or otherwise impair City's special warranty and guarantee, if any, on said Work.

#### 11.07 *Correction Period*

- A. If within two (2) years after the date of Final Acceptance (or such longer period of time as may be prescribed by the terms of any applicable special guarantee required by the Contract

Documents), any Work is found to be defective, or if the repair of any damages to the land or areas made available for Contractor's use by City or permitted by Laws and Regulations as contemplated in Paragraph 5.10.A is found to be defective, Contractor shall promptly, without cost to City and in accordance with City's written instructions:

1. repair such defective land or areas; or
  2. correct such defective Work; or
  3. if the defective Work has been rejected by City, remove it from the Project and replace it with Work that is not defective, and
  4. satisfactorily correct or repair or remove and replace any damage to other Work, to the work of others or other land or areas resulting therefrom.
- B. If Contractor does not promptly comply with the terms of City's written instructions, or in an emergency where delay would cause serious risk of loss or damage, City may have the defective Work corrected or repaired or may have the rejected Work removed and replaced. All claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or other dispute resolution costs) arising out of or relating to such correction or repair or such removal and replacement (including but not limited to all costs of repair or replacement of work of others) will be paid by Contractor.
- C. Where defective Work (and damage to other Work resulting therefrom) has been corrected or removed and replaced under this Paragraph 11.07, the correction period hereunder with respect to such Work may be required to be extended for an additional period of one year after the end of the initial correction period. City shall provide 30 days written notice to Contractor and Developer should such additional warranty coverage be required. Contractor's obligations under this Paragraph 11.07 are in addition to any other obligation or warranty. The provisions of this Paragraph 11.07 shall not be construed as a substitute for, or a waiver of, the provisions of any applicable statute of limitation or repose.

#### 11.08 *City May Correct Defective Work*

- A. If Contractor fails within a reasonable time after written notice from City to correct defective Work, or to remove and replace rejected Work as required by City in accordance with Paragraph 11.06.A, or if Contractor fails to perform the Work in accordance with the Contract Documents, or if Contractor fails to comply with any other provision of the Contract Documents, City may, after seven (7) days written notice to Contractor and the Developer, correct, or remedy any such deficiency.
- B. In exercising the rights and remedies under this Paragraph 11.09, City shall proceed expeditiously. In connection with such corrective or remedial action, City may exclude Contractor from all or part of the Site, take possession of all or part of the Work and suspend Contractor's services related thereto, and incorporate in the Work all materials and equipment incorporated in the Work, stored at the Site or for which City has paid Contractor but which are

stored elsewhere. Contractor shall allow City, City's representatives, agents, consultants, employees, and City's other contractors, access to the Site to enable City to exercise the rights and remedies under this Paragraph.

- C. All claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or other dispute resolution costs) incurred or sustained by City in exercising the rights and remedies under this Paragraph 13.09 will be charged against Contractor, and a Change Order will be issued incorporating the necessary revisions in the Contract Documents with respect to the Work; and City shall be entitled to an appropriate decrease in the Contract Price.
- D. Contractor shall not be allowed an extension of the Contract Time because of any delay in the performance of the Work attributable to the exercise of City's rights and remedies under this Paragraph 11.09.

## **ARTICLE 12 – COMPLETION**

### *12.01 Contractor's Warranty of Title*

Contractor warrants and guarantees that title to all Work, materials, and equipment covered by any Application for Payment will pass to City no later than the time of Final Acceptance and shall be free and clear of all Liens.

### *12.02 Partial Utilization*

- A. Prior to Final Acceptance of all the Work, City may use or occupy any substantially completed part of the Work which has specifically been identified in the Contract Documents, or which City determines constitutes a separately functioning and usable part of the Work that can be used by City for its intended purpose without significant interference with Contractor's performance of the remainder of the Work. City at any time may notify Contractor in writing to permit City to use or occupy any such part of the Work which City determines to be ready for its intended use, subject to the following conditions:
  - 1. Contractor at any time may notify City in writing that Contractor considers any such part of the Work ready for its intended use.
  - 2. Within a reasonable time after notification as enumerated in Paragraph 14.05.A.1, City and Contractor shall make an inspection of that part of the Work to determine its status of completion. If City does not consider that part of the Work to be substantially complete, City will notify Contractor in writing giving the reasons therefor.
  - 3. Partial Utilization will not constitute Final Acceptance by City.

### *12.03 Final Inspection*

- A. Upon written notice from Contractor that the entire Work is complete in accordance with the Contract Documents:

1. within 10 days, City will schedule a Final Inspection with Contractor.
2. City will notify Contractor in writing of all particulars in which this inspection reveals that the Work is incomplete or defective. Contractor shall immediately take such measures as are necessary to complete such Work or remedy such deficiencies.

#### 12.04 *Final Acceptance*

- A. Upon completion by Contractor to City's satisfaction, of any additional Work identified in the Final Inspection, City will issue to Contractor a letter of Final Acceptance upon the satisfaction of the following:
1. All documentation called for in the Contract Documents, including but not limited to the evidence of insurance required by Paragraph 5.03;
  2. consent of the surety, if any, to Final Acceptance;
  3. a list of all pending or released Damage Claims against City that Contractor believes are unsettled; and
  4. affidavits of payments and complete and legally effective releases or waivers (satisfactory to City) of all Lien rights arising out of or Liens filed in connection with the Work.
  5. after all Damage Claims have been resolved:
    - a. directly by the Contractor or;
    - b. Contractor provides evidence that the Damage Claim has been reported to Contractor's insurance provider for resolution.
  6. Issuing Final Acceptance by the City shall not relieve the Contractor of any guarantees or other requirements of the Contract Documents which specifically continue thereafter.

### **ARTICLE 13 – SUSPENSION OF WORK**

#### 13.01 *City May Suspend Work*

- A. At any time and without cause, City may suspend the Work or any portion thereof by written notice to Contractor and which may fix the date on which Work will be resumed. Contractor shall resume the Work on the date so fixed. During temporary suspension of the Work covered by these Contract Documents, for any reason, the City will stop contract time on City participation projects.
- B. Should the Contractor not be able to complete a portion of the Project due to causes beyond the control of and without the fault or negligence of the Contractor, and should it be determined by mutual consent of the Contractor and City that a solution to allow construction to proceed is not

available within a reasonable period of time, Contractor may request an extension in Contract Time, directly attributable to any such suspension.

- C. If it should become necessary to suspend the Work for an indefinite period, the Contractor shall store all materials in such a manner that they will not obstruct or impede the public unnecessarily nor become damaged in any way, and he shall take every precaution to prevent damage or deterioration of the work performed; he shall provide suitable drainage about the work, and erect temporary structures where necessary.

## **ARTICLE 14 – MISCELLANEOUS**

### *14.01 Giving Notice*

- A. Whenever any provision of the Contract Documents requires the giving of written notice, it will be deemed to have been validly given if:
  - 1. 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
  - 2. delivered at or sent by registered or certified mail, postage prepaid, to the last business address known to the giver of the notice.
- B. Business address changes must be promptly made in writing to the other party.
- C. Whenever the Contract Documents specifies giving notice by electronic means such electronic notice shall be deemed sufficient upon confirmation of receipt by the receiving party.

### *14.02 Computation of Times*

When any period of time is referred to in the Contract Documents by days, it will 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 day made a legal holiday the next Working Day shall become the last day of the period.

### *14.03 Cumulative Remedies*

The duties and obligations imposed by these General Conditions and the rights and remedies available hereunder to the parties hereto are in addition to, and are not to be construed in any way as a limitation of, any rights and remedies available to any or all of them which are otherwise imposed or available by Laws or Regulations, by special warranty or guarantee, or by other provisions of the Contract Documents. The provisions of this Paragraph will be as effective as if repeated specifically in the Contract Documents in connection with each particular duty, obligation, right, and remedy to which they apply.

#### 14.04 *Survival of Obligations*

All representations, indemnifications, warranties, and guarantees made in, required by, or given in accordance with the Contract Documents, as well as all continuing obligations indicated in the Contract Documents, will survive final payment, completion, and acceptance of the Work or termination or completion of the Contract or termination of the services of Contractor.

#### 14.05 *Headings*

Article and paragraph headings are inserted for convenience only and do not constitute parts of these General Conditions.



**SECTION 01 11 00**  
**SUMMARY OF WORK**

**PART 1 - GENERAL**

**1.1 SUMMARY**

- A. Section Includes:
  - 1. Summary of Work to be performed in accordance with the Contract Documents
- B. Deviations from this City of Fort Worth Standard Specification
  - 1. None.
- C. Related Specification Sections include, but are not necessarily limited to:
  - 1. Division 0 - Bidding Requirements, Contract Forms, and Conditions of the Contract
  - 2. Division 1 - General Requirements

**1.2 PRICE AND PAYMENT PROCEDURES**

- A. Measurement and Payment
  - 1. Work associated with this Item is considered subsidiary to the various items bid.  
No separate payment will be allowed for this Item.

**1.3 REFERENCES [NOT USED]**

**1.4 ADMINISTRATIVE REQUIREMENTS**

- A. Work Covered by Contract Documents
  - 1. Work is to include furnishing all labor, materials, and equipment, and performing all Work necessary for this construction project as detailed in the Drawings and Specifications.
- B. Subsidiary Work
  - 1. Any and all Work specifically governed by documentary requirements for the project, such as conditions imposed by the Drawings or Contract Documents in which no specific item for bid has been provided for in the Proposal and the item is not a typical unit bid item included on the standard bid item list, then the item shall be considered as a subsidiary item of Work, the cost of which shall be included in the price bid in the Proposal for various bid items.
- C. Use of Premises
  - 1. Coordinate uses of premises under direction of the City.
  - 2. Assume full responsibility for protection and safekeeping of materials and equipment stored on the Site.
  - 3. Use and occupy only portions of the public streets and alleys, or other public places or other rights-of-way as provided for in the ordinances of the City, as shown in the Contract Documents, or as may be specifically authorized in writing by the City.
    - a. A reasonable amount of tools, materials, and equipment for construction purposes may be stored in such space, but no more than is necessary to avoid delay in the construction operations.

- b. Excavated and waste materials shall be stored in such a way as not to interfere with the use of spaces that may be designated to be left free and unobstructed and so as not to inconvenience occupants of adjacent property.
- c. If the street is occupied by railroad tracks, the Work shall be carried on in such manner as not to interfere with the operation of the railroad.
  - 1) All Work shall be in accordance with railroad requirements set forth in Division 0 as well as the railroad permit.

D. Work within Easements

- 1. Do not enter upon private property for any purpose without having previously obtained permission from the owner of such property.
- 2. Do not store equipment or material on private property unless and until the specified approval of the property owner has been secured in writing by the Contractor and a copy furnished to the City.
- 3. Unless specifically provided otherwise, clear all rights-of-way or easements of obstructions which must be removed to make possible proper prosecution of the Work as a part of the project construction operations.
- 4. Preserve and use every precaution to prevent damage to, all trees, shrubbery, plants, lawns, fences, culverts, curbing, and all other types of structures or improvements, to all water, sewer, and gas lines, to all conduits, overhead pole lines, or appurtenances thereof, including the construction of temporary fences and to all other public or private property adjacent to the Work.
- 5. Notify the proper representatives of the owners or occupants of the public or private lands of interest in lands which might be affected by the Work.
  - a. Such notice shall be made at least 48 hours in advance of the beginning of the Work.
  - b. Notices shall be applicable to both public and private utility companies and any corporation, company, individual, or other, either as owners or occupants, whose land or interest in land might be affected by the Work.
  - c. Be responsible for all damage or injury to property of any character resulting from any act, omission, neglect, or misconduct in the manner or method or execution of the Work, or at any time due to defective work, material, or equipment.
- 6. Fence
  - a. Restore all fences encountered and removed during construction of the Project to the original or a better than original condition.
  - b. Erect temporary fencing in place of the fencing removed whenever the Work is not in progress and when the site is vacated overnight, and/or at all times to provide site security.
  - c. The cost for all fence work within easements, including removal, temporary closures and replacement, shall be subsidiary to the various items bid in the project proposal, unless a bid item is specifically provided in the proposal.

**1.5 SUBMITTALS [NOT USED]**

**1.6 ACTION SUBMITTALS/INFORMATIONAL SUBMITTALS [NOT USED]**

**1.7 CLOSEOUT SUBMITTALS [NOT USED]**

**1.8 MAINTENANCE MATERIAL SUBMITTALS [NOT USED]**

**1.9 QUALITY ASSURANCE [NOT USED]**

**1.10 DELIVERY, STORAGE, AND HANDLING [NOT USED]**

**1.11 FIELD [SITE] CONDITIONS [NOT USED]**

**1.12 WARRANTY [NOT USED]**

**PART 2 - PRODUCTS [NOT USED]**

**PART 3 - EXECUTION [NOT USED]**

**END OF SECTION**

Revision Log		
DATE	NAME	SUMMARY OF CHANGE

**SECTION 01 25 00**  
**SUBSTITUTION PROCEDURES**

**PART 1 - GENERAL**

**1.1 SUMMARY**

A. Section Includes:

1. The procedure for requesting the approval of substitution of a product that is not equivalent to a product which is specified by descriptive or performance criteria or defined by reference to 1 or more of the following:
  - a. Name of manufacturer
  - b. Name of vendor
  - c. Trade name
  - d. Catalog number
2. Substitutions are not "or-equals".

B. Deviations from this City of Fort Worth Standard Specification

1. None.

C. Related Specification Sections include, but are not necessarily limited to:

1. Division 0 – Bidding Requirements, Contract Forms and Conditions of the Contract
2. Division 1 – General Requirements

**1.2 PRICE AND PAYMENT PROCEDURES**

A. Measurement and Payment

1. Work associated with this Item is considered subsidiary to the various items bid. No separate payment will be allowed for this Item.

**1.3 REFERENCES [NOT USED]**

**1.4 ADMINISTRATIVE REQUIREMENTS**

A. Request for Substitution - General

1. Within 30 days after award of Contract (unless noted otherwise), the City will consider formal requests from Contractor for substitution of products in place of those specified.
2. Certain types of equipment and kinds of material are described in Specifications by means of references to names of manufacturers and vendors, trade names, or catalog numbers.
  - a. When this method of specifying is used, it is not intended to exclude from consideration other products bearing other manufacturer's or vendor's names, trade names, or catalog numbers, provided said products are "or-equals," as determined by City.
3. Other types of equipment and kinds of material may be acceptable substitutions under the following conditions:
  - a. Or-equals are unavailable due to strike, discontinued production of products meeting specified requirements, or other factors beyond control of Contractor;or,

- b. Contractor proposes a cost and/or time reduction incentive to the City.

## 1.5 SUBMITTALS

- A. See Request for Substitution Form (attached)
- B. Procedure for Requesting Substitution
  1. Substitution shall be considered only:
    - a. After award of Contract
    - b. Under the conditions stated herein
  2. Submit **3** copies of each written request for substitution, including:
    - a. Documentation
      - 1) Complete data substantiating compliance of proposed substitution with Contract Documents
      - 2) Data relating to changes in construction schedule, when a reduction is proposed
      - 3) Data relating to changes in cost
    - b. For products
      - 1) Product identification
        - a) Manufacturer's name
        - b) Telephone number and representative contact name
        - c) Specification Section or Drawing reference of originally specified product, including discrete name or tag number assigned to original product in the Contract Documents
      - 2) Manufacturer's literature clearly marked to show compliance of proposed product with Contract Documents
      - 3) Itemized comparison of original and proposed product addressing product characteristics including, but not necessarily limited to:
        - a) Size
        - b) Composition or materials of construction
        - c) Weight
        - d) Electrical or mechanical requirements
      - 4) Product experience
        - a) Location of past projects utilizing product
        - b) Name and telephone number of persons associated with referenced projects knowledgeable concerning proposed product
        - c) Available field data and reports associated with proposed product
      - 5) Samples
        - a) Provide at request of City.
        - b) Samples become the property of the City.
    - c. For construction methods:
      - 1) Detailed description of proposed method
      - 2) Illustration drawings
  - C. Approval or Rejection
    1. Written approval or rejection of substitution given by the City
    2. City reserves the right to require proposed product to comply with color and pattern of specified product if necessary to secure design intent.
    3. In the event the substitution is approved, if a reduction in cost or time results, it will be documented by Change Order.

4. Substitution will be rejected if:
  - a. Submittal is not through the Contractor with his stamp of approval
  - b. Request is not made in accordance with this Specification Section
  - c. In the Developer's opinion, acceptance will require substantial revision of the original design
  - d. In the City's or Developer's opinion, substitution will not perform adequately the function consistent with the design intent

**1.6 ACTION SUBMITTALS/INFORMATIONAL SUBMITTALS [NOT USED]**

**1.7 CLOSEOUT SUBMITTALS [NOT USED]**

**1.8 MAINTENANCE MATERIAL SUBMITTALS [NOT USED]**

**1.9 QUALITY ASSURANCE**

- A. In making request for substitution or in using an approved product, the Contractor represents that the Contractor:
  1. Has investigated proposed product, and has determined that it is adequate or superior in all respects to that specified, and that it will perform function for which it is intended
  2. Will provide same guarantee for substitute item as for product specified
  3. Will coordinate installation of accepted substitution into Work, to include building modifications if necessary, making such changes as may be required for Work to be complete in all respects
  4. Waives all claims for additional costs related to substitution which subsequently arise

**1.10 DELIVERY, STORAGE, AND HANDLING [NOT USED]**

**1.11 FIELD [SITE] CONDITIONS [NOT USED]**

**1.12 WARRANTY [NOT USED]**

**PART 2 - PRODUCTS [NOT USED]**

**PART 3 - EXECUTION [NOT USED]**

**END OF SECTION**

Revision Log		
DATE	NAME	SUMMARY OF CHANGE

**EXHIBIT A**  
**REQUEST FOR SUBSTITUTION FORM:**

TO: \_\_\_\_\_  
PROJECT: \_\_\_\_\_ DATE: \_\_\_\_\_

We hereby submit for your consideration the following product instead of the specified item for the above project:

SECTION	PARAGRAPH	SPECIFIED ITEM
---------	-----------	----------------

Proposed Substitution: \_\_\_\_\_

Reason for Substitution: \_\_\_\_\_

Include complete information on changes to Drawings and/or Specifications which proposed substitution will require for its proper installation.

Fill in Blanks Below:

A. Will the undersigned contractor pay for changes to the building design, including engineering and detailing costs caused by the requested substitution?

B. \_\_\_\_\_  
What effect does substitution have on other trades?

C. \_\_\_\_\_  
Differences between proposed substitution and specified item?

D. \_\_\_\_\_  
Differences in product cost or product delivery time?

E. \_\_\_\_\_  
Manufacturer's guarantees of the proposed and specified items are:

\_\_\_\_\_ Equal                      \_\_\_\_\_ Better (explain on attachment)

The undersigned states that the function, appearance and quality are equivalent or superior to the specified item.

Submitted By: \_\_\_\_\_ For Use by City

Signature \_\_\_\_\_ as noted                      \_\_\_ Recommended                      \_\_\_ Recommended

Firm \_\_\_\_\_                      \_\_\_ Not recommended                      \_\_\_ Received late

Address \_\_\_\_\_                      By \_\_\_\_\_

Date \_\_\_\_\_                      Date \_\_\_\_\_

Telephone \_\_\_\_\_                      Remarks \_\_\_\_\_

\_\_\_\_\_

For Use by City:

\_\_\_\_\_ Approved                      \_\_\_\_\_ Rejected  
City \_\_\_\_\_                      Date \_\_\_\_\_

**SECTION 01 32 33**  
**PRECONSTRUCTION VIDEO**

**PART 1 - GENERAL**

**1.1 SUMMARY**

- A. Section Includes:
  - 1. Administrative and procedural requirements for:
    - a. Preconstruction Videos
- B. Deviations from this City of Fort Worth Standard Specification
  - 1. Though not mandatory, it is highly recommended on infill developer projects.
- C. Related Specification Sections include, but are not necessarily limited to:
  - 1. Division 0 – Bidding Requirements, Contract Forms and Conditions of the Contract
  - 2. Division 1 – General Requirements

**1.2 PRICE AND PAYMENT PROCEDURES**

- A. Measurement and Payment
  - 1. Work associated with this Item is considered subsidiary to the various items bid.  
No separate payment will be allowed for this Item.

**1.3 REFERENCES [NOT USED]**

**1.4 ADMINISTRATIVE REQUIREMENTS**

- A. Preconstruction Video
  - 1. Produce a preconstruction video of the site/alignment, including all areas in the vicinity of and to be affected by construction.
    - a. Provide digital copy of video upon request by the City.
  - 2. Retain a copy of the preconstruction video until the end of the maintenance surety period.

**1.5 SUBMITTALS [NOT USED]**

**1.6 ACTION SUBMITTALS/INFORMATIONAL SUBMITTALS [NOT USED]**

**1.7 CLOSEOUT SUBMITTALS [NOT USED]**

**1.8 MAINTENANCE MATERIAL SUBMITTALS [NOT USED]**

**1.9 QUALITY ASSURANCE [NOT USED]**

**1.10 DELIVERY, STORAGE, AND HANDLING [NOT USED]**

**1.11 FIELD [SITE] CONDITIONS [NOT USED]**

**1.12 WARRANTY [NOT USED]**

**PART 2 - PRODUCTS [NOT USED]**



**PART 3 - EXECUTION [NOT USED]**

**END OF SECTION**

Revision Log		
DATE	NAME	SUMMARY OF CHANGE

**SECTION 01 33 00**  
**DAP SUBMITTALS**

**PART 1 - GENERAL**

**1.1 SUMMARY**

- A. Section Includes:
  - 1. General methods and requirements of submissions applicable to the following Work-related submittals:
    - a. Shop Drawings
    - b. Product Data (including Standard Product List submittals)
    - c. Samples
    - d. Mock Ups
- B. Deviations from this City of Fort Worth Standard Specification
  - 1. None.
- C. Related Specification Sections include, but are not necessarily limited to:
  - 1. Division 0 – Bidding Requirements, Contract Forms and Conditions of the Contract
  - 2. Division 1 – General Requirements

**1.2 PRICE AND PAYMENT PROCEDURES**

- A. Measurement and Payment
  - 1. Work associated with this Item is considered subsidiary to the various items bid. No separate payment will be allowed for this Item.

**1.3 REFERENCES [NOT USED]**

**1.4 ADMINISTRATIVE REQUIREMENTS**

- A. Coordination
  - 1. Notify the City in writing, at the time of submittal, of any deviations in the submittals from the requirements of the Contract Documents.
  - 2. Coordination of Submittal Times
    - a. Prepare, prioritize and transmit each submittal sufficiently in advance of performing the related Work or other applicable activities, or within the time specified in the individual Work Sections, of the Specifications.
    - b. Contractor is responsible such that the installation will not be delayed by processing times including, but not limited to:
      - a) Disapproval and resubmittal (if required)
      - b) Coordination with other submittals
      - c) Testing
      - d) Purchasing
      - e) Fabrication
      - f) Delivery
      - g) Similar sequenced activities
    - c. No extension of time will be authorized because of the Contractor's failure to transmit submittals sufficiently in advance of the Work.

- d. Make submittals promptly in accordance with approved schedule, and in such sequence as to cause no delay in the Work or in the work of any other contractor.

#### B. Submittal Numbering

1. When submitting shop drawings or samples, utilize a 9-character submittal cross-reference identification numbering system in the following manner:
  - a. Use the first 6 digits of the applicable Specification Section Number.
  - b. For the next 2 digits number use numbers 01-99 to sequentially number each initial separate item or drawing submitted under each specific Section number.
  - c. Last use a letter, A-Z, indicating the resubmission of the same drawing (i.e. A=2nd submission, B=3rd submission, C=4th submission, etc.). A typical submittal number would be as follows:

03 30 00-08-B

- 1) 03 30 00 is the Specification Section for Concrete
- 2) 08 is the eighth initial submittal under this Specification Section
- 3) B is the third submission (second resubmission) of that particular shop drawing

#### C. Contractor Certification

1. Review shop drawings, product data and samples, including those by subcontractors, prior to submission to determine and verify the following:
  - a. Field measurements
  - b. Field construction criteria
  - c. Catalog numbers and similar data
  - d. Conformance with the Contract Documents
2. Provide each shop drawing, sample and product data submitted by the Contractor with a Certification Statement affixed including:
  - a. The Contractor's Company name
  - b. Signature of submittal reviewer
  - c. Certification Statement
    - 1) "By this submittal, I hereby represent that I have determined and verified field measurements, field construction criteria, materials, dimensions, catalog numbers and similar data and I have checked and coordinated each item with other applicable approved shop drawings."

#### D. Submittal Format

1. Fold shop drawings larger than 8 ½ inches x 11 inches to 8 ½ inches x 11 inches.
2. Bind shop drawings and product data sheets together.
3. Order
  - a. Cover Sheet
    - 1) Description of Packet
    - 2) Contractor Certification
  - b. List of items / Table of Contents
  - c. Product Data /Shop Drawings/Samples /Calculations

#### E. Submittal Content

1. The date of submission and the dates of any previous submissions

2. The Project title and number
  3. Contractor identification
  4. The names of:
    - a. Contractor
    - b. Supplier
    - c. Manufacturer
  5. Identification of the product, with the Specification Section number, page and paragraph(s)
  6. Field dimensions, clearly identified as such
  7. Relation to adjacent or critical features of the Work or materials
  8. Applicable standards, such as ASTM or Federal Specification numbers
  9. Identification by highlighting of deviations from Contract Documents
  10. Identification by highlighting of revisions on resubmittals
  11. An 8-inch x 3-inch blank space for Contractor and City stamps
- F. Shop Drawings
1. As specified in individual Work Sections includes, but is not necessarily limited to:
    - a. Custom-prepared data such as fabrication and erection/installation (working) drawings
    - b. Scheduled information
    - c. Setting diagrams
    - d. Actual shopwork manufacturing instructions
    - e. Custom templates
    - f. Special wiring diagrams
    - g. Coordination drawings
    - h. Individual system or equipment inspection and test reports including:
      - 1) Performance curves and certifications
    - i. As applicable to the Work
  2. Details
    - a. Relation of the various parts to the main members and lines of the structure
    - b. Where correct fabrication of the Work depends upon field measurements
      - 1) Provide such measurements and note on the drawings prior to submitting for approval.
- G. Product Data
1. For submittals of product data for products included on the City's Standard Product List, clearly identify each item selected for use on the Project.
  2. For submittals of product data for products not included on the City's Standard Product List, submittal data may include, but is not necessarily limited to:
    - a. Standard prepared data for manufactured products (sometimes referred to as catalog data)
      - 1) Such as the manufacturer's product specification and installation instructions
      - 2) Availability of colors and patterns
      - 3) Manufacturer's printed statements of compliances and applicability
      - 4) Roughing-in diagrams and templates
      - 5) Catalog cuts
      - 6) Product photographs

- 7) Standard wiring diagrams
- 8) Printed performance curves and operational-range diagrams
- 9) Production or quality control inspection and test reports and certifications
- 10) Mill reports
- 11) Product operating and maintenance instructions and recommended spare-parts listing and printed product warranties
- 12) As applicable to the Work

#### H. Samples

1. As specified in individual Sections, include, but are not necessarily limited to:
  - a. Physical examples of the Work such as:
    - 1) Sections of manufactured or fabricated Work
    - 2) Small cuts or containers of materials
    - 3) Complete units of repetitively used products color/texture/pattern swatches and range sets
    - 4) Specimens for coordination of visual effect
    - 5) Graphic symbols and units of Work to be used by the City for independent inspection and testing, as applicable to the Work
- I. Do not start Work requiring a shop drawing, sample or product data nor any material to be fabricated or installed prior to the approval or qualified approval of such item.
  1. Fabrication performed, materials purchased or on-site construction accomplished which does not conform to approved shop drawings and data is at the Contractor's risk.
  2. The City will not be liable for any expense or delay due to corrections or remedies required to accomplish conformity.
  3. Complete project Work, materials, fabrication, and installations in conformance with approved shop drawings, applicable samples, and product data.

#### J. Submittal Distribution

1. Electronic Distribution
  - a. Confirm development of Project directory for electronic submittals to be uploaded to City's Buzzsaw site, or another external FTP site approved by the City.
  - b. Shop Drawings
    - 1) Upload submittal to designated project directory and notify appropriate City representatives via email of submittal posting.
    - 2) Hard Copies
      - a) 3 copies for all submittals
      - b) If Contractor requires more than 1 hard copy of Shop Drawings returned, Contractor shall submit more than the number of copies listed above.
  - c. Product Data
    - 1) Upload submittal to designated project directory and notify appropriate City representatives via email of submittal posting.
    - 2) Hard Copies
      - a) 3 copies for all submittals
  - d. Samples
    - 1) Distributed to the Project Representative
2. Hard Copy Distribution (if required in lieu of electronic distribution)

- a. Shop Drawings
    - 1) Distributed to the City
    - 2) Copies
      - a) 8 copies for mechanical submittals
      - b) 7 copies for all other submittals
      - c) If Contractor requires more than 3 copies of Shop Drawings returned, Contractor shall submit more than the number of copies listed above.
  - b. Product Data
    - 1) Distributed to the City
    - 2) Copies
      - a) 4 copies
  - c. Samples
    - 1) Distributed to the Project Representative
    - 2) Copies
      - a) Submit the number stated in the respective Specification Sections.
3. Distribute reproductions of approved shop drawings and copies of approved product data and samples, where required, to the job site file and elsewhere as directed by the City.
- a. Provide number of copies as directed by the City but not exceeding the number previously specified.

#### K. Submittal Review

1. The review of shop drawings, data and samples will be for general conformance with the design concept and Contract Documents. This is not to be construed as:
  - a. Permitting any departure from the Contract requirements
  - b. Relieving the Contractor of responsibility for any errors, including details, dimensions, and materials
  - c. Approving departures from details furnished by the City, except as otherwise provided herein
2. The review and approval of shop drawings, samples or product data by the City does not relieve the Contractor from his/her responsibility with regard to the fulfillment of the terms of the Contract.
  - a. All risks of error and omission are assumed by the Contractor, and the City will have no responsibility therefore.
3. The Contractor remains responsible for details and accuracy, for coordinating the Work with all other associated work and trades, for selecting fabrication processes, for techniques of assembly and for performing Work in a safe manner.
4. If the shop drawings, data or samples as submitted describe variations and show a departure from the Contract requirements which City finds to be in the interest of the City and to be so minor as not to involve a change in Contract Price or time for performance, the City may return the reviewed drawings without noting an exception.
5. Submittals will be returned to the Contractor under 1 of the following codes:
  - a. Code 1
    - 1) "NO EXCEPTIONS TAKEN" is assigned when there are no notations or comments on the submittal.
      - a) When returned under this code the Contractor may release the equipment and/or material for manufacture.
  - b. Code 2

- 1) "EXCEPTIONS NOTED". This code is assigned when a confirmation of the notations and comments IS NOT required by the Contractor.
    - a) The Contractor may release the equipment or material for manufacture; however, all notations and comments must be incorporated into the final product.
  - c. Code 3
    - 1) "EXCEPTIONS NOTED/RESUBMIT". This combination of codes is assigned when notations and comments are extensive enough to require a resubmittal of the package.
      - a) The Contractor may release the equipment or material for manufacture; however, all notations and comments must be incorporated into the final product.
      - b) This resubmittal is to address all comments, omissions and non-conforming items that were noted.
      - c) Resubmittal is to be received by the City within 15 Calendar Days of the date of the City's transmittal requiring the resubmittal.
  - d. Code 4
    - 1) "NOT APPROVED" is assigned when the submittal does not meet the intent of the Contract Documents.
      - a) The Contractor must resubmit the entire package revised to bring the submittal into conformance.
      - b) It may be necessary to resubmit using a different manufacturer/vendor to meet the Contract Documents.
6. Resubmittals
- a. Handled in the same manner as first submittals
    - 1) Corrections other than requested by the City
    - 2) Marked with revision triangle or other similar method
      - a) At Contractor's risk if not marked
  - b. Submittals for each item will be reviewed no more than twice at the City's expense.
    - 1) All subsequent reviews will be performed at times convenient to the City and at the Contractor's expense, based on the City's or City Representative's then prevailing rates.
    - 2) Provide Contractor reimbursement to the City within 30 Calendar Days for all such fees invoiced by the City.
  - c. The need for more than 1 resubmission or any other delay in obtaining City's review of submittals, will not entitle the Contractor to an extension of Contract Time.
7. Partial Submittals
- a. City reserves the right to not review submittals deemed partial, at the City's discretion.
  - b. Submittals deemed by the City to be not complete will be returned to the Contractor, and will be considered "Not Approved" until resubmitted.
  - c. The City may at its option provide a list or mark the submittal directing the Contractor to the areas that are incomplete.
8. If the Contractor considers any correction indicated on the shop drawings to constitute a change to the Contract Documents, then written notice must be provided thereof to the Developer at least 7 Calendar Days prior to release for manufacture.

9. When the shop drawings have been completed to the satisfaction of the City, the Contractor may carry out the construction in accordance therewith and no further changes therein except upon written instructions from the City.
10. Each submittal, appropriately coded, will be returned within 30 Calendar Days following receipt of submittal by the City.

L. Mock ups

1. Mock Up units as specified in individual Sections, include, but are not necessarily limited to, complete units of the standard of acceptance for that type of Work to be used on the Project. Remove at the completion of the Work or when directed.

M. Qualifications

1. If specifically required in other Sections of these Specifications, submit a P.E. Certification for each item required.

N. Request for Information (RFI)

1. Contractor Request for additional information
  - a. Clarification or interpretation of the contract documents
  - b. When the Contractor believes there is a conflict between Contract Documents
  - c. When the Contractor believes there is a conflict between the Drawings and Specifications
    - 1) Identify the conflict and request clarification
2. Sufficient information shall be attached to permit a written response without further information.

**1.5 SUBMITTALS [NOT USED]**

**1.6 ACTION SUBMITTALS/INFORMATIONAL SUBMITTALS [NOT USED]**

**1.7 CLOSEOUT SUBMITTALS [NOT USED]**

**1.8 MAINTENANCE MATERIAL SUBMITTALS [NOT USED]**

**1.9 QUALITY ASSURANCE [NOT USED]**

**1.10 DELIVERY, STORAGE, AND HANDLING [NOT USED]**

**1.11 FIELD [SITE] CONDITIONS [NOT USED]**

**1.12 WARRANTY [NOT USED]**



**PART 2 - PRODUCTS [NOT USED]**

**PART 3 - EXECUTION [NOT USED]**

**END OF SECTION**

Revision Log		
DATE	NAME	SUMMARY OF CHANGE
12/20/2012	D. Johnson	1.4.K.8. Working Days modified to Calendar Days

1 **SECTION 01 35 13**  
2 **SPECIAL PROJECT PROCEDURES**  
3

4 **PART 1 - GENERAL**

5 **1.1 SUMMARY**

6 A. Section Includes:

- 7 1. The procedures for special project circumstances that includes, but is not limited to:  
8 a. Coordination with the Texas Department of Transportation  
9 b. Work near High Voltage Lines  
10 c. Confined Space Entry Program  
11 d. Air Pollution Watch Days  
12 e. Use of Explosives, Drop Weight, Etc.  
13 f. Water Department Notification  
14 g. Public Notification Prior to Beginning Construction  
15 h. Coordination with United States Army Corps of Engineers  
16 i. Coordination within Railroad permits areas  
17 j. Dust Control  
18 k. Employee Parking

19 B. Deviations from this City of Fort Worth Standard Specification

20 **1. 1.3.B and 1.3.C.**

21 C. Related Specification Sections include, but are not necessarily limited to:

- 22 1. Division 0 – Bidding Requirements, Contract Forms and Conditions of the Contract  
23 2. Division 1 – General Requirements  
24 3. Section 33 12 25 – Connection to Existing Water Mains  
25

26 **1.2 REFERENCES**

27 A. Reference Standards

- 28 1. Reference standards cited in this Specification refer to the current reference  
29 standard published at the time of the latest revision date logged at the end of this  
30 Specification, unless a date is specifically cited.  
31 2. Health and Safety Code, Title 9. Safety, Subtitle A. Public Safety, Chapter 752.  
32 High Voltage Overhead Lines.  
33 3. North Central Texas Council of Governments (NCTCOG) – Clean Construction  
34 Specification

35 **1.3 ADMINISTRATIVE REQUIREMENTS**

36 A. Coordination with the Texas Department of Transportation

- 37 1. When work in the right-of-way which is under the jurisdiction of the Texas  
38 Department of Transportation (TxDOT):  
39 a. Notify the Texas Department of Transportation prior to commencing any work  
40 therein in accordance with the provisions of the permit

- 1           b. All work performed in the TxDOT right-of-way shall be performed in  
2 compliance with and subject to approval from the Texas Department of  
3 Transportation

4       **B. Coordination with the North Tarrant Transportation Authority (NTTA)**

5           a. **When work in the right-of-way which is under the jurisdiction of the**  
6 **NTTA:**

- 7           1) **Notify the NTTA prior to commencing any work therein in accordance**  
8 **with the provisions of the appendix.**  
9           2) **All work performed in the NTTA right-of-way shall be performed in**  
10 **compliance with and subject to approval from the NTTA.**

11       **C. Coordination with the Tarrant Regional Water District (TRWD)**

12           a. **When work in the right-of-way or crossing their waterlines which is under**  
13 **the jurisdiction of the TRWD:**

- 14           1) **Notify the TRWD prior to commencing any work therein in**  
15 **accordance with the provisions of the appendix.**  
16           2) **All work performed in the TRWD right-of-way shall be performed in**  
17 **compliance with and subject to approval from the TRWD.**  
18

19       **D. Work near High Voltage Lines**

20           1. Regulatory Requirements

- 21           a. All Work near High Voltage Lines (more than 600 volts measured between  
22 conductors or between a conductor and the ground) shall be in accordance with  
23 Health and Safety Code, Title 9, Subtitle A, Chapter 752.

24           2. Warning sign

- 25           a. Provide sign of sufficient size meeting all OSHA requirements.

26           3. Equipment operating within 10 feet of high voltage lines will require the following  
27 safety features

- 28           a. Insulating cage-type of guard about the boom or arm  
29           b. Insulator links on the lift hook connections for back hoes or dippers  
30           c. Equipment must meet the safety requirements as set forth by OSHA and the  
31 safety requirements of the owner of the high voltage lines

32           4. Work within 6 feet of high voltage electric lines

33           a. Notification shall be given to:

- 34           1) The power company (example: ONCOR)  
35           a) Maintain an accurate log of all such calls to power company and record  
36           action taken in each case.

37           b. Coordination with power company

- 38           1) After notification coordinate with the power company to:

- 39           a) Erect temporary mechanical barriers, de-energize the lines, or raise or  
40           lower the lines

41           c. No personnel may work within 6 feet of a high voltage line before the above  
42           requirements have been met.

43       **E. Confined Space Entry Program**

44           1. Provide and follow approved Confined Space Entry Program in accordance with  
45 OSHA requirements.

46           2. Confined Spaces include:

- 47           a. Manholes

- 1                   b. All other confined spaces in accordance with OSHA's Permit Required for  
2                   Confined Spaces
- 3       F. Use of Explosives, Drop Weight, Etc.
- 4           1. When Contract Documents permit on the project the following will apply:
- 5           a. Public Notification
- 6               1) Submit notice to City and proof of adequate insurance coverage, 24 hours  
7               prior to commencing.
- 8               2) Minimum 24 hour public notification in accordance with Section 01 31 13
- 9       G. Water Department Coordination
- 10           1. During the construction of this project, it will be necessary to deactivate, for a  
11           period of time, existing lines. The Contractor shall be required to coordinate with  
12           the Water Department to determine the best times for deactivating and activating  
13           those lines.
- 14           2. Coordinate any event that will require connecting to or the operation of an existing  
15           City water line system with the City's representative.
- 16           a. Coordination shall be in accordance with Section 33 12 25.
- 17           b. If needed, obtain a hydrant water meter from the Water Department for use  
18           during the life of named project.
- 19           c. In the event that a water valve on an existing live system be turned off and on  
20           to accommodate the construction of the project is required, coordinate this  
21           activity through the appropriate City representative.
- 22               1) Do not operate water line valves of existing water system.
- 23                   a) Failure to comply will render the Contractor in violation of Texas Penal  
24                   Code Title 7, Chapter 28.03 (Criminal Mischief) and the Contractor  
25                   will be prosecuted to the full extent of the law.
- 26                   b) In addition, the Contractor will assume all liabilities and  
27                   responsibilities as a result of these actions.
- 28       H. Public Notification Prior to Beginning Construction
- 29           1. Prior to beginning construction on any block in the project, on a block by block  
30           basis, prepare and deliver a notice or flyer of the pending construction to the front  
31           door of each residence or business that will be impacted by construction. The notice  
32           shall be prepared as follows:
- 33           a. Post notice or flyer 7 days prior to beginning any construction activity on each  
34           block in the project area.
- 35               1) Prepare flyer on the Contractor's letterhead and include the following  
36               information:
- 37                   a) Name of Project
- 38                   b) City Project No (CPN)
- 39                   c) Scope of Project (i.e. type of construction activity)
- 40                   d) Actual construction duration within the block
- 41                   e) Name of the contractor's foreman and phone number
- 42                   f) Name of the City's inspector and phone number
- 43                   g) City's after-hours phone number
- 44               2) A sample of the 'pre-construction notification' flyer is attached as Exhibit  
45               A.
- 46               3) Submit schedule showing the construction start and finish time for each  
47               block of the project to the inspector.
- 48               4) Deliver flyer to the City Inspector for review prior to distribution.

- 1                   b. No construction will be allowed to begin on any block until the flyer is  
2                   delivered to all residents of the block.
- 3           I. Public Notification of Temporary Water Service Interruption during Construction
- 4           1. In the event it becomes necessary to temporarily shut down water service to  
5           residents or businesses during construction, prepare and deliver a notice or flyer of  
6           the pending interruption to the front door of each affected resident.
- 7           2. Prepared notice as follows:
- 8           a. The notification or flyer shall be posted 24 hours prior to the temporary  
9           interruption.
- 10           b. Prepare flyer on the contractor's letterhead and include the following  
11           information:
- 12               1) Name of the project
- 13               2) City Project Number
- 14               3) Date of the interruption of service
- 15               4) Period the interruption will take place
- 16               5) Name of the contractor's foreman and phone number
- 17               6) Name of the City's inspector and phone number
- 18           c. A sample of the temporary water service interruption notification is attached as  
19           Exhibit B.
- 20           d. Deliver a copy of the temporary interruption notification to the City inspector  
21           for review prior to being distributed.
- 22           e. No interruption of water service can occur until the flyer has been delivered to  
23           all affected residents and businesses.
- 24           f. Electronic versions of the sample flyers can be obtained from the Project  
25           Construction Inspector.
- 26           J. Coordination with United States Army Corps of Engineers (USACE)
- 27           1. At locations in the Project where construction activities occur in areas where  
28           USACE permits are required, meet all requirements set forth in each designated  
29           permit.
- 30           K. Coordination within Railroad Permit Areas
- 31           1. At locations in the project where construction activities occur in areas where  
32           railroad permits are required, meet all requirements set forth in each designated  
33           railroad permit. This includes, but is not limited to, provisions for:
- 34               a. Flagmen
- 35               b. Inspectors
- 36               c. Safety training
- 37               d. Additional insurance
- 38               e. Insurance certificates
- 39               f. Other employees required to protect the right-of-way and property of the  
40               Railroad Company from damage arising out of and/or from the construction of  
41               the project. Proper utility clearance procedures shall be used in accordance  
42               with the permit guidelines.
- 43           2. Obtain any supplemental information needed to comply with the railroad's  
44           requirements.
- 45           L. Dust Control
- 46           1. Use acceptable measures to control dust at the Site.
- 47               a. If water is used to control dust, capture and properly dispose of waste water.



**EXHIBIT A**

(To be printed on Contractor's Letterhead)

Date: \_\_\_\_\_

CPN No.: \_\_\_\_\_

Project Name:

Mapsco Location:

Limits of Construction:

# NOTICE OF CONSTRUCTION

**THIS IS TO INFORM YOU THAT UNDER A CONTRACT WITH THE CITY OF FORT WORTH, OUR COMPANY WILL WORK ON UTILITY LINES ON OR AROUND YOUR PROPERTY.**

**CONSTRUCTION WILL BEGIN APPROXIMATELY SEVEN DAYS FROM THE DATE OF THIS NOTICE.**

**IF YOU HAVE QUESTIONS ABOUT ACCESS, SECURITY, SAFETY OR ANY OTHER ISSUE, PLEASE CALL:**

**Mr. <CONTRACTOR'S SUPERINTENDENT> AT <TELEPHONE NO.>**

**OR**

**Mr. <CITY INSPECTOR> AT < TELEPHONE NO.>**

**AFTER 4:30 PM OR ON WEEKENDS, PLEASE CALL (817) 392 8306**

**PLEASE KEEP THIS FLYER HANDY WHEN YOU CALL**

1  
2

**EXHIBIT B**



Date: \_\_\_\_\_

**DOE NO. XXXX**  
**Project Name:**

**NOTICE OF TEMPORARY WATER SERVICE  
INTERRUPTION**

DUE TO UTILITY IMPROVEMENTS IN YOUR NEIGHBORHOOD, YOUR  
WATER SERVICE WILL BE INTERRUPTED ON \_\_\_\_\_  
BETWEEN THE HOURS OF \_\_\_\_\_ AND \_\_\_\_\_.

IF YOU HAVE QUESTIONS ABOUT THIS SHUT-OUT, PLEASE CALL:

MR. \_\_\_\_\_ AT \_\_\_\_\_  
(CONTRACTORS SUPERINTENDENT) (TELEPHONE NUMBER)

OR

MR. \_\_\_\_\_ AT \_\_\_\_\_  
(CITY INSPECTOR) (TELEPHONE NUMBER)

THIS INCONVENIENCE WILL BE AS SHORT AS POSSIBLE.

THANK YOU,

\_\_\_\_\_, CONTRACTOR

3  
4



**SECTION 01 45 23**  
**TESTING AND INSPECTION SERVICES**

**PART 1 - GENERAL**

**1.1 SUMMARY**

- A. Section Includes:
  - 1. Testing and inspection services procedures and coordination
- B. Deviations from this City of Fort Worth Standard Specification
  - 1. None.
- C. Related Specification Sections include, but are not necessarily limited to:
  - 1. Division 0 – Bidding Requirements, Contract Forms and Conditions of the Contract
  - 2. Division 1 – General Requirements

**1.2 PRICE AND PAYMENT PROCEDURES**

- A. Measurement and Payment
  - 1. Work associated with this Item is considered subsidiary to the various Items bid. No separate payment will be allowed for this Item.
    - a. Contractor is responsible for performing, coordinating, and payment of all Quality Control testing.
    - b. City is responsible for performing and payment for first set of Quality Assurance testing.
      - 1) If the first Quality Assurance test performed by the City fails, the Contractor is responsible for payment of subsequent Quality Assurance testing until a passing test occurs.
        - a) Final acceptance will not be issued by City until all required payments for testing by Contractor have been paid in full.

**1.3 REFERENCES [NOT USED]**

**1.4 ADMINISTRATIVE REQUIREMENTS**

- A. Testing
  - 1. Complete testing in accordance with the Contract Documents.
  - 2. Coordination
    - a. When testing is required to be performed by the City, notify City, sufficiently in advance, when testing is needed.
    - b. When testing is required to be completed by the Contractor, notify City, sufficiently in advance, that testing will be performed.
  - 3. Distribution of Testing Reports
    - a. Electronic Distribution
      - 1) Confirm development of Project directory for electronic submittals to be uploaded to the City's document management system, or another form of distribution approved by the City.

- 2) Upload test reports to designated project directory and notify appropriate City representatives via email of submittal posting.
- 3) Hard Copies
  - a) 1 copy for all submittals submitted to the Project Representative
- b. Hard Copy Distribution (if required in lieu of electronic distribution)
  - 1) Tests performed by City
    - a) Distribute 1 hard copy to the Contractor
  - 2) Tests performed by the Contractor
    - a) Distribute 3 hard copies to City’s Project Representative
- 4. Provide City’s Project Representative with trip tickets for each delivered load of Concrete or Lime material including the following information:
  - a. Name of pit
  - b. Date of delivery
  - c. Material delivered

**B. Inspection**

- 1. Inspection or lack of inspection does not relieve the Contractor from obligation to perform work in accordance with the Contract Documents.

**1.5 SUBMITTALS [NOT USED]**

**1.6 ACTION SUBMITTALS/INFORMATIONAL SUBMITTALS [NOT USED]**

**1.7 CLOSEOUT SUBMITTALS [NOT USED]**

**1.8 MAINTENANCE MATERIAL SUBMITTALS [NOT USED]**

**1.9 QUALITY ASSURANCE [NOT USED]**

**1.10 DELIVERY, STORAGE, AND HANDLING [NOT USED]**

**1.11 FIELD [SITE] CONDITIONS [NOT USED]**

**1.12 WARRANTY [NOT USED]**

**PART 2 - PRODUCTS [NOT USED]**

**PART 3 - EXECUTION [NOT USED]**

**END OF SECTION**

Revision Log		
DATE	NAME	SUMMARY OF CHANGE
03/20/2020	D.V. Magaña	Removed reference to Buzzsaw and noted that electronic submittals be uploaded through the City’s document management system.

**SECTION 01 50 00**  
**TEMPORARY FACILITIES AND CONTROLS**

**PART 1 - GENERAL**

**1.1 SUMMARY**

A. Section Includes:

1. Provide temporary facilities and controls needed for the Work including, but not necessarily limited to:
  - a. Temporary utilities
  - b. Sanitary facilities
  - c. Storage Sheds and Buildings
  - d. Dust control
  - e. Temporary fencing of the construction site

B. Deviations from this City of Fort Worth Standard Specification

1. None.

C. Related Specification Sections include, but are not necessarily limited to:

1. Division 0 – Bidding Requirements, Contract Forms and Conditions of the Contract
2. Division 1 – General Requirements

**1.2 PRICE AND PAYMENT PROCEDURES**

A. Measurement and Payment

1. Work associated with this Item is considered subsidiary to the various Items bid. No separate payment will be allowed for this Item.

**1.3 REFERENCES [NOT USED]**

**1.4 ADMINISTRATIVE REQUIREMENTS**

A. Temporary Utilities

1. Obtaining Temporary Service
  - a. Make arrangements with utility service companies for temporary services.
  - b. Abide by rules and regulations of utility service companies or authorities having jurisdiction.
  - c. Be responsible for utility service costs until Work is approved for Final Acceptance.
    - 1) Included are fuel, power, light, heat and other utility services necessary for execution, completion, testing and initial operation of Work.
2. Water
  - a. Contractor to provide water required for and in connection with Work to be performed and for specified tests of piping, equipment, devices or other use as required for the completion of the Work.
  - b. Provide and maintain adequate supply of potable water for domestic consumption by Contractor personnel and City's Project Representatives.
  - c. Coordination
    - 1) Contact City 1 week before water for construction is desired

- d. Contractor Payment for Construction Water
  - 1) Obtain construction water meter from City for payment as billed by City's established rates.
3. Electricity and Lighting
  - a. Provide and pay for electric powered service as required for Work, including testing of Work.
    - 1) Provide power for lighting, operation of equipment, or other use.
  - b. Electric power service includes temporary power service or generator to maintain operations during scheduled shutdown.
4. Telephone
  - a. Provide emergency telephone service at Site for use by Contractor personnel and others performing work or furnishing services at Site.
5. Temporary Heat and Ventilation
  - a. Provide temporary heat as necessary for protection or completion of Work.
  - b. Provide temporary heat and ventilation to assure safe working conditions.
- B. Sanitary Facilities
  1. Provide and maintain sanitary facilities for persons on Site.
    - a. Comply with regulations of State and local departments of health.
  2. Enforce use of sanitary facilities by construction personnel at job site.
    - a. Enclose and anchor sanitary facilities.
    - b. No discharge will be allowed from these facilities.
    - c. Collect and store sewage and waste so as not to cause nuisance or health problem.
    - d. Haul sewage and waste off-site at no less than weekly intervals and properly dispose in accordance with applicable regulation.
  3. Locate facilities near Work Site and keep clean and maintained throughout Project.
  4. Remove facilities at completion of Project
- C. Storage Sheds and Buildings
  1. Provide adequately ventilated, watertight, weatherproof storage facilities with floor above ground level for materials and equipment susceptible to weather damage.
  2. Storage of materials not susceptible to weather damage may be on blocks off ground.
  3. Store materials in a neat and orderly manner.
    - a. Place materials and equipment to permit easy access for identification, inspection and inventory.
  4. Equip building with lockable doors and lighting, and provide electrical service for equipment space heaters and heating or ventilation as necessary to provide storage environments acceptable to specified manufacturers.
  5. Fill and grade site for temporary structures to provide drainage away from temporary and existing buildings.
  6. Remove building from site prior to Final Acceptance.
- D. Temporary Fencing
  1. Provide and maintain for the duration or construction when required in contract documents
- E. Dust Control

1. Contractor is responsible for maintaining dust control through the duration of the project.
  - a. Contractor remains on-call at all times
  - b. Must respond in a timely manner
- F. Temporary Protection of Construction
  1. Contractor or subcontractors are responsible for protecting Work from damage due to weather.

**1.5 SUBMITTALS [NOT USED]**

**1.6 ACTION SUBMITTALS/INFORMATIONAL SUBMITTALS [NOT USED]**

**1.7 CLOSEOUT SUBMITTALS [NOT USED]**

**1.8 MAINTENANCE MATERIAL SUBMITTALS [NOT USED]**

**1.9 QUALITY ASSURANCE [NOT USED]**

**1.10 DELIVERY, STORAGE, AND HANDLING [NOT USED]**

**1.11 FIELD [SITE] CONDITIONS [NOT USED]**

**1.12 WARRANTY [NOT USED]**

**PART 2 - PRODUCTS [NOT USED]**

**PART 3 - EXECUTION [NOT USED]**

**3.1 INSTALLERS [NOT USED]**

**3.2 EXAMINATION [NOT USED]**

**3.3 PREPARATION [NOT USED]**

**3.4 INSTALLATION**

A. Temporary Facilities

1. Maintain all temporary facilities for duration of construction activities as needed.

**3.5 [REPAIR] / [RESTORATION]**

**3.6 RE-INSTALLATION**

**3.7 FIELD [or] SITE QUALITY CONTROL [NOT USED]**

**3.8 SYSTEM STARTUP [NOT USED]**

**3.9 ADJUSTING [NOT USED]**

**3.10 CLEANING [NOT USED]**

**3.11 CLOSEOUT ACTIVITIES**

A. Temporary Facilities

1. Remove all temporary facilities and restore area after completion of the Work, to a condition equal to or better than prior to start of Work.

**3.12 PROTECTION [NOT USED]**

**3.13 MAINTENANCE [NOT USED]**

**3.14 ATTACHMENTS [NOT USED]**

**END OF SECTION**

Revision Log		
DATE	NAME	SUMMARY OF CHANGE

**SECTION 01 55 26**  
**STREET USE PERMIT AND MODIFICATIONS TO TRAFFIC CONTROL**

**PART 1 - GENERAL**

**1.1 SUMMARY**

- A. Section Includes:
  - 1. Administrative procedures for:
    - a. Street Use Permit
    - b. Modification of approved traffic control
    - c. Removal of Street Signs
- B. Deviations from this City of Fort Worth Standard Specification
  - 1. None.
- C. Related Specification Sections include, but are not necessarily limited to:
  - 1. Division 0 – Bidding Requirements, Contract Forms and Conditions of the Contract
  - 2. Division 1 – General Requirements
  - 3. Section 34 71 13 – Traffic Control

**1.2 PRICE AND PAYMENT PROCEDURES**

- A. Measurement and Payment
  - 1. Work associated with this Item is considered subsidiary to the various Items bid. No separate payment will be allowed for this Item.

**1.3 REFERENCES**

- A. Reference Standards
  - 1. Reference standards cited in this specification refer to the current reference standard published at the time of the latest revision date logged at the end of this specification, unless a date is specifically cited.
  - 2. Texas Manual on Uniform Traffic Control Devices (TMUTCD).

**1.4 ADMINISTRATIVE REQUIREMENTS**

- A. Traffic Control
  - 1. General
    - a. When traffic control plans are included in the Drawings, provide Traffic Control in accordance with Drawings and Section 34 71 13.
    - b. When traffic control plans are not included in the Drawings, prepare traffic control plans in accordance with Section 34 71 13 and submit to City for review.
      - 1) Allow minimum 10 working days for review of proposed Traffic Control.
- B. Street Use Permit
  - 1. Prior to installation of Traffic Control, a City Street Use Permit is required.
    - a. To obtain Street Use Permit, submit Traffic Control Plans to City Transportation and Public Works Department.

- 1) Allow a minimum of 5 working days for permit review.
- 2) Contractor's responsibility to coordinate review of Traffic Control plans for Street Use Permit, such that construction is not delayed.

C. Modification to Approved Traffic Control

1. Prior to installation traffic control:
  - a. Submit revised traffic control plans to City Department Transportation and Public Works Department.
    - 1) Revise Traffic Control plans in accordance with Section 34 71 13.
    - 2) Allow minimum 5 working days for review of revised Traffic Control.
    - 3) It is the Contractor's responsibility to coordinate review of Traffic Control plans for Street Use Permit, such that construction is not delayed.

D. Removal of Street Sign

1. If it is determined that a street sign must be removed for construction, then contact City Transportation and Public Works Department, Signs and Markings Division to remove the sign.

E. Temporary Signage

1. In the case of regulatory signs, replace permanent sign with temporary sign meeting requirements of the latest edition of the Texas Manual on Uniform Traffic Control Devices (MUTCD).
2. Install temporary sign before the removal of permanent sign.
3. When construction is complete, to the extent that the permanent sign can be reinstalled, contact the City Transportation and Public Works Department, Signs and Markings Division, to reinstall the permanent sign.

F. Traffic Control Standards

1. Traffic Control Standards can be found on the City's Buzzsaw website.

**1.5 SUBMITTALS [NOT USED]**

**1.6 ACTION SUBMITTALS/INFORMATIONAL SUBMITTALS [NOT USED]**

**1.7 CLOSEOUT SUBMITTALS [NOT USED]**

**1.8 MAINTENANCE MATERIAL SUBMITTALS [NOT USED]**

**1.9 QUALITY ASSURANCE [NOT USED]**

**1.10 DELIVERY, STORAGE, AND HANDLING [NOT USED]**

**1.11 FIELD [SITE] CONDITIONS [NOT USED]**

**1.12 WARRANTY [NOT USED]**

**PART 2 - PRODUCTS [NOT USED]**

**PART 3 - EXECUTION [NOT USED]**

**END OF SECTION**



Revision Log		
DATE	NAME	SUMMARY OF CHANGE

**SECTION 01 57 13**  
**STORM WATER POLLUTION PREVENTION**

**PART 1 - GENERAL**

**1.1 SUMMARY**

- A. Section Includes:
  - 1. Procedures for Storm Water Pollution Prevention Plans
- B. Deviations from this City of Fort Worth Standard Specification
  - 1. None.
- C. Related Specification Sections include, but are not necessarily limited to:
  - 1. Division 0 – Bidding Requirements, Contract Forms and Conditions of the Contract
  - 2. Division 1 – General Requirements
  - 3. Section 31 25 00 – Erosion and Sediment Control

**1.2 PRICE AND PAYMENT PROCEDURES**

- A. Measurement and Payment
  - 1. Construction Activities resulting in less than 1 acre of disturbance
    - a. Work associated with this Item is considered subsidiary to the various Items bid. No separate payment will be allowed for this Item.
  - 2. Construction Activities resulting in greater than 1 acre of disturbance
    - a. Measurement and Payment shall be in accordance with Section 31 25 00.

**1.3 REFERENCES**

- A. Abbreviations and Acronyms
  - 1. Notice of Intent: NOI
  - 2. Notice of Termination: NOT
  - 3. Storm Water Pollution Prevention Plan: SWPPP
  - 4. Texas Commission on Environmental Quality: TCEQ
  - 5. Notice of Change: NOC
- A. Reference Standards
  - 1. Reference standards cited in this Specification refer to the current reference standard published at the time of the latest revision date logged at the end of this Specification, unless a date is specifically cited.
  - 2. Integrated Storm Management (iSWM) Technical Manual for Construction Controls

**1.4 ADMINISTRATIVE REQUIREMENTS**

- A. General
  - 1. Contractor is responsible for resolution and payment of any fines issued associated with compliance to Stormwater Pollution Prevention Plan.

- B. Construction Activities resulting in:
1. Less than 1 acre of disturbance
    - a. Provide erosion and sediment control in accordance with Section 31 25 00 and Drawings.
  2. 1 to less than 5 acres of disturbance
    - a. Texas Pollutant Discharge Elimination System (TPDES) General Construction Permit is required
    - b. Complete SWPPP in accordance with TCEQ requirements
      - 1) TCEQ Small Construction Site Notice Required under general permit TXR150000
        - a) Sign and post at job site
        - b) Prior to Preconstruction Meeting, send 1 copy to City Department of Transportation and Public Works, Environmental Division, (817) 392-6088.
      - 2) Provide erosion and sediment control in accordance with:
        - a) Section 31 25 00
        - b) The Drawings
        - c) TXR150000 General Permit
        - d) SWPPP
        - e) TCEQ requirements
  3. 5 acres or more of Disturbance
    - a. Texas Pollutant Discharge Elimination System (TPDES) General Construction Permit is required
    - b. Complete SWPPP in accordance with TCEQ requirements
      - 1) Prepare a TCEQ NOI form and submit to TCEQ along with required fee
        - a) Sign and post at job site
        - b) Send copy to City Department of Transportation and Public Works, Environmental Division, (817) 392-6088.
      - 2) TCEQ Notice of Change required if making changes or updates to NOI
      - 3) Provide erosion and sediment control in accordance with:
        - a) Section 31 25 00
        - b) The Drawings
        - c) TXR150000 General Permit
        - d) SWPPP
        - e) TCEQ requirements
      - 4) Once the project has been completed and all the closeout requirements of TCEQ have been met a TCEQ Notice of Termination can be submitted.
        - a) Send copy to City Department of Transportation and Public Works, Environmental Division, (817) 392-6088.

## 1.5 SUBMITTALS

### A. SWPPP

1. Submit in accordance with Section 01 33 00, except as stated herein.
  - a. Prior to the Preconstruction Meeting, submit a draft copy of SWPPP to the City as follows:
    - 1) 1 copy to the City Project Manager
      - a) City Project Manager will forward to the City Department of Transportation and Public Works, Environmental Division for review

**B. Modified SWPPP**

1. If the SWPPP is revised during construction, resubmit modified SWPPP to the City in accordance with Section 01 33 00.

**1.6 ACTION SUBMITTALS/INFORMATIONAL SUBMITTALS [NOT USED]**

**1.7 CLOSEOUT SUBMITTALS [NOT USED]**

**1.8 MAINTENANCE MATERIAL SUBMITTALS [NOT USED]**

**1.9 QUALITY ASSURANCE [NOT USED]**

**1.10 DELIVERY, STORAGE, AND HANDLING [NOT USED]**

**1.11 FIELD [SITE] CONDITIONS [NOT USED]**

**1.12 WARRANTY [NOT USED]**

**PART 2 - PRODUCTS [NOT USED]**

**PART 3 - EXECUTION [NOT USED]**

**END OF SECTION**

Revision Log		
DATE	NAME	SUMMARY OF CHANGE

**SECTION 01 58 13**  
**TEMPORARY PROJECT SIGNAGE**

**PART 1 - GENERAL**

**1.1 SUMMARY**

- A. Section Includes:
  - 1. Temporary Project Signage Requirements
- B. Deviations from this City of Fort Worth Standard Specification
  - 1. None.
- C. Related Specification Sections include, but are not necessarily limited to:
  - 1. Division 0 – Bidding Requirements, Contract Forms and Conditions of the Contract
  - 2. Division 1 – General Requirements

**1.2 PRICE AND PAYMENT PROCEDURES**

- A. Measurement and Payment
  - 1. Work associated with this Item is considered subsidiary to the various Items bid.  
No separate payment will be allowed for this Item.

**1.3 REFERENCES [NOT USED]**

**1.4 ADMINISTRATIVE REQUIREMENTS [NOT USED]**

**1.5 SUBMITTALS [NOT USED]**

**1.6 ACTION SUBMITTALS/INFORMATIONAL SUBMITTALS [NOT USED]**

**1.7 CLOSEOUT SUBMITTALS [NOT USED]**

**1.8 MAINTENANCE MATERIAL SUBMITTALS [NOT USED]**

**1.9 QUALITY ASSURANCE [NOT USED]**

**1.10 DELIVERY, STORAGE, AND HANDLING [NOT USED]**

**1.11 FIELD [SITE] CONDITIONS [NOT USED]**

**1.12 WARRANTY [NOT USED]**

**PART 2 - PRODUCTS**

**2.1 OWNER-FURNISHED [or] OWNER-SUPPLIED PRODUCTS [NOT USED]**

**2.2 EQUIPMENT, PRODUCT TYPES, AND MATERIALS**

- A. Design Criteria
  - 1. Provide free standing Project Designation Sign in accordance with City's Standard Details for project signs.

B. Materials

1. Sign

- a. Constructed of 3/4-inch fir plywood, grade A-C (exterior) or better

**2.3 ACCESSORIES [NOT USED]**

**2.4 SOURCE QUALITY CONTROL [NOT USED]**

**PART 3 - EXECUTION**

**3.1 INSTALLERS [NOT USED]**

**3.2 EXAMINATION [NOT USED]**

**3.3 PREPARATION [NOT USED]**

**3.4 INSTALLATION**

A. General

1. Provide vertical installation at extents of project.
2. Relocate sign as needed, upon request of the City.

B. Mounting options

- a. Skids
- b. Posts
- c. Barricade

**3.5 REPAIR / RESTORATION [NOT USED]**

**3.6 RE-INSTALLATION [NOT USED]**

**3.7 FIELD [or] SITE QUALITY CONTROL [NOT USED]**

**3.8 SYSTEM STARTUP [NOT USED]**

**3.9 ADJUSTING [NOT USED]**

**3.10 CLEANING [NOT USED]**

**3.11 CLOSEOUT ACTIVITIES [NOT USED]**

**3.12 PROTECTION [NOT USED]**

**3.13 MAINTENANCE**

A. General

1. Maintenance will include painting and repairs as needed or directed by the City.

**3.14 ATTACHMENTS [NOT USED]**

**END OF SECTION**

Revision Log		
DATE	NAME	SUMMARY OF CHANGE
4/7/2014	M. Domenech	Revised for DAP application

**SECTION 01 60 00**  
**PRODUCT REQUIREMENTS**

**PART 1 - GENERAL**

**1.1 SUMMARY**

- A. Section Includes:
  - 1. References for Product Requirements and City Standard Products List
- B. Deviations from this City of Fort Worth Standard Specification
  - 1. None.
- C. Related Specification Sections include, but are not necessarily limited to:
  - 1. Division 0 – Bidding Requirements, Contract Forms and Conditions of the Contract
  - 2. Division 1 – General Requirements

**1.2 PRICE AND PAYMENT PROCEDURES [NOT USED]**

**1.3 REFERENCES [NOT USED]**

**1.4 ADMINISTRATIVE REQUIREMENTS**

A list of City approved products for use is available through the City's website at: <https://apps.fortworthtexas.gov/ProjectResources/> and following the directory path: 02 - Construction Documents\Standard Products List

- A. Only products specifically included on City's Standard Product List in these Contract Documents shall be allowed for use on the Project.
  - 1. Any subsequently approved products will only be allowed for use upon specific approval by the City.
- B. Any specific product requirements in the Contract Documents supersede similar products included on the City's Standard Product List.
  - 1. The City reserves the right to not allow products to be used for certain projects even though the product is listed on the City's Standard Product List.
- C. Although a specific product is included on City's Standard Product List, not all products from that manufacturer are approved for use, including but not limited to, that manufacturer's standard product.
- D. See Section 01 33 00 for submittal requirements of Product Data included on City's Standard Product List.

**1.5 SUBMITTALS [NOT USED]**

**1.6 ACTION SUBMITTALS/INFORMATIONAL SUBMITTALS [NOT USED]**

**1.7 CLOSEOUT SUBMITTALS [NOT USED]**

**1.8 MAINTENANCE MATERIAL SUBMITTALS [NOT USED]**

**1.9 QUALITY ASSURANCE [NOT USED]**



**1.10 DELIVERY, STORAGE, AND HANDLING [NOT USED]**

**1.11 FIELD [SITE] CONDITIONS [NOT USED]**

**1.12 WARRANTY [NOT USED]**

**PART 2 - PRODUCTS [NOT USED]**

**PART 3 - EXECUTION [NOT USED]**

**END OF SECTION**

Revision Log		
DATE	NAME	SUMMARY OF CHANGE
10/12/12	D. Johnson	Modified Location of City's Standard Product List
4/7/2014	M.Domenech	Revised for DAP application
03/20/2020	D.V. Magaña	Removed reference to Buzzsaw and noted that the City approved products list is accessible through the City's website.

**SECTION 01 66 00**  
**PRODUCT STORAGE AND HANDLING REQUIREMENTS**

**PART 1 - GENERAL**

**1.1 SUMMARY**

- A. Section Includes:
  - 1. Scheduling of product delivery
  - 2. Packaging of products for delivery
  - 3. Protection of products against damage from:
    - a. Handling
    - b. Exposure to elements or harsh environments
- B. Deviations from this City of Fort Worth Standard Specification
  - 1. None.
- C. Related Specification Sections include, but are not necessarily limited to:
  - 1. Division 0 – Bidding Requirements, Contract Forms and Conditions of the Contract
  - 2. Division 1 – General Requirements

**1.2 PRICE AND PAYMENT PROCEDURES**

- A. Measurement and Payment
  - 1. Work associated with this Item is considered subsidiary to the various Items bid.  
No separate payment will be allowed for this Item.

**1.3 REFERENCES [NOT USED]**

**1.4 ADMINISTRATIVE REQUIREMENTS [NOT USED]**

**1.5 SUBMITTALS [NOT USED]**

**1.6 ACTION SUBMITTALS/INFORMATIONAL SUBMITTALS [NOT USED]**

**1.7 CLOSEOUT SUBMITTALS [NOT USED]**

**1.8 MAINTENANCE MATERIAL SUBMITTALS [NOT USED]**

**1.9 QUALITY ASSURANCE [NOT USED]**

**1.10 DELIVERY AND HANDLING**

- A. Delivery Requirements
  - 1. Schedule delivery of products or equipment as required to allow timely installation and to avoid prolonged storage.
  - 2. Provide appropriate personnel and equipment to receive deliveries.
  - 3. Delivery trucks will not be permitted to wait extended periods of time on the Site for personnel or equipment to receive the delivery.

4. Deliver products or equipment in manufacturer's original unbroken cartons or other containers designed and constructed to protect the contents from physical or environmental damage.
5. Clearly and fully mark and identify as to manufacturer, item and installation location.
6. Provide manufacturer's instructions for storage and handling.

B. Handling Requirements

1. Handle products or equipment in accordance with these Contract Documents and manufacturer's recommendations and instructions.

C. Storage Requirements

1. Store materials in accordance with manufacturer's recommendations and requirements of these Specifications.
2. Make necessary provisions for safe storage of materials and equipment.
  - a. Place loose soil materials and materials to be incorporated into Work to prevent damage to any part of Work or existing facilities and to maintain free access at all times to all parts of Work and to utility service company installations in vicinity of Work.
3. Keep materials and equipment neatly and compactly stored in locations that will cause minimum inconvenience to other contractors, public travel, adjoining owners, tenants and occupants.
  - a. Arrange storage to provide easy access for inspection.
4. Restrict storage to areas available on construction site for storage of material and equipment as shown on Drawings, or approved by City's Project Representative.
5. Provide off-site storage and protection when on-site storage is not adequate.
  - a. Provide addresses of and access to off-site storage locations for inspection by City's Project Representative.
6. Do not use lawns, grass plots or other private property for storage purposes without written permission of owner or other person in possession or control of premises.
7. Store in manufacturers' unopened containers.
8. Neatly, safely and compactly stack materials delivered and stored along line of Work to avoid inconvenience and damage to property owners and general public and maintain at least 3 feet from fire hydrant.
9. Keep public and private driveways and street crossings open.
10. Repair or replace damaged lawns, sidewalks, streets or other improvements to satisfaction of City's Project Representative.
  - a. Total length which materials may be distributed along route of construction at one time is 1,000 linear feet, unless otherwise approved in writing by City's Project Representative.

**1.11 FIELD [SITE] CONDITIONS [NOT USED]**

**1.12 WARRANTY [NOT USED]**

**PART 2 - PRODUCTS [NOT USED]**

**PART 3 - EXECUTION**

**3.1 INSTALLERS [NOT USED]**

**3.2 EXAMINATION [NOT USED]**

**3.3 PREPARATION [NOT USED]**

**3.4 ERECTION [NOT USED]**

**3.5 REPAIR / RESTORATION [NOT USED]**

**3.6 RE-INSTALLATION [NOT USED]**

**3.7 FIELD [or] SITE QUALITY CONTROL**

A. Tests and Inspections

1. Inspect all products or equipment delivered to the site prior to unloading.

B. Non-Conforming Work

1. Reject all products or equipment that are damaged, used or in any other way unsatisfactory for use on the project.

**3.8 SYSTEM STARTUP [NOT USED]**

**3.9 ADJUSTING [NOT USED]**

**3.10 CLEANING [NOT USED]**

**3.11 CLOSEOUT ACTIVITIES [NOT USED]**

**3.12 PROTECTION**

- A. Protect all products or equipment in accordance with manufacturer's written directions.
- B. Store products or equipment in location to avoid physical damage to items while in storage.
- C. Protect equipment from exposure to elements and keep thoroughly dry if required by the manufacturer.

**3.13 MAINTENANCE [NOT USED]**

**3.14 ATTACHMENTS [NOT USED]**

**END OF SECTION**

Revision Log		
DATE	NAME	SUMMARY OF CHANGE
4/7/2014	M.Domenech	Revised for DAP application

**SECTION 01 70 00**  
**MOBILIZATION AND REMOBILIZATION**

**PART 1 - GENERAL**

**1.1 SUMMARY**

A. Section Includes:

1. Mobilization and Demobilization
  - a. Mobilization
    - 1) Transportation of Contractor's personnel, equipment, and operating supplies to the Site
    - 2) Establishment of necessary general facilities for the Contractor's operation at the Site
    - 3) Premiums paid for performance and payment bonds
    - 4) Transportation of Contractor's personnel, equipment, and operating supplies to another location within the designated Site
    - 5) Relocation of necessary general facilities for the Contractor's operation from 1 location to another location on the Site.
  - b. Demobilization
    - 1) Transportation of Contractor's personnel, equipment, and operating supplies away from the Site including disassembly
    - 2) Site Clean-up
    - 3) Removal of all buildings and/or other facilities assembled at the Site for this Contract
  - c. Mobilization and Demobilization do not include activities for specific items of work that are for which payment is provided elsewhere in the contract.
2. Remobilization
  - a. Remobilization for Suspension of Work specifically required in the Contract Documents or as required by City includes:
    - 1) Demobilization
      - a) Transportation of Contractor's personnel, equipment, and operating supplies from the Site including disassembly or temporarily securing equipment, supplies, and other facilities as designated by the Contract Documents necessary to suspend the Work.
      - b) Site Clean-up as designated in the Contract Documents
    - 2) Remobilization
      - a) Transportation of Contractor's personnel, equipment, and operating supplies to the Site necessary to resume the Work.
      - b) Establishment of necessary general facilities for the Contractor's operation at the Site necessary to resume the Work.
    - 3) No Payments will be made for:
      - a) Mobilization and Demobilization from one location to another on the Site in the normal progress of performing the Work.
      - b) Stand-by or idle time
      - c) Lost profits
3. Mobilizations and Demobilization for Miscellaneous Projects
  - a. Mobilization and Demobilization

- 1) Mobilization shall consist of the activities and cost on a Work Order basis necessary for:
    - a) Transportation of Contractor's personnel, equipment, and operating supplies to the Site for the issued Work Order.
    - b) Establishment of necessary general facilities for the Contractor's operation at the Site for the issued Work Order
  - 2) Demobilization shall consist of the activities and cost necessary for:
    - a) Transportation of Contractor's personnel, equipment, and operating supplies from the Site including disassembly for each issued Work Order
    - b) Site Clean-up for each issued Work Order
    - c) Removal of all buildings or other facilities assembled at the Site for each Work Oder
  - b. Mobilization and Demobilization do not include activities for specific items of work for which payment is provided elsewhere in the contract.
  4. Emergency Mobilizations and Demobilization for Miscellaneous Projects
    - a. A Mobilization for Miscellaneous Projects when directed by the City and the mobilization occurs within 24 hours of the issuance of the Work Order.
- B. Deviations from this City of Fort Worth Standard Specification
1. None.
- C. Related Specification Sections include, but are not necessarily limited to:
1. Division 0 – Bidding Requirements, Contract Forms and Conditions of the Contract
  2. Division 1 – General Requirements

## 1.2 PRICE AND PAYMENT PROCEDURES

- A. Measurement and Payment
1. Mobilization and Demobilization
    - a. Measure
      - 1) This Item is considered subsidiary to the various Items bid.
    - b. Payment
      - 1) The work performed and materials furnished in accordance with this Item are subsidiary to the various Items bid and no other compensation will be allowed.
  2. Remobilization for suspension of Work as specifically required in the Contract Documents
    - a. Measurement
      - 1) Measurement for this Item shall be per each remobilization performed.
    - b. Payment
      - 1) The work performed and materials furnished in accordance with this Item and measured as provided under "Measurement" will be paid for at the unit price per each "Specified Remobilization" in accordance with Contract Documents.
    - c. The price shall include:
      - 1) Demobilization as described in Section 1.1.A.2.a.1)
      - 2) Remobilization as described in Section 1.1.A.2.a.2)
    - d. No payments will be made for standby, idle time, or lost profits associated this Item.

3. Remobilization for suspension of Work as required by City
  - a. Measurement and Payment
    - 1) This shall be submitted as a Contract Claim in accordance with Article 10 of Section 00 72 00.
    - 2) No payments will be made for standby, idle time, or lost profits associated with this Item.
4. Mobilizations and Demobilizations for Miscellaneous Projects
  - a. Measurement
    - 1) Measurement for this Item shall be for each Mobilization and Demobilization required by the Contract Documents
  - b. Payment
    - 1) The Work performed and materials furnished in accordance with this Item and measured as provided under “Measurement” will be paid for at the unit price per each “Work Order Mobilization” in accordance with Contract Documents. Demobilization shall be considered subsidiary to mobilization and shall not be paid for separately.
  - c. The price shall include:
    - 1) Mobilization as described in Section 1.1.A.3.a.1)
    - 2) Demobilization as described in Section 1.1.A.3.a.2)
  - d. No payments will be made for standby, idle time, or lost profits associated this Item.
5. Emergency Mobilizations and Demobilizations for Miscellaneous Projects
  - a. Measurement
    - 1) Measurement for this Item shall be for each Mobilization and Demobilization required by the Contract Documents
  - b. Payment
    - 1) The Work performed and materials furnished in accordance with this Item and measured as provided under “Measurement” will be paid for at the unit price per each “Work Order Emergency Mobilization” in accordance with Contract Documents. Demobilization shall be considered subsidiary to mobilization and shall not be paid for separately.
  - c. The price shall include
    - 1) Mobilization as described in Section 1.1.A.4.a)
    - 2) Demobilization as described in Section 1.1.A.3.a.2)
  - d. No payments will be made for standby, idle time, or lost profits associated this Item.

**1.3 REFERENCES [NOT USED]**

**1.4 ADMINISTRATIVE REQUIREMENTS [NOT USED]**

**1.5 SUBMITTALS [NOT USED]**

**1.6 INFORMATIONAL SUBMITTALS [NOT USED]**

**1.7 CLOSEOUT SUBMITTALS [NOT USED]**

**1.8 MAINTENANCE MATERIAL SUBMITTALS [NOT USED]**

**1.9 QUALITY ASSURANCE [NOT USED]**

**1.10 DELIVERY, STORAGE, AND HANDLING [NOT USED]**



**1.11 FIELD [SITE] CONDITIONS [NOT USED]**

**1.12 WARRANTY [NOT USED]**

**PART 2 - PRODUCTS [NOT USED]**

**PART 3 - EXECUTION [NOT USED]**

**END OF SECTION**

Revision Log		
DATE	NAME	SUMMARY OF CHANGE
4/7/2014	M.Domenech	Revised for DAP application

**SECTION 01 71 23**  
**CONSTRUCTION STAKING AND SURVEY**

**PART 1 - GENERAL**

**1.1 SUMMARY**

- A. Section Includes:
  - 1. Requirements for construction staking and construction survey
- B. Deviations from this City of Fort Worth Standard Specification
  - 1. None.
- C. Related Specification Sections include, but are not necessarily limited to:
  - 1. Division 0 – Bidding Requirements, Contract Forms and Conditions of the Contract
  - 2. Division 1 – General Requirements

**1.2 PRICE AND PAYMENT PROCEDURES**

- A. Measurement and Payment
  - 1. Construction Staking
    - a. Measurement
      - 1) This Item is considered subsidiary to the various Items bid.
    - b. Payment
      - 1) The work performed and the materials furnished in accordance with this Item are subsidiary to the various Items bid and no other compensation will be allowed.
  - 2. Construction Survey
    - a. Measurement
      - 1) This Item is considered subsidiary to the various Items bid.
    - b. Payment
      - 1) The work performed and the materials furnished in accordance with this Item are subsidiary to the various Items bid and no other compensation will be allowed.

**1.3 REFERENCES [NOT USED]**

**1.4 ADMINISTRATIVE REQUIREMENTS [NOT USED]**

**1.5 SUBMITTALS**

- A. Submittals, if required, shall be in accordance with Section 01 33 00.
- B. All submittals shall be approved by the City prior to delivery.

**1.6 ACTION SUBMITTALS/INFORMATIONAL SUBMITTALS**

- A. Certificates
  - 1. Provide certificate certifying that elevations and locations of improvements are in conformance or non-conformance with requirements of the Contract Documents.
    - a. Certificate must be sealed by a registered professional land surveyor in the State of Texas.

B. Field Quality Control Submittals

1. Documentation verifying accuracy of field engineering work.

**1.7 CLOSEOUT SUBMITTALS [NOT USED]**

**1.8 MAINTENANCE MATERIAL SUBMITTALS [NOT USED]**

**1.9 QUALITY ASSURANCE**

A. Construction Staking

1. Construction staking will be performed by the City.
2. Coordination
  - a. Contact City's Project Representative at least 2 weeks in advance for scheduling of Construction Staking.
  - b. It is the Contractor's responsibility to coordinate staking such that construction activities are not delayed or negatively impacted.
3. General
  - a. Contractor is responsible for preserving and maintaining stakes furnished by City.
  - b. If in the opinion of the City, a sufficient number of stakes or markings have been lost, destroyed or disturbed, by Contractor's neglect, such that the contracted Work cannot take place, then the Contractor will be required to pay the City for new staking with a 25 percent markup. The cost for staking will be deducted from the payment due to the Contractor for the Project.

B. Construction Survey

1. Construction Survey will be performed by the City.
2. Coordination
  - a. Contractor to verify that control data established in the design survey remains intact.
  - b. Coordinate with the City prior to field investigation to determine which horizontal and vertical control data will be required for construction survey.
  - c. It is the Contractor's responsibility to coordinate Construction Survey such that construction activities are not delayed or negatively impacted.
  - d. Notify City if any control data needs to be restored or replaced due to damage caused during construction operations.
    - 1) City shall perform replacements and/or restorations.
3. General
  - a. Construction survey will be performed in order to maintain complete and accurate logs of control and survey work as it progresses for Project Records.
  - b. The Contractor will need to ensure coordination is maintained with the City to perform construction survey to obtain construction features, including but not limited to the following:
    - 1) All Utility Lines
      - a) Rim and flowline elevations and coordinates for each manhole or junction structure
    - 2) Water Lines
      - a) Top of pipe elevations and coordinates for waterlines at the following locations:
        - (1) Every 250 linear feet

- (2) Horizontal and vertical points of inflection, curvature, etc. (All Fittings)
  - (3) Cathodic protection test stations
  - (4) Sampling stations
  - (5) Meter boxes/vaults (All sizes)
  - (6) Fire lines
  - (7) Fire hydrants
  - (8) Gate valves
  - (9) Plugs, stubouts, dead-end lines
  - (10) Air Release valves (Manhole rim and vent pipe)
  - (11) Blow off valves (Manhole rim and valve lid)
  - (12) Pressure plane valves
  - (13) Cleaning wyes
  - (14) Casing pipe (each end)
- b) Storm Sewer
- (1) Top of pipe elevations and coordinates at the following locations:
    - (a) Every 250 linear feet
    - (b) Horizontal and vertical points of inflection, curvature, etc.
- c) Sanitary Sewer
- (1) Top of pipe elevations and coordinates for sanitary sewer lines at the following locations:
    - (a) Every 250 linear feet
    - (b) Horizontal and vertical points of inflection, curvature, etc.
    - (c) Cleanouts
- c. Construction survey will be performed in order to maintain complete and accurate logs of control and survey work associated with meeting or exceeding the line and grade required by these Specifications.
- d. The Contractor will need to ensure coordination is maintained with the City to perform construction survey and to verify control data, including but not limited to the following:
- 1) Established benchmarks and control points provided for the Contractor's use are accurate
  - 2) Benchmarks were used to furnish and maintain all reference lines and grades for tunneling
  - 3) Lines and grades were used to establish the location of the pipe
  - 4) Submit to the City copies of field notes used to establish all lines and grades and allow the City to check guidance system setup prior to beginning each tunneling drive.
  - 5) Provide access for the City to verify the guidance system and the line and grade of the carrier pipe on a daily basis.
  - 6) The Contractor remains fully responsible for the accuracy of the work and the correction of it, as required.
  - 7) Monitor line and grade continuously during construction.
  - 8) Record deviation with respect to design line and grade once at each pipe joint and submit daily records to City.
  - 9) If the installation does not meet the specified tolerances, immediately notify the City and correct the installation in accordance with the Contract Documents.

#### **1.10 DELIVERY, STORAGE, AND HANDLING [NOT USED]**

**1.11 FIELD [SITE] CONDITIONS [NOT USED]**

**1.12 WARRANTY [NOT USED]**

**PART 2 - PRODUCTS [NOT USED]**

**PART 3 - EXECUTION**

**3.1 INSTALLERS [NOT USED]**

**3.2 EXAMINATION [NOT USED]**

**3.3 PREPARATION [NOT USED]**

**3.4 APPLICATION**

**3.5 REPAIR / RESTORATION [NOT USED]**

**3.6 RE-INSTALLATION [NOT USED]**

**3.7 FIELD [or] SITE QUALITY CONTROL**

- A. It is the Contractor’s responsibility to maintain all stakes and control data placed by the City in accordance with this Specification.
- B. Do not change or relocate stakes or control data without approval from the City.

**3.8 SYSTEM STARTUP [NOT USED]**

**3.9 ADJUSTING [NOT USED]**

**3.10 CLEANING [NOT USED]**

**3.11 CLOSEOUT ACTIVITIES [NOT USED]**

**3.12 PROTECTION [NOT USED]**

**3.13 MAINTENANCE [NOT USED]**

**3.14 ATTACHMENTS [NOT USED]**

**END OF SECTION**

Revision Log		
DATE	NAME	SUMMARY OF CHANGE
4/7/2014	M.Domenech	Revised for DAP application

**SECTION 01 74 23**  
**CLEANING**

**PART 1 - GENERAL**

**1.1 SUMMARY**

A. Section Includes:

1. Intermediate and final cleaning for Work not including special cleaning of closed systems specified elsewhere

B. Deviations from this City of Fort Worth Standard Specification

1. None.

C. Related Specification Sections include, but are not necessarily limited to:

1. Division 0 – Bidding Requirements, Contract Forms and Conditions of the Contract
2. Division 1 – General Requirements
3. Section 32 92 13 – Hydro-Mulching, Seeding and Sodding

**1.2 PRICE AND PAYMENT PROCEDURES**

A. Measurement and Payment

1. Work associated with this Item is considered subsidiary to the various Items bid. No separate payment will be allowed for this Item.

**1.3 REFERENCES [NOT USED]**

**1.4 ADMINISTRATIVE REQUIREMENTS**

A. Scheduling

1. Schedule cleaning operations so that dust and other contaminants disturbed by cleaning process will not fall on newly painted surfaces.
2. Schedule final cleaning upon completion of Work and immediately prior to final inspection.

**1.5 SUBMITTALS [NOT USED]**

**1.6 ACTION SUBMITTALS/INFORMATIONAL SUBMITTALS [NOT USED]**

**1.7 CLOSEOUT SUBMITTALS [NOT USED]**

**1.8 MAINTENANCE MATERIAL SUBMITTALS [NOT USED]**

**1.9 QUALITY ASSURANCE [NOT USED]**

**1.10 STORAGE, AND HANDLING**

A. Storage and Handling Requirements

1. Store cleaning products and cleaning wastes in containers specifically designed for those materials.

**1.11 FIELD [SITE] CONDITIONS [NOT USED]**

**1.12 WARRANTY [NOT USED]**

**PART 2 - PRODUCTS**

**2.1 OWNER-FURNISHED [or] OWNER-SUPPLIED PRODUCTS [NOT USED]**

**2.2 MATERIALS**

A. Cleaning Agents

1. Compatible with surface being cleaned
2. New and uncontaminated
3. For manufactured surfaces
  - a. Material recommended by manufacturer

**2.3 ACCESSORIES [NOT USED]**

**2.4 SOURCE QUALITY CONTROL [NOT USED]**

**PART 3 - EXECUTION**

**3.1 INSTALLERS [NOT USED]**

**3.2 EXAMINATION [NOT USED]**

**3.3 PREPARATION [NOT USED]**

**3.4 APPLICATION [NOT USED]**

**3.5 REPAIR / RESTORATION [NOT USED]**

**3.6 RE-INSTALLATION [NOT USED]**

**3.7 FIELD [or] SITE QUALITY CONTROL [NOT USED]**

**3.8 SYSTEM STARTUP [NOT USED]**

**3.9 ADJUSTING [NOT USED]**

**3.10 CLEANING**

A. General

1. Prevent accumulation of wastes that create hazardous conditions.
2. Conduct cleaning and disposal operations to comply with laws and safety orders of governing authorities.
3. Do not dispose of volatile wastes such as mineral spirits, oil or paint thinner in storm or sanitary drains or sewers.
4. Dispose of degradable debris at an approved solid waste disposal site.
5. Dispose of nondegradable debris at an approved solid waste disposal site or in an alternate manner approved by City and regulatory agencies.

6. Handle materials in a controlled manner with as few handlings as possible.
7. Thoroughly clean, sweep, wash and polish all Work and equipment associated with this project.
8. Remove all signs of temporary construction and activities incidental to construction of required permanent Work.
9. If project is not cleaned to the satisfaction of the City, the City reserves the right to have the cleaning completed at the expense of the Contractor.
10. Do not burn on-site.

**B. Intermediate Cleaning during Construction**

1. Keep Work areas clean so as not to hinder health, safety or convenience of personnel in existing facility operations.
2. At maximum weekly intervals, dispose of waste materials, debris and rubbish.
3. Confine construction debris daily in strategically located container(s):
  - a. Cover to prevent blowing by wind
  - b. Store debris away from construction or operational activities
  - c. Haul from site at a minimum of once per week
4. Vacuum clean interior areas when ready to receive finish painting.
  - a. Continue vacuum cleaning on an as-needed basis, until Final Acceptance.
5. Prior to storm events, thoroughly clean site of all loose or unsecured items, which may become airborne or transported by flowing water during the storm.

**C. Exterior (Site or Right of Way) Final Cleaning**

1. Remove trash and debris containers from site.
  - a. Re-seed areas disturbed by location of trash and debris containers in accordance with Section 32 92 13.
2. Sweep roadway to remove all rocks, pieces of asphalt, concrete or any other object that may hinder or disrupt the flow of traffic along the roadway.
3. Clean any interior areas including, but not limited to, vaults, manholes, structures, junction boxes and inlets.
4. If no longer required for maintenance of erosion facilities, and upon approval by City, remove erosion control from site.
5. Clean signs, lights, signals, etc.

**3.11 CLOSEOUT ACTIVITIES [NOT USED]**

**3.12 PROTECTION [NOT USED]**

**3.13 MAINTENANCE [NOT USED]**

**3.14 ATTACHMENTS [NOT USED]**



**END OF SECTION**

Revision Log		
DATE	NAME	SUMMARY OF CHANGE
4/7/2014	M.Domenech	Revised for DAP application

**SECTION 01 77 19**  
**CLOSEOUT REQUIREMENTS**

**PART 1 - GENERAL**

**1.1 SUMMARY**

- A. Section Includes:
  - 1. The procedure for closing out a contract
- B. Deviations from this City of Fort Worth Standard Specification
  - 1. None.
- C. Related Specification Sections include, but are not necessarily limited to:
  - 1. Division 0 – Bidding Requirements, Contract Forms and Conditions of the Contract
  - 2. Division 1 – General Requirements

**1.2 PRICE AND PAYMENT PROCEDURES**

- A. Measurement and Payment
  - 1. Work associated with this Item is considered subsidiary to the various Items bid.  
No separate payment will be allowed for this Item.

**1.3 REFERENCES [NOT USED]**

**1.4 ADMINISTRATIVE REQUIREMENTS**

- A. Guarantees, Bonds and Affidavits
  - 1. No application for final payment will be accepted until all guarantees, bonds, certificates, licenses and affidavits required for Work or equipment as specified are satisfactorily filed with the City.
- B. Release of Liens or Claims
  - 1. No application for final payment will be accepted until satisfactory evidence of release of liens has been submitted to the City.

**1.5 SUBMITTALS**

- A. Submit all required documentation to City's Project Representative.

**1.6 INFORMATIONAL SUBMITTALS [NOT USED]**

**1.7 CLOSEOUT SUBMITTALS [NOT USED]**

**PART 2 - PRODUCTS [NOT USED]**

**PART 3 - EXECUTION**

**3.1 INSTALLERS [NOT USED]**

**3.2 EXAMINATION [NOT USED]**

**3.3 PREPARATION [NOT USED]**

**3.4 CLOSEOUT PROCEDURE**

- A. Prior to requesting Final Inspection, submit:
  - 1. Project Record Documents in accordance with Section 01 78 39
  - 2. Operation and Maintenance Data, if required, in accordance with Section 01 78 23
- B. Prior to requesting Final Inspection, perform final cleaning in accordance with Section 01 74 23.
- C. Final Inspection
  - 1. After final cleaning, provide notice to the City Project Representative that the Work is completed.
    - a. The City will make an initial Final Inspection with the Contractor present.
    - b. Upon completion of this inspection, the City will notify the Contractor, in writing within 10 business days, of any particulars in which this inspection reveals that the Work is defective or incomplete.
  - 2. Upon receiving written notice from the City, immediately undertake the Work required to remedy deficiencies and complete the Work to the satisfaction of the City.
  - 3. Upon completion of Work associated with the items listed in the City's written notice, inform the City, that the required Work has been completed. Upon receipt of this notice, the City, in the presence of the Contractor, will make a subsequent Final Inspection of the project.
  - 4. Provide all special accessories required to place each item of equipment in full operation. These special accessory items include, but are not limited to:
    - a. Specified spare parts
    - b. Adequate oil and grease as required for the first lubrication of the equipment
    - c. Initial fill up of all chemical tanks and fuel tanks
    - d. Light bulbs
    - e. Fuses
    - f. Vault keys
    - g. Handwheels
    - h. Other expendable items as required for initial start-up and operation of all equipment
- D. Notice of Project Completion

1. Once the City Project Representative finds the Work subsequent to Final Inspection to be satisfactory, the City will issue a Notice of Project Completion (Green Sheet).

E. Supporting Documentation

1. Coordinate with the City Project Representative to complete the following additional forms:
  - a. Final Payment Request
  - b. Statement of Contract Time
  - c. Affidavit of Payment and Release of Liens
  - d. Consent of Surety to Final Payment
  - e. Pipe Report (if required)
  - f. Contractor’s Evaluation of City
  - g. Performance Evaluation of Contractor

F. Letter of Final Acceptance

1. Upon review and acceptance of Notice of Project Completion and Supporting Documentation, in accordance with General Conditions, City will issue Letter of Final Acceptance and release the Final Payment Request for payment.

**3.5 REPAIR / RESTORATION [NOT USED]**

**3.6 RE-INSTALLATION [NOT USED]**

**3.7 FIELD [or] SITE QUALITY CONTROL [NOT USED]**

**3.8 SYSTEM STARTUP [NOT USED]**

**3.9 ADJUSTING [NOT USED]**

**3.10 CLEANING [NOT USED]**

**3.11 CLOSEOUT ACTIVITIES [NOT USED]**

**3.12 PROTECTION [NOT USED]**

**3.13 MAINTENANCE [NOT USED]**

**3.14 ATTACHMENTS [NOT USED]**

**END OF SECTION**

Revision Log		
DATE	NAME	SUMMARY OF CHANGE
4/7/2014	M.Domenech	Revised for DAP application

**SECTION 01 78 23**  
**OPERATION AND MAINTENANCE DATA**

**PART 1 - GENERAL**

**1.1 SUMMARY**

- A. Section Includes:
  - 1. Product data and related information appropriate for City's maintenance and operation of products furnished under Contract
  - 2. Such products may include, but are not limited to:
    - a. Traffic Controllers
    - b. Irrigation Controllers (to be operated by the City)
    - c. Butterfly Valves
- B. Deviations from this City of Fort Worth Standard Specification
  - 1. None.
- C. Related Specification Sections include, but are not necessarily limited to:
  - 1. Division 0 – Bidding Requirements, Contract Forms and Conditions of the Contract
  - 2. Division 1 – General Requirements

**1.2 PRICE AND PAYMENT PROCEDURES**

- A. Measurement and Payment
  - 1. Work associated with this Item is considered subsidiary to the various Items bid. No separate payment will be allowed for this Item.

**1.3 REFERENCES [NOT USED]**

**1.4 ADMINISTRATIVE REQUIREMENTS**

- A. Schedule
  - 1. Submit manuals in final form to the City within 30 calendar days of product shipment to the project site.

**1.5 SUBMITTALS**

- A. Submittals shall be in accordance with Section 01 33 00. All submittals shall be approved by the City prior to delivery.

**1.6 INFORMATIONAL SUBMITTALS**

- A. Submittal Form
  - 1. Prepare data in form of an instructional manual for use by City personnel.
  - 2. Format
    - a. Size: 8 ½ inches x 11 inches
    - b. Paper
      - 1) 40 pound minimum, white, for typed pages
      - 2) Holes reinforced with plastic, cloth or metal
    - c. Text: Manufacturer's printed data, or neatly typewritten

- d. Drawings
    - 1) Provide reinforced punched binder tab, bind in with text
    - 2) Reduce larger drawings and fold to size of text pages.
  - e. Provide fly-leaf for each separate product, or each piece of operating equipment.
    - 1) Provide typed description of product, and major component parts of equipment.
    - 2) Provide indexed tabs.
  - f. Cover
    - 1) Identify each volume with typed or printed title "OPERATING AND MAINTENANCE INSTRUCTIONS".
    - 2) List:
      - a) Title of Project
      - b) Identity of separate structure as applicable
      - c) Identity of general subject matter covered in the manual
3. Binders
- a. Commercial quality 3-ring binders with durable and cleanable plastic covers
  - b. When multiple binders are used, correlate the data into related consistent groupings.
4. If available, provide an electronic form of the O&M Manual.
- B. Manual Content
- 1. Neatly typewritten table of contents for each volume, arranged in systematic order
    - a. Contractor, name of responsible principal, address and telephone number
    - b. A list of each product required to be included, indexed to content of the volume
    - c. List, with each product:
      - 1) The name, address and telephone number of the subcontractor or installer
      - 2) A list of each product required to be included, indexed to content of the volume
      - 3) Identify area of responsibility of each
      - 4) Local source of supply for parts and replacement
    - d. Identify each product by product name and other identifying symbols as set forth in Contract Documents.
  - 2. Product Data
    - a. Include only those sheets which are pertinent to the specific product.
    - b. Annotate each sheet to:
      - 1) Clearly identify specific product or part installed
      - 2) Clearly identify data applicable to installation
      - 3) Delete references to inapplicable information
  - 3. Drawings
    - a. Supplement product data with drawings as necessary to clearly illustrate:
      - 1) Relations of component parts of equipment and systems
      - 2) Control and flow diagrams
    - b. Coordinate drawings with information in Project Record Documents to assure correct illustration of completed installation.
    - c. Do not use Project Record Drawings as maintenance drawings.
  - 4. Written text, as required to supplement product data for the particular installation:
    - a. Organize in consistent format under separate headings for different procedures.
    - b. Provide logical sequence of instructions of each procedure.

5. Copy of each warranty, bond and service contract issued
  - a. Provide information sheet for City personnel giving:
    - 1) Proper procedures in event of failure
    - 2) Instances which might affect validity of warranties or bonds
- C. Manual for Materials and Finishes
  1. Submit 5 copies of complete manual in final form.
  2. Content, for architectural products, applied materials and finishes:
    - a. Manufacturer's data, giving full information on products
      - 1) Catalog number, size, composition
      - 2) Color and texture designations
      - 3) Information required for reordering special manufactured products
    - b. Instructions for care and maintenance
      - 1) Manufacturer's recommendation for types of cleaning agents and methods
      - 2) Cautions against cleaning agents and methods which are detrimental to product
      - 3) Recommended schedule for cleaning and maintenance
  3. Content, for moisture protection and weather exposure products:
    - a. Manufacturer's data, giving full information on products
      - 1) Applicable standards
      - 2) Chemical composition
      - 3) Details of installation
    - b. Instructions for inspection, maintenance and repair
- D. Manual for Equipment and Systems
  1. Submit 5 copies of complete manual in final form.
  2. Content, for each unit of equipment and system, as appropriate:
    - a. Description of unit and component parts
      - 1) Function, normal operating characteristics and limiting conditions
      - 2) Performance curves, engineering data and tests
      - 3) Complete nomenclature and commercial number of replaceable parts
    - b. Operating procedures
      - 1) Start-up, break-in, routine and normal operating instructions
      - 2) Regulation, control, stopping, shut-down and emergency instructions
      - 3) Summer and winter operating instructions
      - 4) Special operating instructions
    - c. Maintenance procedures
      - 1) Routine operations
      - 2) Guide to "trouble shooting"
      - 3) Disassembly, repair and reassembly
      - 4) Alignment, adjusting and checking
    - d. Servicing and lubrication schedule
      - 1) List of lubricants required
    - e. Manufacturer's printed operating and maintenance instructions
    - f. Description of sequence of operation by control manufacturer
      - 1) Predicted life of parts subject to wear
      - 2) Items recommended to be stocked as spare parts
    - g. As installed control diagrams by controls manufacturer
    - h. Each contractor's coordination drawings
      - 1) As installed color coded piping diagrams

- i. Charts of valve tag numbers, with location and function of each valve
  - j. List of original manufacturer's spare parts, manufacturer's current prices, and recommended quantities to be maintained in storage
  - k. Other data as required under pertinent Sections of Specifications
3. Content, for each electric and electronic system, as appropriate:
- a. Description of system and component parts
    - 1) Function, normal operating characteristics, and limiting conditions
    - 2) Performance curves, engineering data and tests
    - 3) Complete nomenclature and commercial number of replaceable parts
  - b. Circuit directories of panelboards
    - 1) Electrical service
    - 2) Controls
    - 3) Communications
  - c. As installed color coded wiring diagrams
  - d. Operating procedures
    - 1) Routine and normal operating instructions
    - 2) Sequences required
    - 3) Special operating instructions
  - e. Maintenance procedures
    - 1) Routine operations
    - 2) Guide to "trouble shooting"
    - 3) Disassembly, repair and reassembly
    - 4) Adjustment and checking
  - f. Manufacturer's printed operating and maintenance instructions
  - g. List of original manufacturer's spare parts, manufacturer's current prices, and recommended quantities to be maintained in storage
  - h. Other data as required under pertinent Sections of Specifications
4. Prepare and include additional data when the need for such data becomes apparent during instruction of City's personnel.

### **1.7 CLOSEOUT SUBMITTALS [NOT USED]**

### **1.8 MAINTENANCE MATERIAL SUBMITTALS [NOT USED]**

### **1.9 QUALITY ASSURANCE**

- A. Provide operation and maintenance data by personnel with the following criteria:
1. Trained and experienced in maintenance and operation of described products
  2. Skilled as technical writer to the extent required to communicate essential data
  3. Skilled as draftsman competent to prepare required drawings



**1.10 DELIVERY, STORAGE, AND HANDLING [NOT USED]**

**1.11 FIELD [SITE] CONDITIONS [NOT USED]**

**1.12 WARRANTY [NOT USED]**

**PART 2 - PRODUCTS [NOT USED]**

**PART 3 - EXECUTION [NOT USED]**

**END OF SECTION**

Revision Log		
DATE	NAME	SUMMARY OF CHANGE
8/31/2012	D. Johnson	1.5.A.1 – title of section removed
4/7/2014	M.Domenech	Revised for DAP Application

**SECTION 01 78 39**  
**PROJECT RECORD DOCUMENTS**

**PART 1 - GENERAL**

**1.1 SUMMARY**

- A. Section Includes:
  - 1. Work associated with the documenting the project and recording changes to project documents, including:
    - a. Record Drawings
    - b. Water Meter Service Reports
    - c. Sanitary Sewer Service Reports
    - d. Large Water Meter Reports
- B. Deviations from this City of Fort Worth Standard Specification
  - 1. None.
- C. Related Specification Sections include, but are not necessarily limited to:
  - 1. Division 0 – Bidding Requirements, Contract Forms and Conditions of the Contract
  - 2. Division 1 – General Requirements

**1.2 PRICE AND PAYMENT PROCEDURES**

- A. Measurement and Payment
  - 1. Work associated with this Item is considered subsidiary to the various Items bid. No separate payment will be allowed for this Item.

**1.3 REFERENCES [NOT USED]**

**1.4 ADMINISTRATIVE REQUIREMENTS [NOT USED]**

**1.5 SUBMITTALS**

- A. Prior to submitting a request for Final Inspection, deliver Project Record Documents to City's Project Representative.

**1.6 ACTION SUBMITTALS/INFORMATIONAL SUBMITTALS [NOT USED]**

**1.7 CLOSEOUT SUBMITTALS [NOT USED]**

**1.8 MAINTENANCE MATERIAL SUBMITTALS [NOT USED]**

**1.9 QUALITY ASSURANCE**

- A. Accuracy of Records
  - 1. Thoroughly coordinate changes within the Record Documents, making adequate and proper entries on each page of Specifications and each sheet of Drawings and other Documents where such entry is required to show the change properly.
  - 2. Accuracy of records shall be such that future search for items shown in the Contract Documents may rely reasonably on information obtained from the approved Project Record Documents.

3. To facilitate accuracy of records, make entries within 24 hours after receipt of information that the change has occurred.
4. Provide factual information regarding all aspects of the Work, both concealed and visible, to enable future modification of the Work to proceed without lengthy and expensive site measurement, investigation and examination.

#### **1.10 STORAGE AND HANDLING**

##### **A. Storage and Handling Requirements**

1. Maintain the job set of Record Documents completely protected from deterioration and from loss and damage until completion of the Work and transfer of all recorded data to the final Project Record Documents.
2. In the event of loss of recorded data, use means necessary to again secure the data to the City's approval.
  - a. In such case, provide replacements to the standards originally required by the Contract Documents.

#### **1.11 FIELD [SITE] CONDITIONS [NOT USED]**

#### **1.12 WARRANTY [NOT USED]**

### **PART 2 - PRODUCTS**

#### **2.1 OWNER-FURNISHED [OR] OWNER-SUPPLIED PRODUCTS [NOT USED]**

#### **2.2 RECORD DOCUMENTS**

##### **A. Job set**

1. Promptly following receipt of the Notice to Proceed, secure from the City, at no charge to the Contractor, 1 complete set of all Documents comprising the Contract.

##### **B. Final Record Documents**

1. At a time nearing the completion of the Work and prior to Final Inspection, provide the City 1 complete set of all Final Record Drawings in the Contract.

#### **2.3 ACCESSORIES [NOT USED]**

#### **2.4 SOURCE QUALITY CONTROL [NOT USED]**

### **PART 3 - EXECUTION**

#### **3.1 INSTALLERS [NOT USED]**

#### **3.2 EXAMINATION [NOT USED]**

#### **3.3 PREPARATION [NOT USED]**

#### **3.4 MAINTENANCE DOCUMENTS**

##### **A. Maintenance of Job Set**

1. Immediately upon receipt of the job set, identify each of the Documents with the title, "RECORD DOCUMENTS - JOB SET".

2. Preservation
  - a. Considering the Contract completion time, the probable number of occasions upon which the job set must be taken out for new entries and for examination, and the conditions under which these activities will be performed, devise a suitable method for protecting the job set.
  - b. Do not use the job set for any purpose except entry of new data and for review by the City, until start of transfer of data to final Project Record Documents.
  - c. Maintain the job set at the site of work.
3. Coordination with Construction Survey
  - a. At a minimum clearly mark any deviations from Contract Documents associated with installation of the infrastructure.
4. Making entries on Drawings
  - a. Record any deviations from Contract Documents.
  - b. Use an erasable colored pencil (not ink or indelible pencil), clearly describe the change by graphic line and note as required.
  - c. Date all entries.
  - d. Call attention to the entry by a "cloud" drawn around the area or areas affected.
  - e. In the event of overlapping changes, use different colors for the overlapping changes.
5. Conversion of schematic layouts
  - a. In some cases on the Drawings, arrangements of conduits, circuits, piping, ducts, and similar items, are shown schematically and are not intended to portray precise physical layout.
    - 1) Final physical arrangement is determined by the Contractor, subject to the City's approval.
    - 2) However, design of future modifications of the facility may require accurate information as to the final physical layout of items which are shown only schematically on the Drawings.
  - b. Show on the job set of Record Drawings, by dimension accurate to within 1 inch, the centerline of each run of items.
    - 1) Final physical arrangement is determined by the Contractor, subject to the City's approval.
    - 2) Show, by symbol or note, the vertical location of the Item ("under slab", "in ceiling plenum", "exposed", and the like).
    - 3) Make all identification sufficiently descriptive that it may be related reliably to the Specifications.
  - c. The City may waive the requirements for conversion of schematic layouts where, in the City's judgment, conversion serves no useful purpose. However, do not rely upon waivers being issued except as specifically issued in writing by the City.

## B. Final Project Record Documents

1. Transfer of data to Drawings
  - a. Carefully transfer change data shown on the job set of Record Drawings to the corresponding final documents, coordinating the changes as required.
  - b. Clearly indicate at each affected detail and other Drawing a full description of changes made during construction, and the actual location of items.
  - c. Call attention to each entry by drawing a "cloud" around the area or areas affected.

- d. Make changes neatly, consistently and with the proper media to assure longevity and clear reproduction.
- 2. Transfer of data to other Documents
  - a. If the Documents, other than Drawings, have been kept clean during progress of the Work, and if entries thereon have been orderly to the approval of the City, the job set of those Documents, other than Drawings, will be accepted as final Record Documents.
  - b. If any such Document is not so approved by the City, secure a new copy of that Document from the City at the City's usual charge for reproduction and handling, and carefully transfer the change data to the new copy to the approval of the City.

**3.5 REPAIR / RESTORATION [NOT USED]**

**3.6 RE-INSTALLATION [NOT USED]**

**3.7 FIELD [OR] SITE QUALITY CONTROL [NOT USED]**

**3.8 SYSTEM STARTUP [NOT USED]**

**3.9 ADJUSTING [NOT USED]**

**3.10 CLEANING [NOT USED]**

**3.11 CLOSEOUT ACTIVITIES [NOT USED]**

**3.12 PROTECTION [NOT USED]**

**3.13 MAINTENANCE [NOT USED]**

**3.14 ATTACHMENTS [NOT USED]**

**END OF SECTION**

Revision Log		
DATE	NAME	SUMMARY OF CHANGE
4/7/2014	M.Domenech	Revised for DAP Application

**SECTION 33 04 12**  
**MAGNESIUM ANODE CATHODIC PROTECTION**

**PART 1 - GENERAL**

**1.1 SUMMARY**

- A. Section Includes:
1. Requirements for Cathodic Protection Systems on concrete cylinder pipes, carbon steel pipes and ductile iron pipes using Magnesium Anodes
  2. **Requirements for performing Soil Corrosivity Investigation and Cathodic Protection System Design.**
  3. The Cathodic Protection System shall include, but not be limited to the following:
    - a. Materials and installation
    - b. Post-installation survey
    - c. Final Report to include recommendations
- B. Deviations from this City of Fort Worth Standard Specification
1. **Added 1.1.A.2**
  2. **Added 1.1.C.3 & 4**
  3. **Modified 1.2.A.1**
  4. **Added 1.2.A.2**
  5. **Added 1.6.B & C**
  6. **Added 1.9.A.2**
- C. Related Specification Sections include, but are not necessarily limited to:
1. Division 0 – Bidding Requirements, Contract Forms, and Conditions of the Contract
  2. Division 1 – General Requirements
  3. **Section 33 04 10 – Joint Bonding and Electrical Isolation**
  4. **Section 33 04 11 – Corrosion Control Test Stations**
  5. Section 33 05 26 – Utility Markers/Locators

**1.2 PRICE AND PAYMENT PROCEDURES**

- A. Measurement and Payment
1. **Cathodic Protection**
    - a. Measurement
      - 1) Measurement for this Item shall be by lump sum.
    - b. Payment:
      - 1) The work performed and materials furnished in accordance with this Item shall be paid for at the lump sum price bid for “Cathodic Protection” for each material of utility pipe bid.
    - c. The price bid shall include:
      - 1) Mobilization
      - 2) Anode groundbeds
      - 3) Anode test stations
      - 4) Excavation

- 5) Furnishing, placement, and compaction of backfill
  - 6) Field welding
  - 7) Connections
  - 8) Adjustments
  - 9) Testing
  - 10) Clean-up
  - 11) Start-up/Commissioning
2. **Soil Corrosivity Investigation and Cathodic Protection Design**
- a. **Measurement**
    - 1) **Measurement for this Item shall be by lump sum.**
  - b. **Payment:**
    - 1) **The work performed and materials furnished in accordance with this Item shall be paid for at the lump sum price bid for “Soil Corrosivity Investigation and Cathodic Protection Design”.**
  - c. **The price bid shall include:**
    - 1) **In-Situ soil resistivity testing**
    - 2) **Soil analysis**
    - 3) **Foreign utility investigation**
    - 4) **Soil corrosivity report**
    - 5) **Cathodic protection design**

### 1.3 REFERENCES

#### A. Abbreviations and Acronyms

1. AWG: American Wire Gauge
2. CSE: Copper/Copper Sulfate Reference Electrode
3. HMWPE: High Molecular Weight Polyethylene

#### B. Definitions

1. Anode: The electrode of an electrochemical cell at which oxidation occurs.
2. Cable/Wire: One conductor or multiple conductors insulated from one another.
3. Cathode: The electrode of an electrochemical cell at which reduction is the principal reaction.
4. Cathodic Polarization: The change of electrode potential in the negative direction caused by direct current (DC) flow across the electrode/electrolyte interface.
5. Cathodic Protection: A technique used to reduce the corrosion of a metal surface by making that surface the cathode of an electrochemical cell.
6. Corrosion: Degradation of a material, usually a metal, that results from a reaction with its environment.
7. Corrosion Control Engineer: NACE certified, licensed engineer in the state of Texas, employed by a Corrosion Engineering Firm.
8. Corrosion Engineering Firm: Engineering firm in charge of the corrosion protection design on behalf of the Contractor.
9. Criterion: Standard for assessment of the effectiveness of a Cathodic Protection System.
10. Current: Flow of electric charge.
11. Electrode: A conductor used to establish contact with an electrolyte and through which current is transferred to or from an electrolyte.

12. Electrolyte: A chemical substance containing ions that migrate in an electric field (i.e., soil or water).
13. Foreign Structure: Any metallic structure that is not intended as a part of a system under Cathodic Protection.
14. Galvanic Anode: A metal that provides sacrificial protection to another metal that is less active (more noble) when electrically coupled in an electrolyte.
15. Interference: Any electrical disturbance on a metallic structure as a result of stray current.
16. Pipe-to-Electrolyte Potential: The potential difference between the pipe and the electrolyte that is measured with reference to an electrode in contact with the electrolyte.
17. Polarized Potential: The potential across the structure/electrolyte interface that is the sum of the free corrosion potential and the cathodic polarization
18. Reference Electrode: An electrode whose open-circuit potential is constant under similar conditions of measurement and is used to measure the relative potentials of other electrodes
19. Stray Current: Current flow through paths other than the intended circuit.
20. Voltage: Electromotive force or difference in electrode potential expressed in volts.

C. Reference Standards

1. NACE International (NACE).

**1.4 ADMINISTRATIVE REQUIREMENTS [NOT USED]**

**1.5 SUBMITTALS**

- A. Submittals shall be in accordance with Section 01 33 00.
- B. All submittals shall be approved by the City prior to delivery.

**1.6 ACTION SUBMITTALS/INFORMATIONAL SUBMITTALS**

A. Product Data

1. Submit product data for all components of the Cathodic Protection System. Data submitted shall include:
  - a. Anodes
  - b. Anode Test Stations
  - c. Wiring
  - d. Splicing Materials
  - e. Thermite Weld Materials
  - f. Weld Coatings

**B. Shop Drawings**

1. **Soil Corrosivity Report sealed by a Licensed Professional Engineer in Texas including:**
  - a. **Perform in-situ soil resistivity testing**
    - 1) **Measure soil resistivity using the Wenner four-electrode method along the proposed alignment. The resistivity testing shall be conducted at 800 to 1,000 foot intervals to a depth of 10-feet below grade or the proposed pipeline depth, whichever is shallower.**
    - 2) **Collect samples at intervals of at least every 800 – 1,000 linear feet.**



- b. **Perform Soil Analysis**
    - 1) **Test collected soil samples for saturated resistivities, pH, and concentrations of chlorides, sulfates, and bicarbonates.**
  - c. **Perform Foreign Utility Investigation**
    - 1) **Coordinate with various utilities and agencies to map existing utilities in the general vicinity of the proposed water line. Identify existing assets that could potentially impact the corrosion control system for the proposed water line.**
  - d. **Report**
    - 1) **Prepare a soil corrosivity report with interpretation and analysis of the in-situ soil resistivity testing, laboratory soil analysis including soil sample resistivity testing and chemical analysis, and foreign utility investigation.**
    - 2) **Discuss the degree of corrosivity of the soil with respect to proposed pipeline material.**
    - 3) **Provide recommendations for corrosion control of the proposed material option.**
2. **Cathodic Protection Design sealed by a Licensed Professional Engineer in Texas including:**
  - a. **Drawings in accordance with Sections 33 04 10, 33 04 11, and this Section, as recommended in the approved Corrosivity Report.**

**C. Qualification Statements**

- 1. **Prior to performing soil corrosivity testing and design of cathodic protection system, submit qualifications for Licensed Professionals in accordance with Article 1.9 of this Section for review and acceptance by City.**

**1.7 CLOSEOUT SUBMITTALS**

- A. The results of all testing procedures shall be submitted to the Engineer or the City for review and approval. Testing information required includes:
  - 1. Anode groundbed current outputs
  - 2. Pipe-to-soil potentials
  - 3. Results of interference testing
  - 4. Results of electrical isolation joint tests
  - 5. Operating and maintenance instructions
- B. Results of all testing are to be submitted to Owner for inclusion in the O&M manual.
- C. Provide written documentation from the Corrosion Control Engineer of any deficiencies discovered during the post installation inspection.

**1.8 MAINTENANCE MATERIAL SUBMITTALS [NOT USED]**

**1.9 QUALITY ASSURANCE**

- A. Qualifications
  - 1. Cathodic Protection installer shall show adequate documented experience in the type of Cathodic Protection work required for the project.
  - 2. **Licensed Professionals**





1. Test stations shall consist of test wires, a terminal head and a traffic box as shown on the Drawings.
2. The terminal box shall be a 7 terminal NM-7 with cast iron lockable lid as manufactured by CP Test Services, or approved equal.
3. The Precast Concrete traffic box shall be a 10.25-inch diameter 3-RT with a cast iron cover marked "CP Test" as manufactured by Brooks Products, Inc, or approved equal.
4. If the area is not paved, the test station shall be installed in a 24-inch x 24-inch x 6-inch square concrete pad.
5. Install a marker sign adjacent to all flush-mounted test stations.

F. Shunt

1. Monitoring shunt shall be a 0.01 ohm Type RS shunt as manufactured by Holloway, or approved equal.
2. There shall be at least 1 shunt in each Magnesium Anode test station.

G. Test Lead Wire

1. Test station lead wires shall be #12 AWG stranded copper cable with type TW, THW or THHN insulation, black in color.

H. Permanent Reference Electrode

1. The permanent reference electrode shall be a copper sulfate Permacell Plus double membrane ceramic cell in a geomembrane package, as manufactured by Corpro Companies, Inc., or approved equal.
2. The permanent reference electrode shall be equipped with No. 14 AWG stranded copper wire with blue HMWPE insulation of suitable length to attach to the terminal board of the test station.

I. Marker Sign

1. Provide marker sign in accordance with Section 33 05 26.

**2.3 ACCESSORIES [NOT USED]**

**2.4 SOURCE QUALITY CONTROL [NOT USED]**

**PART 3 - EXECUTION**

**3.1 INSTALLERS [NOT USED]**

**3.2 EXAMINATION [NOT USED]**

**3.3 PREPARATION [NOT USED]**

**3.4 INSTALLATION**

A. Installation of Sacrificial Anodes

1. Placement
  - a. Each anode shall be installed vertically in a 12-inch diameter by 10 foot deep hole or by trench maintaining the same spacing as shown on the Drawings.
  - b. Centerline of the anode shall be at a minimum of 10 feet from the centerline of the pipe.

- c. Anodes shall be installed within the pipeline right-of-way.
  2. Augured Hole
    - a. The anode hole diameter shall easily accommodate the anode.
  3. Backfilling
    - a. After the hole is augured, the packaged anode shall be lowered into the hole and the soil shall be firmly tamped around the package so that it is in intimate contact with the package.
    - b. Pour a minimum of 5 gallons of water into the anode hole.
    - c. Backfill the remainder of the anode hole.
  4. Anode Lead Wire
    - a. Lead wires from the anodes shall be run underground at a minimum depth of 24 inches.
    - b. Each anode lead wire shall be connected to an anode header cable as indicated on the Drawings.
  5. Handling
    - a. Anodes shall be handled in a manner that will avoid damaging anode materials and wire connections.
- B. Installation of Permanent Anode
  1. Location
    - a. Install 1 permanent copper sulfate reference electrode at each anode ground bed.
    - b. The permanent reference electrode shall be within 6 inches of the pipe at pipe depth.
    - c. Prepare and install the permanent reference electrode in strict accordance with the manufacturer's recommendations.
  2. Placement
    - a. Place the permanent reference electrode in the same ditch with the water line and carefully covered with the same soil as the pipeline backfill.
  3. Lead Wire
    - a. Protect the permanent reference electrode lead wire during backfill operations and route to the test station along with the water line test leads and anode ground bed cables.
- C. Installation of Wire and Cable
  1. Depth
    - a. All underground wire and cable shall be installed at a minimum of 24 inches below final grade with a minimum separation of 6 inches from other underground structures.
  2. Anode Header Cable
    - a. Each anode lead wire shall be connected to a #10 AWG/HMWPE header cable which shall be routed into a flush-to-grade test station.
  3. Anode Lead Wire to Header Cable Connection
    - a. Each anode lead wire to header cable connection shall be made using a copper compression connector.
    - b. Each connection shall be taped using rubber tape, vinyl tape and coated with Scotchkote electrical coating as shown on the Drawings.
  4. Anode-to-Pipeline Connection

- a. Connect each group of anodes to the pipeline through a test station as shown on the Drawings.
  - b. A 0.01 ohm shunt shall be used to connect the anode header cable to the pipeline as shown on the Drawings.
5. A 3-inch wide, yellow, non-detectable warning tape labeled "Cathodic Protection Cable Buried Below" shall be buried at a depth of 18 inches below the surface and along the length of all Cathodic Protection cable trenches.

D. Test Lead Wire Attachment

1. Test lead cables shall be attached to the pipe by thermite welding.
2. The pipe to which the wires are to be attached shall be clean and dry.
3. A grinding wheel shall be used to remove all coating, mill scale, oxide, grease and dirt from the pipe over an area approximately 3 inches square.
  - a. The surface shall be cleaned to bright metal.
4. The wires to be thermite welded to the pipe shall have approximately 1 inch of insulation removed from each end, exposing clean, oxide-free copper for welding.
5. Charges and Molds
  - a. Weld charges and mold size shall be as specified by the manufacturer for the specific surface configuration.
  - b. Care shall be taken during installation to be sure correct charges are used.
  - c. Welding charges and molds shall be the product of a manufacturer regularly engaged in the production of such materials.
6. Using the proper size thermite weld mold as recommended by the manufacturer, the wire shall be placed between the graphite mold and the prepared metal surface.
7. The metal disk shall be placed in the bottom of the mold.
8. The cap from the weld charge container shall be removed and the contents poured into the mold.
9. Squeeze the bottom of the weld charge container to spread ignition powder over the charge.
10. Close the mold cover and ignite the starting powder with a flint gun. The mold should be held firmly in place until all of the charge has burned and the weld has cooled slightly.
11. Remove the thermite weld mold and gently strike the weld with a hammer to remove the weld slag.
12. Pull on the wire to assure a secure connection.
13. If the weld is not secure or the wire breaks, repeat the procedure.
14. If the weld is secure, coat all bare metal and weld metal with Stopaq CZ tape, or approved equal.

E. Flush-to-Grade Anode Test Stations

1. Flush-to-grade anode test stations shall be installed as shown on the Drawings.
2. Test stations shall be installed in a 24-inch x 24-inch x 6-inch square concrete pad.
3. Sufficient slack shall be coiled beneath the test station to allow for soil settlement and to prevent damage to the leads during backfilling.
  - a. Additional slack shall be left to allow for withdrawal of the terminal board a minimum of 12 inches above the top of the concrete pad for test purposes.

F. Post Installation Backfilling of Cables

1. General

- a. During the backfilling operation, cables shall be protected to prevent damage to the wire insulation and conductor integrity.

**3.5 REPAIR**

A. Cut wires shall be spliced by using a copper compression connector.

1. The connection shall be completely sealed against moisture penetration by the use of rubber tape, vinyl tape and Scotchkote electrical coating.

B. Damaged or missing test station components shall be replaced by equal components.

**3.6 RE-INSTALLATION [NOT USED]**

**3.7 FIELD QUALITY CONTROL**

A. Field Tests and Inspections

1. All components of the Cathodic Protection System shall be visually inspected by the City prior to commissioning of the system.

**3.8 SYSTEM STARTUP**

A. General

1. The Cathodic Protection System shall be inspected, energized and adjusted (commissioned) as soon as possible after the Cathodic Protection equipment has been installed.

B. Equipment

1. All Cathodic Protection testing instruments shall be in proper working order and calibrated according to factory specifications.

C. Commissioning

1. The commissioning of the Cathodic Protection System shall be performed by, or under the direct supervision of, the Corrosion Engineering Firm qualified to verify compliance with this Specification and with the referenced corrosion control standards set forth by NACE International.

D. Method

1. Measure native state structure-to-soil potentials along the water line using the permanent reference electrodes at each anode test station and a portable reference electrode at all other test stations and at above grade pipeline appurtenances.
2. Energize the Cathodic Protection System by connecting each Magnesium Anode groundbed to the pipeline lead in the test station junction box by means of a 0.01 ohm shunt.
3. Record each anode groundbed current using the shunt.
4. Allow sufficient time for the pipeline to polarize.
5. Adjust, if necessary, the Cathodic Protection current output in each anode test station to satisfy the 100-mV polarization shift criterion or the -850 millivolts-CSE polarized potential criterion as established by NACE International standards.
6. Record all final current outputs measured at each test station.

7. Verify that all electrical isolation devices are operating properly including flange isolators and casing spacers.
8. Verify that interference does not exist with foreign structures.
9. Perform joint tests with owners of the foreign structures (if any) and mitigate any interference detected.
10. If necessary, install resistance bonds to mitigate interference.
11. Interference testing coordination with the owners of foreign structures is the responsibility of the Cathodic Protection tester.

E. Verification and Responsibilities

1. Contractor shall correct, at his expense, any deficiencies in materials or installation procedures discovered during the post-installation inspection.

**3.9 ADJUSTING [NOT USED]**

**3.10 CLEANING [NOT USED]**

**3.11 CLOSEOUT ACTIVITIES [NOT USED]**

**3.12 PROTECTION [NOT USED]**

**3.13 MAINTENANCE [NOT USED]**

**3.14 ATTACHMENTS [NOT USED]**

**END OF SECTION**

Revision Log		
DATE	NAME	SUMMARY OF CHANGE





- 1 e) Various restraints
- 2 f) Various uses
- 3 c. The price bid shall include:
- 4 1) Furnishing and installing Ductile Iron Pipe with joints as specified by the
- 5 Drawings
- 6 2) Mobilization
- 7 3) Polyethylene encasement
- 8 4) Lining
- 9 5) Pavement removal
- 10 6) Excavation
- 11 7) Hauling
- 12 8) Disposal of excess material
- 13 9) Furnishing, placement and compaction of embedment
- 14 10) Furnishing, placement and compaction of backfill
- 15 11) Trench water stops
- 16 12) Thrust restraint, if required in Contract Documents
- 17 13) Bolts and nuts
- 18 14) Gaskets
- 19 15) Clean-up
- 20 16) Cleaning
- 21 17) Disinfection
- 22 18) Testing

### 23 1.3 REFERENCES

#### 24 A. Definitions

- 25 1. Gland or Follower Gland
- 26 a. Non-restrained, mechanical joint fitting
- 27 2. Retainer Gland
- 28 a. Mechanically restrained mechanical joint fitting

#### 29 B. Reference Standards

- 30 1. Reference standards cited in this Specification refer to the current reference
- 31 standard published at the time of the latest revision date logged at the end of this
- 32 Specification, unless a date is specifically cited.
- 33 2. American Association of State Highway and Transportation Officials (AASHTO).
- 34 3. American Society of Mechanical Engineers (ASME):
- 35 a. B16.1, Gray Iron Pipe Flanges and Flanged Fittings (Classes 25, 125 and 250).
- 36 4. ASTM International (ASTM):
- 37 a. A193, Standard Specification for Alloy-Steel and Stainless Steel Bolting for
- 38 High Temperature or High Pressure Service and Other Special Purpose
- 39 Applications
- 40 b. A194, Specification for Carbon and Alloy Steel Nuts for Bolts for High
- 41 Pressure or High Temperature Service, or Both
- 42 c. A242, Standard Specification for High-Strength Low-Alloy Structural Steel.
- 43 d. A307, Standard Specification for Carbon Steel Bolts and Studs, 60,000 psi
- 44 Tensile Strength.
- 45 e. A674, Standard Practice for Polyethylene Encasement for Ductile Iron Pipe for
- 46 Water or Other Liquids.

- f. B117, Standard Practice for Operating Salt Spray (Fog) Apparatus.
  - g. B633, Standard Specification for Electrodeposited Coatings of Zinc on Iron and Steel.
5. American Water Works Association (AWWA):
    - a. C203, Coal-Tar Protective Coatings and Linings for Steel Water Pipelines - Enamel and Tape - Hot Applied.
    - b. C600, Installation of Ductile-Iron Water Mains and their Appurtenances.
    - c. M41, Ductile-Iron Pipe and Fittings.
  6. American Water Works Association/American National Standards Institute (AWWA/ANSI):
    - a. C104/A21.4, Cement-Mortar Lining for Ductile-Iron Pipe and Fittings.
    - b. C105/A21.5, Polyethylene Encasement for Ductile-Iron Pipe Systems.
    - c. C111/A21.11, Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings.
    - d. C115/A21.15, Flanged Ductile-Iron Pipe with Ductile-Iron or Gray-Iron Threaded Flanges.
    - e. C150/A21.50, Thickness Design of Ductile-Iron Pipe.
    - f. C151/A21.51, Ductile-Iron Pipe, Centrifugally Cast, for Water.
    - g. C600, Installation of Ductile-Iron Water Mains and their Appurtenances
  7. NSF International (NSF):
    - a. 61, Drinking Water System Components - Health Effects.
  8. Society for Protective Coatings (SSPC):
    - a. PA 2, Measurement of Dry Coating Thickness with Magnetic Gages.

#### 1.4 ADMINISTRATIVE REQUIREMENTS [NOT USED]

#### 1.5 SUBMITTALS

- A. Submittals shall be in accordance with Section 01 33 00.
- B. All submittals shall be approved by the City prior to delivery and/or fabrication for specials.

#### 1.6 ACTION SUBMITTALS / INFORMATIONAL SUBMITTALS

- A. Product Data
  1. Interior lining
    - a. If it is other than cement mortar lining in accordance with AWWA/ANSI C104/A21.4, including:
      - 1) Material
      - 2) Application recommendations
      - 3) Field touch-up procedures
  2. Thrust Restraint
    - a. Retainer glands, thrust harnesses or any other means
  3. Gaskets
    - a. If hydrocarbon or other special gaskets are required
- B. Shop Drawings – Furnish for Ductile Iron Pipe used in the water distribution system or for a wastewater force main for 24-inch and greater diameters, including:
  1. Wall thickness design calculations sealed by a Licensed Professional Engineer in Texas including:

- 1 a. Working pressure
- 2 b. Surge pressure
- 3 c. Deflection
- 4 2. Provide thrust restraint calculations for all fittings and valves, sealed by a Licensed
- 5 Professional Engineer in Texas, to verify the restraint lengths shown in the
- 6 Drawings.
- 7 3. Lay schedule/drawing for 24-inch and greater diameters, sealed by a Licensed
- 8 Professional Engineer in Texas including:
- 9 a. Pipe class
- 10 b. Joints type
- 11 c. Fittings
- 12 d. Stationing
- 13 e. Transitions
- 14 f. Joint deflection

15 C. Certificates

- 16 1. Furnish an affidavit certifying that all Ductile Iron Pipe meets the provisions of this
- 17 Section, each run of pipe furnished has met Specifications, all inspections have
- 18 been made, and that all tests have been performed in accordance with
- 19 AWWA/ANSI C151/A21.51.
- 20 2. Furnish a certificate stating that buried bolts and nuts conform to ASTM B117.

21 **1.7 CLOSEOUT SUBMITTALS [NOT USED]**

22 **1.8 MAINTENANCE MATERIAL SUBMITTALS [NOT USED]**

23 **1.9 QUALITY ASSURANCE**

24 A. Qualifications

- 25 1. Manufacturers
- 26 a. Finished pipe shall be the product of 1 manufacturer.
- 27 1) Change orders, specials, and field changes may be provided by a different
- 28 manufacturer upon City approval.
- 29 b. Pipe manufacturing operations (pipe, lining, and coatings) shall be performed
- 30 under the control of the manufacturer.
- 31 c. Ductile Iron Pipe
- 32 1) Manufactured in accordance with AWWA/ANSI C151/A21.51
- 33 a) Perform quality control tests and maintain results as outlined within
- 34 standard to assure compliance.
- 35 2) Subject each pipe to a hydrostatic test of not less than 500 psi for duration
- 36 of at least 10 seconds.

37 B. Preconstruction Testing

- 38 1. The City may, at its own cost, subject random lengths of pipe for testing by an
- 39 independent laboratory for compliance with this Specification.
- 40 a. The compliance test shall be performed in the United States.
- 41 b. Any visible defects or failure to meet the quality standards herein will be
- 42 grounds for rejecting the entire order.

1 **1.10 DELIVERY, STORAGE, AND HANDLING**

2 A. Storage and Handling Requirements

- 3 1. Ductile Iron Pipe shall be stored and handled in accordance with the guidelines as  
4 stated in AWWA M41.  
5 2. Secure and maintain a location to store the material in accordance with Section 01  
6 66 00.

7 **1.11 FIELD [SITE] CONDITIONS [NOT USED]**

8 **1.12 WARRANTY [NOT USED]**

9 **PART 2 - PRODUCTS**

10 **2.1 OWNER-FURNISHED [OR] OWNER-SUPPLIED PRODUCTS [NOT USED]**

11 **2.2 EQUIPMENT, PRODUCT TYPES AND MATERIALS**

12 A. Manufacturers

- 13 1. Only the manufacturers as listed in the City’s Standard Products List will be  
14 considered as shown in Section 01 60 00.  
15 a. The manufacturer must comply with this Specification and related Sections.  
16 2. Any product that is not listed on the Standard Products List is considered a  
17 substitution and shall be submitted in accordance with Section 01 25 00.

18 B. Pipe

- 19 1. Pipe shall be in accordance with AWWA/ANSI C111/A21.11, AWWA/ANSI  
20 C150/A21.15, and AWWA/ANSI C151/A21.51.  
21 2. All pipe shall meet the requirements of NSF 61.  
22 3. Pipe shall have a lay length of 18 feet or 20 feet except for special fittings or  
23 closure pieces and necessary to comply with the Drawings.  
24 4. As a minimum the following pressures classes apply. The Drawings may specify a  
25 higher pressure class or the pressure and deflection design criteria may also require  
26 a higher pressure class, but in no case should they be less than the following:  
27

<b>Diameter (inches)</b>	<b>Min Pressure Class (psi)</b>
3 through 12	350
14 through 20	250
24	200
30 through 64	150

- 28  
29 **5. For sections of pipe deeper than 17 feet, Special Thickness Class (STC) 54 pipe**  
30 **is required. These stations include:**

- 31 a. **STA 2+50 to STA 3+22**  
32 6. Pipe markings shall meet the minimum requirements of AWWA/ANSI  
33 C151/A21.51. Minimum pipe markings shall be as follows:  
34 a. “DI” or “Ductile” shall be clearly labeled on each pipe

- 1 b. Weight, pressure class and nominal thickness of each pipe
- 2 c. Year and country pipe was cast
- 3 d. Manufacturer's mark
- 4 7. Pressure and Deflection Design
- 5 a. Pipe design shall be based on trench conditions and design pressure class
- 6 specified in the Drawings.
- 7 b. Pipe shall be designed according to the methods indicated in AWWA/ANSI
- 8 C150/A21.50, AWWA/ANSI C151/A21.51, and AWWA M41 for trench
- 9 construction, using the following parameters:
- 10 1) Unit Weight of Fill ( $w$ ) = 130 pcf
- 11 2) Live Load = AASHTO HS 20
- 12 3) Trench Depth = 12 feet minimum, or as indicated in Drawings
- 13 4) Bedding Conditions = Type 4
- 14 5) Working Pressure ( $P_w$ ) = 150 psi
- 15 6) Surge Allowance ( $P_s$ ) = 100 psi
- 16 7) Design Internal Pressure ( $P_i$ ) =  $P_w + P_s$  or 2:1 safety factor of the actual
- 17 working pressure plus the actual surge pressure, whichever is greater.
- 18 a) Test Pressure =
- 19 (1) No less than 1.25 minimum times the stated working pressure (187
- 20 psi minimum) of the pipeline measured at the highest elevation
- 21 along the test section.
- 22 (2) No less than 1.5 times the stated working pressure (225 psi
- 23 minimum) at the lowest elevation of the test section.
- 24 8) Maximum Calculated Deflection ( $D_x$ ) = 3 percent
- 25 9) Restrained Joint Safety Factor ( $S_f$ ) = 15 percent
- 26 c. Trench depths shall be verified after existing utilities are located.
- 27 1) Vertical alignment changes required because of existing utility or other
- 28 conflicts shall be accommodated by an appropriate change in pipe design
- 29 depth.
- 30 2) In no case shall pipe be installed deeper than its design allows.
- 31 8. Provisions for Thrust
- 32 a. Thrust at bends, tees, plugs or other fittings shall be mechanically restrained
- 33 joints when required by the Drawings, corrosion resistant joints.
- 34 b. In addition to the mechanical joint restraint required for all bends and fittings,
- 35 horizontal and vertical bends shall be restrained by concrete thrust blocking
- 36 and by mechanical joint restraint along the length of the pipe, as recommended
- 37 by the pipe manufacturer, unless shown otherwise in the design drawings.
- 38 Inclusion in the plans of dimensions for joint restraint lengths along the pipe, or
- 39 dimensions for concrete thrust blocking, shall be interpreted to mean the
- 40 exclusion of the other method of restraint, unless both methods are specifically
- 41 required in the plans.
- 42 c. No thrust restraint contribution shall be allowed for the restrained length of
- 43 pipe within the casing.
- 44 d. Restrained joints, when required, shall be used for a sufficient distance from
- 45 each side of the bend, tee, plug, valve or other fitting to resist thrust which will
- 46 be developed at the design pressure of the pipe. For the purpose of thrust, the
- 47 following shall apply:
- 48 1) Valves shall be calculated as dead ends.

- 1                   2) Design pressure shall be greater than the working pressure of the pipe or  
2                   the internal pressure ( $P_i$ ) whichever is greater.  
3                   3) Restrained joints shall consist of approved mechanical restrained or push-  
4                   on restrained joints as listed in the City's Standard Products List as shown  
5                   in Section 01 60 00.  
6                   e. The Pipe Manufacturer shall verify the length of pipe with restrained joints to  
7                   resist thrust in accordance with the Drawings, AWWA M41, and the following:  
8                   1) The weight of earth ( $W_e$ ) shall be calculated as the weight of the projected  
9                   soil prism above the pipe, for unsaturated soil conditions.  
10                  2) Soil density = 130 pcf (maximum value to be used), for unsaturated soil  
11                  conditions  
12                  3) If indicated on the Drawings and the Geotechnical Borings that ground  
13                  water is expected, account for reduced soil density.
- 14                  9. Joints  
15                  a. General – Comply with AWWA/ANSI C111/A21.11.  
16                  b. Push-On Joints  
17                  c. Mechanical Joints  
18                  d. Push-On Restrained Joints  
19                  1) Restraining Push-on joints by means of a special gasket  
20                  a) Only those products that are listed in Section 01 60 00  
21                  b) The working pressure rating of the restrained gasket must exceed the  
22                  test pressure of the pipe line to be installed.  
23                  c) Approved for use of restraining Ductile Iron Pipe in casing with a  
24                  carrier pipe of 4-inches to 12-inches  
25                  d) Otherwise only approved if specially listed on the Drawings  
26                  2) Push-on Restrained Joint bell and spigot  
27                  a) Only those products list in the standard products list will be allowed for  
28                  the size listed in the standard products list per Section 01 60 00.  
29                  b) Pressure rating shall exceed the working and test pressure of the pipe  
30                  line.  
31                  e. Flanged Joints – AWWA/ANSI C115/A21.15, ASME B16.1, Class 125  
32                  f. Flange bolt circles and bolt holes shall match those of ASME B16.1, Class 125.  
33                  g. Field fabricated flanges are prohibited.
- 34                  10. Gaskets  
35                  a. Provide Gaskets in accordance with Section 33 11 05.
- 36                  11. Isolation Flanges  
37                  a. Flanges required by the drawings to be Isolation Flanges shall conform to  
38                  Section 33 04 10.
- 39                  12. Bolts and Nuts  
40                  a. Mechanical Joints  
41                  1) Provide bolts and nuts in accordance with Section 33 11 05.  
42                  b. Flanged Ends  
43                  1) Meet requirements of AWWA C115.  
44                  a) Provide bolts and nuts in accordance with Section 33 11 05.
- 45                  13. Flange Coatings  
46                  a. Connections to Steel Flanges  
47                  1) Buried connections with Steel Flanges shall be coated with a Petrolatum  
48                  Tape System in accordance with Section 33 11 05.

14. Ductile Iron Pipe Exterior Coatings

- a. All ductile iron shall have an asphaltic coating, minimum of 1 mil thick, on the pipe exterior, unless otherwise specified in the Contract Documents.

15. Polyethylene Encasement

- a. All buried Ductile Iron Pipe shall be polyethylene encased.
- ~~b. Only manufacturers listed in the City's Standard Products List as shown in Section 01 60 00 will be considered acceptable.~~
- ~~c. Use only virgin polyethylene material.~~
- ~~d. Encasement for buried pipe shall be 8 mil linear low density (LLD) polyethylene conforming to AWWA/ANSI C105/A21.5 or 4 mil high density cross laminated (HDCL) polyethylene encasement conforming to AWWA/ANSI C105/A21.5 and ASTM A674.~~
- ~~e. Marking: At a minimum of every 2 feet along its length, the mark the polyethylene film with the following information:~~
  - ~~1) Manufacturer's name or trademark~~
  - ~~2) Year of manufacturer~~
  - ~~3) AWWA/ANSI C105/A21.5~~
  - ~~4) Minimum film thickness and material type~~
  - ~~5) Applicable range of nominal diameter sizes~~
  - ~~6) Warning Corrosion Protection Repair Any Damage~~
- ~~f. Special Markings/Colors~~
  - ~~1) Reclaimed Water, perform one of the following:~~
    - ~~a) Label polyethylene encasement with "RECLAIMED WATER";~~
    - ~~b) Provide purple polyethylene in accordance with the American Public Works Association Uniform Color Code; or~~
    - ~~c) Attach purple reclaimed water marker tape to the polyethylene wrap.~~
  - ~~2) Wastewater, perform one of the following:~~
    - ~~a) Label polyethylene encasement with "WASTEWATER";~~
    - ~~b) Provide green polyethylene in accordance with the American Public Works Association Uniform Color Code; or~~
    - ~~c) Attach green sanitary sewer marker tape to the polyethylene wrap.~~
- g. Polyethylene encasement for use with ductile iron pipe systems shall consist of three layers of co-extruded linear low density polyethylene (LLDPE), fused into a single thickness of not less than eight mils.
- h. The inside surface of the polyethylene wrap to be in contact with the pipe exterior shall be infused with a blend of anti-microbial biocide to mitigate microbiologically influenced corrosion and a volatile corrosion inhibitor to control galvanic corrosion.
- i. Minimum widths

**Polyethylene Tube and Sheet Sizes for Push-On Joint Pipe**

Nominal Pipe Diameter (inches)	Min. Width – Flat Tube (inches)	Min. Width – Sheet (inches)
3	14	28
4	14	28
6	16	32
8	20	40



10	24	48
12	27	54
14	30	60
16	34	68
18	37	74
20	41	82
24	54	108
30	67	134
36	81	162
42	81	162
48	95	190
54	108	216
60	108	216
64	121	242

16. Ductile Iron Pipe Interior Lining

a. Cement Mortar Lining

- 1) Ductile Iron Pipe for potable water shall have a cement mortar lining in accordance with AWWA/ANSI C104/A21.04 and be acceptable according to NSF 61.

b. Ceramic Epoxy or Epoxy Linings

- 1) Ductile Iron Pipe for use in wastewater applications shall be lined with a Ceramic Epoxy or Epoxy lining as designated in the City's Standard Products List as shown in Section 01 60 00.
- 2) Apply lining at a minimum of 40 mils DFT.
- 3) Due to the tolerances involved, the gasket area and spigot end up to 6 inches back from the end of the spigot end must be coated with 6 mils nominal, 10 mils maximum using a Joint Compound as supplied by the manufacturer.
  - a) Apply the joint compound by brush to ensure coverage.
  - b) Care should be taken that the joint compound is smooth without excess buildup in the gasket seat or on the spigot ends.
  - c) Coat the gasket seat and spigot ends after the application of the lining.
- 4) Surface preparation shall be in accordance with the manufacturer's recommendations.
- 5) Check thickness using a magnetic film thickness gauge in accordance with the method outlined in SSPC PA 2.
- 6) Test the interior lining of all pipe barrels for pinholes with a non-destructive 2,500 volt test.
  - a) Repair any defects prior to shipment.
- 7) Mark each fitting with the date of application of the lining system along with its numerical sequence of application on that date and records maintained by the applicator of his work.
- 8) For all Ductile Iron Pipe in wastewater service where the pipe has been cut, coat the exposed surface with the touch-up material as recommended by the manufacturer.
  - a) The touch-up material and the lining shall be of the same manufacturer.

1 **2.3 ACCESSORIES [NOT USED]**

2 **2.4 SOURCE QUALITY CONTROL [NOT USED]**

3 **PART 3 - EXECUTION**

4 **3.1 INSTALLERS [NOT USED]**

5 **3.2 EXAMINATION [NOT USED]**

6 **3.3 PREPARATION [NOT USED]**

7 **3.4 INSTALLATION**

8 A. General

- 9 1. Install pipe, fittings, specials and appurtenances as specified herein, as specified in  
10 AWWA C600, AWWA M41 and in accordance with the pipe manufacturer's  
11 recommendations.
- 12 2. See Section 33 11 11 for installation requirements for Ductile Iron Fittings.
- 13 3. Lay pipe to the lines and grades as indicated in the Drawings.
- 14 4. Excavate and backfill trenches in accordance with Section 33 05 10.
- 15 5. Embed Ductile Iron Pipe in accordance with Section 33 05 10.
- 16 6. For installation of carrier pipe within casing, see Section 33 05 24.

17 B. Pipe Handling

- 18 1. Haul and distribute pipe and fittings at the project site.
- 19 2. Handle piping with care to avoid damage.
  - 20 a. Inspect each joint of pipe and reject or repair any damaged pipe prior to  
21 lowering into the trench.
  - 22 b. Do not handle the pipe in such a way that will damage the interior lining.
  - 23 c. Use only nylon ropes, slings or other lifting devices that will not damage the  
24 surface of the pipe for handling the pipe.
- 25 3. At the close of each operating day:
  - 26 a. Keep the pipe clean and free of debris, dirt, animals and trash – during and after  
27 the laying operation.
  - 28 b. Effectively seal the open end of the pipe using a gasketed night cap.

29 C. Joint Making

30 1. Mechanical Joints

- 31 a. Bolt the follower ring into compression against the gasket with the bolts  
32 tightened down evenly then cross torqued in accordance with AWWA C600.
- 33 b. Overstressing of bolts to compensate for poor installation practice will not be  
34 permitted.

35 2. Push-on Joints

- 36 a. Install Push-on joints as defined in AWWA/ANSI C111/A21.11.
- 37 b. Wipe clean the gasket seat inside the bell of all extraneous matter.
- 38 c. Place the gasket in the bell in the position prescribed by the manufacturer.

- 1 d. Apply a thin film of non-toxic vegetable soap lubricant to the inside of the  
2 gasket and the outside of the spigot prior to entering the spigot into the bell.  
3 e. When using a field cut plain end piece of pipe, refinish the field cut and scarf to  
4 conform to AWWA C600.
- 5 3. Flanged Joints  
6 a. Use erection bolts and drift pins to make flanged connections.  
7 1) Do not use undue force or restraint on the ends of the fittings.  
8 2) Apply even and uniform pressure to the gasket.  
9 b. The fitting must be free to move in any direction while bolting.  
10 1) Install flange bolts with all bolt heads faced in one direction.
- 11 4. Joint Deflection  
12 a. Deflect the pipe only when necessary to avoid obstructions or to meet the lines  
13 and grades and shown in the Drawings.  
14 b. The deflection of each joint must be in accordance with AWWA C600 Table 3.  
15 c. The maximum deflection allowed is 50 percent of that indicated in AWWA  
16 C600.  
17 d. The manufacturer's recommendation may be used with the approval of the  
18 Engineer.
- 19 D. Polyethylene Encasement Installation  
20 1. Preparation  
21 a. Remove all lumps of clay, mud, cinders, etc., on pipe surface prior to  
22 installation of polyethylene encasement.  
23 1) Prevent soil or embedment material from becoming trapped between pipe  
24 and polyethylene.  
25 b. Fit polyethylene film to contour of pipe to affect a snug, but not tight encase  
26 with minimum space between polyethylene and pipe.  
27 1) Provide sufficient slack in contouring to prevent stretching polyethylene  
28 where it bridges irregular surfaces such as bell-spigot interfaces, bolted  
29 joints or fittings and to prevent damage to polyethylene due to backfilling  
30 operations.  
31 2) Secure overlaps and ends with adhesive tape and hold.  
32 c. For installations below water table and/or in areas subject to tidal actions, seal  
33 both ends of polyethylene tube with adhesive tape at joint overlap.
- 34 2. Tubular Type (Method A)  
35 a. Cut polyethylene tube to length approximately 2 feet longer than pipe section.  
36 b. Slip tube around pipe, centering it to provide 1-foot overlap on each adjacent  
37 pipe section and bunching it accordion-fashion lengthwise until it clears pipe  
38 ends.  
39 c. Lower pipe into trench and make up pipe joint with preceding section of pipe.  
40 d. Make shallow bell hole at joints to facilitate installation of polyethylene tube.  
41 e. After assembling pipe joint, make overlap of polyethylene tube, pull bunched  
42 polyethylene from preceding length of pipe, slip it over end of the new length  
43 of pipe and wrap until it overlaps joint at end of preceding length of pipe.  
44 f. Secure overlap in place.  
45 g. Take up slack width at top of pipe to make a snug, but not tight, fit along barrel  
46 of pipe, securing fold at quarter points.  
47 h. Repair cuts, tears, punctures or other damage to polyethylene.

- 1 i. Proceed with installation of next pipe in same manner.
- 2 3. Tubular Type (Method B)
- 3 a. Cut polyethylene tube to length approximately 1 foot shorter than pipe section.
- 4 b. Slip tube around pipe, centering it to provide 6 inches of bare pipe at each end.
- 5 c. Take up slack width at top of pipe to make a snug, but not tight, fit along barrel
- 6 of pipe, securing fold at quarter points; secure ends.
- 7 d. Before making up joint, slip 3-foot length of polyethylene tube over end of
- 8 proceeding pipe section, bunching it accordion-fashion lengthwise.
- 9 e. After completing joint, pull 3-foot length of polyethylene over joint,
- 10 overlapping polyethylene previously installed on each adjacent section of pipe
- 11 by at least 1 foot; make each end snug and secure.
- 12 4. Sheet Type
- 13 a. Cut polyethylene sheet to a length approximately 2 feet longer than piece
- 14 section.
- 15 b. Center length to provide 1-foot overlap on each adjacent pipe section, bunching
- 16 it until it clears the pipe ends.
- 17 c. Wrap polyethylene around pipe so that it circumferentially overlaps top
- 18 quadrant of pipe.
- 19 d. Secure cut edge of polyethylene sheet at intervals of approximately 3 feet.
- 20 e. Lower wrapped pipe into trench and make up pipe joint with preceding section
- 21 of pipe.
- 22 f. Make shallow bell hole at joints to facilitate installation of polyethylene.
- 23 g. After completing joint, make overlap and secure ends.
- 24 h. Repair cuts, tears, punctures or other damage to polyethylene.
- 25 i. Proceed with installation of next section of pipe in same manner.
- 26 5. Pipe-Shaped Appurtenances
- 27 a. Cover bends, reducers, offsets and other pipe-shaped appurtenances with
- 28 polyethylene in same manner as pipe and fittings.
- 29 6. Odd-Shaped Appurtenances
- 30 a. When it is not practical to wrap valves, tees, crosses, and other odd-shaped
- 31 pieces in tube, wrap with flat sheet or split length polyethylene tube by passing
- 32 sheet under appurtenances and bringing it up around body.
- 33 b. Make seams by bringing edges together, folding over twice and taping down.
- 34 c. Tape polyethylene securely in place at the valve stem and at any other
- 35 penetrations.
- 36 7. Repairs
- 37 a. Repair any cuts, tears, punctures or damage to polyethylene with adhesive tape
- 38 or with short length of polyethylene sheet or cut open tube, wrapped around
- 39 fitting to cover damaged area and secured in place.
- 40 8. Openings in Encasement
- 41 a. Provide openings for branches, service taps, blow-offs, air valves and similar
- 42 appurtenances by making an X-shaped cut in polyethylene and temporarily
- 43 folding back film.
- 44 b. After appurtenance is installed, tape slack securely to appurtenance and repair
- 45 cut, as well as other damaged area in polyethylene with tape.
- 46 c. Service taps may also be made directly through polyethylene, with any
- 47 resulting damaged areas being repaired as described above.

9. Junctions between Wrapped and Unwrapped Pipe:
  - a. Where polyethylene-wrapped pipe joins an adjacent pipe that is not wrapped, extend polyethylene wrap to cover adjacent pipe for distance of at least 3 feet.
  - b. Secure end with circumferential turns of tape.
  - c. Wrap service lines of dissimilar metals with polyethylene or suitable dielectric tape for minimum clear distance of 3 feet away from Cast or Ductile Iron Pipe.

### **3.5 REPAIR/RESTORATION**

#### **A. Patching**

1. Excessive field-patching is not permitted of lining or coating.
2. Patching of lining or coating will be allowed where area to be repaired does not exceed 100 square inches and has no dimensions greater than 12 inches.
3. In general, there shall not be more than 1 patch on either the lining or the coating of any 1 joint of pipe.
4. Wherever necessary to patch the pipe:
  - a. Make patch with cement mortar as previously specified for interior joints.
  - b. Do not install patched pipe until the patch has been properly and adequately cured and approved for laying by the City.
5. Promptly remove rejected pipe from the site.

### **3.6 RE-INSTALLATION [NOT USED]**

### **3.7 FIELD [OR] SITE QUALITY CONTROL**

#### **A. Potable Water Mains**

1. Cleaning, disinfection, hydrostatic testing and bacteriological testing of water mains
  - a. Clean, flush, pig, disinfect, hydrostatic test and bacteriological test the water main as specified in Section 33 04 40.

#### **B. Wastewater Lines**

1. Closed Circuit Television (CCTV) Inspection
  - a. Provide a Post-CCTV Inspection in accordance with Section 33 01 31.

### **3.8 SYSTEM STARTUP [NOT USED]**

### **3.9 ADJUSTING [NOT USED]**

### **3.10 CLEANING [NOT USED]**

### **3.11 CLOSEOUT ACTIVITIES [NOT USED]**

### **3.12 PROTECTION [NOT USED]**

### **3.13 MAINTENANCE [NOT USED]**

### **3.14 ATTACHMENTS [NOT USED]**

**END OF SECTION**

Revision Log		
DATE	NAME	SUMMARY OF CHANGE
12/20/2012	D. Johnson	1.2.A.1.b. – Updated Payment types 1.3 – Added definitions of gland types for clarity 2.2.B.9, 10, 11 and 12 – Added reference to Section 33 11 05 and removed material specification for bolts, nuts and gaskets

1



- 1 c. The price bid shall include:
  - 2 1) Furnishing and installing Ductile Iron Water Fittings as specified by the
  - 3 Drawings
  - 4 2) Polyethylene encasement
  - 5 3) Lining
  - 6 4) Pavement removal
  - 7 5) Excavation
  - 8 6) Hauling
  - 9 7) Disposal of excess material
  - 10 8) Furnishing and installing bolts, nuts, and restraints
  - 11 9) Furnishing, placement and compaction of embedment
  - 12 10) Furnishing, placement and compaction of backfill
  - 13 11) Trench water stops
  - 14 12) Clean-up
  - 15 13) Cleaning
  - 16 14) Disinfection
  - 17 15) Testing
- 18 2. Ductile Iron Sewer Fittings
  - 19 a. Measurement
    - 20 1) Shall be per ton of fittings supplied
    - 21 2) Fittings weights are the sum of the various types of fittings multiplied by
    - 22 the weight per fitting as listed in AWWA/ANSI C153/A21.53.
    - 23 3) The fitting weights listed in AWWA/ANSI C110/A21.10 are only allowed
    - 24 for specials where an AWWA/ANSI C153/A21.53 is not available, or if the
    - 25 Drawings specifically call for an AWWA/ANSI C110/A21.10 fittings.
    - 26 4) If the Contractor chooses to supply AWWA/ANSI C110/A21.10 (full
    - 27 body) Ductile Iron Fittings in lieu of AWWA/ANSI C153/A21.53
    - 28 (compact) Ductile Iron Fittings at his convenience, then the weight shall be
    - 29 measured in accordance with AWWA/ANSI C153/A21.53.
  - 30 b. Payment
    - 31 1) The work performed and materials furnished in accordance with this Item
    - 32 and measured as provided under "Measurement" will be paid for at the unit
    - 33 price bid per ton of "Ductile Iron Sewer Fittings".
  - 34 c. The price bid shall include:
    - 35 1) Furnishing and installing Ductile Iron Water Fittings as specified by the
    - 36 Drawings
    - 37 2) Epoxy Coating
    - 38 3) Polyethylene encasement
    - 39 4) Lining
    - 40 5) Pavement removal
    - 41 6) Excavation
    - 42 7) Hauling
    - 43 8) Disposal of excess material
    - 44 9) Furnishing and installing bolts, nuts, and restraints
    - 45 10) Furnishing, placement and compaction of embedment
    - 46 11) Furnishing, placement and compaction of backfill
    - 47 12) Clean-up
    - 48 13) Cleaning
    - 49 14) Disinfection



15) Testing

**1.3 REFERENCES**

A. Definitions

1. Gland or Follower Gland
  - a. Non-restrained, mechanical joint fitting
2. Retainer Gland
  - a. Mechanically restrained mechanical joint fitting, consisting of multiple gripping wedges incorporated into a follower gland meeting the applicable requirements of ANSI/AWWA C110/A21.10.

B. Reference Standards

1. Reference standards cited in this Specification refer to the current reference standard published at the time of the latest revision date logged at the end of this Specification, unless a date is specifically cited.
2. American Society of Mechanical Engineers (ASME):
  - a. B16.1, Gray Iron Pipe Flanges and Flanged Fittings (Classes 25, 125 and 250).
3. ASTM International (ASTM):
  - a. A193, Standard Specification for Alloy-Steel and Stainless Steel Bolting for High Temperature or High Pressure Service and Other Special Purpose Applications
  - b. A194, Specification for Carbon and Alloy Steel Nuts for Bolts for High Pressure or High Temperature Service, or Both
  - c. A242, Standard Specification for High-Strength Low-Alloy Structural Steel.
  - d. A674, Standard Practice for Polyethylene Encasement for Ductile Iron Pipe for Water or Other Liquids.
  - e. B117, Standard Practice for Operating Salt Spray (Fog) Apparatus.
4. American Water Works Association (AWWA):
  - a. C203, Coal-Tar Protective Coatings and Linings for Steel Water Pipelines - Enamel and Tape - Hot Applied.
  - b. C600, Installation of Ductile-Iron Water Mains and their Appurtenances.
  - c. M41, Ductile-Iron Pipe and Fittings.
5. American Water Works Association/American National Standards Institute (AWWA/ANSI):
  - a. C104/A21.4, Cement–Mortar Lining for Ductile-Iron Pipe and Fittings.
  - b. C105/A21.5, Polyethylene Encasement for Ductile-Iron Pipe Systems.
  - c. C110/A21.10, Ductile-Iron and Gray-Iron Fittings.
  - d. C111/A21.11, Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings.
  - e. C115/A21.15, Flanged Ductile-Iron Pipe with Ductile-Iron or Gray-Iron Threaded Flanges.
  - f. C151/A21.51, Ductile-Iron Pipe, Centrifugally Cast, for Water.
  - g. C153/A21.53, Ductile-Iron Compact Fittings for Water Service.
6. NSF International (NSF):
  - a. 61, Drinking Water System Components - Health Effects.
7. Society for Protective Coatings (SSPC):
  - a. PA 2, Measurement of Dry Coating Thickness with Magnetic Gages.

1 **1.4 ADMINISTRATIVE REQUIREMENTS [NOT USED]**

2 **1.5 SUBMITTALS**

3 A. Submittals shall be in accordance with Section 01 33 00.

4 B. All submittals shall be approved by the City prior to delivery and/or fabrication for  
5 specials.

6 **1.6 ACTION SUBMITTALS / INFORMATIONAL SUBMITTALS**

7 A. Product Data

8 1. Ductile Iron Fittings

9 a. Pressure class

10 b. Interior lining

11 c. Joint types

12 2. Polyethylene encasement and tape

13 a. Planned method of installation

14 b. Whether the film is linear low density or high density cross linked polyethylene

15 c. The thickness of the film provided

16 3. The interior lining, if it is other than cement mortar lining in accordance with  
17 AWWA/ANSI C104/A21.4

18 a. Material

19 b. Application recommendations

20 c. Field touch-up procedures

21 4. Thrust Restraint

22 a. Retainer glands

23 b. Thrust harnesses

24 c. Any other means

25 5. Gaskets

26 a. Provide Gaskets in accordance with Section 33 11 05.

27 6. Isolation Flanges

28 a. Flanges required by the drawings to be Isolation Flanges shall conform to  
29 Section 33 04 10.

30 7. Bolts and Nuts

31 a. Mechanical Joints

32 1) Provide bolts and nuts in accordance with Section 33 11 05.

33 b. Flanged Ends

34 1) Meet requirements of AWWA C115.

35 a) Provide bolts and nuts in accordance with Section 33 11 05.

36 8. Flange Coatings

37 a. Connections to Steel Flanges

38 1) Buried connections with Steel Flanges shall be coated with a Petrolatum  
39 Tape System in accordance with Section 33 11 05.

40 B. Certificates

41 1. The manufacturer shall furnish an affidavit certifying that all Ductile Iron Fittings  
42 meet the provisions of this Section and meet the requirements of AWWA/ANSI  
43 C110/A21.10 or AWWA/ANSI C153/A21.53.

44 2. Furnish a certificate stating that buried bolts and nuts conform to ASTM B117.

1 **1.7 CLOSEOUT SUBMITTALS [NOT USED]**

2 **1.8 MAINTENANCE MATERIAL SUBMITTALS [NOT USED]**

3 **1.9 QUALITY ASSURANCE**

4 A. Qualifications

5 1. Manufacturers

- 6 a. Fittings manufacturing operations (fittings, lining, and coatings) shall be  
7 performed under the control of the manufacturer.  
8 b. Ductile Iron Fittings shall be manufactured in accordance with AWWA/ANSI  
9 C110/A21.10 or AWWA/ANSI C153/A21.53.  
10 1) Perform quality control tests and maintain the results as outlined in these  
11 standards to assure compliance.

12 B. Preconstruction Testing

- 13 1. The City may, at its own cost, subject random fittings for destructive testing by an  
14 independent laboratory for compliance with this Specification.  
15 a. The compliance test shall be performed in the United States.  
16 b. Any visible defects or failure to meet the quality standards herein will be  
17 grounds for rejecting the entire order.

18 **1.10 DELIVERY, STORAGE, AND HANDLING**

19 A. Storage and Handling Requirements

- 20 1. Store and handle in accordance with the guidelines as stated in AWWA M41.  
21 2. Secure and maintain a location to store the material in accordance with Section 01  
22 66 00.

23 **1.11 FIELD [SITE] CONDITIONS [NOT USED]**

24 **1.12 WARRANTY [NOT USED]**

25 **PART 2 - PRODUCTS**

26 **2.1 OWNER-FURNISHED [OR] OWNER-SUPPLIED PRODUCTS [NOT USED]**

27 **2.2 EQUIPMENT, PRODUCT TYPES AND MATERIALS**

28 A. Manufacturers

- 29 1. Only the manufacturers as listed on the City's Standard Products List will be  
30 considered as shown in Section 01 60 00.  
31 a. The manufacturer must comply with this Specification and related Sections.  
32 2. Any product that is not listed on the Standard Products List is considered a  
33 substitution and shall be submitted in accordance with Section 01 25 00.

34 B. Ductile Iron Fittings

- 35 1. Ductile Iron Fittings shall be in accordance with AWWA/ANSI C110/A21.10,  
36 AWWA/ANSI C153/A21.53.  
37 2. All fittings for potable water service shall meet the requirements of NSF 61.  
38 3. Ductile Iron Fittings, at a minimum, shall meet or exceed the pressures classes of  
39 the pipe which the fitting is connected, unless specifically indicated in the  
40 Drawings.

- 1 4. Fittings Markings  
2 a. Meet the minimum requirements of AWWA/ANSI C151/A21.51.  
3 b. Minimum markings shall include:  
4 1) “DI” or “Ductile” cast or metal stamped on each fitting  
5 2) Applicable AWWA/ANSI standard for that the fitting  
6 3) Pressure rating  
7 4) Number of degrees for all bends  
8 5) Nominal diameter of the openings  
9 6) Year and country fitting was cast  
10 7) Manufacturer’s mark
- 11 5. Joints  
12 a. Mechanical Joints with mechanical restraint  
13 1) Comply with AWWA/ANSI C111/A21.11 and applicable parts of  
14 ANSI/AWWA C110/A21.10.  
15 2) The retainer gland shall have the following working pressure ratings based  
16 on size and type of pipe:  
17 a) Ductile Iron Pipe  
18 (1) 3-inch – 16-inch, 350 psi  
19 (2) 18-inch – 48-inch, 250 psi  
20 b) PVC C900 and C905  
21 (1) 3-inch – 12-inch, 305psi  
22 (2) 14-inch – 16-inch, 235psi  
23 (3) 18-inch – 20-inch, 200psi  
24 (4) 24-inch – 30 –inch 165psi  
25 c) Ratings are for water pressure and must include a minimum safety  
26 factor of 2 to 1 in all sizes  
27 3) Retainer glands shall have specific designs for Ductile Iron and PVC and  
28 should be easily differentiate between the 2.  
29 4) Gland body, wedges and wedge actuating components shall be cast from  
30 grade 65-45-12 ductile iron material in accordance with ASTM A536.  
31 5) Mechanical joint restraint shall require conventional tools and installation  
32 procedures per AWWA C600, while retaining full mechanical joint  
33 deflection during assembly as well as allowing joint deflection after  
34 assembly.  
35 6) Proper actuation of the gripping wedges shall be ensured with torque  
36 limiting twist off nuts.  
37 7) A minimum of 6 wedges shall be required for 8 inch diameter PVC pipe.
- 38 b. Push-On, Restrained Joints  
39 1) Restraining Push-on joints by means of a special gasket  
40 a) Only those products that are listed in 01 60 00  
41 b) The working pressure rating of the restrained gasket must exceed the  
42 test pressure of the pipe line to be installed.  
43 c) Approved for use of restraining Ductile Iron Pipe in casing with a  
44 carrier pipe of 4-inches to 12-inches  
45 d) Otherwise only approved if specially listed on the drawings  
46 2) Push-on Restrained Joint bell and spigot  
47 a) Only those products list in the standard products list will be allowed for  
48 the size listed in the standard products list per Section 01 60 00

- 1                                   b) Pressure rating shall exceed the working and test pressure of the pipe
- 2                                   line
- 3                                   c. Flanged Joints
- 4                                   1) AWWA/ANSI C115/A21.15, ASME B16.1, Class 125
- 5                                   2) Flange bolt circles and bolt holes shall match those of ASME B16.1, Class
- 6                                   125.
- 7                                   3) Field fabricated flanges are prohibited.
- 8                                   6. Gaskets
- 9                                   a. Provide Gaskets in accordance with Section 33 11 05.
- 10                                  7. Isolation Flanges
- 11                                  a. Flanges required by the drawings to be Isolation Flanges shall conform to
- 12                                  Section 33 04 10.
- 13                                  8. Bolts and Nuts
- 14                                  a. Mechanical Joints
- 15                                   1) Provide bolts and nuts in accordance with Section 33 11 05.
- 16                                  b. Flanged Ends
- 17                                   1) Meet requirements of AWWA C115.
- 18                                   a) Provide bolts and nuts in accordance with Section 33 11 05.
- 19                                  9. Flange Coatings
- 20                                  a. Connections to Steel Flanges
- 21                                   1) Buried connections with Steel Flanges shall be coated with a Petrolatum
- 22                                   Tape System in accordance with Section 33 11 05.
- 23                                  10. Ductile Iron Fitting Exterior Coatings
- 24                                  a. All Ductile Iron Fittings shall have an asphaltic coating, minimum of 1 mil
- 25                                  thick, on the exterior, unless otherwise specified in the Contract Documents.
- 26                                  11. Polyethylene Encasement
- 27                                  a. All buried Ductile Iron Fittings shall be polyethylene encased.
- 28                                  ~~b. Only manufacturers listed in the City's Standard Products List as shown~~
- 29                                  ~~in Section 01 60 00 will be considered acceptable.~~
- 30                                  ~~e. Use only virgin polyethylene material.~~
- 31                                  ~~d. Encasement for buried fittings shall be 8 mil linear low density (LLD)~~
- 32                                  ~~polyethylene conforming to AWWA/ANSI C105/A21.5 or 4 mil high~~
- 33                                  ~~density cross laminated (HDCL) polyethylene encasement conforming to~~
- 34                                  ~~conforming to AWWA/ANSI C105/A21.5 and ASTM A674.~~
- 35                                  ~~e. Marking: At a minimum of every 2 feet along its length, the mark the~~
- 36                                  ~~polyethylene film with the following information:~~
- 37                                   ~~1) Manufacturer's name or trademark~~
- 38                                   ~~2) Year of manufacturer~~
- 39                                   ~~3) AWWA/ANSI C105/A21.5~~
- 40                                   ~~4) Minimum film thickness and material type~~
- 41                                   ~~5) Applicable range of nominal diameter sizes~~
- 42                                   ~~6) Warning Corrosion Protection Repair Any Damage~~
- 43                                  ~~f. Special Markings/Colors~~
- 44                                   ~~1) Reclaimed Water, perform one of the following:~~
- 45                                   ~~a) Label polyethylene encasement with "RECLAIMED WATER",~~
- 46                                   ~~b) Provide purple polyethylene in accordance with the American~~
- 47                                   ~~Public Works Association Uniform Color Code; or~~



- 1) Ductile Iron Fittings for use in wastewater applications shall be lined with a Ceramic Epoxy or Epoxy lining as designated in the Standard Products List as shown in Section 01 60 00.
- 2) Apply lining at a minimum of 40 mils DFT
- 3) Due to the tolerances involved, the gasket area and spigot end up to 6 inches back from the end of the spigot end must be coated with 6 mils nominal, 10 mils maximum using a Joint Compound as supplied by the manufacturer.
  - a) Apply the joint compound by brush to ensure coverage.
  - b) Care should be taken that the joint compound is smooth without excess buildup in the gasket seat or on the spigot ends.
  - c) Coat the gasket seat and spigot ends after the application of the lining.
- 4) Surface preparation shall be in accordance with the manufacturer's recommendations.
- 5) Check thickness using a magnetic film thickness gauge in accordance with the method outlined in SSPC PA 2.
- 6) Test the interior lining of all fittings for pinholes with a non-destructive 2,500 volt test.
  - a) Repair any defects prior to shipment.
- 7) Mark each fitting with the date of application of the lining system along with its numerical sequence of application on that date and records maintained by the applicator of his work.
- 8) For all Ductile Iron Fittings in wastewater service where the fitting has been cut, coat the exposed surface with the touch-up material as recommended by the manufacturer.
  - a) The touch-up material and the lining shall be of the same manufacturer.

### 2.3 ACCESSORIES [NOT USED]

### 2.4 SOURCE QUALITY CONTROL [NOT USED]

## PART 3 - EXECUTION

### 3.1 INSTALLERS [NOT USED]

### 3.2 EXAMINATION [NOT USED]

### 3.3 PREPARATION [NOT USED]

### 3.4 INSTALLATION

#### A. General

1. Install fittings, specials and appurtenances as specified herein, as specified in AWWA C600, AWWA M41, and in accordance with the fittings manufacturer's recommendations.
2. Lay fittings to the lines and grades as indicated in the Drawings.
3. Excavate and backfill trenches in accordance with 33 05 10.
4. Embed Ductile Iron Fittings in accordance with 33 05 10.

#### B. Joint Making

1. Mechanical Joints with required mechanical restraint

- 1 a. All mechanical joints require mechanical restraint.
- 2 b. Bolt the retainer gland into compression against the gasket, with the bolts
- 3 tightened down evenly then cross torqued in accordance with AWWA C600.
- 4 c. Overstressing of bolts to compensate for poor installation practice will not be
- 5 permitted.
- 6 2. Push-on Joints (restrained)
- 7 a. All push-on joints shall be restrained push-on type.
- 8 b. Install Push-on joints as defined in AWWA/ANSI C111/A21.11.
- 9 c. Wipe clean the gasket seat inside the bell of all extraneous matter.
- 10 d. Place the gasket in the bell in the position prescribed by the manufacturer.
- 11 e. Apply a thin film of non-toxic vegetable soap lubricant to the inside of the
- 12 gasket and the outside of the spigot prior to entering the spigot into the bell.
- 13 f. When using a field cut plain end piece of pipe, refinished the field cut and scarf
- 14 to conform to AWWA M-41.
- 15 3. Flanged Joints
- 16 a. Use erection bolts and drift pins to make flanged connections.
- 17 1) Do not use undue force or restraint on the ends of the fittings.
- 18 2) Apply even and uniform pressure to the gasket.
- 19 b. The fitting must be free to move in any direction while bolting.
- 20 1) Install flange bolts with all bolt heads faced in 1 direction.
- 21 4. Joint Deflection
- 22 a. Deflect the pipe only when necessary to avoid obstructions or to meet the lines
- 23 and grades and shown in the Drawings.
- 24 b. The deflection of each joint must be in accordance with AWWA C600 Table 3.
- 25 c. The maximum deflection allowed is 50 percent of that indicated in AWWA
- 26 C600.
- 27 d. The manufacturer's recommendation may be used with the approval of the
- 28 Engineer.
- 29 C. Polyethylene Encasement Installation
- 30 1. Preparation
- 31 a. Remove all lumps of clay, mud, cinders, etc., on fittings surface prior to
- 32 installation of polyethylene encasement.
- 33 1) Prevent soil or embedment material from becoming trapped between
- 34 fittings and polyethylene.
- 35 b. Fit polyethylene film to contour of fittings to affect a snug, but not tight encase
- 36 with minimum space between polyethylene and fittings.
- 37 1) Provide sufficient slack in contouring to prevent stretching polyethylene
- 38 where it bridges irregular surfaces such as bell-spigot interfaces, bolted
- 39 joints or fittings, and to prevent damage to polyethylene due to backfilling
- 40 operations.
- 41 2) Secure overlaps and ends with adhesive tape and hold.
- 42 c. For installations below water table and/or in areas subject to tidal actions, seal
- 43 both ends of polyethylene tube with adhesive tape at joint overlap.
- 44 2. Tubular Type (Method A)
- 45 a. Cut polyethylene tube to length approximately 2 feet longer than fittings
- 46 section.



- 1           b. Slip tube around fittings, centering it to provide 1 foot overlap on each adjacent  
2           pipe section and bunching it accordion-fashion lengthwise until it clears fittings  
3           ends.
- 4           c. Lower fittings into trench with preceding section of pipe.
- 5           d. Make shallow bell hole at joints to facilitate installation of polyethylene tube.
- 6           e. After assembling fittings make overlap of polyethylene tube, pull bunched  
7           polyethylene from preceding length of pipe, slip it over end of the fitting and  
8           wrap until it overlaps joint at end of preceding length of pipe.
- 9           f. Secure overlap in place.
- 10          g. Take up slack width at top of fitting to make a snug, but not tight, fit along  
11          barrel of fitting, securing fold at quarter points.
- 12          h. Repair cuts, tears, punctures or other damage to polyethylene.
- 13          i. Proceed with installation of next fitting in same manner.
- 14         3. Tubular Type (Method B)
- 15           a. Cut polyethylene tube to length approximately 1 foot shorter than fitting  
16           section.
- 17           b. Slip tube around fitting, centering it to provide 6 inches of bare fitting at each  
18           end.
- 19           c. Take up slack width at top of fitting to make a snug, but not tight, fit along  
20           barrel of fitting, securing fold at quarter points; secure ends.
- 21           d. Before making up joint, slip 3-foot length of polyethylene tube over end of  
22           preceding pipe section, bunching it accordion-fashion lengthwise.
- 23           e. After completing joint, pull 3-foot length of polyethylene over joint,  
24           overlapping polyethylene previously installed on each adjacent section of pipe  
25           by at least 1 foot; make each end snug and secure.
- 26         4. Sheet Type
- 27           a. Cut polyethylene sheet to a length approximately 2 feet longer than piece  
28           section.
- 29           b. Center length to provide 1-foot overlap on each fitting, bunching it until it  
30           clears the fitting ends.
- 31           c. Wrap polyethylene around fitting so that it circumferentially overlaps top  
32           quadrant of fitting.
- 33           d. Secure cut edge of polyethylene sheet at intervals of approximately 3 feet.
- 34           e. Lower wrapped fitting into trench with preceding section of pipe.
- 35           f. Make shallow bell hole at joints to facilitate installation of polyethylene.
- 36           g. After completing joint, make overlap and secure ends.
- 37           h. Repair cuts, tears, punctures or other damage to polyethylene.
- 38           i. Proceed with installation of fittings in same manner.
- 39         5. Pipe-Shaped Appurtenances
- 40           a. Cover bends, reducers, offsets, and other pipe-shaped appurtenances with  
41           polyethylene in same manner as pipe and fittings.
- 42         6. Odd-Shaped Appurtenances
- 43           a. When it is not practical to wrap valves, tees, crosses and other odd-shaped  
44           pieces in tube, wrap with flat sheet or split length polyethylene tube by passing  
45           sheet under appurtenances and bringing it up around body.
- 46           b. Make seams by bringing edges together, folding over twice and taping down.
- 47           c. Tape polyethylene securely in place at the valve stem and at any other  
48           penetrations.

- 1           7. Repairs
- 2           a. Repair any cuts, tears, punctures or damage to polyethylene with adhesive tape
- 3           or with short length of polyethylene sheet or cut open tube, wrapped around
- 4           fitting to cover damaged area, and secure in place.
- 5           8. Openings in Encasement
- 6           a. Provide openings for branches, service taps, blow-offs, air valves and similar
- 7           appurtenances by making an X-shaped cut in polyethylene and temporarily
- 8           folding back film.
- 9           b. After appurtenance is installed, tape slack securely to appurtenance and repair
- 10          cut, as well as other damaged area in polyethylene with tape.
- 11          c. Service taps may also be made directly through polyethylene, with any
- 12          resulting damaged areas being repaired as described above.
- 13          9. Junctions between Wrapped and Unwrapped Fittings
- 14          a. Where polyethylene-wrapped fitting joins an adjacent pipe that is not wrapped,
- 15          extend polyethylene wrap to cover adjacent pipe for distance of at least 3 feet.
- 16          b. Secure end with circumferential turns of tape.
- 17          c. Wrap service lines of dissimilar metals with polyethylene or suitable dielectric
- 18          tape for minimum clear distance of 3 feet away from cast or Ductile Iron
- 19          Fittings.
- 20         D. Blocking
- 21           1. Install concrete blocking in accordance with Section 03 30 00 for all bends, tees,
- 22           crosses and plugs in the pipe lines as indicated in the Drawings.
- 23           2. Place the concrete blocking so as to rest against firm undisturbed trench walls,
- 24           normal to the thrust.
- 25           3. The supporting area for each block shall be at least as great as that indicated on the
- 26           Drawings and shall be sufficient to withstand the thrust, including water hammer,
- 27           which may develop.
- 28           4. Each block shall rest on a firm, undisturbed foundation or trench bottom.
- 29           5. If the Contractor encounters soil that appears to be different than that which was
- 30           used to calculate the blocking according to the Drawings, the Contractor shall
- 31           notify the Engineer prior to the installation of the blocking.

### 32     **3.5 REPAIR/RESTORATION**

- 33     A. Patching
- 34         1. Excessive field-patching is not permitted of lining or coating.
- 35         2. Patching of lining or coating will be allowed where area to be repaired does not
- 36         exceed 100 square inches and has no dimensions greater than 12 inches.
- 37         3. In general, there shall not be more than 1 patch on either the lining or the coating of
- 38         any fitting.
- 39         4. Wherever necessary to patch the fitting:
- 40           a. Make patch with cement mortar as previously specified for interior joints.
- 41           b. Do not install patched fitting until the patch has been properly and adequately
- 42           cured and approved for laying by the City.
- 43           c. Promptly remove rejected fittings from the site.



**SECTION 33 11 13**  
**CONCRETE PRESSURE PIPE, BAR-WRAPPED, STEEL CYLINDER TYPE**

**PART 1 - GENERAL**

**1.1 SUMMARY**

A. Section Includes:

1. Concrete Pressure Pipe, Bar-Wrapped, Steel Cylinder Type (Concrete Pressure Pipe) 24-inch through 72-inch for potable water applications in conformance with AWWA C303

B. Deviations from this City of Fort Worth Standard Specification

1. **Added 1.3.A.3.H**
2. **Added 1.3.A.5.c**
3. **Added 1.3.A.9**
4. **Added 1.3.B.3.b & c**
5. **Modify 1.6.B.4.a**
6. **Added 1.6.B.5**
7. **Added 1.6.C.2 & 3**
8. **Modify 1.9.A.1.a**
9. **Modify 1.9.C.2.a**
10. **Added 1.10.A.4.d.iv**
11. **Added 1.10.A.4.d.v**
12. **Added 2.2.B.6 & 7**
13. **Modified 2.2.B.9.a.1.g**
14. **Modify 2.2.B.12.a**
15. **Modify 2.2.B.19.a**
16. **Added 2.2.C.1.e.12, 13, & 14**
17. **Added 2.2.C.1.g**
18. **Added 2.2.C.1.h**
19. **Added 2.2.C.2.b.2 & 3**
20. **Added 2.2.C.2.c.1.b & c**
21. **Added 2.2.C.1.e.8 & 9**
22. **Added 2.2.C.7.**
23. **Modify 3.4.B.3**
24. **Modify 3.4.C.1.e.1**
25. **Added 3.4.C.2.a.6**
26. **Modify 3.4.C.4.a**
27. **Added 3.7.A.2**

- C. Related Specification Sections include, but are not necessarily limited to:
1. Division 0 – Bidding Requirements, Contract Forms, and Conditions of the Contract
  2. Division 1 – General Requirements
  3. Section 33 01 31 – Closed Circuit Television (CCTV) Inspection
  4. Section 33 04 10 – Joint Bonding and Electrical Isolation
  5. Section 33 04 40 – Cleaning and Acceptance Testing of Water Mains
  6. Section 33 05 10 – Utility Trench Excavation, Embedment and Backfill
  7. Section 33 11 05 – Bolts, Nuts, and Gaskets

## 1.2 PRICE AND PAYMENT PROCEDURES

### A. Measurement and Payment

1. Concrete Pressure Pipe
  - a. Measurement
    - 1) Measured horizontally along the surface from center line to centerline of the fitting or appurtenance
  - b. Payment
    - 1) The work performed and materials furnished in accordance with this Item and measured as provided under “Measurement” shall be paid for at the unit price bid per linear foot for “Concrete AWWA C303 Pipe” installed for:
      - a) Various sizes
      - b) Various types of backfill
  - c. The price bid shall include:
    - 1) Furnishing and installing Concrete Pressure Pipe with joints as specified by the Drawings
    - 2) Mobilization
    - 3) Coating
    - 4) Lining
    - 5) Pavement removal
    - 6) Excavation
    - 7) Hauling
    - 8) Disposal of excess material
    - 9) Furnishing, placement, and compaction of embedment
    - 10) Trench water stops
    - 11) Joint restraint
    - 12) Bolts and nuts
    - 13) Welding
    - 14) Gaskets, if allowed
    - 15) Furnishing, placement, and compaction of backfill
    - 16) Clean-up
    - 17) Cleaning
    - 18) Disinfection
    - 19) Testing
2. Concrete Pressure Pipe Fittings
  - a. Measurement
    - 1) Measurement for this Item shall be by lump sum.

- b. Payment
  - 1) The work performed and materials furnished in accordance with this Item shall be paid for at the lump sum price bid for “C303 Fittings” installed for:
    - a) Various sizes
    - b) Various types of backfill
- c. The price bid shall include:
  - 1) Furnishing and installing Concrete Pressure Pipe Fittings as specified by the Drawings
  - 2) Mobilization
  - 3) Coating
  - 4) Lining
  - 5) Pavement removal
  - 6) Excavation
  - 7) Hauling
  - 8) Disposal of excess material
  - 9) Furnishing, placement, and compaction of embedment
  - 10) Trench water stops
  - 11) Joint restraint
  - 12) Bolts and nuts
  - 13) Welding
  - 14) Gaskets, if allowed
  - 15) Furnishing, placement, and compaction of backfill
  - 16) Clean-up
  - 17) Cleaning
  - 18) Disinfection
  - 19) Testing

### 1.3 REFERENCES

#### A. Reference Standards

- 1. Reference standards cited in this Specification refer to the current reference standard published at the time of the latest revision date logged at the end of this Specification, unless a date is specifically cited.
- 2. American Society of Mechanical Engineers (ASME):
  - a. B16.1, Gray Iron Pipe Flanges and Flanged Fittings (Classes 25, 125 and 250).
- 3. American Society of Testing and Materials (ASTM):
  - a. A242, Standard Specification for High-Strength Low-Alloy Structural Steel.
  - b. A307, Standard Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength.
  - c. B117, Standard Practice for Operating Salt Spray (Fog) Apparatus.
  - d. B633, Standard Specification for Electrodeposited Coatings of Zinc on Iron and Steel.
  - e. C33, Standard Specification for Concrete Aggregates.
  - f. C144, Standard Specification for Aggregate for Masonry Mortar.
  - g. C150, Specification for Portland Cement.
  - h. C595, Standard Specification for Blended Hydraulic Cements**
  - i. C293, Standard Test Method for Flexural Strength of Concrete (Using Simple Beam with Center-Point Loading).
  - j. C497, Methods of Testing Concrete Pipe.

- k. C882, Standard Test Method for Bond Strength of Epoxy-Resin Systems Used With Concrete By Slant Shear.
- l. C1090, Standard Test Method for Measuring Changes in Height of Cylindrical Specimens of Hydraulic-Cement Grout.
- m. E165, Standard Practice for Liquid Penetrant Examination for General Industry.
- 4. American Welding Society (AWS):
  - a. D1.1, Structural Welding Code - Steel.
- 5. American Water Works Association (AWWA):
  - a. C206, Field Welding of Steel Water Pipe.
  - b. C207, Steel Pipe Flanges for Waterworks Service - Sizes 4 IN through 144 IN.
  - c. **C208 Dimensions for Steel Water Pipe Fittings**
  - d. C303, Concrete Pressure Pipe, Bar-Wrapped, Steel-Cylinder Type.
  - e. M9, Concrete Pressure Pipe.
- 6. American Water Works Association/American National Standards Institute (AWWA/ANSI):
  - a. C111/A21.11, Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings.
- 7. International Organization for Standardization (ISO).
- 8. National Sanitation Foundation (NSF):
  - a. NSF 61, Drinking Water System Components - Health Effects
- 9. **American Concrete Pressure Pipe Association (ACPPA).**

#### **1.4 ADMINISTRATIVE REQUIREMENTS [NOT USED]**

#### **1.5 SUBMITTALS**

- A. Submittals shall be in accordance with Section 01 33 00.
- B. All submittals shall be approved by the City prior to delivery and/or fabrication for specials.

#### **1.6 ACTION SUBMITTALS/INFORMATIONAL SUBMITTALS**

- A. Product Data
  - 1. Exterior Coating
    - a. Material data
    - b. Application recommendations
    - c. Field touch-up procedures
  - 2. Joint Wrappers
    - a. Material data
    - b. Installation recommendations
  - 3. Flexible Joint Couplings
    - a. Manufacturer
    - b. Model
  - 4. Mixes
    - a. Mortar for interior joints and patches
    - b. Bonding agents for patches
  - 5. Gaskets (if applicable)

- B. Shop Drawings – Furnish for Concrete Pressure Pipe used in the potable water systems including:
1. Wall thickness design calculations sealed by a Licensed Professional Engineer in Texas including:
    - a. Internal pressure
      - 1) Working Pressure
      - 2) Test Pressure
      - 3) Surge pressure
    - b. External pressure
      - 1) Deflection
      - 2) Buckling
    - c. Special physical loading such as supports or joint design
    - d. Thermal expansion and/or contraction, if applicable for the proposed installation
  2. Thrust restraint calculations for all fittings and valves including the restraint length sealed by a Licensed Professional Engineer in Texas.
  3. Fabrication and lay drawings showing a schematic location with profile and a tabulated layout schedule that is sealed by a Licensed Professional Engineer in Texas and includes:
    - a. Pipe class
    - b. Cylinder thickness**
    - c. Bar diameter and spacing**
    - d. Joint types
    - e. Fittings
    - f. Thrust Restraint
    - g. Stationing (in accordance with the Drawings)
    - h. Transitions
    - i. Joint deflection
    - j. Outlet locations for welding, ventilation, and access
    - k. Welding requirements
  4. Pipe within Casing
    - a. Provide drawings detailing how pipe is restrained to prevent floating within the casing **and built up mortar rings used for pipe supports.**
  5. **Contractor's proposed field welding procedure in accordance with AWWA C206 and AWS D1.1**
- C. Certificates and Test Reports
1. Submittals for certificates and testing reports shall be as outlined in Article 1.9 of this Section.
  2. **Certified test reports for factory welds of fittings from an independent certified welding inspector not employed by the pipe manufacturer.**
  3. **Certified test reports for field welds from an independent certified welding inspector not employed by the pipe manufacturer.**



## 1.7 CLOSEOUT SUBMITTALS [NOT USED]

## 1.8 MAINTENANCE MATERIAL SUBMITTALS [NOT USED]

## 1.9 QUALITY ASSURANCE

### A. Qualifications

#### 1. Manufacturers

- a. Shall be American Concrete Pressure Pipe Association (ACPPA) Quality Program certified, I.S.O. **9001** Quality Certification Program certified, or equal, for Concrete Pressure Pipe and accessory manufacturing.
- b. Pipe manufacturing operations (pipe, lining, and coatings) shall be performed under the control of the manufacturer.
- c. Pipe shall be the product of 1 manufacturer which has had not less than 5 years successful experience manufacturing AWWA C303 pipe of the particular type and size indicated.
  - 1) This experience record will be thoroughly investigated by the Engineer, and acceptance will be at the sole discretion of the Engineer and City.
  - 2) Pipe manufacturing operations (pipe, fittings, lining, and coating) shall be performed at 1 location, unless otherwise approved by the Engineer.
- d. Pipe shall be manufactured in accordance with the latest revisions of AWWA C303.

### B. Certifications

1. Prior to shipment of the pipe, the Pipe Manufacturer shall submit the following:
  - a. A Certificate of Adequacy of Design stating that the pipe to be furnished complies with AWWA C303 and these Specifications
  - b. Copies of results of factory hydrostatic tests shall be provided to the Engineer
  - c. Mill certificates, including chemical and physical test results for each heat of steel
    - 1) The manufacturer shall perform the tests described in AWWA C303, for all pipe, fittings, and specials, except that the absorption test detailed in this Specification shall supersede the requirements of the applicable portion of AWWA C303.
  - d. Certified test reports for welder certification for factory and field welds in accordance with AWWA C303, Section 5
  - e. Certified test reports for cement mortar tests
  - f. Certified test reports for steel cylinder tests

### C. Hydrostatic Pressure Testing

1. Hydrostatic pressure testing shall meet or exceed the requirements of AWWA C303 Section 4.6 – Fabrication.
  - a. Each pipe cylinder, with rings welded to its ends, shall be hydrostatically tested prior to application of lining or coating.
  - b. The internal test pressure shall be that which results in a fiber stress equal to 75 percent of the minimum yield strength of the steel used.
  - c. Each pipe cylinder tested shall be completely watertight under maximum test pressure.
  - d. Test pressure shall be held for sufficient time to observe the weld seams.

- e. Pipe manufacturer shall maintain a recording of the pressure gauge report and provide to the Engineer.
2. Fittings shall be fabricated from hydrostatically tested pipe or fabricated of welded steel sheets or plates **per AWWA C208**
  - a. Fittings shall be tested in accordance with AWWA C303. **All welds on fittings shall be tested by hydrostatic test, ultrasonic test, air test, or magnetic particle test. Air test shall be made by applying air to the welds at 10 pounds per square inch pressure and checking for leaks around and through welds with a soap solution. In addition, 5 percent of welds on fittings shall be checked with x-ray or ultrasonic testing by an independent certified welding inspector paid for by the pipe manufacturer**
3. Factory Testing
  - a. Cement Mortar Coating - Absorption Test
    - 1) A water absorption test shall be performed on samples of cured mortar coating taken from each working shift.
      - a) The mortar coating samples shall have been cured in the same manner as the pipe.
      - b) A test value shall consist of the average of a minimum of 3 samples taken from the same working shift.
      - c) The test method shall be in accordance with ASTM C497, Method A.
      - d) The average absorption value for any test shall not exceed 9 percent and no individual sample shall have an absorption exceeding 11 percent.
      - e) Tests for each working shift shall be performed on a daily basis until conformance to the absorption requirements has been established by 10 consecutive passing test results, at which time testing may be performed on a weekly basis for each working shift.
        - (1) Daily testing shall be resumed for each working shift with failing absorption test results and shall be maintained until conformance to the absorption requirements is re-established by 10 consecutive passing test results.
- D. Cement Mortar Lining
  1. Shop-applied cement mortar linings shall be tested in accordance with AWWA C303.
- E. City Testing and Inspection
  1. The City reserves the option to have an independent testing laboratory, at the City's expense, inspect pipe and fittings at the pipe manufacturer's plant.
    - a. The City's testing laboratory and Engineer shall have free access to the manufacturer's plant.
    - b. The pipe manufacturer shall notify the City, in writing, at least 2 weeks prior to pipe fabrication as to start of fabrication and fabricating schedule. The City will then advise the manufacturer as to City's decision regarding tests to be performed by an independent testing laboratory.
    - c. In the event the City elects to retain an independent testing laboratory to make material tests and weld tests, it is the intent that the tests be limited to 1 spot testing of each category unless the tests do not show compliance with the standard.

- 1) If these tests do not show compliance, the City reserves the right to have the laboratory make additional tests and observations.
2. The inspection and testing by the independent testing laboratory anticipates that production of pipe shall be done over a normal period of time and without "slow downs" or other abnormal delays.
  - a. In the event that an abnormal production time is required, and the City is required to pay excessive costs for inspection, then the Contractor shall be required to reimburse the City for such costs over and above those which would have been incurred under a normal schedule of production as determined by the Engineer.

F. Manufacturer's Technician for Pipe Installation

1. Pipe Manufacturer's Representative
  - a. During the construction period, the pipe manufacturer shall furnish the services of a factory trained, qualified, job experienced technician to advise and instruct, as necessary, in pipe laying and pipe jointing.
    - 1) The technician shall assist and advise the Contractor in his pipe laying operations and shall instruct construction personnel in proper joint assembly and joint inspection procedures.
    - 2) The technician is not required to be on-site full time; however, the technician shall be regularly on-site during the first 2 weeks of pipe laying and thereafter as requested by the Engineer, City or Contractor.

**1.10 DELIVERY, STORAGE, AND HANDLING**

A. Packing

1. Prepare pipe for shipment to:
  - a. Afford maximum protection from normal hazards of transportation
  - b. Allow pipe to reach project site in an undamaged condition
2. Pipe damaged in shipment shall not be delivered to the project site unless such damaged pipe is properly repaired.
3. After the completed pipe and fittings have been removed from the final cure at the manufacturing plant:
  - a. Protect pipe lining from drying by means of plastic end covers banded to the pipe ends.
  - b. Maintain covers over the pipe ends at all times until ready to be installed.
  - c. Moisture shall be maintained inside the pipe by periodic addition of water as necessary.
4. Pipes shall be carefully supported during shipment and storage.
  - a. Pipe, fittings and specials shall be separated so that they do not bear against each other and the whole load shall be securely fastened to prevent movement in transit.
  - b. Ship pipe on padded bunks with tie-down straps approximately over stulling.
  - c. Store pipe on padded skids, sand or dirt berms, tires or other suitable means to protect the pipe from damage.
  - d. Each end and each length of pipe, fitting or special (~~42-inches and larger~~) and the middle of each pipe joint shall be internally supported and braced with stulls to maintain a true circular shape.
    - i. Internal stulls shall consist of timber or steel firmly wedged and secured so that stulls remain in place during storage, shipment and installation.

- ii. Pipe shall be rotated so that one stull remains vertical during storage, shipment and installation.
  - iii. At a minimum, stulls shall be placed at each end and center.
  - iv. **Pipe shall be stulled as required to maintain roundness of +/- 1%, or D<sup>2</sup>/4,000 (inches), whichever is less, during shipping and handling.**
  - v. **Do not remove stulls until pipe is backfilled.**
- B. Delivery, Handling, and Storage
- 1. Once the first shipment of pipe has been delivered to the site, the Engineer and the Contractor shall inspect the pipe's interior coating for excessive cracking.
    - a. If excessive cracking is found, exceeding the allowance in AWWA C303, modify shipping procedures to reduce or eliminate cracking.
  - 2. Deliver, handle and store pipe in accordance with the manufacturer's recommendations to protect coating systems.
- C. Marking for Identification
- 1. For each joint of pipe and each fitting, plainly mark on 1 end:
    - a. Class for which it is designated
    - b. Date of manufacturer
    - c. Identification number
    - d. Top centerlines shall be marked on all specials.
- D. Point of Delivery
- 1. The Contractor is responsible for securing and maintaining a location to store the material in accordance with Section 01 66 00.

### 1.11 WARRANTY [NOT USED]

## PART 2 - PRODUCTS

### 2.1 OWNER-FURNISHED [NOT USED]

### 2.2 EQUIPMENT, PRODUCT TYPES, AND MATERIALS

- A. Manufacturers
- 1. Only the manufacturers as listed in the City's Standard Products List will be considered as shown in Section 01 60 00.
    - a. The manufacturer must comply with this Specification and related Sections.
  - 2. Any product that is not listed on the Standard Products List is considered a substitution and shall be submitted in accordance with Section 01 25 00.
- B. Materials
- 1. General
    - a. Pipe shall be manufactured in accordance with the latest revisions of AWWA C303, AWWA M9, as well as the special requirements of this Specification.
    - b. All pipe shall meet the requirements of NSF 61.
  - 2. Cement
    - a. Cement for use in concrete and mortar shall be Type I or II Portland Cement.
  - 3. Aggregates
    - a. Aggregates for concrete lining and coating shall conform to ASTM C33.

4. Sand
  - a. Sand used for inside and outside joints shall be of silica base, conforming to ASTM C144.
5. Special Coating (Mortar Rings)
  - a. Pipe to be installed in casing shall have 2 built-up mortar rings, each approximately 2 feet long and slightly higher than the pipe bell, to prevent the pipe from being supported by the pipe bell.
  - b. Built-up mortar rings are to be applied at the quarter points of the pipe section.
6. **Lining**
  - a. **Mortar lining shall be centrifugally cast to leave a smooth lining. All rough spots shall be ground down with a rubbing stone or other approved method.**
7. **Coating**
  - a. **Mortar coating shall be dense, hard, with no cracks larger than hairline (0.010 inches)**
8. Bushings, Couplings and Plugs
  - a. Where outlets or taps are threaded, furnish and install brass reducing bushings in larger steel half couplings for the outlet size indicated.
  - b. Threaded plugs shall be brass.
9. Mixes
  - a. Cement Mortar
    - 1) Cement mortar used for pouring joints shall consist of:
      - a) 1 part Portland Cement
      - b) 2 parts clean, fine, sharp silica sand
      - c) Mixed with water
      - d) No manufactured sand shall be permitted.
      - e) Exterior joint mortar shall be mixed to the consistency of thick cream.
      - f) Interior joint mortar shall be mixed with as little water as possible so that the mortar is very stiff, but workable.
      - g) Cement shall be ASTM C150, Type I or Type II or **ASTM C595 Type II Cement.**
      - h) Sand shall conform to ASTM C144.
    - 2) Cement mortar used for patching shall be mixed as per cement mortar for inside joints.
10. Joint Wrappers
  - a. Joint wrappers shall be manufactured by Mar-Mac Manufacturing Company, or approved equal.
  - b. For pipe within casing, Flex Protex joint filler, or approved equal, may be used for pipes that can be welded from the interior.
11. Flexible Joint Couplings
  - a. Flexible Joint Couplings shall be Dresser Style 38, Smith-Blair Style 411 or approved equal.
12. Pipe Ends
  - a. The standard pipe end shall include **Carnegie** steel joint ring and a continuous solid rubber ring gasket as per AWWA M9.
13. Gaskets
  - 1) Flange in accordance with AWWA C207.

- 2) Provide Gaskets in accordance with Section 33 11 05.
  14. Bolts and Nuts
    - a. Flanged Ends
      - 1) Flange in accordance with AWWA C207.
      - 2) Provide bolts and nuts in accordance with Section 33 11 05.
  15. Isolation Flanges
    - a. Flanges required by the drawings to be Isolation Flanges shall conform to Section 33 04 10.
  16. Flange Coatings
    - a. Flange Coatings in accordance with Section 33 11 05.
  17. Threaded Outlets
    - a. Where outlets or taps are threaded, Threaded with CC Threads and furnish and install brass bushings for the outlet size indicated.
  18. Weld Lead Outlets (if applicable)
    - a. Use of threaded outlets for access for weld leads is permitted.
    - b. Additional outlet configurations shall be approved by the Engineer.
    - c. Outlets shall be welded after use.
  19. Snap Rings
    - a. Snap rings shall be manufactured by ~~Hansen~~ **Thompson Pipe Group**, or approved equal.
- C. Performance / Design Criteria
1. Pipe Design
    - a. Pipe shall be designed, manufactured and tested in accordance with the latest revisions of AWWA C303, AWWA M9, as well as the special requirements of this Specification.
    - b. Sizes and pressure classes (working pressure) shall be as specified in the Drawings.
    - c. For the purposes of pipe design, working pressure plus transient pressure shall be as indicated below.
    - d. Pipe design shall be based on trench conditions and design pressure class specified in the Drawings.
    - e. Pipe shall be designed according to the methods indicated in AWWA C303 and AWWA M9 for trench construction, using the following parameters:
      - 1) Unit Weight of Fill (w) = 130 pounds per cubic foot
      - 2) Live Load = AASHTO H-20 truck for unpaved conditions
      - 3) Live Load = Cooper E-80 loading for railroad crossings
      - 4) Trench Depth = As indicated on Drawings
      - 5) Coefficient  $K_u' = 0.150$
      - 6) Trench Width ( $B_d$ ) as indicated on Drawings
      - 7) Bedding Conditions = as indicated on Drawings
      - 8) Pressure Class = 150 psi min. working pressure
      - 9) Surge Allowance = 100 psi minimum
        - a) where: Total Pressure (including surge) = 150 psi + 100 psi = 250 psi
      - 10) Deflection Lag Factor = 1.0
      - 11) Soil Reaction Modulus ( $E'$ ) < 1,000
      - 12) **Maximum calculated deflection,  $D_y = D_x = 1\%$  or  $D^2/4,000$  (inches), whichever is less**

**13) Coefficient k = 0.09**

**14) Pipe shall be designed for full vacuum conditions.**

- f. Trench depths indicated on Drawings shall be verified after existing utilities are located.
  - 1) Vertical alignment changes required because of existing utility or other conflicts shall be accommodated by an appropriate change in pipe design depth.
  - 2) In no case shall pipe be installed deeper than its design allows.
- g. **Where the pipe requires additional external support to achieve the specified maximum deflection, the Contractor (with concurrence from the pipe manufacturer) will be required to furnish alternate methods for pipe embedment.**
  - 1) **No additional compensation will be made to the Contractor by the City where this method is required.**
- h. **Steel Provided**
  - 1) **Bar reinforcement = 40% of the total area of circumferential reinforcement**
  - 2) **Steel Cylinder = 60% of the total area of circumferential reinforcement**

i. **Minimum gauge thickness of steel cylinder for pipe and fittings shall be as designed, but not less than the following:**

<u>Nominal Pipe Size (in)</u>	<u>Minimum Gauge No.</u>	<u>Minimum Gauge Thickness (in)</u>
<u>16 - 24</u>	<u>18</u>	<u>0.0478</u>
<u>30</u>	<u>16</u>	<u>0.0598</u>
<u>36</u>	<u>14</u>	<u>0.0747</u>
<u>42</u>	<u>13</u>	<u>0.0897</u>
<u>48</u>	<u>12</u>	<u>0.1046</u>
<u>54</u>	<u>11</u>	<u>0.1196</u>
<u>60</u>	<u>10</u>	<u>0.1345</u>
<u>66</u>	<u>10</u>	<u>0.1345</u>
<u>72</u>	<u>9</u>	<u>0.1495</u>

2. Provisions for Thrust

- a. Thrust at bends, tees or other fittings shall be resisted by welded joints or snap rings.
  - 1) Thrust at bends adjacent to casing shall be restrained by welding joints through the casing and a sufficient distance each side of the casing.
  - 2) No thrust restraint contribution shall be allowed for pipe in casing unless the annular space in the casing is filled with grout.
  - 3) The distance for thrust restraint shown on the Drawings is the minimum restraint and does not relieve the manufacturer from calculating the restraint needs as specified herein.
    - a) In no case shall the restrained distance be less than indicated on the Drawings.
- b. Restrained joints shall be used a sufficient distance from each side of the bend, tee, plug or other fitting to resist thrust which develops at the design pressure of the pipe.
  - 1) The distance for thrust restraint shown on the Drawings is the minimum restraint and does not relieve the manufacturer from calculating the restraint needs as specified herein.
    - a) In no case shall the restrained distance be less than indicated on the Drawings.
  - 2) **At a minimum, all fittings and specials with outlets shall be welded to connecting pipes regardless of if the fittings are indicated to be restrained in the Drawings.**
  - 3) **Weld all joints at vertical and horizontal points of inflection regardless of if those locations are indicated to be restrained in the Drawings.**
  - 4) **Welding(restraint) of joints on curved pipe sections (with minimum radius shown on Drawings) are not required to be restrained, unless called out on Drawings, or if thrust design warrants.**
  - 5) Restrained joints shall consist of welded joints or snap rings.
  - 6) In areas where restrained joints are used for thrust restraint, the pipe shall have adequate cylinder thickness to transmit the thrust forces.
- c. Thrust restraint design



- 1) The length of pipe with restrained joints to resist thrust forces shall be verified by the pipe manufacturer in accordance with AWWA M9, **TRDP**, and the following:
  - a) The Weight of Earth (We) shall be calculated as the weight of the projected soil prism above the pipe.
    - (1) Soil Density = 130 pounds per cubic foot (maximum value to be used for unsaturated soil).
  - b) **Thrust design pressure equal to the working pressure plus surge pressure.**
  - c) **Friction factor = 0.25**
- d. Thrust collars will only be permitted for temporary plugs.
  - 1) Thrust collars may not be used for any other application, unless approved in writing by the Engineer.
3. Inside Diameter
  - a. The inside diameter, of the cement mortar lining shall be the nominal diameter specified, unless otherwise indicated on the Drawings.
4. Joint Bonds, Insulated Connections and Flange Gaskets
  - a. Joint Bonds, Insulated Connection and Flange Gaskets shall be in accordance with Section 33 04 10.
5. Bend Fittings
  - a. All bend fittings shall be long radius to permit passage of pipeline pigs.
6. Fittings with Flanges
  - a. Flanged joints shall be provided at connections to valves and where indicated on the Drawings.
  - b. Ends to be fitted with slip-on flanges shall have the longitudinal or spiral welds ground flush to accommodate the type of flanges provided.
  - c. Pipe flanges and field welding of flanges to Concrete Pressure Pipe shall conform to the requirements of AWWA C207 and AWWA C206.
  - d. Pipe flanges shall be of rated pressure equal to or greater than the adjacent pipe class.
  - e. Flanges shall match the fittings or appurtenances which are to be attached.
  - f. Flanges shall be Class E with 275 psi working pressure in accordance with AWWA C207 and in accordance with ASME B16.1 Class 125 for areas designated with a 225 psi test pressure.
7. **Pipe, fittings and specials shall be designed such that the maximum stresses in the pipe due to thrust loading will not exceed 23,000 psi. The minimum thickness of sheet or plate for fittings shall be in accordance with AWWA C303. Bend fittings over 15 degrees, pipe with 24 inch and larger outlets, and wyes shall have the following minimum thickness:**
  - a. **36 inch diameter and smaller = 0.25 inches**
  - b. **Greater than 36 inch to 60 inch diameter = 0.375 inches**

## 2.3 ACCESSORIES [NOT USED]

## 2.4 SOURCE QUALITY CONTROL [NOT USED]

# PART 3 - EXECUTION

## 3.1 INSTALLERS [NOT USED]

## 3.2 EXAMINATION [NOT USED]

## 3.3 PREPARATION [NOT USED]

## 3.4 INSTALLATION

### A. General

1. Install Concrete Pressure Pipe, fittings, specials and appurtenances as required for the proper functioning of the completed pipe line.
2. Install pipe, fittings, specials and appurtenances as specified herein, as specified in AWWA M9, and in accordance with the pipe manufacturer's recommendations.
3. Lay pipe to the lines and grades show on the Drawings.
4. Excavate, embed and backfill trenches in accordance with Section 33 05 10.
5. At the close of each operating day:
  - a. Keep the pipe clean and free of debris, dirt, animals and trash – during and after the laying operation.
  - b. Effectively seal the open end of the pipe using a gasketed night cap.
6. If pipe is placed in casing, restrain pipe from floating as required in Article 1.6.B.4.

### B. Pipe Handling

1. Haul and distribute pipe fittings at the project site and handle piping with care to avoid damage.
2. Before lowering into the trench and inspect each joint of pipe and reject or repair any damaged pipe.
3. Pipe shall be handled at all times with a minimum of 1 wide non-abrasive sling, belts or other equipment designed to prevent damage to the coating or lining.  
**Chains will not be allowed.**
4. The equipment shall be kept in such repair that its continued use is not injurious to the coating.
5. The spacing of pipe supports required to handle the pipe shall be adequate to prevent cracking or damage to the lining or coating.

### C. Pipe Jointing

1. General
  - a. Thoroughly clean the bell and spigot rings before laying each joint of pipe by brushing and wiping.
  - b. If any damage to the protective coating on the metal has occurred, repair the damage before laying the pipe.
  - c. Lubricate the gasket and the inside surface of the bell with an approved lubricant (flax soap) which will facilitate the telescoping of the joint.

- d. Tightly fit together sections of pipe and exercise care to secure true alignment and grade.
  - e. When a joint of pipe is being laid, place the gasket on the spigot ring and enter the spigot end of the pipe into the bell of the adjoining pipe and force into position.
    - 1) The inside joint space between ends of the pipe sections shall have an opening within the tolerances as recommended by the pipe manufacturer.  
**Use joint spacers at all locations to prevent over-stabbing joints.**
  - f. No "blocking up" of pipe or joints will be permitted, and if the pipe is not uniformly supported or the joint not made up properly, remove the joint and properly prepare the trench.
  - g. After joining, check the position of the gasket with a feeler gauge.
    - 1) If the gasket is out of position, disassemble the joint and repeat the joint laying procedure.
  - h. For interior welded joints, complete backfilling before welding.
  - i. For exterior field-welded joints, provide adequate working room under and beside the pipe.
2. Exterior Joints
    - a. Make the exterior joint by placing a joint wrapper around the pipe and secure in place with 2 metal straps.
      - 1) The wrapper shall be 9 inches wide for pipe 36-inches and larger, and 7 inches wide for smaller pipe, hemmed on each side.
      - 2) The wrapper shall be fiberglass reinforced or burlap cloth, with lengths encircling the pipe, leaving enough opening between ends to allow the mortar to be poured inside the wrapper into the joint.
      - 3) Fill the joint with mortar from 1 side in 1 continuous operation until it has flowed entirely around the pipe.
      - 4) During the filling of the joint, pat or manipulate the sides of the wrapper to settle the mortar and expel any entrapped air.
      - 5) Leave wrappers in place undisturbed until the mortar has set-up.
      - 6) **Do not embed or backfill over pipe for a minimum of two hours to allow mortar to set up. At the start of the project, excavate two joints of pipe to verify mortar does not have shrinkage cracks.**
  3. Interior Joints
    - a. Upon completion of backfilling of the pipe trench, fill the inside joint recess with a stiff cement mortar/high-strength grout.
    - b. Prior to placing of mortar/grout, clean out dirt or trash which has collected in the joint and moisten the concrete surfaces of the joint space by spraying or brushing with a wet brush.
    - c. Ram or pack the stiff mortar/grout into the joint space and take extreme care to insure that no voids remain in the joint space.
    - d. After the joint has been filled, level the surfaces of the joint mortar/grout with the interior surfaces of the pipe with a steel trowel so that the surface is smooth.
    - e. Interior joints of pipe smaller than 21-inches shall have the bottom of the bell buttered with grout, prior to inserting the spigot, such that when the spigot is pushed into position it will extrude surplus grout from the joint.
      - 1) The surplus grout shall be struck off flush with the inside of the pipe by pulling a filled burlap bag or an inflated ball through the pipe with a rope.

4. Welded Joints
  - a. Weld joints in accordance with the AWWA M9 **and AWWA C206**.
    - 1) Contractor shall provide adequate ventilation for welders and for the City to observe welds.
    - 2) Unless otherwise specified on the Drawings, welds shall be full circle fillet welds.
  - b. Adequate provisions for reducing temperature stresses shall be the responsibility of the Contractor.
  - c. Before welding:
    - 1) Thoroughly clean pipe ends.
    - 2) Weld pipe by machine or by the manual shielded electric arc process.
  - d. Welding shall be performed so as not to damage lining or coating.
  - e. Furnish labor, equipment, tools and supplies, including shielded type welding rod.
    - 1) Protect welding rod from any deterioration prior to its use.
    - 2) If any portion of a box or carton is damaged, reject the entire box or carton.
  - f. In all hand welding:
    - 1) The metal shall be deposited in successive layers.
    - 2) Not more than 1/8 inch of metal shall be deposited in each pass.
    - 3) Each pass except the final 1, whether in butt or fillet welds, shall be thoroughly bobbed or peened to relieve shrinkage stresses and to remove dirt, slag or flux before the succeeding bead is applied.
    - 4) Each pass shall be thoroughly fused into the plates at each side of the welding groove or fillet and shall not be permitted to pile up in the center of the weld.
    - 5) Undercutting along the side shall not be permitted.
  - g. Welds shall be free from pin holes, non-metallic inclusions, air pockets, undercutting and/or any other defects.
  - h. If the ends of the pipe are laminated, split or damaged to the extent that satisfactory welding contact cannot be obtained, remove the pipe from the line.
  - i. Furnish each welder employed with a steel stencil for marking the welds so that the work of each welder may be identified.
    - 1) Have each welder stencil the pipe adjacent to the weld with the stencil assigned to him.
      - a) In the event any welder leaves the job, his stencil shall be voided and not duplicated if another welder is employed.
  - j. Welders
    - 1) Each welder employed by the Contractor shall be required to satisfactorily pass a welding test in accordance with AWWA C206 before being allowed to weld on the line.
    - 2) After each welder has qualified in the preliminary tests referred to above, inspections shall be made of joints in the line.
      - a) The inspection will be done by a Certified Welding Inspector retained by the City.
    - 3) Any welder making defective welds shall not be allowed to continue to weld.
  - k. Weld Testing

- 1) Dye penetrant tests in accordance with ASTM E165, or magnetic particle test in accordance with AWWA C206 and set forth in AWS D.1.1. shall be performed by the Contractor under the supervision and inspection of the City's Representative or an independent testing laboratory, on all full welded joints.
  - a) Welds that are defective will be replaced or repaired, whichever is deemed necessary by the Engineer, at the Contractor's expense.
  - b) If the Contractor disagrees with the Engineer's interpretation of welding tests, test sections may be cut from the joint for physical testing. The Contractor shall bear the expense of repairing the joint, regardless of the results of physical testing.
    - (1) The procedure for repairing the joint shall be approved by the Engineer before proceeding.
5. Protection of Exposed Metal
  - a. Protect exposed ferrous metal by a minimum of 1 inch coating of cement mortar as previously specified for inside joints, unless otherwise specified in the Drawings.
  - b. Exposed large flat surfaces such as flanges, bolts, caulked joints, threaded outlets, closures, etc., shall have coating reinforced with galvanized wire mesh.
  - c. Thoroughly clean and wet the surface receiving a cement mortar coating with water just prior to placing the cement mortar coating.
  - d. After placing, take care to prevent cement mortar from drying out too rapidly by covering with damp earth or burlap.
  - e. Cement mortar coating shall not be applied during freezing weather.
6. Patching
  - a. Excessive field-patching of lining or coating shall not be permitted.
  - b. Patching of lining or coating will be allowed where area to be repaired does not exceed 100 square inches and has no dimensions greater than 12 inches.
  - c. In general, there shall not be more than 1 patch on either the lining or the coating of any 1 joint of pipe.
  - d. Wherever necessary to patch the pipe, make patch with cement mortar as previously specified for interior joints.
  - e. Do not install patched pipe until the patch has been properly and adequately cured and approved for laying by the City.
  - f. Promptly remove rejected pipe from the site.

### **3.5 REPAIR / RESTORATION [NOT USED]**

### **3.6 RE-INSTALLATION [NOT USED]**

### **3.7 FIELD QUALITY CONTROL**

#### **A. Field [OR] Site Tests and Inspections**

1. Cleaning and Testing
  - a. Cleaning, disinfection, hydrostatic testing and bacteriological testing of water mains
    - 1) Clean, flush, pig, disinfect, hydrostatic test and bacteriological test the water main as specified in Section 33 04 40.

#### **2. Deflection Testing**

- a. Prior to hydrostatic testing, the City's inspector and Contractor shall perform deflection testing at a minimum rate of 2 measurements for every joint of pipe.
- b. City may reject any areas not meeting the deflection requirements of this Section.
- c. Complete internal welding of joints, welding inspections and grout of the inside joints prior to measuring deflection. The welding inspections shall be done by an independent CWI as described in Section 01 45 23.
- d. Deflection measurements shall be made by the City's inspector and Contractor.
  - 1) Welds that are defective will be replaced or repaired, whichever is deemed necessary by the City, at the Contractor's expense.
  - 2) Method for taking measurements shall be agreed to by the City in writing prior to installing the first joint of pipe.
  - 3) Measurements shall be recorded by the Contractor.
  - 4) Make deflection measurements no sooner than 5 days and no later than 30 days after backfilling operations are complete.
- e. Determine deflection with vertical measurements taken at the locations indicated below. Locations where vertical measurements are taken shall be clearly marked on the interior of the pipe.
  - 1) For pipe joints 36 feet in length, or less, vertical measurements shall be taken at two locations, 1/4-distance from each pipe end.
  - 2) For pipe joints exceeding 36 feet in length, vertical measurements shall be taken at 3 locations including 1/4-distance from each pipe end and at the pipe midpoint.
- f. Correction of Pipe Not Complying with the Deflection Requirements
  - 1) If the average joint deflection of a single joint of any single measurement fails to meet specifications, the entire joint shall be reworked in accordance with the manufacturer's recommendations and as directed by the City at no additional cost to the City. This may include uncovering the pipe, re-compaction of the pipe bedding, and repair of the coating. It is the Contractor's responsibility to continuously measure and calculate pipe deflection to verify it meets specification.

3.8 SYSTEM STARTUP [NOT USED]

3.9 ADJUSTING [NOT USED]

3.10 CLEANING [NOT USED]

3.11 CLOSEOUT ACTIVITIES [NOT USED]

3.12 PROTECTION [NOT USED]

3.13 MAINTENANCE [NOT USED]

3.14 ATTACHMENTS [NOT USED]

END OF SECTION

Revision Log		
DATE	NAME	SUMMARY OF CHANGE
12/20/2012	D. Johnson	1.10.A.4.d. – Size revision for stall requirement 2.2.B.10, 11, 12 and 13 – Added reference to Sections 33 11 05 and 33 04 10; removed material specifications for bolts, nuts and gaskets

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**SECTION 33 11 14**  
**BURIED STEEL PIPE AND FITTINGS**

**PART 1 - GENERAL**

**1.1 SUMMARY**

A. Section Includes:

1. Buried Steel Pipe 24-inches and larger for ~~potable~~ water **transmission** applications

B. Deviations from this City of Fort Worth Standard Specification

1. **Modified 1.1.A.1**
2. **Modified 1.3.A.4.a**
3. **Added 1.3.A.4.g**
4. **Added 1.3.A.6.j & k**
5. **Added 1.3.A.12.f**
6. **Modified 1.6.B.1.a.1**
7. **Modified 1.6.B.3.a**
8. **Added 1.6.B.3.l**
9. **Modified 1.6.C.1**
10. **Added 1.6.C.1.h & i**
11. **Modified 1.9.A.1.a, c, and d**
12. **Modified 1.10.A.4.d.4**
13. **Modified 2.2.B.2.a.1**
14. **Deleted 2.2.B.2.a.1.k.1**
15. **Modified 2.2.B.2.a.1.k.2 & 3**
16. **Deleted 2.2.B.2.b.1.a**
17. **Added 2.2.B.2.b.1.c**
18. **Modified 2.2.B.3.a**
19. **Modified 2.2.B.3.b.1 & 3**
20. **Modified 2.2.B.4**
21. **Modified 2.2.B.7.a & e**
22. **Modified 2.2.B.8.b**
23. **Modified 2.2.B.10**
24. **Modified 2.2.B.11.a.2**
25. **Added 2.2.B.11.a.5**
26. **Modified 2.2.B.12.b, c, & d**
27. **Added 2.2.B.13**
28. **Added 2.2.C.1.e.10**
29. **Modified 2.2.C.1.g**
30. **Added 2.2.C.2.b.1 and 2.**





- 1) Measured horizontally along the surface from center line to center line of the fitting or appurtenance
  - b. Payment
    - 1) The work performed and materials furnished in accordance with this Item and measured as provided under "Measurement" will be paid for at the unit price bid per linear foot of "Steel AWWA C200 Pipe" installed for:
      - a) Various sizes
      - b) Various type of backfill
  - c. The price bid shall include:
    - 1) Furnishing and installing Buried Steel Pipe with joints as specified by the Drawings
    - 2) Mobilization
    - 3) Coating
    - 4) Lining
    - 5) Pavement removal
    - 6) Excavation
    - 7) Hauling
    - 8) Disposal of excess material
    - 9) Furnishing, placement and compaction of embedment
    - 10) Thrust restraint
    - 11) Bolts and nuts
    - 12) Welding
    - 13) Gaskets
    - 14) Furnishing, placement and compaction of backfill
    - 15) Trench water stops
    - 16) Clean-up
    - 17) Cleaning
    - 18) Disinfection
    - 19) Testing
2. Buried Steel Pipe Fittings
- a. Measurement
    - 1) Measurement for this Item shall be by lump sum.
  - b. Payment
    - 1) The work performed and materials furnished in accordance with this Item and measured as provided under "Measurement" will be paid for at the lump sum price bid for "Steel Fittings".
  - c. The price bid shall include:
    - 1) Furnishing and installing Buried Steel Pipe with joints as specified by the Drawings
    - 2) Mobilization
    - 3) Coating
    - 4) Lining
    - 5) Pavement removal
    - 6) Excavation
    - 7) Hauling
    - 8) Disposal of excess material
    - 9) Furnishing, placement and compaction of embedment
    - 10) Thrust restraint
    - 11) Bolts and nuts

- 1 12) Welding
- 2 13) Gaskets
- 3 14) Furnishing, placement and compaction of backfill
- 4 15) Trench water stops
- 5 16) Clean-up
- 6 17) Cleaning
- 7 18) Disinfection
- 8 19) Testing

9 **1.3 REFERENCES**

10 **A. Reference Standards**

- 11 1. Reference standards cited in this Specification refer to the current reference
- 12 standard published at the time of the latest revision date logged at the end of this
- 13 Specification, unless a date is specifically cited.
- 14 2. American Association of State Highway and Transportation Officials(AASHTO).
- 15 3. American Society of Mechanical Engineers (ASME):
- 16 a. B16.1, Gray Iron Pipe Flanges and Flanged Fittings Classes 25, 125 and 250).
- 17 4. ANSI International (ASTM):
- 18 a. ~~A307, Standard Specification for Carbon Steel Bolts and Studs, 60,000 PDI~~
- 19 ~~Tensile Strength~~ **A193, Standard Specification for Alloy-Steel and**
- 20 **Stainless Steel Bolting for High-Temperature or High-Pressure Service**
- 21 **and Other Special Purpose Application.**
- 22 b. B117, Standard Practice for Operating Salt Spray (Fog) Apparatus.
- 23 c. B633, Standard Specification for Electrodeposited Coatings of Zinc on Iron and
- 24 Steel.
- 25 d. C33, Standard Specifications for Concrete Aggregates.
- 26 e. C144, Standard Specification for Aggregate for Masonry Mortar.
- 27 f. C150, Standard Specification for Portland Cement.
- 28 **g. C595, Standard Specification for Blended Hydraulic Cements**
- 29 h. C216, Standard Specification for Facing Brick (Solid Masonry Units Made
- 30 from Clay or Shale).
- 31 i. D16, Standard Terminology for Paint, Related Coatings, Materials, and
- 32 Applications.
- 33 j. D242, Standard Specification for Mineral Filler for Bituminous Paving
- 34 Mixtures.
- 35 k. DD522, Standard Test Methods for Mandrel Bend Test of Attached Organic
- 36 Coatings.
- 37 l. D2240, Standard Test Method for Rubber Property-Durometer Hardness.
- 38 m. D4541, Standard Test Method for Pull-Off Strength of Coatings Using Portable
- 39 Adhesion Testers.
- 40 n. E165, Standard Practice for Liquid Penetrant Examination for General Industry.
- 41 5. American Welding Society (AWS)
- 42 a. D1.1, Structure Welding Code - Steel.
- 43 6. American Water Works Association (AWWA):
- 44 a. C200, Steel Water Pipe - 6 Inches and Larger.
- 45 b. C205, Cement Mortar Protective Lining and Coating for Steel Water Pipe 4 Ins
- 46 and Larger Shop-Applied.
- 47 c. C206, Field Welding of Steel Water Pipe.

- 1 d. C207, Steel Pipe Flanges for Waterworks Service - Sizes 4 IN through 144 IN
- 2 e. C208, Dimensions for Fabricated Steel Water Pipe Fittings.
- 3 f. C210, Liquid-Epoxy Coating Systems for the Interior and Exterior of Steel
- 4 Water Pipelines.
- 5 g. C216, Heat Shrinkable Cross-Linked Polyolefin Coatings for the Exterior of
- 6 Special Sections, Connections, and Fittings for Steel Water Pipelines
- 7 h. C222, Polyurethane Coatings for the Interior and Exterior of Steel Water Pipe
- 8 and Fittings
- 9 i. M11, Steel Pipe - A Guide for Design and Installation.
- 10 **j. C217, Petrolatum and Petroleum Wax Tape Coating for the Exterior of**
- 11 **Special Sections, Connection, and Fittings for Steel Water Pipelines**
- 12 **k. C604, Installation of Steel Water Pipe**
- 13 7. American Water Works Association/American National Standards Institute
- 14 (AWWA/ANSI):
- 15 a. C111/A21.11, Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and
- 16 Fittings.
- 17 8. International Organization for Standardization (ISO).
- 18 9. NACE International (NACE):
- 19 a. SP0188, Discontinuity (Holiday) Testing of New Protective Coatings on
- 20 Conductive Substrates.
- 21 10. NSF International (NSF):
- 22 a. 61, Drinking Water System Components - Health Effects.
- 23 11. Spray Polyurethane Foam Alliance (SPFA).
- 24 12. Society for Protective Coatings (SSPC)/National Associate of Corrosion Engineers
- 25 (NACE)
- 26 a. PA 2, Measurement of Dry Coating Thickness with Magnetic Gages.
- 27 b. SP 1, Solvent Cleaning.
- 28 c. SP 2, Hand Tool Cleaning.
- 29 d. SP 3, Power Tool Cleaning.
- 30 e. SP 10/NACE No. 2 Near-White Blast Cleaning
- 31 **f. SP 5 White Metal Abrasive Blast**

#### 32 **1.4 ADMINISTRATIVE REQUIREMENTS [NOT USED]**

#### 33 **1.5 SUBMITTALS**

- 34 A. Submittals shall be in accordance with Section 01 33 00.
- 35 B. All submittals shall be approved by the City prior to delivery and/or fabrication for
- 36 specials.

#### 37 **1.6 ACTION SUBMITTALS/INFORMATIONAL SUBMITTALS**

- 38 A. Product Data
- 39 1. Exterior Coating
- 40 a. Material data
- 41 b. Application recommendations
- 42 c. Field touch-up procedures
- 43 2. Heat Shrink Sleeves, if applicable
- 44 a. Material data

- 1 b. Installation recommendations
- 2 3. Joint Wrappers, if applicable
- 3 a. Material data
- 4 b. Installation recommendations
- 5 4. Mixes
- 6 a. Mortar for interior joints and patches
- 7 b. Bonding agents for patches
- 8 5. Gaskets
- 9 B. Shop Drawings
- 10 1. Wall thickness design calculations sealed by a Licensed Professional Engineer in
- 11 Texas including:
- 12 a. Internal pressure
- 13 1) Maximum design **working** pressure
- 14 2) Surge pressure
- 15 b. External pressure
- 16 1) Deflection
- 17 2) Buckling
- 18 3) Extreme loading conditions
- 19 c. Special physical loading such as supports or joint design
- 20 d. Thermal expansion and/or contraction
- 21 2. Thrust restraint calculations for all fittings and valves including the restraint length
- 22 sealed by a Licensed Professional Engineer in Texas to verify the restraint lengths
- 23 shown in the Drawings.
- 24 3. Fabrication and lay drawings showing a schematic location with profile and a
- 25 tabulated layout schedule that is sealed by a Licensed Professional Engineer in
- 26 Texas and includes:
- 27 a. Pipe **wall thickness**
- 28 b. Joint types
- 29 c. Fittings
- 30 d. Outlets
- 31 e. Thrust Restraint
- 32 f. Stationing (in accordance with the Drawings)
- 33 g. Transitions
- 34 h. Joint deflection
- 35 i. Interior lining
- 36 j. Outlet locations for welding, ventilation, and access
- 37 k. Welding requirements and provisions for thermal stress control
- 38 l. **Contractor's proposed field welding procedure in accordance with AWWA**
- 39 **C206 and AWS D1.1**
- 40 C. Certificates and Test Reports
- 41 1. ~~Prior to~~ **Within 30 days of** shipment of the pipe, the pipe manufacturer shall submit
- 42 the following:
- 43 a. A Certificate of Adequacy of Design stating that the pipe to be furnished
- 44 complies with AWWA C200, AWWA C205, AWWA C210, AWWA C222
- 45 and these Specifications.
- 46 b. Copies of results of factory hydrostatic tests shall be provided to the Engineer.

- c. Mill certificates, including chemical and physical test results for each heat of steel.
- d. A Certified Test Report from the polyurethane coating manufacturer indicating that the coatings were applied in accordance with manufacturer's requirements and in accordance with this Specification.
- e. Certified test reports for welder certification for factory and field welds in accordance with AWWA C200, Section 4.11.
- f. Certified test reports for cement mortar tests.
- g. Certified test reports for steel cylinder tests.
- h. **Certified test reports for factory welds of fittings from an independent certified welding inspector, not employed by the pipe manufacturer.**
- i. **Certified test report for field welds from an independent certified welding inspector, not employed by the pipe manufacturer.**

#### 1.7 CLOSEOUT SUBMITTALS [NOT USED]

#### 1.8 MAINTENANCE MATERIAL SUBMITTALS [NOT USED]

#### 1.9 QUALITY ASSURANCE

##### A. Qualifications

##### 1. Manufacturers

- a. Shall be certified under S.P.F.A. or I.S.O. **9001** quality certification program for steel pipe and accessory manufacturing
- b. Finished pipe shall be the product of 1 manufacturer.
- c. Pipe **and fitting** manufacturing operations (pipe, lining and coatings) shall be performed under the control of the manufacturer.
- d. The pipe manufacturer shall not have less than 5 years successful experience manufacturing pipe, **including the lining and coating**, to AWWA Standards of the particular type and size indicated or demonstrate an experience record that is satisfactory to the Engineer and City.
  - 1) This experience record will be thoroughly investigated by the Engineer, and acceptance will be at the sole discretion of the Engineer and City.
  - 2) Pipe manufacturing operations (pipe, fittings, lining, coating) shall be performed **under the control of the manufacturer**
- e. Manufacture pipe in accordance with the latest revisions of AWWA C200, AWWA C205, AWWA C210 and AWWA C222.

#### 1.10 DELIVERY, STORAGE, AND HANDLING

##### A. Packing

- 1. Prepare pipe for shipment to:
  - a. Afford maximum protection from normal hazard of transportation
  - b. Allow pipe to reach project site in an undamaged condition
- 2. Pipe damaged in shipment shall not be delivered to the project site unless such damaged pipe is properly repaired.
- 3. After the completed pipe and fittings have been removed from the final cure at the manufacturing plant:
  - a. Protect pipe lining from drying by means of plastic end covers banded to the pipe ends.
  - b. Maintain covers over the pipe ends at all times until ready to be installed.

- 1 c. Moisture shall be maintained inside the pipe by periodic addition of water, as  
2 necessary.
- 3 4. Pipes shall be carefully supported during shipment and storage.
- 4 a. Pipe, fittings and specials shall be separated so that they do not bear against  
5 each other and the whole load shall be securely fastened to prevent movement  
6 in transit.
- 7 b. Ship pipe on padded bunks with tie-down straps approximately over stulling.
- 8 c. Store pipe on padded skids, sand or dirt berms, tires or other suitable means to  
9 protect the pipe from damage.
- 10 d. Each end of each length of pipe, fitting or special and the middle of each pipe  
11 joint shall be internally supported and braced with stulls to maintain a true  
12 circular shape.
- 13 1) Internal stulls shall consist of timber or steel firmly wedged and secured so  
14 that stulls remain in place during storage, shipment and installation.
- 15 2) Pipe shall be rotated so that 1 stull remains vertical during storage,  
16 shipment and installation.
- 17 3) At a minimum, stulls shall be placed at each end and center.
- 18 a) Additional stulls may be required depending upon the length of the  
19 joints and pipe design.
- 20 4) Stulls shall not be removed until backfill operations are complete,  
21 ~~(excluding final clean up), unless it can be demonstrated to the City's~~  
22 ~~satisfaction that removal of stulls will not adversely affect pipe~~  
23 ~~installation.~~
- 24 i. Pipe shall be stulled as required to maintain roundness of +/- 1%, or  
25 D<sup>2</sup>/4,000 (inches), whichever is less, during shipping and handling.
- 26 B. Delivery, Handling, and Storage
- 27 1. Once the first shipment of pipe has been delivered to the site, the Engineer and the  
28 Contractor shall inspect the pipe's interior coating for excessive cracking.
- 29 2. If excessive cracking is found, the Contractor shall modify shipping procedures to  
30 reduce or eliminate cracking.
- 31 3. Deliver, handle and store pipe in accordance with the manufacturer's  
32 recommendations to protect coating systems.
- 33 4. Secure and maintain a location to store the material in accordance with Section 01  
34 66 00.

35 **1.11 FIELD CONDITIONS [NOT USED]**

36 **1.12 WARRANTY [NOT USED]**

37 **PART 2 - PRODUCTS**

38 **2.1 OWNER-FURNISHED [NOT USED]**

39 **2.2 EQUIPMENT, PRODUCT TYPES, AND MATERIALS**

40 A. Manufacturers

- 41 1. Only the manufacturers as listed by the City's Standard Products List will be  
42 considered as shown in Section 01 60 00.
- 43 a. The manufacturer must comply with this Specification and related Sections.





- 1 a) ~~Corropipe II Omni, and GP II (E) Touch-Up, respectively, as~~  
2 ~~manufactured by Madison Chemical Industries, or~~  
3 b) Durashield 110, 210, 310, or Durashield 310 JARS as manufactured by  
4 LifeLast, Inc., or  
5 c) Carboline Polygard 777 or 777PL  
6 d) Properties specified above.  
7 e) Mix and apply polyurethane coatings in accordance with the coating  
8 manufacturer's recommendations.
- 9 3. Cement Mortar Linings  
10 a. Cement mortar linings shall be shop-applied (plant-spun).  
11 b. Shop-applied cement mortar linings shall conform to the requirements of  
12 AWWA C205 with the following modifications:  
13 1) Sand used for cement mortar shall be silica sand ASTM C33 and shall not  
14 leach in water.  
15 2) Curing of the linings shall conform to the requirements of AWWA C205.  
16 3) Cement mortar linings shall be dense and smooth without bumps,  
17 blisters, ridges, or spalling, to the satisfaction of the Engineer. Lining  
18 shall be in intimate contact with steel cylinder and shall not have a  
19 drumming sound when tapped.
- 20 4. Gaskets  
21 1) Flange gaskets in accordance with AWWA C207. O-ring gaskets in  
22 accordance with AWWA C200.  
23 2) Provide Gaskets in accordance with Section 33 11 05.
- 24 5. Bolts and Nuts  
25 a. Flanged Ends  
26 1) Flange in accordance with AWWA C207.  
27 2) Provide bolts and nuts in accordance with Section 33 11 05.
- 28 6. Flange Coatings  
29 a. Flange Coatings in accordance with Section 33 11 05.
- 30 7. Steel shall:  
31 a. Meet the requirements of AWWA C200 (42,000 psi minimum yield strength)  
32 b. Be of continuous casting  
33 c. Be homogeneous  
34 d. Be suitable for field welding  
35 e. Be fully killed  
36 f. Be fine austenitic grain size
- 37 8. Bend Fittings  
38 a. Fabricate all fittings from hydrostatically tested pipe.  
39 b. All bend fittings shall be long radius to permit easy passage of pipeline pigs.  
40 All bend fittings shall have a minimum radius of 2.5 times the diameter.
- 41 9. Threaded Outlets  
42 a. Where outlets or taps are threaded, Threaded with CC Threads and furnish and  
43 install brass bushings for the outlet size indicated.
- 44 10. Weld Lead Outlets  
45 a. Use of threaded outlets for access for weld leads is permitted.  
46 b. Additional outlet configurations shall be approved by the Engineer.  
47 c. Outlets shall be welded after use and covered with a heat shrink sleeve.
- 48 11. Mixes

- 1 a. Mortar for Joints  
2 1) Mortar shall be 1 part cement to 2 parts sand.  
3 2) Cement shall be ASTM C150, Type I or Type II **or ASTM C595 Type II**  
4 **Cement.**  
5 3) Sand shall be of sharp silica base.  
6 a) Sand shall conform to ASTM C144.  
7 4) Interior joint mortar shall be mixed with as little water as possible so that  
8 the mortar is very stiff, but workable.  
9 5) **Exterior joint mortar shall be mixed to the consistency of a thick**  
10 **cream.**  
11 6) Water for cement mortar shall be from a potable water source.  
12 7) Mortar for patching shall be as per interior joints.  
13 b. Bonding Agent  
14 1) Bonding Agent for Cement Mortar Lining must meet NSF 61, if cement  
15 lining is in contact with potable water.  
16 2) Bonding agent for cement mortar lining patching shall be:  
17 a) Probond Epoxy Bonding Agent ET-150, parts A and B  
18 b) Sikadur 32 Hi-Mod, or  
19 c) Approved equal

20 12. Heat Shrink Sleeves for Polyurethane Coated Steel Pipe

- 21 a. Primer: Provide as recommended by the sleeve manufacturer.  
22 b. Filler Mastic: Provide mastic filler as recommended by the heat shrink sleeve  
23 manufacturer **for all locations which have 1/8", or larger, change in outside**  
24 **diameter.**  
25 1) Size and type shall be as recommended by the sleeve manufacturer for type  
26 of pipe and joint. **Filler material shall have a melting point of 500**  
27 **degrees F or higher. Filler shall be Canusa SG79 or Raychem**  
28 **covalence 939 filler.**  
29 c. Joint Coating: Cross-linked polyolefin wrap or sleeve with a mastic sealant, 85  
30 mils total thickness, suitable for pipeline operating temperature, sleeve material  
31 recovery as recommended by the manufacturer.  
32 1) **Standard recovery sleeve shall be used for welded or bell and spigot**  
33 **joints.** High recovery sleeves shall be provided for flanged and coupling  
34 style joints with a minimum of 50 percent recovery.  
35 2) Sleeve length shall provide a minimum of 3 inches overlap onto intact pipe  
36 coating on each side of the joint. **Sleeve shall be a minimum of 17 inches**  
37 **wide.**  
38 3) Width to take into consideration shrinkage of the sleeve due to installation  
39 and joint profile  
40 d. Heat shrink sleeves shall meet AWWA C216, as manufactured by:  
41 1) Canusa **CPS: Aqua-Shield AOW – WAB System**  
42 ~~2) Raychem, or Berry CPG – Covalence: Water Wrap - WAB~~  
43 ~~3) Approved equal~~  
44 e. Provide heat shrink sleeve suitable to interior joint welding without damage to  
45 heat shrink sleeve.

46 13. **Special Coatings in Tunnels and Casings:**

- 1 a. **Pipe within a casing or tunnel shall be a mortar coating over the**  
2 **polyurethane coating. The coating shall contain at least two mortar bands**  
3 **at a minimum of two inches thick and thick enough to have a larger**  
4 **outside diameter than the bell (including heat shrink sleeve). The intent of**  
5 **the mortar coating is to allow the pipe to be installed by skidding on rails.**  
6 **The Manufacturer shall design the mortar bands and reinforcement**  
7 **sufficiently to prevent damage to the coating from the installation process.**

8 C. Performance / Design Criteria

9 1. Pipe Design

- 10 a. Steel pipe shall be designed, manufactured and tested in conformance with  
11 AWWA C200, AWWA M11 and these Specifications.  
12 b. Sizes and pressure classes (working pressure) shall be as shown below.  
13 c. For the purpose of pipe design, the transient pressure plus working pressure  
14 shall be as indicated below.  
15 d. Fittings, specials and connections shall be designed for the same pressures as  
16 the adjacent pipe.  
17 e. Pipe design shall be based on trench conditions and the design pressure in  
18 accordance with AWWA M11; using the following parameters:  
19 1) Unit Weight of Fill (W) = 130 pounds per cubic foot  
20 2) Live Load  
21 a) = AASHTO HS 20, at all locations except at railroads  
22 b) = Cooper E80, at Railroads  
23 3) Trench Depth = As indicated in the Drawings  
24 4) Deflection Lag Factor ( $D_1$ ) = 1.0  
25 5) Coefficient (K) = 0.10  
26 6) Maximum Calculated Deflection:  
27 a)  $D_x = 3$  percent (for polyurethane coated pipe)  
28 b)  $D_x = 2$  percent (for cement mortar coated pipe)  
29 7) Soil Reaction Modulus ( $E'$ ) < 1,000  
30 8) Working Pressure = 150 psi  
31 a) Test Pressure =  
32 (1) No less than 1.25 minimum times the stated working pressure (187  
33 psi minimum) of the pipeline measured at the highest elevation  
34 along the test section.  
35 (2) No less than 1.5 times the stated working pressure (225 psi  
36 minimum) at the lowest elevation of the test section.  
37 9) Surge Allowance = 100 psi, minimum  
38 a) Where Total Pressure (including surge) = 150 psi + 100 psi = 250 psi  
39 **10) Design pipe for full vacuum conditions without buckling or damage to**  
40 **lining, coating, or pipe joints.**  
41 f. Fittings and specials shall be:  
42 1) Designed in accordance with AWWA C208 and AWWA M11 except that  
43 crotch plates shall be used for outlet reinforcement for all Pressure  
44 Diameter Values, PDV, greater than 6,000.  
45 g. Where the pipe requires additional external support to achieve the specified  
46 maximum deflection, the Contractor ~~and pipe supplier~~ **(with concurrence**  
47 **from the pipe manufacturer)** will be required to furnish alternate methods for  
48 pipe embedment.

- 1) No additional compensation will be made to the Contractor by the City where this method is required.
- h. Trench depths indicated shall be verified after existing utilities are located.
- 1) Vertical alignment changes required because of existing utility or other conflicts shall be accommodated by an appropriate change in pipe design depth.
- 2) In no case shall pipe be installed deeper than its design allows.
- i. Field fabrication or cutting is not allowed, unless otherwise approved by the City.
2. Provisions for Thrust
- a. Thrust at bends, tees or other fittings shall be resisted by restrained joints.
- 1) Thrust at bends adjacent to casing shall be restrained by welding joints through the casing and a sufficient distance each side of the casing.
- 2) The distance for thrust restraint shown on the Drawings is the minimum restraint and does not relieve the manufacturer from calculating the restraint needs as specified herein.
- a) In no case shall the restrained distance be less than indicated on the Drawings.
- b. Restrained joints shall be used a sufficient distance from each side of the bend, tee, plug or other fitting to resist thrust which develops at the design pressure of the pipe.
- 1) **At a minimum, all fittings and specials with outlets shall be welded to connecting pipes regardless of if the fittings are indicated to be restrained in the Drawings.**
- 2) **Weld all joints at vertical and horizontal points of inflection regardless of if those locations are indicated to be restrained in the Drawings.**
- 3) **Welding(restraint) of joints on curved pipe sections (with minimum radius shown on Drawings) are not required to be restrained, unless called out on Drawings, or if thrust design warrants.**
- c. Restrained joints shall consist of welded joints **(or flanged joints if shown on the Drawings).**
- d. The length of pipe designed with restrained joints to resist thrust shall be verified by the pipe manufacturer in accordance with AWWA M11 and the following:
- 1) The weight of the earth ( $W_e$ ) shall be calculated as the weight of the projected soil prism above the pipe, for unsaturated soil conditions
- 2) Soil Density = ~~140~~ **130** pounds per cubic foot (maximum value to be used), for unsaturated soil conditions
- 3) Coefficient of Friction = 0.25 (maximum value to be used for polyurethane coated steel pipe).
- 4) If indicated on the Drawings and the Geotechnical Borings that ground water is expected, account for reduced soil density.
- 5) For horizontal bends, the length of pipe to be restrained shall be calculated as follows:

$$L = \frac{P A (1 - \cos \Delta)}{f (2W_e + W_p + W_w)}$$

Where:

- 1  $\Delta$  = Deflection angle
- 2 L = Length of pipe to be restrained on each side
- 3 P = internal pressure (**working pressure plus surge allowance**)
- 4 A = Cross sectional area of pipe steel cylinder I.D.
- 5  $W_e$  = Weight of prism of soil over the pipe
- 6  $W_p$  = Weight of pipe
- 7  $W_w$  = Weight of water
- 8 f = Coefficient of friction between pipe and soil

9 3. Inside Diameter

10 a. The inside diameter, including the cement-mortar lining, shall be a minimum of

11 the nominal diameter of the pipe specified, unless otherwise indicated on the

12 Drawings.

13 4. Wall Thickness

14 a. The minimum pipe wall steel thickness shall be as designed, but not less than

15 **0.188 inches** ~~0.25 inches~~ or pipe D/240, whichever is greater for pipe and

16 fittings, with no minus tolerance, where D is the nominal inside pipe diameter.

17 **Thickness must be sufficient to meet full buried vacuum conditions in all**

18 **locations.**

19 b. Where indicated on the Drawings, pipe and fittings shall have thicker steel pipe

20 wall.

21 c. The minimum steel wall thickness shall also be such that the fiber stress shall

22 not exceed:

23 1) 50 percent of the minimum yield strength of the steel for working pressure

24 and

25 2) 75 percent of the minimum yield strength of the steel at the maximum

26 pressure (including transient pressure), nor the following, at the specified

27 working pressure:

Pipe Type	Maximum Stress at Working Pressure
Polyurethane Coated Steel	23,000 psi
Mortar Coated Steel	NOT USED

29

30 d. Pipe which is placed in casing or tunnel shall have a minimum pipe wall steel

31 thickness of 0.375 inches or pipe D/144, whichever is greater, where D is the

32 nominal pipe diameter.

33 e. Pipe, fittings and specials shall be designed such that the maximum stresses in

34 the pipe due to thrust loading will not exceed ~~18,000~~ **23,000 psi.**

35 5. Seams

36 a. Except for mill-type pipe, the piping shall be made from steel plates **or coils**

37 rolled into cylinders or sections thereof with the longitudinal and girth seams

38 butt welded or shall be spirally formed and butt welded.

39 1) There shall be not more than 2 longitudinal seams.

40 2) Girth seams shall be butt welded and shall not be spaced closer than 6 feet

41 except in specials and fittings.

42 6. Joint Length

43 a. Maximum joint length shall not exceed 50 feet.

44 b. Maximum joint length of steel pipe installed in casing shall ~~meet the project~~

45 **requirements not exceed 25 feet.**

- 1 c. Manufactured random segments of pipe will not be permitted for straight runs  
2 of pipe.  
3 1) Closing piece segments, however, shall be acceptable.
- 4 7. Joint Bonds, Insulated Connections and Flange Gaskets  
5 a. Joint Bonds, Insulated Connection, and Flange Gaskets shall be in accordance  
6 with Section 33 04 10.
- 7 8. Bend Fittings  
8 a. All bend fittings shall be long radius **minimum 2.5 times the pipe ID** to  
9 permit passage of pipeline pigs.
- 10 9. Pipe Ends  
11 a. Pipe ends shall be:  
12 1) Lap welded slip joints  
13 2) Butt strap joint  
14 3) Flanged joint  
15 4) Flexible coupled joint  
16 5) Roll groove gasket joint  
17 b. Pipe ends shall be welded or harnessed where indicated and as necessary to  
18 resist thrust forces.  
19 1) Thrust at bends adjacent to casing shall be restrained by welding joints  
20 through the casing and a sufficient distance each side of the casing.
- 21 c. Rubber Gasket Joint  
22 1) Rubber gasketed joints (O-ring or Carnegie Joints) will only be allowed for  
23 pipe sizes 54-inch diameter and smaller.  
24 2) Joints shall conform to AWWA C200 standard.  
25 3) The joints shall consist of:  
26 a) Bell  
27 (1) Flared bell end formed and sized by forcing the pipe or a plug die  
28 or by expanding on segmental dies.  
29 b) Spigot  
30 (1) Rolled spigot or carnegie shaped steel joint ring in accordance with  
31 AWWA C200 and as shown as **Item A or B in Figure 6-1** of the  
32 AWWA M11 **Fifth Edition**.  
33 4) The welded area of bell and spigot pipe ends shall be checked after forming  
34 by the dye penetrant or magnetic particle method.  
35 5) The difference in diameter between the interior diameter (I.D.) of the bell  
36 and the outer diameter (O.D.) of the spigot shoulder at point of full  
37 engagement with an allowable deflection shall be no more than 0.04 inches  
38 as measured on the circumference with a diameter tape.  
39 6) The gasket shall have sufficient volume to approximately fill the area of the  
40 groove and shall conform to AWWA C200.  
41 7) The joint shall be suitable for the specified test and/or surge pressure and  
42 deflection.  
43 8) Joints shall be of clearances such that water tightness shall be provided  
44 under all operating and test conditions with a pipe diameter deflection  
45 ~~based upon the supplied pipe coating~~ **of five percent**.  
46 9) Joints shall be electrically continuous.
- 47 d. Lap Welded Slip Joint  
48 1) Lap welded slip joint shall be provided in all locations for pipe larger than  
49 **48**-inches and where joints are welded for thrust restraint.

- 1 2) Lap welded slip joints may be welded from the inside or outside.  
2 3) Ends of pipe, fittings and specials for field welded joints shall be prepared  
3 with 1 end expanded in order to receive a plain end making a bell and plain  
4 end type of joint.  
5 a) Clearance between the surfaces of lap joints shall not exceed 1/8 inch at  
6 any point around the periphery.  
7 4) In addition to the provisions for a minimum lap of 1½ inches as specified in  
8 AWWA C200, the depth of bell shall be such as to provide for a minimum  
9 distance of 1 inch between the weld and the nearest tangent of the bell  
10 radius when welds are to be located on the inside of the pipe.  
11 e. Fittings with Flanges  
12 1) Flanged joints shall be provided at connections to valves and where  
13 indicated on the Drawings.  
14 2) Ends to be fitted with slip-on flanges shall have the longitudinal or spiral  
15 welds ground flush to accommodate the type of flanges provided.  
16 3) Pipe flanges and **field** welding of flanges to steel pipe shall conform to the  
17 requirements of AWWA C207 and AWWA C206.  
18 4) Pipe flanges shall be of rated pressure equal to or greater than the adjacent  
19 pipe class.  
20 5) Flanges shall match the fittings or appurtenances which are to be attached.  
21 6) Flanges shall be ~~Class E with 275 psi working pressure in accordance with~~  
22 ~~AWWA C207 and drilled in accordance with ASME B16.1 Class 125 for~~  
23 ~~areas designated with a 225 test pressure~~ **Flanges shall be Class E for**  
24 **working pressure up to 275 psi in accordance with AWWA C207 and**  
25 **as needed to match appurtenances. Drillings per AWWA C207 or as**  
26 **needed to match valves or equipment**  
27 7) When Isolation Flanges are required by the Drawings, Drillings shall  
28 accommodate the required spacing for mylar sleeves according to Section  
29 33 04 10.  
30 f. Flexible Couplings  
31 1) Flexible couplings shall be provided where specified on the Drawings.  
32 2) Ends to be joined by flexible couplings shall be:  
33 a) Plain-end type, prepared as stipulated in AWWA C200.  
34 b) Welds on ends to be joined by couplings shall be ground flush to  
35 permit slipping the coupling in at least 1 direction to clear the pipe  
36 joint.  
37 c) Harness bolts and lugs shall comply with AWWA M11.  
38 g. Butt Strap Closure Joints  
39 1) Where necessary to make closure to pipe previously laid, closure joints  
40 shall be installed using butt strap joints in accordance with AWWA C206  
41 and applicable provisions of this Specification.  
42 10. Polyurethane Coating  
43 a. Applicator Qualifications  
44 1) Equipment shall be certified by the coating manufacturer to meet the  
45 requirements for:  
46 a) Material mixing  
47 b) Temperature control  
48 c) Application rate  
49 d) Ratio control for multi-part coatings





- a) Thinning is not permitted.
  - 2) Apply directly to pipe to achieve a total dry film thickness (DFT) of 35 mils.
  - 3) Multiple-pass, 1 coat application process is permitted provided maximum allowable recoat time specified by coating manufacturer is not exceeded.
  - 4) Provide cutbacks in accordance with coating manufacturer's recommendations as appropriate for the type of joint and heat shrink sleeve to be used.
- h. Recoating
- 1) Recoat only when coating has cured less than maximum time specified by coating manufacturer.
  - 2) When coating has cured for more than recoat time, brush-blast or thoroughly sand the surface.
  - 3) Blow-off cleaning using clean, dry, high pressure compressed air.
- i. Curing
- 1) Do not handle pipe until coating has been allowed to cure, per manufacturer's recommendations.

#### **11. Joint Primer for Holdback**

- a. **Prime coating and lining holdback area per manufacturer's recommendation appropriate for field welding.**

### **2.3 ACCESSORIES [NOT USED]**

### **2.4 SOURCE QUALITY CONTROL**

#### **A. Marking for Identification**

1. For each joint of pipe and each fitting, plainly mark on 1 end:
  - a. Class for which it is designated
  - b. Date of manufacturer
  - c. Identification number
  - d. Top centerlines shall be marked on all specials

#### **B. Factory Testing**

1. Cement Mortar Lining - Shop-applied cement mortar linings shall be tested in accordance with AWWA C205.
2. Polyurethane Coating - The polyurethane coating shall be tested in accordance with AWWA C222.
  - a. Thickness: Test thickness of coating in accordance with SSPC PA 2.
    - 1) Test coating system applied to the pipe for holidays according to the procedures outlined in NACE SP0188 using a high voltage spark tester (operating at 100 volts per mil), for the dry film thickness (DFT) specified of 35 mil.
  - b. Adhesion Testing
    - 1) Polyurethane coatings or linings shall have an adhesion to steel of 1,500 pounds per square inch, minimum.
    - 2) Test polyurethane coating adhesion to steel substrates using pneumatic pull off equipment, such as HATE Model 108 or Delfesko Positest, in accordance with ASTM D4541 and AWWA C222, except as modified in this Section.
    - 3) Adhesion testing records shall include:

- 1 a) Pipe identification
- 2 b) Surface tested (interior or exterior)
- 3 c) Surface temperature
- 4 d) Coating thickness
- 5 e) Tensile force applied
- 6 f) Mode of failure
- 7 g) Percentage of substrate failure relative of dolly surface
- 8 4) Glue dollies for adhesion testing to the coating surface and allowed to cure
- 9 for a minimum of 12 hours.
- 10 a) Because of high cohesive strength, score polyurethane coatings around
- 11 the dolly prior to conducting the adhesion test.
- 12 5) Failure shall be by adhesive and cohesive failure only.
- 13 a) Adhesive failure is defined as separation of the coating from the steel
- 14 substrate.
- 15 b) Cohesive failure is defined as failure within the coating, resulting in
- 16 coating remaining both on the steel substrate and dolly.
- 17 6) Retest partial adhesion and glue failure if the substrate failure is less than
- 18 50 percent relative of the dolly surface area and the applied tension was less
- 19 than the specified adhesion.
- 20 7) Glue failures in excess of the minimum required tensile adhesion are
- 21 accepted as meeting the specified adhesion requirements.
- 22 8) Conduct, accept and reject adhesion tests on polyurethane pipe coating and
- 23 lining independently (where applicable).
- 24 9) Frequency of adhesion testing in accordance with AWWA C222.
- 25 10) Randomly select repair patches on the polyurethane coating for adhesion
- 26 testing in a manner as described herein and at the discretion of the coating
- 27 inspector conducting the adhesion tests.
- 28 a) Adhesion of repairs shall be as specified by the coating manufacturer
- 29 for the type of repair.

### 30 C. Manufacturer's Technician for Pipe Installation

- 31 1. Pipe Manufacturer's Representative
- 32 a. If required by the Engineer or requested by the Contractor during construction,
- 33 the pipe manufacturer shall furnish the services of a factory trained, qualified,
- 34 job experienced technician to advise and instruct as necessary in pipe laying
- 35 and pipe jointing.
- 36 1) The technician shall assist and advise the Contractor in his pipe laying
- 37 operations and shall instruct construction personnel in proper joint
- 38 assembly and joint inspection procedures.
- 39 2) The technician is not required to be on-site full time; however, the
- 40 technician shall be regularly on-site during the first 2 weeks of pipe laying
- 41 and thereafter as requested by the Engineer, City or Contractor.
- 42 2. Polyurethane Coating Manufacturer's Representative
- 43 a. The pipe manufacturer shall provide services of polyurethane coating
- 44 manufacturer's representative and a representative from the heat shrink joint
- 45 manufacturer for a period of not less than 3 days at beginning of actual pipe
- 46 laying operations to advise Contractor and City regarding installation, including
- 47 but not limited to:
- 48 1) Handling and storage
- 49 2) Cleaning and inspecting

- 1 3) Coating repairs
- 2 4) Field applied coating
- 3 5) Heat shrink installation procedures
- 4 6) General construction methods and how they may affect pipe coating
- 5 b. Representative shall be required to return if, in the opinion of the Engineer, the
- 6 polyurethane coating or the Contractor's construction methods do not comply
- 7 with Contract Specifications.
- 8 1) Cost for the manufacturer's representatives to return to the site shall be at
- 9 no additional cost to the City.

10 D. Hydrostatic Pressure Testing

- 11 1. Perform hydrostatic pressure testing in accordance with AWWA C200.
- 12 2. Hydrostatically test each joint of pipe prior to application of lining or coating.
- 13 a. The internal test pressure shall be that which results in a fiber stress equal to 75
- 14 percent of the minimum yield strength of the steel used.
- 15 b. Each joint of pipe tested shall be completely watertight under maximum test
- 16 pressure.
- 17 c. Test pressure shall be held for sufficient time to observe the weld seams.
- 18 d. Maintain a recording pressure gauge, reference number of pipe tested, etc.
- 19 1) The pipe shall be numbered in order that this information can be recorded.
- 20 e. **Fittings shall be fabricated from hydrostatically tested pipe. All welds on**
- 21 **fittings shall be tested by hydrostatic test, ultrasonic test, air test, or**
- 22 **magnetic particle test. Air test shall be made by applying air to the welds**
- 23 **at 10 pounds per square inch pressure and checking for leaks around and**
- 24 **through welds with a soap solution. In addition, 5 percent of welds on**
- 25 **fittings shall be checked with x-ray or ultrasonic testing by an independent**
- 26 **certified welding inspector paid for by the Pipe Manufacturer.**
- 27 ~~3. Test fittings by:~~
- 28 ~~a. Hydrostatic test~~
- 29 ~~b. Magnetic particle test~~
- 30 ~~c. Ultrasonic~~
- 31 ~~d. Radiography~~
- 32 ~~e. Dye penetrant test~~

33 E. City Testing and Inspection

- 34 1. Pipe may be subject to inspection at the manufacturer's facility by an independent
- 35 testing laboratory, which laboratory shall be selected and retained by the City.
- 36 a. Representatives of the City, City's laboratory, or the Engineer shall have access
- 37 to the work whenever it is in preparation or progress.
- 38 b. Pipe manufacturer shall provide proper facilities for access and for inspection.
- 39 c. Pipe manufacturer shall notify the City in writing, a minimum of 2 weeks prior
- 40 to the pipe fabrication so that the City may advise the manufacturer as to the
- 41 City's decision regarding tests to be performed by an independent testing
- 42 laboratory.
- 43 d. Material, fabricated parts and pipe, which are discovered to be defective, or
- 44 which do not conform to the requirements of this Specification shall be subject
- 45 to rejection at any time prior to City's final acceptance of the product.
- 46 2. The inspection and testing by the independent testing laboratory anticipates that
- 47 production of pipe shall be done over a normal period of time and without "slow
- 48 downs" or other abnormal delays.

- 1 a. The pipe manufacturer shall coordinate their manufacturing schedule with the  
2 Contractor and advise the Contractor of any changes in the schedule.

3 **PART 3 - EXECUTION**

4 **3.1 INSTALLERS [NOT USED]**

5 **3.2 EXAMINATION [NOT USED]**

6 **3.3 PREPARATION [NOT USED]**

7 **3.4 INSTALLATION**

8 A. General

- 9 1. Install steel pipe, fittings, specials and appurtenances as specified herein, as  
10 specified in AWWA M11, in accordance with ~~the pipe manufacturer's~~  
11 ~~recommendations~~ **AWWA C604** and as required for the proper functioning of the  
12 completed pipe line.
- 13 2. Lay pipe to the lines and grades as indicated in the Drawings.
- 14 3. Excavate, embed and backfill trenches in accordance with Section 33 05 10.
- 15 4. For installation of carrier pipe within casing, see Section 33 05 24.
- 16 5. Inspect and test each joint for holidays just prior to pipe being lowered into the  
17 ditch.
- 18 a. All damaged areas and holidays are to be repaired before the pipe is lowered  
19 into the trench.
- 20 6. Place and consolidate embedment and backfill prior to removing pipe stulls.
- 21 7. Maximum allowable pipe deflection is limited to:
- 22 a. 2 percent for mortar coated steel pipe
- 23 b. 3 percent for polyurethane coated steel pipe
- 24 8. Install bonds at all pipe joints, except for welded joints or insulated joints.

25 B. Pipe Handling

- 26 1. Haul and distribute pipe and fittings at the project site.
- 27 2. Handle pipe with care to avoid damage.
- 28 a. Pipe shall be handled at all times with ~~sufficient~~ **a minimum of two** non-  
29 abrasive slings, belts or other equipment designed to prevent damage to the  
30 coating or lining.
- 31 b. The spacing of pipe supports required to handle the pipe shall be adequate to  
32 prevent cracking or damage to the lining or coating. **For joints exceeding 40**  
33 **feet, a spreader bar shall be used.**
- 34 c. Inspect each joint of pipe and reject or repair any damaged pipe prior to  
35 lowering into the trench.
- 36 d. The equipment shall be kept in such repair that its continued use is not injurious  
37 to the coating.
- 38 e. Do not lay pipe in wet conditions.
- 39 3. At the close of each operating day:
- 40 a. Keep the pipe clean and free of debris, dirt, animals and trash – during and after  
41 the laying operation.

- 1                   b. Effectively seal the open end of the pipe using a gasketed night cap.
- 2           C. Line Up at Bends
- 3           1. Line up pipe for joining so as to prevent damage thereto.
- 4           a. Thoroughly clean the bell and spigot ends of each joint of pipe of foreign
- 5           matter, rust and scale before placing spigot into bell.
- 6           2. Where abrupt changes in grade and direction occur, employ special shop fabricated
- 7           fittings for the purpose.
- 8           a. Field cutting the ends of the steel pipe to accomplish angular changes in grade
- 9           or direction of the line shall not be permitted.
- 10          3. **Over-stabbed joints shall not be acceptable. A joint shall be considered over-**
- 11          **stabbed if the stabbed section is greater than the manufacturer's**
- 12          **recommendation. All over-stabbed joints shall be re-stabbed, but-strapped, or**
- 13          **welded.**
- 14          D. Pipe Laying
- 15          1. Rubber Gasket Joints
- 16          a. Join rubber gasket joints in accordance with the manufacturer's
- 17          recommendations.
- 18          b. Clean bell and spigot of foreign material.
- 19          c. Lubricate gaskets and bell and relieve gasket tension around the perimeter of
- 20          the pipe.
- 21          d. Engage spigot as far as possible in bell. **Use joint spacers to prevent over-**
- 22          **stabbing the bell.**
- 23          e. Joint deflection or pull shall not exceed the manufacturer's recommendation.
- 24          f. Check gasket with feeler gauge all around the pipe.
- 25          g. In areas of petroleum hydrocarbon soil contamination, install special Neoprene
- 26          gaskets or approved equal.
- 27          2. Welded Joints
- 28          a. Weld joints in accordance with AWWA C206.
- 29                1) Contractor shall provide adequate ventilation for welders and for City's
- 30                representative to observe welds.
- 31                2) Welds shall be full circle fillet welds, unless otherwise specified.
- 32                3) Welding shall be completed after application of field applied joint coating
- 33                **if weld after backfill is used.**
- 34          b. Adequate provisions for reducing temperature stresses shall be the
- 35          responsibility of the Contractor.
- 36          c. After the pipe has been joined and properly aligned and prior to the start of the
- 37          welding procedure:
- 38                1) The spigot and bell shall be made essentially concentric by shimming or
- 39                tacking to obtain clearance tolerance around the periphery of the joint.
- 40                2) In no case shall the clearance tolerance be permitted to accumulate.
- 41          d. Before welding:
- 42                1) Thoroughly clean pipe ends.
- 43                2) Weld pipe by machine or by the manual shielded electric arc process.
- 44                3) Welding shall be performed so as not to damage lining or coating.
- 45                4) Cover the polyurethane coating as necessary to protect from weld splatter.
- 46          e. Furnish labor, equipment, tools and supplies, including shielded type welding
- 47          rod.
- 48                1) Protect welding rod from any deterioration prior to its use.

- 1                   2) If any portion of a box or carton is damaged, reject the entire box or carton.
- 2           f. Hand Welding
- 3                   1) The metal shall be deposited in successive layers.
- 4                   2) Not more than 1/8 inch of metal shall be deposited in each pass.
- 5                   3) Each pass except the final 1, whether in butt or fillet welds, shall be
- 6                   thoroughly bobbed or peened to relieve shrinkage stresses and to remove
- 7                   dirt, slag or flux before the succeeding bead is applied.
- 8                   4) Each pass shall be thoroughly fused into the plates at each side of the
- 9                   welding groove or fillet and shall not be permitted to pile up in the center of
- 10                  the weld.
- 11                  5) Undercutting along the side shall not be permitted.
- 12           g. Welds shall be free from pin holes, non-metallic inclusions, air pockets,
- 13                  undercutting and/or any other defects.
- 14           h. If the ends of the pipe are laminated, split or damaged to the extent that
- 15                  satisfactory welding contact cannot be obtained, remove the pipe from the line.
- 16           i. Furnish each welder employed with a steel stencil for marking the welds, so
- 17                  that the work of each welder may be identified.
- 18           j. Have each welder stencil the pipe adjacent to the weld with the stencil assigned
- 19                  to him.
- 20                  1) In the event any welder leaves the job, his stencil shall be voided and not
- 21                  duplicated if another welder is employed.
- 22           k. Welders
- 23                  1) Use only competent, skilled and qualified workmen.
- 24                      a) Each welder employed by the Contractor shall be required to
- 25                      satisfactorily pass a welding test in accordance with AWWA C206
- 26                      before being allowed to weld on the line.
- 27                      b) After each welder has qualified in the preliminary tests referred to
- 28                      above, inspections shall be made of joints in the line.
- 29                      c) Any welder making defective welds shall not be allowed to continue to
- 30                      weld.

31           E. Interior Joint Grouting

- 32           1. Upon completion of backfilling of the pipe trench, clean out dirt or trash which has
- 33                  collected in the joint and moisten the concrete surfaces of the joint space by
- 34                  spraying or brushing with a wet brush.
- 35           2. Fill the inside of the joint recess with a stiff cement mortar.
- 36           3. Where the mortar joint opening is 1 inch or wider, such as where trimmed spigots
- 37                  are required, apply a bonding agent to mortar and steel surface prior to placing joint
- 38                  mortar.
- 39           4. Ram or pack the stiff mortar into the joint space and take extreme care to ensure
- 40                  that no voids remain in the joint space.
- 41           5. After the joint has been filled, level the surfaces of the joint mortar with the interior
- 42                  surfaces of the pipe with a steel trowel so that the surface is smooth.
- 43           6. Interior joints of pipe ~~24 inch and smaller~~ shall have the bell buttered with mortar,
- 44                  prior to inserting the spigot, such that when the spigot is pushed into position it will
- 45                  extrude surplus mortar from the joint.
- 46                  a. The surplus mortar shall be struck off flush with the inside of the pipe by
- 47                  pulling a filled burlap bag or inflated ball through the pipe with a rope.

1 F. Exterior Joint Protection

2 1. Heat Shrink Sleeves

3 a. General

- 4 1) Buried pipe joints shall be field coated after pipe assembly in accordance  
5 with AWWA C216, using Heat Shrink Sleeves.  
6 2) Width of heat shrink sleeve shall be sufficient to overlap the polyurethane  
7 coating by a minimum of 3 inches.  
8 3) Overlapping of 2 or more heat shrink sleeves to achieve the necessary  
9 width will not be permitted.

10 b. Installation

- 11 1) Clean pipe surface and adjacent coating of all mud, oil, grease, rust and  
12 other foreign contaminants with a wire brush in accordance with  
13 SSPC SP 2, or SSPC SP 3. Remove oil or grease contamination by solvent  
14 wiping the pipe and adjacent coating in accordance with SSPC SP 1.  
15 a) Clean the full circumference of the pipe and a minimum of 6 inches  
16 onto the existing coating.  
17 2) Remove all loose or damaged pipe coating at joint and either repair the  
18 coating as specified herein or increase the length of the joint coating, where  
19 reasonable and practical.  
20 3) Complete joint bonding of non-welded pipe joints before application of  
21 joint coating.  
22 4) Joint bonds shall be low profile bonds and all gaps and crevices around the  
23 bonds shall be filled with mastic sealant.  
24 5) Store sleeves in shipping box until use is required.  
25 a) Keep dry and sheltered from exposure to direct sunlight.  
26 b) Store off the ground or concrete floors and maintain at a temperature  
27 between 60 degrees F and 100 degrees F as recommended by the sleeve  
28 manufacturer.  
29 6) Metal surface shall be free of all dirt, dust and flash rusting prior to sleeve  
30 application.  
31 7) Preheat pipe uniformly to 140 degrees F to 160 degrees F or as  
32 recommended by the sleeve manufacturer.  
33 a) Monitor pipe temperature using a surface temperature gauge, infrared  
34 thermometer or color changing crayons.  
35 b) Protect preheated pipe from rain, snow, frost or moisture with tenting  
36 or shields and do not permit the joint to cool.  
37 8) Prime joint with specified primer and fill all cracks, crevices and gaps with  
38 mastic filler in accordance with the manufacturer's recommendations for  
39 the full circumference of the pipe.  
40 9) Apply heat shrink sleeve when it is at a minimum temperature of 60  
41 degrees F and while maintaining the pipe temperature above the preheat  
42 temperature specified.  
43 10) Apply sleeve in accordance with the manufacturer's instructions and center  
44 the sleeve over the joint to provide a minimum of 3-inch overlay onto the  
45 existing pipe coating.  
46 11) Apply heat to the sleeve using either propane fire infrared heaters or wrap  
47 around heaters.  
48 a) Hold flame a minimum of 6 inches from the sleeve surface.  
49 b) Periodically roll the coating on the pipe surface.

- 1 c) Heat from the center of the sleeve to the outer edge until properly
- 2 seated, then begin in the opposite direction.
- 3 d) Monitor sleeve for color change, where appropriate, or with appropriate
- 4 temperature gauges.
- 5 e) Take care not to excessively heat the parent coating.
- 6 12) Completed joint sleeve shall be fully bonded to the pipe and existing
- 7 coating surface, without voids, mastic beading shall be visible along the full
- 8 circumference of the sleeve, and there shall be no wrinkling or excessive
- 9 burns on the sleeves.
- 10 a) Sleeves which do not meet these requirements shall be removed and the
- 11 joint recoated as directed by the Engineer.
- 12 b) Minor repairs may be repaired using heat shrink sleeve repair kits.
- 13 13) Allow the sleeve to cool before moving, handling or backfilling. In hot
- 14 climates, provide shading from direct sunlight.
- 15 a) Water quenching will be allowed only when permitted by the sleeve
- 16 manufacturer.

17 G. Protective Welded Joints Coating System – Weld After Backfill

18 1. General

- 19 a. Application of protective coating at the pipe joints will be as follows:
- 20 1) Apply a ~~3-layer~~ joint coating system consisting of a factory applied 35 mil
- 21 polyurethane coating
- 22 2) A field applied 60 mil by 6-inch wide strip of CANUSA HCO Wrapid Tape
- 23 heat resistant tape at the location of the welding
- 24 3) A field applied 110 mil (full recovered thickness) by 18 inch wide
- 25 CANUSA AquaWrap high shrink heat shrinkable joint sleeve
- 26 4) **In lieu of the CANUSA sleeve, contractor may use a single sleeve Berry**
- 27 **CPG-Covalence: Water wrap WAB.**
- 28 5) After the heat shrinkable joint sleeve is installed, backfill the trench and
- 29 then weld the joint.
- 30 b. The Contractor is responsible for his operations so that they do not damage the
- 31 factory applied coating system.
- 32 c. When applying the ~~3-layer~~ joint coating system for post welding the joints, the
- 33 Contractor must show that his operation will not damage the joint coating
- 34 system to the Engineer's satisfaction.
- 35 d. The Contractor will be required to fully uncover a maximum of 10 joints,
- 36 selected at random by the Engineer or City to visually inspect and test the joint
- 37 after welding. Any damage must be repaired.
- 38 1) If the Contractor's welding procedure damages the ~~3-layer~~ joint coating
- 39 system **on any one of the excavated joints**, the Contractor, at the direction
- 40 of the Engineer, will be required to modify his welding procedure. **The**
- 41 **City reserves the right to require the Contractor to expose additional**
- 42 **joints if damage to the joint coating system is found.**

43 2. Joint Coating (~~3-layer~~)

- 44 a. Apply ~~3-layer~~ Joint Coating System before Welding the Joint
- 45 b. Pipe Manufacturing and Heat Tape
- 46 1) A 35-mil thickness polyurethane coating shall be applied over entire length
- 47 of pipe.





- 10) Completed joint sleeve shall be fully bonded to the pipe and existing coating surface, without voids, mastic beading shall be visible along the full circumference of the sleeve, and there shall be no wrinkling or excessive burns on the sleeves.
  - a) Sleeves which do not meet these requirements shall be removed and the joint recoated as directed by the Engineer.
  - b) Minor repairs may be repaired using heat shrink sleeve repair kits.
- 11) Allow the sleeve to cool before moving, handling or backfilling.
  - a) In hot climates, provide shading from direct sunlight.
  - b) Water quenching will be allowed only when permitted by the sleeve manufacturer.
- 12) Holiday testing shall be performed using a high voltage holiday tester (operating at 100 volts per mil) at each joint after field application of heat shrinkable joint sleeve per SP0188.
  - a) If any holidays or cuts are detected, the sleeve shall be repaired using the heat shrink sleeve manufacturer's recommendation.
  - b) The damaged area shall be covered with a minimum of 50-mm overlap around the damaged area.

#### H. Protection of Buried Metal

1. Coat buried ferrous metal such as bolts and flanges, which cannot be protected with factory or field-applied polyurethane coatings or heat shrink sleeves, with 2 wraps of wax tape and encase in flowable fill.

### 3.5 REPAIR

#### A. Repair and Field Touchup of Polyurethane Coating

1. For repair and field touch-up of polyurethane coating, apply:
  - ~~a. Madison GP II (E) Touchup Polyurethane Coating~~
  - b. Lifelast Durasheid 110, 210, 310 or 310 JARS
  - c. ~~ITW Futura Coatings Protec II~~, or Carboline 777 or 777PL
  - d. Coating manufacturer's recommendation
2. Holidays
  - a. Remove all traces of oil, grease, dust, dirt and other debris.
  - b. Roughen area to be patched by sanding with rough grade sandpaper (40 grit).
  - c. Apply a 35-mil coat of repair material described above.
  - d. Work repair material into scratched surface by brushing or rolling in accordance with manufacturer's recommendations.
  - e. Retest for Holiday.
3. Field Cuts or Large Damage
  - a. If in the opinion of the City the polyurethane coating is excessively damaged, the pipe segment will be rejected until the coating system is removed and replaced so that the system is in a like-new condition.
  - b. Remove burrs from field cut ends or handling damage and smooth out edge of polyurethane coating.
  - c. Remove all traces of oil, grease, dust, dirt and other debris.
  - d. Roughen area to be patched with rough grade sandpaper (40 grit).
  - e. Feather edges and include overlap of 2 inches of roughened polyurethane in area to be patched.

- f. Apply a 35-mil coat of repair material described above, in accordance with manufacturer's recommendations.
- g. Work repair material into scratched surface by brushing.
- h. Feather edges of repair material into prepared surface.
- i. Cover at least 1 inch of roughed area surrounding damage or adjacent to field cut.
- j. Test repairs for holidays.

**B. Patch of Cement Mortar Lining**

1. Repair cracks larger than 1/16 inch.
2. Pipes with disbonded linings will be rejected.
3. Excessive patching of lining shall not be permitted.
4. Repair in accordance with AWWA C205 and as follows:
  - a. Apply bonding agent to patch area.
  - b. Patching of lining shall be allowed where area to be repaired does not exceed 100 square inches and has no dimension greater than 12 inches.
  - c. In general, there shall be not more than 1 patch in the lining of any joint of pipe.
5. Wherever necessary to patch the pipe, make the patch with the mortar indicated.
6. Do not install patched pipe until the patch has been properly and adequately cured, unless approved by the City.

**3.6 RE-INSTALLATION [NOT USED]**

**3.7 FIELD QUALITY CONTROL**

**A. Field Tests and Inspections**

1. Quality Control of Field Applied Polyurethane Coating
  - a. Surface Preparation
    - 1) Visually inspect surface preparation to ensure cleanliness and dryness requirements have been met.
    - 2) Use Testex tape on at least 1 joint per day to ensure that adequate profile is being achieved.
  - b. Visual
    - 1) Visually inspect cured coating to ensure that the coating is completely cured with no blisters, cracks, pinholes, missed areas, excessive roughness, "sticky" or "goeey" areas.
    - 2) Check to ensure that the coating completely covers the steel and existing coating.
  - c. Thickness
    - 1) Use a magnetic dry film thickness (DFT) gauge on cured coating to ensure adequate thickness has been achieved according to SSPC PA 2.
      - a) If the thickness of the coating is below the minimum specified millage anywhere along the length of the pipe, then adjustments must be made to the spray system to correct the problem.
    - 2) At a minimum, the thickness shall be measured for every 50 square feet of sprayed area.
  - d. Adhesion
    - 1) Perform the following procedure on a minimum of 1 joint per day:

- 1 a) Select area to test that has cured for at least 1 hour for fast setting  
2 coatings.  
3 b) Test and repair in accordance with AWWA C222 Dolly Pull-off Test.  
4 e. Holiday Testing  
5 1) Holiday testing shall be performed using a high voltage holiday tester at  
6 each joint no sooner than 1 hour after field application of polyurethane  
7 coating.  
8 f. Inspection at Welding Joints  
9 1) When applying the 3 layer joint coating system for post welding the joints,  
10 the Contractor must show that his operation will not damage the joint  
11 coating system to the Engineer's satisfaction.  
12 2) The Contractor will be required to fully uncover a maximum of 10 joints,  
13 selected at random by the Engineer or City to visually inspect and test the  
14 joint after welding.  
15 3) Any damage must be repaired.  
16 4) If the Contractor's welding procedure damages the 3 layer joint coating  
17 system, the Contractor, at the direction of the Engineer, will be required to  
18 modify his welding procedure.
- 19 2. Weld Testing  
20 a. Dye penetrant tests in accordance with ASTM E165, or magnetic particle test in  
21 accordance with AWWA C206 and set forth in AWS D.1.1. shall be performed  
22 by the Contractor under the supervision and inspection of the City's  
23 Representative or an independent testing laboratory, on all full welded joints.  
24 1) Welds that are defective will be replaced or repaired, whichever is deemed  
25 necessary by the Engineer, at the Contractor's expense.  
26 2) If the Contractor disagrees with the Engineer's interpretation of welding  
27 tests, test sections may be cut from the joint for physical testing. The  
28 Contractor shall bear the expense of repairing the joint, regardless of the  
29 results of physical testing.  
30 3) The procedure for repairing the joint shall be approved by the Engineer  
31 before proceeding.
- 32 3. Deflection Testing  
33 a. Prior to hydrostatic testing, the City's inspector shall perform deflection testing  
34 at a minimum rate of 1 measurement for every 2,500 linear feet of water line.  
35 **and per the requirements as indicated below.**  
36 1) **Complete internal welding of joints, welding inspections and grout of**  
37 **the inside joints prior to measure deflection. The welding inspections**  
38 **shall be done by an independent CWI.**  
39 2) **Measure deflection in the presence of the City.**  
40 a) **Replace or repair defective welds, as deemed necessary by the City,**  
41 **at the Contractor's expense.**  
42 b) **Measurement method used to determine deflection shall be agreed**  
43 **upon in writing amongst the City, Contractor, and Engineer prior**  
44 **to installing the first joint of pipe.**  
45 c) **Record and document all measurements.**  
46 d) **Measure deflection no sooner than 5 days and no later than 30 days**  
47 **after backfilling operations are complete.**



- 1 **3.8 SYSTEM STARTUP [NOT USED]**
- 2 **3.9 ADJUSTING [NOT USED]**
- 3 **3.10 CLEANING [NOT USED]**
- 4 **3.11 CLOSEOUT ACTIVITIES [NOT USED]**
- 5 **3.12 PROTECTION [NOT USED]**
- 6 **3.13 MAINTENANCE [NOT USED]**
- 7 **3.14 ATTACHMENTS [NOT USED]**

8 **END OF SECTION**

9

Revision Log		
DATE	NAME	SUMMARY OF CHANGE
12/20/2012	D. Johnson	2.2.B.4, 5, and 6 – Added reference to Section 33 11 05 and removed material specification for bolts, nuts, gaskets and flange coating

10

## **APPENDIX**

GC-4.01 Availability of Lands

GC-4.02 Subsurface and Physical Conditions

GC-6.06.D Minority and Women Owned Business Enterprise Compliance

GC-6.07 Wage Rates

GC-6.09 Permits and Utilities

GR-01 60 00 Product Requirements

# **GC-4.01 Availability of Lands**



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# **GC-4.02 Subsurface and Physical Conditions**

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# ECS Southwest, LLP

Geotechnical Engineering Report

Primrose Hybrid South – Bridges

Old Granbury Road and Columbus Trail  
Fort Worth, Texas 76123

ECS Project Number 63:1566-C

October 10, 2022





October 10, 2022

Mr. William J. Greene III, AIA  
VP Design Management  
JPI Real Estate Acquisition II, LLC  
1999 Bryan Street, Suite 900  
Dallas, Texas 75201-3136

ECS Project No. 63:1566-C

Reference: Geotechnical Engineering Report  
**Primrose Hybrid South – Bridges**  
Old Granbury Road and Columbus Trail  
Fort Worth, Texas 76123

Dear Mr. Greene:

ECS Southwest, LLP (ECS) has completed the subsurface exploration, laboratory testing, and geotechnical engineering services for the above-referenced project. Our services were performed in general accordance with our agreed to scope of work. This report presents our understanding of the geotechnical aspects of the project along with the results of the field exploration and laboratory testing conducted, and our design and construction recommendations.

It has been our pleasure to be of service to JPI Real Estate Acquisition II, LLC during the design phase of this project. We would appreciate the opportunity to remain involved during the continuation of the design phase, and we would like to provide our services during construction phase operations as well to verify subsurface conditions assumed for this report. Should you have any questions concerning the information contained in this report, or if we can be of further assistance to you, please contact us.

Respectfully submitted,

**ECS Southwest, LLP**

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## **APPENDICES**

### **Appendix A – Figures**

- Site Location Map
- Boring Location Diagram
- Regional Geology

### **Appendix B – Field Operations**

- Reference Notes for Boring Logs
- Boring Logs B-01 to B-05
- WinCore Logs

### **Appendix C – Laboratory Testing**

- Laboratory Testing Summary

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## EXECUTIVE SUMMARY

The following summarizes the main findings of the exploration, particularly those that may have a cost impact on the planned development. Further, our principal foundation recommendations are summarized. This executive summary is intended as a very brief overview of the primary geotechnical conditions that are expected to affect design and construction. Information gleaned from the executive summary should not be utilized in lieu of reading the entire geotechnical report.

- Based on the information provided by the client, we understand that the project consists of the design and construction for the proposed bridges on Brewer Blvd. A total of five borings were drilled for the bridges.
- The borings encountered fat clay/sandy fat clay and clayey sand followed by tan weathered limestone. Gray limestone was encountered below the overburden soils at depths of approximately 10 to 20 feet. Groundwater was observed within Borings B-04 and B-05 at depths of about 22 to 30 feet during drilling.
- The planned bridge structures can be supported on straight drilled shafts bearing in the gray limestone.
- It is recommended that ECS conduct a geotechnical review of the project plans (prior to issuance for construction) to check to see that ECS' geotechnical recommendations have been properly interpreted and implemented.
- To prevent misinterpretation of ECS recommendations, ECS should be retained to perform quality control testing and documentation during construction of the earthwork and foundations for the project.



---

## 1.0 INTRODUCTION

The purpose of this study was to provide geotechnical information for the design and construction for the bridges on Brewer Blvd. The recommendations developed for this report are based on project information provided by the client.

Our services were provided in accordance with our Proposal No. 63:2480-GP and dated on August 19, 2022, and was executed on August 22, 2022, which includes our Terms and Conditions of Service.

This report contains the procedures and results of our subsurface exploration and laboratory testing programs, review of existing site conditions, engineering analyses, and recommendations for the design and construction of the project.

The report includes the following items.

- A brief review and description of our field and laboratory test procedures and the results of testing conducted.
- A review of surface topographical features and site conditions.
- A review of area and site geologic conditions.
- A review of subsurface soil stratigraphy with pertinent available physical properties.
- A final copy of our soil test borings.
- Design parameters for drilled shaft foundation and bridge abutment.
- Recommendations for site preparation and construction of compacted fills, including an evaluation of on-site soils for use as compacted fills.

## 2.0 PROJECT INFORMATION

### 2.1 PROJECT LOCATION/CURRENT SITE USE

The project site is located at the southeast corner of Old Granbury Road and Columbus Trail, Fort Worth, Texas (GPS: 32.6237 N, 97.4160 W). Two creeks are running across this property, Summer Creek (south) and Tributary 5 (north). The site is currently undeveloped with some vegetation and isolated trees. Based on the contour map obtained from NCTCOG ([www.dfwmaps.com](http://www.dfwmaps.com)) the overall property slopes down from east to west with minimum and maximum elevations of approximately 730 ft and 750 ft, respectively. The location is depicted in Figure 2.1.1 as shown below.

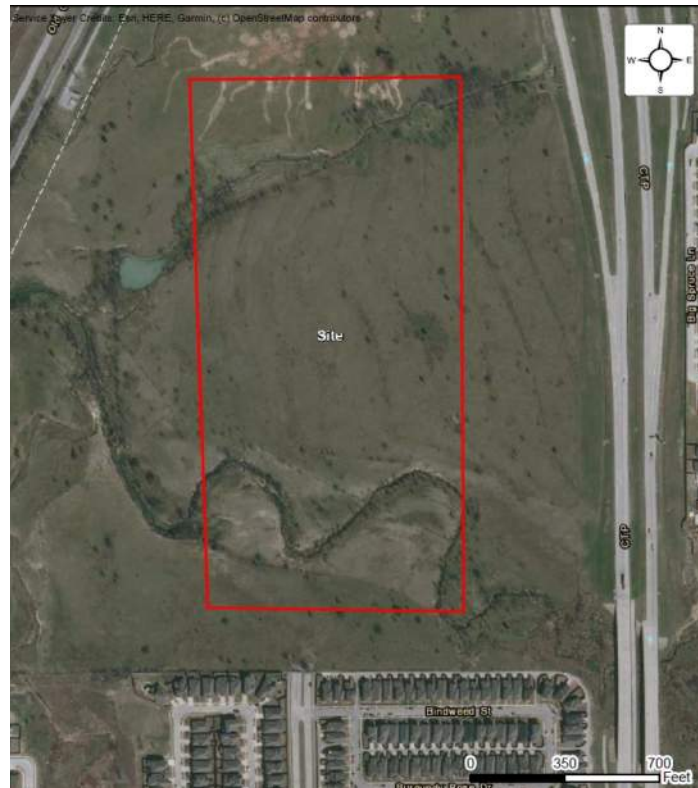


Figure 2.1.1 Site Location

### 2.2 PROPOSED CONSTRUCTION

The following information explains our understanding and assumptions of the planned development including proposed bridge structure and related infrastructure. Should the following information differ from the final design, we recommend that ECS be provided the opportunity to review the updated information and modify our recommendations if appropriate.

SUBJECT	DESIGN INFORMATION / ASSUMPTIONS
Maximum Shaft Load (provided by the client)	80 to 430 tons
Finish Grade (assumed)	within 2 feet from the existing grade.

*If ECS' understanding of the project is not correct, please contact ECS so that we may review these changes and revise our recommendations, as appropriate.*

---

### 3.0 FIELD EXPLORATION

The field exploration was planned with the objective of characterizing the project site in general geotechnical and geological terms and to evaluate subsequent field and laboratory data to assist in the determination of geotechnical recommendations.

The subsurface conditions were explored by five (5) borings drilled to a maximum depth of about 40 feet below the existing site grades. An ATV-mounted drill rig with continuous flight augers was utilized to drill the borings.

The boring locations were determined by and identified in the field by ECS personnel (verified by the client) using the supplied diagram. The approximate as-drilled boring locations are shown on the Boring Location Diagram in Appendix A. The ground surface elevations noted in this report were obtained from NCTCOG ([www.dfwmaps.com](http://www.dfwmaps.com)), which provided elevation contours in 2-foot intervals.

Representative soil samples were obtained by means of the split-barrel and Shelby tube sampling procedures in accordance with ASTM Specifications D-1586 and D-1587, respectively. In the split-barrel sampling procedure, a 2-inch O.D., and split-barrel sampler is driven into the soil a distance of 18 inches by means of a 140-pound hammer falling 30 inches. The number of blows required to drive the sampler through a 12-inch interval is termed the Standard Penetration Test (SPT) value and is indicated for each sample on the boring logs. In the Shelby tube sampling procedure, a thin walled, steel seamless tube with sharp cutting edges is pushed hydraulically into the soil, and a relatively undisturbed sample is obtained.

Texas Cone Penetrometer tests were performed to evaluate the load carrying capacity of the tan and gray limestone encountered. These tests were performed in general accordance with test method Tex-132-E in the Texas Department of Transportation (TxDOT) Manual of Testing Procedures. The results of these tests are shown on the attached boring logs at the depths of occurrence.

Field logs of the soils encountered in the borings were maintained by the drill crew. After recovery, each geotechnical soil sample was removed from the sampler and visually classified. Representative portions of each soil sample were then wrapped in plastic and transported to our laboratory for further visual examination and laboratory testing. After completion of the drilling operations, the boreholes were backfilled with auger cuttings to the existing ground surface.

#### 3.1 SUBSURFACE CHARACTERIZATION

The regional parent geologic mapping indicates that the site is underlain by the Weno Limestone, Denton Clay, Fort Worth Limestone and Duck Creek Formation (Kwl). The Weno Limestone formation generally consists of alternating layers of limestone, shale, and sandstone. Chemical and mechanical weathering of the parent rock produces moderately to highly active clay soils. The parent rock consists of alternating layers of limestone and shale while the Duck Creek formation consists predominately of hard limestone with marl layers. Generally, the more intact un-weathered limestone is grayish in color and weathers into a tan limestone or into highly plastic clay soils. These clays typically exhibit high to very high shrink/swell with change in moisture contents. The clays can typically range from Tan directly above the rock to darker colors near the ground

surface and will have higher shrink/swell tendencies near the surface. Please refer to the regional geology in Appendix A.

The subsurface conditions encountered were generally consistent with published geological mapping. The following sections provide generalized characterizations of the soil and rock strata. Please refer to the boring logs in Appendix B.

**Subsurface Stratigraphy**

Approximate Depth to Bottom of Strata (ft)	Elevation of Bottom of Strata <sup>(1)</sup> (ft)	Stratum	Description	Consistency
4 to 10 <sup>2</sup>	EL. + 726.0 to 740.0	I	(CH) SANDY FAT CLAY/FAT CLAY, dark brown, light brown hard, with limestone fragments	Hard
1.5 to 15 <sup>3</sup>	EL. + 729.0 to 736.0	II	(SC) CLAYEY SAND, dark brown, light brown, with limestone fragments	Medium Dense to Very Dense
10 to 20 <sup>4</sup>	EL. + 722.0 to 729.0	III	LIMESTONE, weathered, tan	-
30 to 40 <sup>5</sup>	EL. + 702.0 to 708.0	IV	LIMESTONE, dark gray, gray	-

Notes:

- (1) Please note that the ground surface elevations were not surveyed by a licensed surveyor; these elevations are approximate based on dfwmaps.com. Elevation ranges are approximate +/- several feet.
- (2) Encountered in borings B-01, B-02, B-04, and B-05.
- (3) Encountered in borings B-02 to B-05.
- (4) Encountered in all Borings.
- (5) Encountered in all Borings. These borings were terminated in this stratum at the depths of 30 feet to 40 feet.

**3.2 GROUNDWATER OBSERVATIONS**

Groundwater level observations were made in the borings during drilling operations. In auger drilling operations, water is not introduced into the borehole and the groundwater position can often be determined by observing water flowing into the excavation. Furthermore, visual observation of soil samples retrieved can often be used in evaluating the groundwater conditions. Groundwater was observed within Borings B-04 and B-05 at depths of about 22 to 30 feet during drilling and at the completion of drilling.

Variations in groundwater levels can occur as a result of changes in precipitation, evaporation, surface water runoff, construction activities, and other factors not immediately apparent at the time of this exploration. The highest groundwater observations are normally observed in the late winter and early spring. Therefore, the groundwater conditions at this site could be different at the time of construction. The possibility of groundwater level fluctuation should be considered when developing the design and construction plans for the project.

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### **3.3 LABORATORY TESTING**

The laboratory testing consisted of selected tests performed on samples obtained during our field exploration operations. Classification and index property tests were performed on representative soil samples. The tests included moisture content, Atterberg limits, and gradation tests (percent passing No. 200 sieve).

Soil samples were visually classified on the basis of texture and plasticity in accordance with ASTM D2488 Standard Practice for Description and Identification of Soils (Visual-Manual Procedures) and including USCS classification symbols, and ASTM D2487 Standard Practice for Classification for Engineering Purposes (Unified Soil Classification System (USCS)). After classification, the samples were grouped in the major zones noted on the boring logs in Appendix B. The group symbols for each soil type are indicated in parentheses along with the soil descriptions. The stratification lines between strata on the logs are approximate; in situ, the transitions may be gradual.

## 4.0 DESIGN RECOMMENDATIONS

The following recommendations have been developed on the basis of previously described project characteristics and subsurface conditions. If there are any changes to the project characteristics or if different subsurface conditions are encountered during construction, ECS should be consulted so that the recommendations of this report can be reviewed. Since the grading plans were not available at the time of preparing this report, we have assumed that the foundation elevation of the proposed structure will be within 2 feet of the existing site grades.

### 4.1 POTENTIAL VERTICAL MOVEMENTS

The intent of recommendations contained in this report are provided in order to reduce the potential risk associated with the shrink/swell tendencies of the on-site expansive soil, occurring seasonally, throughout the life of the building with the changes in moisture content. Based on test method TEX-124-E in the Texas Department of Transportation (TxDOT) Manual of Testing Procedures, and our experience with similar soils, we estimate potential vertical soil movements (PVM) will be about 3.0 to 4 inches, based on dry conditions. The actual movements could be greater if poor drainage, ponded water, and/or other unusual sources of moisture are allowed to saturate the soils beneath the structure after construction.

### 4.2 FOUNDATION DESIGN

Based on the subsurface conditions encountered in the borings, the planned bridge structures may be supported on a deep foundation system consisting of drilled straight shafts bearing in gray limestone. The following sections provide recommendations for foundation design and retaining walls.

#### 4.2.1 Straight Drilled Shafts – Axial Design Parameters

Axial design parameters for drilled straight shafts are presented in the following table.

**Axial Design Parameters**

Parameter	Recommendations
Bearing stratum	Gray Limestone
Minimum embedment	4 feet below lowest adjacent final grade
Net allowable end bearing capacity (psf) <sup>1</sup>	60,000
Allowable skin friction in compression (psf) <sup>2</sup>	8,000
Allowable skin friction in tension (psf) <sup>2</sup>	6,000
Reduction in skin friction due to two closely located shafts	No reduction is required for straight drilled shafts with center-to-center spacing of 2.0 times diameter of larger shaft. For closely spaced shafts, the design skin friction varies linearly from the full value at 2.0 times diameters to 50% of the design value at 1.0 times shaft diameter.

Parameter	Recommendations
Groups of 3 or more shafts spaced closer than 2.0 times shaft diameter	Should be evaluated by ECS. Alternative installation sequences will be required to allow for a minimum of 48 hours of concrete curing time, prior to installation of adjacent shafts.
Soil induced uplift <sup>3</sup>	1,500 psf in natural soils down to a depth of 10 feet below final perimeter grades.
Settlement <sup>4</sup>	1 inch
Minimum shaft diameter <sup>5</sup>	24 inches.
<p><i>Notes:</i></p> <ol style="list-style-type: none"> <li><i>1. A minimum penetration of 4 feet or two shaft diameters, whichever is greater, into bearing stratum is required to develop the end bearing.</i></li> <li><i>2. The skin friction should be applied to that portion of the drilled shafts in direct contact with the bearing strata below any temporary casing.</i></li> <li><i>3. The drilled shafts will be subject to uplift due to swelling of the expansive clays in contact with the drilled shafts. The drilled shafts must be designed with adequate embedment depth resist uplift forces and should be reinforced with sufficient, full-depth, vertical reinforcing steel to resist uplift forces.</i></li> <li><i>4. Settlement will primarily be within the elastic range with a portion of settlement occurring during construction.</i></li> <li><i>5. Assumes the pier is designed with adequate reinforcing steel.</i></li> </ol>	

Drilled shafts should be constructed in accordance with TxDOT Item 416.

**Installation:** Groundwater seepage was observed in Boring B-04 and B-05 at depths of 22 to 30 feet during drilling operations and could be observed during installation of the straight drilled shafts, particularly if construction proceeds during a wet period of the year. The construction should anticipate the use of casing to install the drilled shaft foundations. Rapid placement of steel and concrete may permit shaft installation to proceed without casing. However, the seepage rates could be sufficient enough to require the use of temporary casing for proper installation of some of the shafts. We recommend that the contractor be prepared in the event groundwater or casing sidewall conditions are encountered. This office should be contacted for additional recommendations if seepage cannot be controlled by conventional means (i.e., placement of concrete soon after the excavation is complete, use of sump pumps, use of temporary steel casing, etc.).

If casing is used, it must be installed to a sufficient depth to ensure that an adequate seal is obtained. Typically, a casing penetration of 1 to 2 feet into the gray limestone will provide a satisfactory seal. After the satisfactory installation of the temporary casing, water and loose material should be removed prior to beginning the design penetration. The required penetration into the bearing material may be excavated through the casing. The design penetration should be measured from the top of gray limestone, or below the bottom of temporary casing, whichever is deeper. Reinforcing steel and concrete should be placed immediately after the excavation has been completed, cleaned, and observed.

Installation (drill and final concrete placement) of individual shafts should be completed in one day. This time limit does not only have design implications (reduction of side friction, excessive settlement due to the softening and saturation of bearing materials) but also has practical

implications such as losing steel casing in the ground due to excessive soil squeeze and set up, losing shaft integrity due to instabilities or continuous seepage as well as loss of side friction resistance. The concrete should have a slump between 5 and 7 inches and should be placed in a manner that prevents it from striking the reinforcing steel and sides of the excavation (such as using a tremie in the upper 5 feet). We recommend that all drilled shafts be observed by qualified geotechnical personnel, to verify proper shaft installation. The concrete in the upper five feet of the shaft should be mechanically consolidated.

Prior to concrete placement, any infiltrating water should be pumped out so that no more than 1 inch of standing water is present at the bottom of the excavation. A final cleaning should be conducted within 30 minutes of concrete placement and approved by the geotechnical engineer of record. A sufficient head of concrete must be maintained in the casing (if used) during withdrawal.

#### 4.2.2 Lateral Considerations

Drilled Shafts may be subject to lateral loads. For the lateral design consideration of the drilled shafts, we are providing the following information that can be used in ENSOFT's LPILE computer program:

**LPILE Design Parameters for Soil**

Depth	LPILE Material Type	Effective Unit Weight, (pcf)	Undrained Shear Strength, (psf)	Friction Angle, (degrees)	E <sub>50</sub>
0' – 3'	Ignore				
Clay	Stiff Clay without Free Water (Reese)	120	1,500	-	0.007
Clayey Sand	Sand (Reese)	120	-	33	-

**LPILE Design Parameters for Rock**

Depth	LPILE Material Type	Unit Weight, (pcf)	Uniaxial Compressive Strength, (psi)	Elastic Modulus, E <sub>r</sub> (psi)	RQD (%)	K <sub>rm</sub>
Tan Limestone	Weak Rock (Reese)	130	200	30,000	70	0.0005
Gray Limestone	Weak Rock (Reese)	135	500	100,000	90	0.0005

#### 4.2.3 Straight Drilled Shafts – Uplift Considerations

The drilled shafts should contain sufficient reinforcing steel throughout the entire shaft length (top of shaft to bottom of shaft) to resist uplift (tensile) forces due to post-construction heave of the clay soils. The magnitude of uplift is difficult to predict and will vary with the in-situ moisture contents at the time of construction. We recommend using a uniform uplift of 1,500 psf over the entire shaft perimeter to a depth of 10 feet.

Widening the upper portion of the pier (or pier cap) will create the potential for high uplift pressures from the underlying clay soils. This condition should be minimized, and if required, the piers should



be designed for an uplift of 8 ksf acting on the entire surface of the bottom of the widened portion of the pier (or pier cap).

### 4.3 BRIDGE ABUTMENT/RETAINING WALL CONSIDERATIONS

If abutment walls are planned for the bridge, we recommend a cast in place concrete cantilever wall system supported by straight drilled piers be used for the abutments.

Abutment/retaining walls are free to rotate at the top (not restrained). For these walls, the "Active" ( $k_a$ ) soil condition should be used along with a triangular distribution of earth pressures. In addition, site retaining walls should be designed to withstand lateral earth pressures exerted by the backfill and any surcharge loads within the "Critical Soil Zone". The Critical Zone is defined as the area between the back of the retaining wall footing and an imaginary line projected upward and rearward at a 45-degree angle.

The lateral earth pressures developed behind site retaining walls are a function of the backfill soil type, backfill slope angle, and any surcharge loads. For the design of site retaining walls, we recommend the soil parameters provided below.

FOUNDATION SOILS			
Soil Parameter	Estimated Value	Estimated Value	Estimated Value
Backfill Type	Free Draining Granular Material	Select Fill	On-Site Soils
Angle of Internal Friction ( $\phi$ )	33°	28°	20°
Coefficient of Active Earth Pressure ( $k_a$ )	0.29	0.36	0.49
Coefficient of At Rest Earth Pressure ( $k_o$ )	0.46	0.53	0.66
Total Unit Weight ( $\gamma$ )	130 pcf	125 pcf	125 pcf
Active Equivalent Fluid Density (psf/ft) <sup>1</sup>	38	45	61
At Rest Equivalent Fluid Density (psf/ft) <sup>1</sup>	60	66	83
Active Equivalent Fluid Density (psf/ft) <sup>2</sup>	82	85	93
At Rest Equivalent Fluid Density (psf/ft) <sup>2</sup>	93	96	104

Note: <sup>1</sup>- Without Hydrostatic and <sup>2</sup>- With Hydrostatic Pressure.

It is critical that the soils used for backfilling of the retaining walls meet the soil parameters recommended above. If the soils available do not meet those parameters, then ECS should be contacted to provide revised values, and to confirm that only suitable soils will be used for wall backfill.

Care should be used to avoid the operation of heavy equipment to compact the wall backfill since it may overload and damage the wall. In addition, such loads are not typically considered in the design of site retaining walls and are not provided for in our recommendations.

The Values presented above assume the surface of the backfill material to be level. The above values also do not include the effect of surcharge loads.

**Wall Drainage:** Retaining walls should be provided with a wall and foundation drainage system to relieve hydrostatic pressures which may develop behind the walls. This system should consist of

weepholes through the wall and/or a 4-inch perforated, closed joint drain line located along the backside of the walls above the top of the footing. The drain line should be surrounded by a minimum of 6 inches of AASHTO #57 Stone wrapped with an approved non-woven geotextile, such as Mirafi 140-N or equivalent. Wall drains can consist of a 12-inch-wide zone of free draining gravel, such as AASHTO #57 Stone, employed directly behind the wall and separated from the soils beyond with a non-woven geotextile. Alternatively, the wall drain can consist of a suitable geocomposite drainage board material. The wall drain should be hydraulically connected to the foundation drain.

#### 4.4 SEISMIC DESIGN CONSIDERATIONS

**Seismic Site Classification:** The International Building Code (IBC) requires site classification for seismic design based on the upper 100 feet of a soil profile. The methods are utilized in classifying sites, namely the shear wave velocity ( $v_s$ ) method; the undrained shear strength ( $s_u$ ) method; and the Standard Penetration Resistance (N-value) method. The undrained shear strength ( $s_u$ ) method was used in classifying this site.

Seismic Site Classification				
SEISMIC SITE CLASSIFICATION				
Site Class	Soil Profile Name	Shear Wave Velocity, $V_s$ , (ft./s)	N value (bpf)	$S_u$ (psf)
A	Hard Rock	$V_s > 5,000$ fps	N/A	N/A
B	Rock	$2,500 < V_s \leq 5,000$ fps	N/A	N/A
C	Very dense soil and soft rock	$1,200 < V_s \leq 2,500$ fps	$>50$	$S_u \geq 2,000$
D	Stiff Soil Profile	$600 \leq V_s \leq 1,200$ fps	15 to 60	$1,000 \leq S_u \leq 2000$
E	Soft Soil Profile	$V_s < 600$ fps	$<15$	$S_u < 1000$

Based upon our interpretation of the subsurface conditions, the appropriate Seismic Site Classification is "C" as shown in the preceding table.

**Ground Motion Parameters:** In addition to the seismic site classification, ECS has determined the design spectral response acceleration parameters following the IBC methodology. The Mapped Responses were estimated from the USGS website <https://earthquake.usgs.gov/ws/designmaps/>. The design responses for the short (0.2 sec,  $S_{DS}$ ) and 1-second period ( $S_{D1}$ ) are noted in bold at the far right end of the following table.

Ground Motion Parameters								
GROUND MOTION PARAMETERS [IBC Method]								
Period (sec)	Mapped Spectral Response Accelerations (g)		Values of Site Coefficient for Site Class		Maximum Spectral Response Acceleration Adjusted for Site Class (g)		Design Spectral Response Acceleration (g)	
Reference	Figures 1613.3.1 (1) & (2)		Tables 1613.3.3 (1) & (2)		Eqs. 16-37 & 16-38		Eqs. 16-39 & 16-40	
0.2	$S_s$	0.083	$F_a$	1.2	$S_{MS}=F_a S_s$	0.100	$S_{DS}=2/3 S_{MS}$	0.067
1.0	$S_1$	0.047	$F_v$	1.7	$S_{M1}=F_v S_1$	0.080	$S_{D1}=2/3 S_{M1}$	0.053

The Site Class definition should not be confused with the Seismic Design Category designation which the Structural Engineer typically assesses. If a higher site classification is beneficial to the project, we can provide additional testing methods that may yield more favorable results.

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## 5.0 SITE CONSTRUCTION RECOMMENDATIONS

### 5.1 SUBGRADE PREPARATION

In a dry and undisturbed state, the upper 1-foot of the majority of the soil at the site should provide good subgrade support for fill placement and construction operations. However, when wet, this soil will degrade quickly with disturbance from contractor operations. Therefore, good site drainage should be maintained during earthwork operations, which should help maintain the integrity of the soil.

The surface of the site should be kept properly graded in order to enhance drainage of the surface water away from the proposed structures during the construction phase. We recommend that an attempt be made to enhance the natural drainage without interrupting its pattern, where possible. The soils at the site are moisture and disturbance sensitive and contain fines which are considered moderately erodible.

Therefore, the contractor should carefully plan his operation to limit exposure of the subgrade to weather and construction equipment traffic and provide and maintain good site drainage during earthwork operations. All erosion and sedimentation shall be controlled in accordance with sound engineering practice and current jurisdictional requirements.

#### 5.1.1 Stripping and Grubbing

The subgrade preparation should consist of stripping all existing vegetation, topsoil, loose, poorly compacted, or deleterious existing soils, and any soft or unsuitable materials from any areas receiving new fill. Deeper topsoil or organic laden soils may be present in wet, low-lying, and poorly drained areas. ECS should be retained to verify that topsoil and unsuitable surficial materials have been removed prior to the placement of structural fill or construction of structures.

### 5.2 EARTHWORK OPERATIONS

Prior to placement of new general fill, subgrades should be scarified to a minimum depth of 6 inches, compacted to at least 95% of Maximum Dry Density as obtained by the Standard Proctor Method (ASTM D-698) and moisture conditioned above the optimum value. Fills should be benched into the existing soils.

Onsite soils are suitable as fill materials. Imported soil used for general fill should not have a Plasticity Index (PI) of greater than the material encountered onsite. General fill material, outside of the proposed subgrade improvements, should be placed at +3% or above optimum moisture content and compacted to at least 95% of the Maximum Dry Density as obtained by the Standard Proctor Method (ASTM D-698). Fill soils should be placed in 8 inch loose lifts for mass grading operations and 4 inch lifts for trench type excavations where walk behind or "jumping jack" compaction equipment is used.

Upon completion of the filling operations, care should be taken to maintain the soil moisture content prior to construction of floor slabs and pavements. Soil moisture levels can be preserved by various methods that can include covering with plastic, watering, etc. If the soil becomes desiccated, the affected material should be removed and replaced, or these materials should be scarified, moisture conditioned and recompacted.

## **5.3 MATERIAL SPECIFICATIONS**

### **5.3.1 On-Site Clay Fill**

On-site soil should be free of rock fragments greater than 4 inches in size, organic matter, and other deleterious materials. Excessive large-sized clay clods should be avoided where possible or conditioned as may be necessary.

Where clay is used to establish site grades or wall backfill, we recommend that the clay material be placed and compacted to at least 95% of the Maximum Dry Density at or above the optimum moisture content as obtained using the Standard Proctor Method (ASTM D-698). These soils should be free of deleterious materials and be reworked to achieve a uniform moisture content above the optimum moisture content.

### **5.3.2 Select Fill**

Free draining granular materials may include sand, crushed stone, and gravel. The material should have less than 5 percent passing the No. 200 sieve, and less than 40 percent passing the No. 40 sieve. The material passing No. 40 sieve should be non-plastic. ASTM C33 No. 57 or 67, Coarse Aggregate, will meet these requirements.

The granular material may be compacted at or above optimum moisture content and compacted to at least 95% of the Maximum Dry Density as obtain using the Standard Proctor Method (ASTM D-698).

### **5.3.3 Free Draining Granular Fill**

Free draining granular materials may include sand, crushed stone, and gravel. The material should have less than 5 percent passing the No. 200 sieve, and less than 40 percent passing the No. 40 sieve. The material passing No. 40 sieve should be non-plastic. ASTM C33 No. 57 or 67, Coarse Aggregate, will meet these requirements.

The granular material may be compacted at or above optimum moisture content and compacted to at least 95% of the Maximum Dry Density as obtain using the Standard Proctor Method (ASTM D-698).

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## 6.0 CLOSING

ECS has prepared this report of findings, evaluations, and recommendations to guide geotechnical-related design and construction aspects of the project.

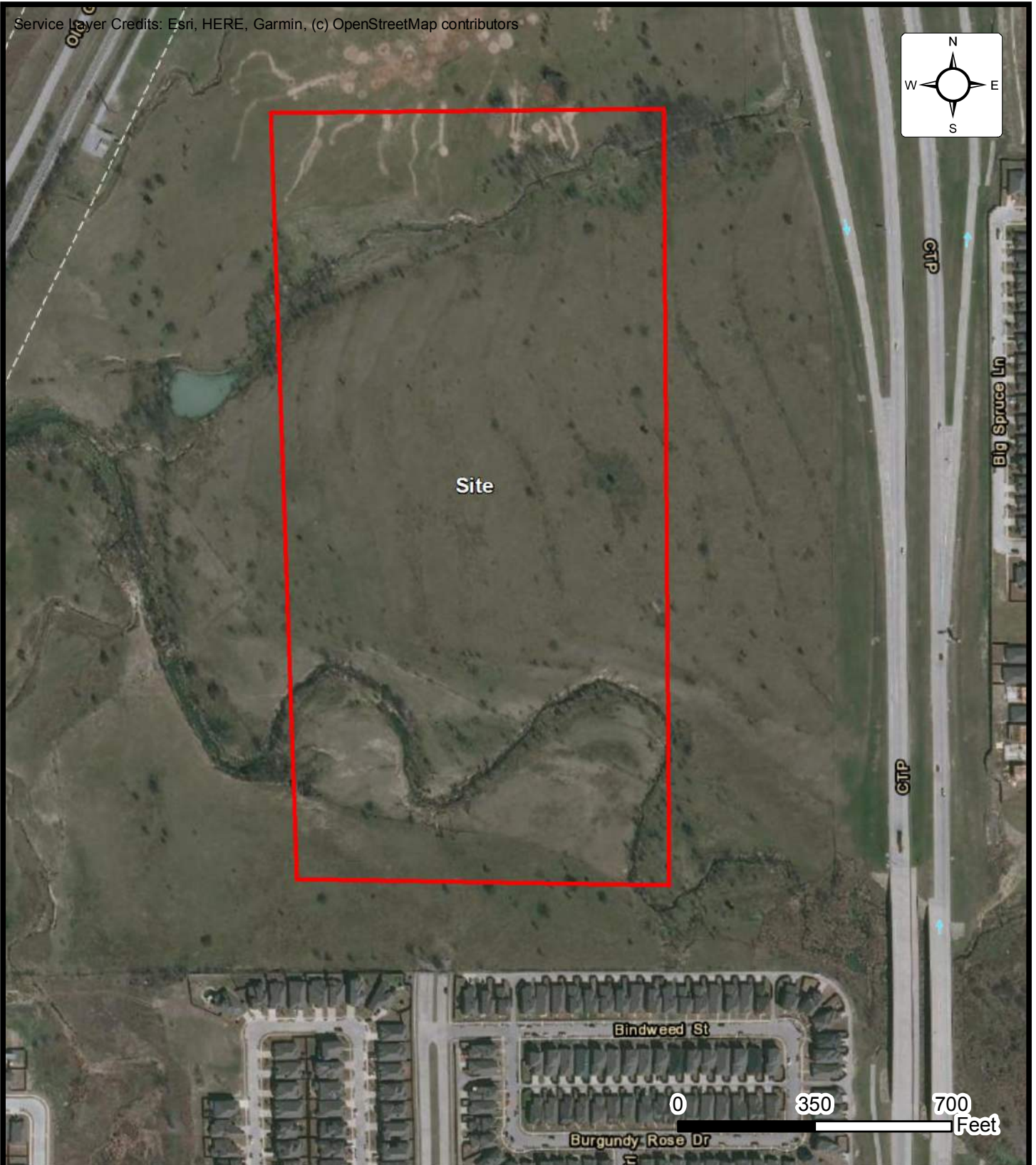
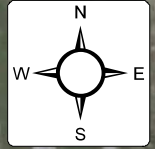
The description of the proposed project is based on information provided to ECS by the client. If any of this information is inaccurate, either due to our interpretation of the documents provided or site or design changes that may occur later, ECS should be contacted immediately in order that we can review the report in light of the changes and provide additional or alternate recommendations as may be required to reflect the proposed construction.

Field observations, monitoring, and quality assurance testing during earthwork and foundation installation are an extension of and integral to the geotechnical design recommendation. We recommend that the owner retain these quality assurance services and that ECS be allowed to continue our involvement throughout these critical phases of construction to provide general consultation as issues arise. ECS is not responsible for the conclusions, opinions, or recommendations of others based on the data in this report.

ECS is not responsible for the conclusions, opinions, or recommendations of others based on the data in this report.

## **APPENDIX A – Figures**

Site Location Diagram  
Boring Location Diagram  
Regional Geology



# SITE LOCATION DIAGRAM PRIMROSE HYBRID SOUTH - BRIDGES

OLD GRANBURY RD AND COLUMBUS TRAIL, FORT WORTH

JPI REAL ESTATE ACQUISITION II, LLC.

ENGINEER  
MRZ

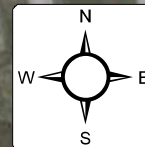
SCALE  
AS NOTED

PROJECT NO.  
63:1566-C

FIGURE  
1 OF 1

DATE  
9/14/2022





B-05



B-04



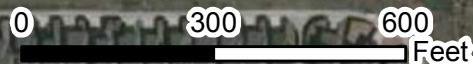
B-03



B-02



B-01



Rindweed St



# BORING LOCATION DIAGRAM PRIMROSE HYBRID SOUTH - BRIDGES

OLD GRANBURY RD AND COLUMBUS TRAIL, FORT WORTH

JPI REAL ESTATE ACQUISITION II, LLC.

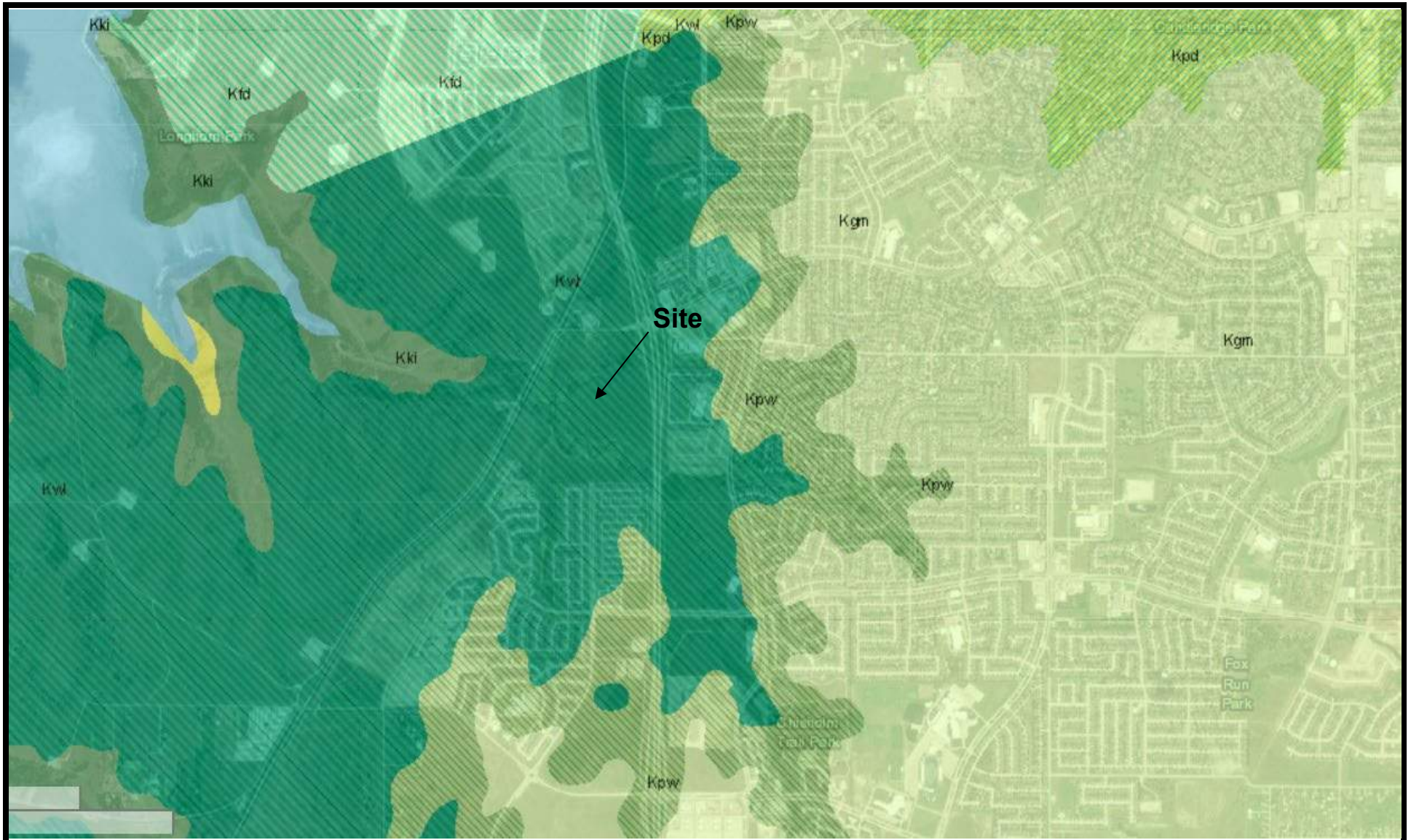
ENGINEER  
MRZ

SCALE  
AS NOTED

PROJECT NO.  
63:1566-C

FIGURE  
1 OF 1

DATE  
9/14/2022



**REGIONAL GEOLOGY**  
**PRIMROSE HYBRID SOUTH - BRIDGES**

**LENO LIMESTONE FORMATION (KWL)**

**OLD GRANBURY RD AND COLUMBUS TRAIL, FORT WORTH**  
**JPI REAL ESTATE ACQUISITION II, LLC.**

ENGINEER

MH

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1 OF 1

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## **APPENDIX B – Field Operations**

Reference Notes for Boring Logs  
Boring Logs B-01 to B-05  
WinCore Logs



# REFERENCE NOTES FOR BORING LOGS

MATERIAL <sup>1,2</sup>	
	<b>ASPHALT</b>
	<b>CONCRETE</b>
	<b>GRAVEL</b>
	<b>TOPSOIL</b>
	<b>VOID</b>
	<b>BRICK</b>
	<b>AGGREGATE BASE COURSE</b>
	<b>GW WELL-GRADED GRAVEL</b> gravel-sand mixtures, little or no fines
	<b>GP POORLY-GRADED GRAVEL</b> gravel-sand mixtures, little or no fines
	<b>GM SILTY GRAVEL</b> gravel-sand-silt mixtures
	<b>GC CLAYEY GRAVEL</b> gravel-sand-clay mixtures
	<b>SW WELL-GRADED SAND</b> gravelly sand, little or no fines
	<b>SP POORLY-GRADED SAND</b> gravelly sand, little or no fines
	<b>SM SILTY SAND</b> sand-silt mixtures
	<b>SC CLAYEY SAND</b> sand-clay mixtures
	<b>ML SILT</b> non-plastic to medium plasticity
	<b>MH ELASTIC SILT</b> high plasticity
	<b>CL LEAN CLAY</b> low to medium plasticity
	<b>CH FAT CLAY</b> high plasticity
	<b>OL ORGANIC SILT or CLAY</b> non-plastic to low plasticity
	<b>OH ORGANIC SILT or CLAY</b> high plasticity
	<b>PT PEAT</b> highly organic soils

DRILLING SAMPLING SYMBOLS & ABBREVIATIONS			
SS	Split Spoon Sampler	PM	Pressuremeter Test
ST	Shelby Tube Sampler	RD	Rock Bit Drilling
WS	Wash Sample	RC	Rock Core, NX, BX, AX
BS	Bulk Sample of Cuttings	REC	Rock Sample Recovery %
PA	Power Auger (no sample)	RQD	Rock Quality Designation %
HSA	Hollow Stem Auger		

PARTICLE SIZE IDENTIFICATION	
DESIGNATION	PARTICLE SIZES
Boulders	12 inches (300 mm) or larger
Cobbles	3 inches to 12 inches (75 mm to 300 mm)
Gravel: Coarse	¾ inch to 3 inches (19 mm to 75 mm)
Gravel: Fine	4.75 mm to 19 mm (No. 4 sieve to ¾ inch)
Sand: Coarse	2.00 mm to 4.75 mm (No. 10 to No. 4 sieve)
Sand: Medium	0.425 mm to 2.00 mm (No. 40 to No. 10 sieve)
Sand: Fine	0.074 mm to 0.425 mm (No. 200 to No. 40 sieve)
Silt & Clay ("Fines")	<0.074 mm (smaller than a No. 200 sieve)

COHESIVE SILTS & CLAYS		
UNCONFINED COMPRESSIVE STRENGTH, QP <sup>4</sup>	SPT <sup>5</sup> (BPF)	CONSISTENCY <sup>7</sup> (COHESIVE)
<0.25	<2	Very Soft
0.25 - <0.50	2 - 4	Soft
0.50 - <1.00	5 - 8	Firm
1.00 - <2.00	9 - 15	Stiff
2.00 - <4.00	16 - 30	Very Stiff
4.00 - 8.00	31 - 50	Hard
>8.00	>50	Very Hard

RELATIVE AMOUNT <sup>7</sup>	COARSE GRAINED (%) <sup>8</sup>	FINE GRAINED (%) <sup>8</sup>
Trace	≤5	≤5
With	10 - 20	10 - 25
Adjective (ex: "Silty")	25 - 45	30 - 45

GRAVELS, SANDS & NON-COHESIVE SILTS	
SPT <sup>5</sup>	DENSITY
<5	Very Loose
5 - 10	Loose
11 - 30	Medium Dense
31 - 50	Dense
>50	Very Dense

WATER LEVELS <sup>6</sup>	
	WL (First Encountered)
	WL (Completion)
	WL (Seasonal High Water)
	WL (Stabilized)

FILL AND ROCK			
FILL	POSSIBLE FILL	PROBABLE FILL	ROCK

<sup>1</sup>Classifications and symbols per ASTM D 2488-17 (Visual-Manual Procedure) unless noted otherwise.

<sup>2</sup>To be consistent with general practice, "POORLY GRADED" has been removed from GP, GP-GM, GP-GC, SP, SP-SM, SP-SC soil types on the boring logs.

<sup>3</sup>Non-ASTM designations are included in soil descriptions and symbols along with ASTM symbol [Ex: (SM-FILL)].

<sup>4</sup>Typically estimated via pocket penetrometer or Torvane shear test and expressed in tons per square foot (tsf).

<sup>5</sup>Standard Penetration Test (SPT) refers to the number of hammer blows (blow count) of a 140 lb. hammer falling 30 inches on a 2 inch OD split spoon sampler required to drive the sampler 12 inches (ASTM D 1586). "N-value" is another term for "blow count" and is expressed in blows per foot (bpf). SPT correlations per 7.4.2 Method B and need to be corrected if using an auto hammer.

<sup>6</sup>The water levels are those levels actually measured in the borehole at the times indicated by the symbol. The measurements are relatively reliable when augering, without adding fluids, in granular soils. In clay and cohesive silts, the determination of water levels may require several days for the water level to stabilize. In such cases, additional methods of measurement are generally employed.

<sup>7</sup>Minor deviation from ASTM D 2488-17 Note 14.

<sup>8</sup>Percentages are estimated to the nearest 5% per ASTM D 2488-17.

SITE LOCATION:  
**Old Granbury Rd and Columbus Trail, Fort Worth, Texas, 76123**

LATITUDE: <b>32.622564</b>	LONGITUDE: <b>-97.416493</b>	STATION:	SURFACE ELEVATION: <b>744.0</b>	LOSS OF CIRCULATION
				BOTTOM OF CASING

DEPTH (FT)	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE D/ST. (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL	WATER LEVELS	ELEVATION (FT)	BLOWS/6" (N - Value)	Plastic Limit Water Content Liquid Limit X ————— ● ————— Δ <input checked="" type="checkbox"/> STANDARD PENETRATION BLOWS/FT ROCK QUALITY DESIGNATION & RECOVERY — RQD — REC <input type="checkbox"/> CALIBRATED PENETROMETER TON/SF <input checked="" type="checkbox"/> TEXAS CONE PENETRATION BLOWS/FT
5	S-1	ST	24	24	(CH) SANDY FAT CLAY, brown, light brown, hard, with limestone fragments		739		○ 4.50
	S-2	ST	24	24			○ 4.50		
	S-3	ST	24	24			○ 4.50		
	S-4	ST	24	24			○ 4.50		
	S-5	ST	24	24			○ 4.50		
10					LIMESTONE, weathered, tan		734		
15					LIMESTONE, gray		729		☒ 100/ 2.00"
20							724		☒ 100/ 1.00"
25							719		☒ 100/ 0.75"
30							714		☒ 100/ 0.50"

**CONTINUED ON NEXT PAGE**

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES. IN-SITU THE TRANSITION MAY BE GRADUAL

<input checked="" type="checkbox"/> WL (First Encountered) <b>DRY</b>	BORING STARTED: <b>Sep 08 2022</b>	CAVE IN DEPTH:
<input checked="" type="checkbox"/> WL (Completion) <b>DRY</b>	BORING COMPLETED: <b>Sep 08 2022</b>	HAMMER TYPE: <b>Auto</b>
<input checked="" type="checkbox"/> WL (Seasonal High Water)	EQUIPMENT: <b>Track Rig</b>	LOGGED BY: <b>TL2</b>
<input checked="" type="checkbox"/> WL (Stabilized)		DRILLING METHOD: <b>CFA</b>

**GEOTECHNICAL BOREHOLE LOG**

CLIENT: <b>JPI Real Estate Acquisition II, LLC.</b>	PROJECT NO.: <b>63:1566-C</b>	BORING NO.: <b>B-01</b>	SHEET: <b>2 of 2</b>	
PROJECT NAME: <b>Primrose Hybrid South - Bridges</b>	DRILLER/CONTRACTOR: <b>CoreCo</b>			

SITE LOCATION: <b>Old Granbury Rd and Columbus Trail, Fort Worth, Texas, 76123</b>	LOSS OF CIRCULATION	
---	---------------------	--

LATITUDE: <b>32.622564</b>	LONGITUDE: <b>-97.416493</b>	STATION:	SURFACE ELEVATION: <b>744.0</b>	BOTTOM OF CASING	
-------------------------------	---------------------------------	----------	------------------------------------	------------------	--

DEPTH (FT)	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE DIST. (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL	WATER LEVELS	ELEVATION (FT)	BLOWS/6" (N - Value)	Plastic Limit    Water Content    Liquid Limit X ————— ● ————— Δ <input checked="" type="checkbox"/> STANDARD PENETRATION BLOWS/FT ROCK QUALITY DESIGNATION & RECOVERY <input type="checkbox"/> RQD <input type="checkbox"/> REC <input type="checkbox"/> CALIBRATED PENETROMETER TON/SF <input checked="" type="checkbox"/> TEXAS CONE PENETRATION BLOWS/FT
35					LIMESTONE, gray		709		100/ 0.50"
40					<b>END OF BORING AT 40 FT</b>		704		100/ 0.50"
45							699		
50							694		
55							689		
60							684		


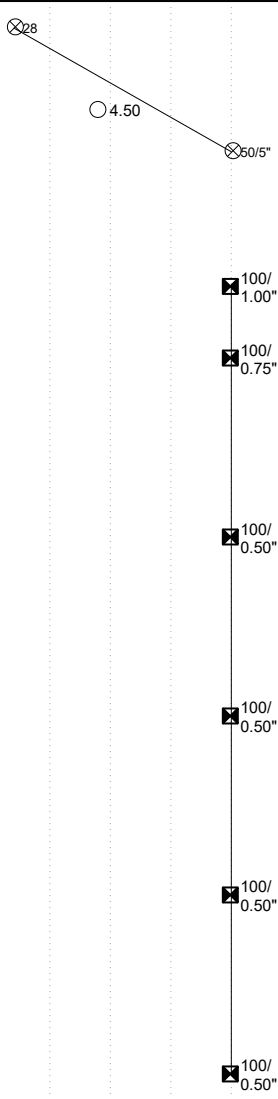







THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES. IN-SITU THE TRANSITION MAY BE GRADUAL

<input type="checkbox"/> WL (First Encountered)	<b>DRY</b>	BORING STARTED: <b>Sep 08 2022</b>	CAVE IN DEPTH:
<input checked="" type="checkbox"/> WL (Completion)	<b>DRY</b>	BORING COMPLETED: <b>Sep 08 2022</b>	HAMMER TYPE: <b>Auto</b>
<input checked="" type="checkbox"/> WL (Seasonal High Water)		EQUIPMENT: <b>Track Rig</b>	LOGGED BY: <b>TL2</b>
<input checked="" type="checkbox"/> WL (Stabilized)			DRILLING METHOD: <b>CFA</b>

GEOTECHNICAL BOREHOLE LOG

SITE LOCATION:  
**Old Granbury Rd and Columbus Trail, Fort Worth, Texas, 76123**

LATITUDE: <b>32.623081</b>	LONGITUDE: <b>-97.416267</b>	STATION:	SURFACE ELEVATION: <b>732.0</b>	LOSS OF CIRCULATION 
				BOTTOM OF CASING 

DEPTH (FT)	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE D/ST. (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL	WATER LEVELS	ELEVATION (FT)	BLOWS/6" (N - Value)	Plastic Limit Water Content Liquid Limit X ● ———— Δ <input checked="" type="checkbox"/> STANDARD PENETRATION BLOWS/FT ROCK QUALITY DESIGNATION & RECOVERY — RQD — REC <input type="checkbox"/> CALIBRATED PENETROMETER TON/SF <input checked="" type="checkbox"/> TEXAS CONE PENETRATION BLOWS/FT
	S-1	SS	18	18	(SC) CLAYEY SAND, brown, medium dense			13-12-16 (28)	
	S-2	ST	24	24	(CH) SANDY FAT CLAY, brown, hard, with limestone fragments			50/5" (50/5")	
5	S-3	SS	5	5	LIMESTONE, weathered, tan			727	
10					LIMESTONE, gray, dark gray			722	100/1.00"
15								717	100/0.75"
20								712	100/0.50"
25								707	100/0.50"
30					END OF BORING AT 30 FT			702	100/0.50"
35									

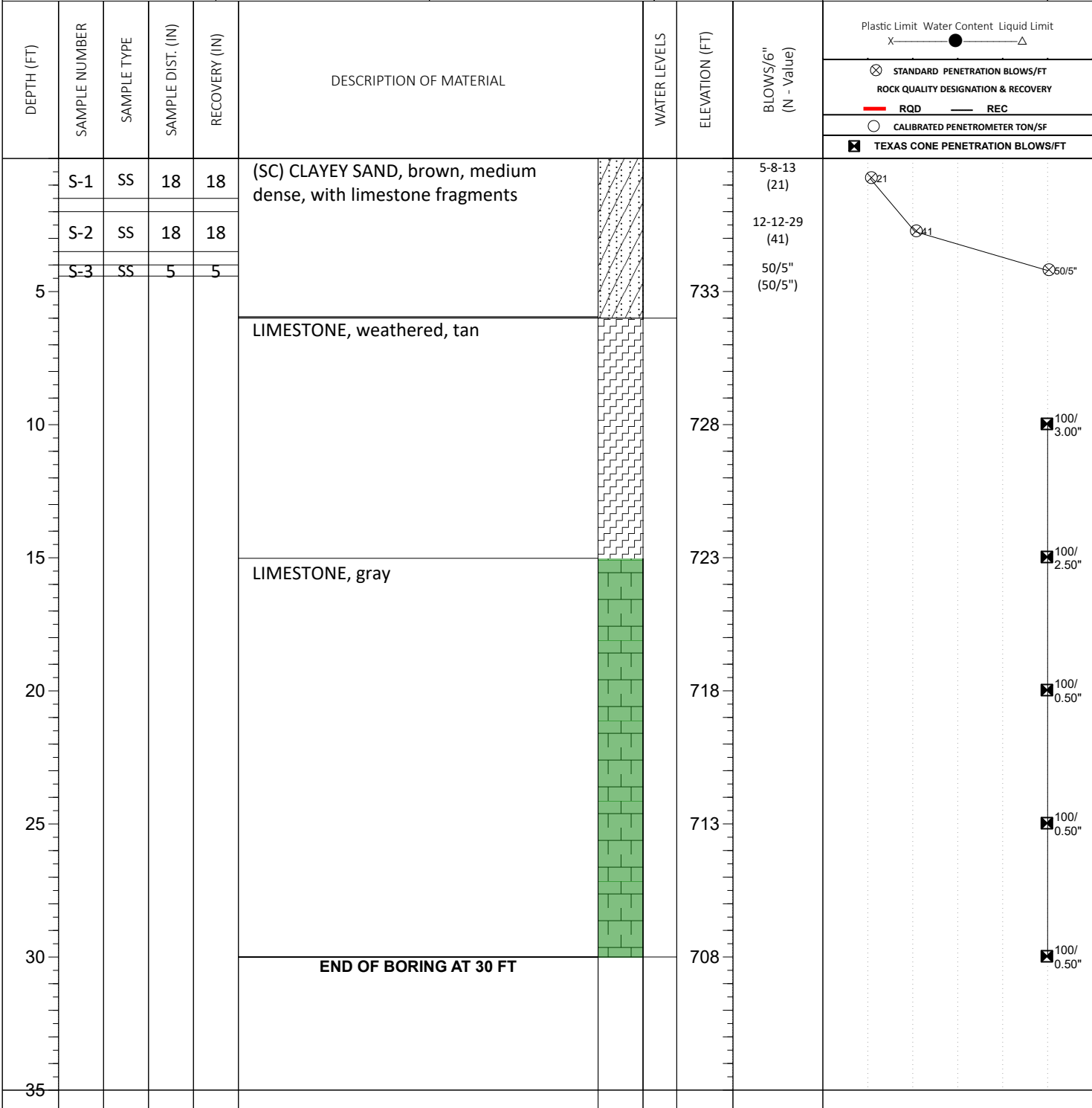
THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES. IN-SITU THE TRANSITION MAY BE GRADUAL

<input checked="" type="checkbox"/> WL (First Encountered) <b>DRY</b>	BORING STARTED: <b>Sep 08 2022</b>	CAVE IN DEPTH:
<input checked="" type="checkbox"/> WL (Completion) <b>DRY</b>	BORING COMPLETED: <b>Sep 08 2022</b>	HAMMER TYPE: <b>Auto</b>
<input checked="" type="checkbox"/> WL (Seasonal High Water)	EQUIPMENT: <b>Track Rig</b>	LOGGED BY: <b>TL2</b>
<input checked="" type="checkbox"/> WL (Stabilized)		DRILLING METHOD: <b>CFA</b>

**GEOTECHNICAL BOREHOLE LOG**

SITE LOCATION:  
**Old Granbury Rd and Columbus Trail, Fort Worth, Texas, 76123**

LATITUDE: <b>32.623701</b>	LONGITUDE: <b>-97.416062</b>	STATION:	SURFACE ELEVATION: <b>738.0</b>	LOSS OF CIRCULATION
				BOTTOM OF CASING



THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES. IN-SITU THE TRANSITION MAY BE GRADUAL

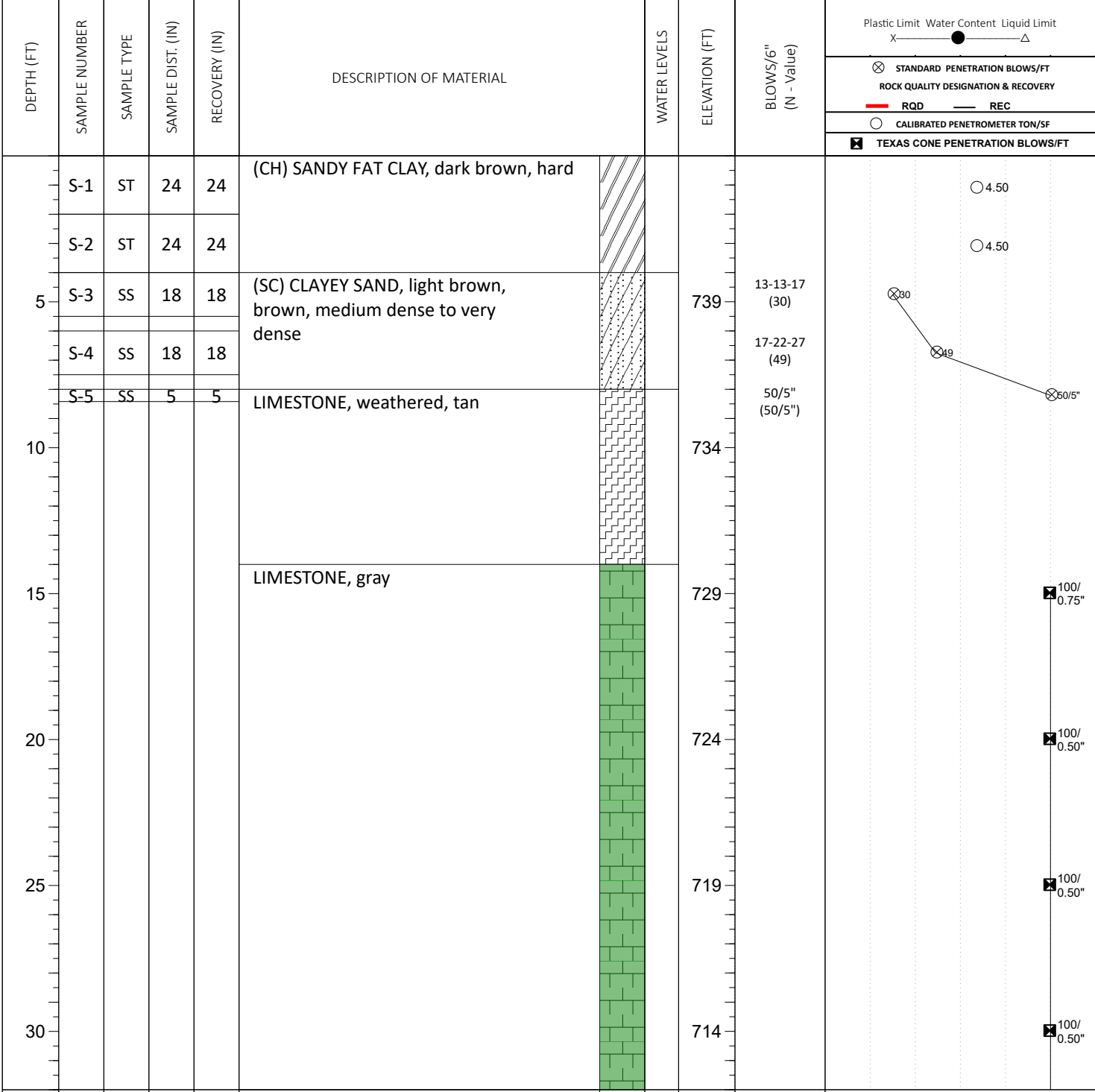
<input checked="" type="checkbox"/> WL (First Encountered) <b>DRY</b>	BORING STARTED: <b>Sep 09 2022</b>	CAVE IN DEPTH:
<input checked="" type="checkbox"/> WL (Completion) <b>DRY</b>	BORING COMPLETED: <b>Sep 09 2022</b>	HAMMER TYPE: <b>Auto</b>
<input checked="" type="checkbox"/> WL (Seasonal High Water)	EQUIPMENT: <b>Track Rig</b>	LOGGED BY: <b>TL2</b>
<input checked="" type="checkbox"/> WL (Stabilized)		DRILLING METHOD: <b>CFA</b>

**GEOTECHNICAL BOREHOLE LOG**



SITE LOCATION:  
**Old Granbury Rd and Columbus Trail, Forth Worth, Texas, 76123**

NORTHING: <b>14870578.3</b>	EASTING: <b>2456996.7</b>	STATION:	SURFACE ELEVATION: <b>744.0</b>	LOSS OF CIRCULATION 
				BOTTOM OF CASING 



**CONTINUED ON NEXT PAGE**

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES. IN-SITU THE TRANSITION MAY BE GRADUAL

<input checked="" type="checkbox"/> WL (First Encountered) <b>22</b>	BORING STARTED: <b>Sep 07 2022</b>	CAVE IN DEPTH:
<input checked="" type="checkbox"/> WL (Completion) <b>N/A</b>	BORING COMPLETED: <b>Sep 07 2022</b>	HAMMER TYPE: <b>Auto</b>
<input checked="" type="checkbox"/> WL (Seasonal High Water)	EQUIPMENT: <b>Truck</b>	DRILLING METHOD: <b>CFA</b>
<input checked="" type="checkbox"/> WL (Stabilized)	LOGGED BY: <b>TL2</b>	

**GEOTECHNICAL BOREHOLE LOG**



SITE LOCATION:  
**Old Granbury Rd and Columbus Trail, Fort Worth, Texas, 76123**

LATITUDE: <b>32.627421</b>	LONGITUDE: <b>-97.415793</b>	STATION:	SURFACE ELEVATION: <b>744.0</b>	LOSS OF CIRCULATION
				BOTTOM OF CASING

DEPTH (FT)	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE D/ST. (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL	WATER LEVELS	ELEVATION (FT)	BLOWS/6" (N - Value)	Plastic Limit Water Content Liquid Limit		
									X	●	△
5	S-1	ST	24	24	(CH) SANDY FAT CLAY, dark brown, hard, with limestone fragments		739	13-15-15 (30)	○ 4.50		
	S-2	ST	24	24					○ 4.50		
	S-3	SS	18	18					⊗ 30		
	S-4	SS	18	18					⊗ 12		
10	S-5	SS	18	18	(SC) CLAYEY SAND, dark brown, light brown, medium dense to very dense, with limestone fragments		734	12-17-29 (46)	⊗ 46		
15	S-6	SS	3	3	LIMESTONE, weathered, tan		729	50/3" (50/3")	⊗ 50/3"		
20					LIMESTONE, light gray		724		⊠ 100/0.75"		
25							719		⊠ 100/1.00"		
30							714		⊠ 100/0.75"		

**CONTINUED ON NEXT PAGE**

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES. IN-SITU THE TRANSITION MAY BE GRADUAL

<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td>∇ WL (First Encountered)</td> <td style="text-align: center;"><b>30</b></td> </tr> <tr> <td>▼ WL (Completion)</td> <td style="text-align: center;"><b>N/A</b></td> </tr> <tr> <td>∇ WL (Seasonal High Water)</td> <td></td> </tr> <tr> <td>∇ WL (Stabilized)</td> <td></td> </tr> </table>	∇ WL (First Encountered)	<b>30</b>	▼ WL (Completion)	<b>N/A</b>	∇ WL (Seasonal High Water)		∇ WL (Stabilized)		<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td>BORING STARTED:</td> <td style="text-align: center;"><b>Sep 09 2022</b></td> <td rowspan="2">CAVE IN DEPTH:</td> </tr> <tr> <td>BORING COMPLETED:</td> <td style="text-align: center;"><b>Sep 09 2022</b></td> <td>HAMMER TYPE: <b>Auto</b></td> </tr> <tr> <td>EQUIPMENT:</td> <td style="text-align: center;"><b>Track Rig</b></td> <td>DRILLING METHOD: <b>CFA</b></td> </tr> <tr> <td>LOGGED BY:</td> <td style="text-align: center;"><b>TL2</b></td> <td></td> </tr> </table>	BORING STARTED:	<b>Sep 09 2022</b>	CAVE IN DEPTH:	BORING COMPLETED:	<b>Sep 09 2022</b>	HAMMER TYPE: <b>Auto</b>	EQUIPMENT:	<b>Track Rig</b>	DRILLING METHOD: <b>CFA</b>	LOGGED BY:	<b>TL2</b>	
∇ WL (First Encountered)	<b>30</b>																				
▼ WL (Completion)	<b>N/A</b>																				
∇ WL (Seasonal High Water)																					
∇ WL (Stabilized)																					
BORING STARTED:	<b>Sep 09 2022</b>	CAVE IN DEPTH:																			
BORING COMPLETED:	<b>Sep 09 2022</b>		HAMMER TYPE: <b>Auto</b>																		
EQUIPMENT:	<b>Track Rig</b>	DRILLING METHOD: <b>CFA</b>																			
LOGGED BY:	<b>TL2</b>																				

**GEOTECHNICAL BOREHOLE LOG**





# DRILLING LOG

WinCore  
Version 3.3

County Tarrant  
Highway  
CSJ

Hole B-01  
Structure Bridge  
Station  
Offset

District Fort Worth  
Date 9/8/22  
Grnd. Elev. 744.00 ft  
GW Elev. N/A

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Deviator Press. (psi)	Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
5			CLAY, brown, light brown, hard (CH)							
734. 10			LIMESTONE, weathered, tan							
729. 15		50 (1) 50 (1)	LIMESTONE, gray							
20		50 (0.5) 50 (0.5)								
25		50 (0.5) 50 (0.25)								
30		50 (0.25) 50 (0.25)								
35		50 (0.25) 50 (0.25)								
704. 40		50 (0.25) 50 (0.25)								
45										
50										
55										
60										

Remarks: 32.622564°, -97.416493°

The ground water elevation was not determined during the course of this boring.

Driller: PT

Logger: JL

Organization: CoreCo



# DRILLING LOG

WinCore  
Version 3.3

County Tarrant  
Highway  
CSJ

Hole B-02  
Structure Bridge  
Station  
Offset

District Fort Worth  
Date 9/8/22  
Grnd. Elev. 732.00 ft  
GW Elev. N/A

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Deviator Press. (psi)	Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
730.			SAND, brown, medium dense							
5			CLAY, brown, hard, with limestone fragments (CH)							
726.		50 (0.5) 50 (0.5)	LIMESTONE, weathered, tan							
722.		50 (0.5) 50 (0.25)	LIMESTONE, gray, dark gray							
15		50 (0.25) 50 (0.25)								
20		50 (0.25) 50 (0.25)								
25		50 (0.25) 50 (0.25)								
702.		50 (0.25) 50 (0.25)								
35										
40										
45										
50										
55										
60										

Remarks: 32.623081°, -97.416267°

The ground water elevation was not determined during the course of this boring.

Driller: PT

Logger: JL

Organization: CoreCo



# DRILLING LOG

WinCore  
Version 3.3

County Tarrant  
Highway  
CSJ

Hole B-03  
Structure Bridge  
Station  
Offset

District Fort Worth  
Date 9/9/22  
Grnd. Elev. 738.00 ft  
GW Elev. N/A

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Deviator Press. (psi)	Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
732.0			SAND, brown, medium dense, with limestone fragments							
728.0		50 (1.5) 50 (1.5)	LIMESTONE, weathered, tan							
15		50 (1.5) 50 (1)	LIMESTONE, gray							
20		50 (0.25) 50 (0.25)								
25		50 (0.25) 50 (0.25)								
708.0		50 (0.25) 50 (0.25)								

Remarks: 32.623701°, -97.416062°

The ground water elevation was not determined during the course of this boring.

Driller: PT

Logger: JL

Organization: CoreCo



# DRILLING LOG

WinCore  
Version 3.3

County Tarrant  
Highway  
CSJ

Hole B-04  
Structure Bridge  
Station  
Offset

District Fort Worth  
Date 9/9/22  
Grnd. Elev. 744.00 ft  
GW Elev. 723.00 ft

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Deviator Press. (psi)	Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
740.			CLAY, dark brown, very hard (CH)							
5			SAND, light brown, brown, medium dense to very dense							
730.		50 (0.5) 50 (0.25)	LIMESTONE, gray							
20		50 (0.25) 50 (0.25)								
25		50 (0.25) 50 (0.25)								
30		50 (0.25) 50 (0.25)								
35		50 (0.125) 50 (0.125)								
704.		50 (0) 50 (0)								
45										
50										
55										
60										

Remarks: 32.626956°, -97.415765°

Any ground water elevation information provided on this boring log is representative of conditions existing on the day and for the specific location where this information was collected. The actual groundwater elevation may fluctuate due to time, climatic conditions, and/or construction activity.

Driller: PT

Logger: JL

Organization: CoreCo





# DRILLING LOG

WinCore  
Version 3.3

County Tarrant  
Highway  
CSJ

Hole B-05  
Structure Bridge  
Station  
Offset

District Fort Worth  
Date 9/9/22  
Grnd. Elev. 744.00 ft  
GW Elev. 714.00 ft

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks	
				Lateral Deviator Press. (psi)	Stress (psi)	MC	LL	PI	Wet Den. (pcf)		
740.			CLAY, dark brown, with limestone seams, very hard (CH)								
5											
10			SAND, light brown, brown, medium dense to very dense								
729.		15		LIMESTONE, weathered, tan							
724.		20	50 (0.5) 50 (0.25)	LIMESTONE, light gray							
25		50 (0.5) 50 (0.5)									
30	50 (0.25) 50 (0.5)										
35	50 (0) 50 (0)										
704.	40	50 (0) 50 (0)									
45											
50											
55											
60											

Remarks: 32.627421°, -97.415793°

Any ground water elevation information provided on this boring log is representative of conditions existing on the day and for the specific location where this information was collected. The actual groundwater elevation may fluctuate due to time, climatic conditions, and/or construction activity.

Driller: PT

Logger: JL

Organization: CoreCo

## **APPENDIX C – Laboratory Testing**

Laboratory Testing Summary

## Laboratory Testing Summary

Sample Location	Sample Number	Depth (feet)	^MC (%)	Soil Type	Atterberg Limits			**Percent Passing No. 200 Sieve	Moisture - Density		@ LBR (%)	#Organic Content (%)
					LL	PL	PI		<Maximum Density (pcf)	<Optimum Moisture (%)		
B-01	S-4	6-8	17.4	CH	56	19	37	73.9				
B-02	S-2	2-4	11.9	CH	62	19	43	50.1				
B-04	S-1	0-2	15.5	CH	79	25	54	78.0				
B-05	S-3	4-5.5	9.7	CH	74	23	51	50.3				

**Notes:** See test reports for test method, ^ASTM D2216-19, \*ASTM D2488, \*\*ASTM D1140-17, @FM 5-515, #ASTM D2974-20e1 < See test report for D4718 corrected values

**Definitions:** MC: Moisture Content, Soil Type: USCS (Unified Soil Classification System), LL: Liquid Limit, PL: Plastic Limit, PI: Plasticity Index, CBR: California Bearing Ratio, OC: Organic Content

Project: Primrose Hybrid South - Bridges  
Client: JPI Real Estate Acquisition II, LLC.

Project No.: 63:1566-C  
Date Reported: 9/15/2022



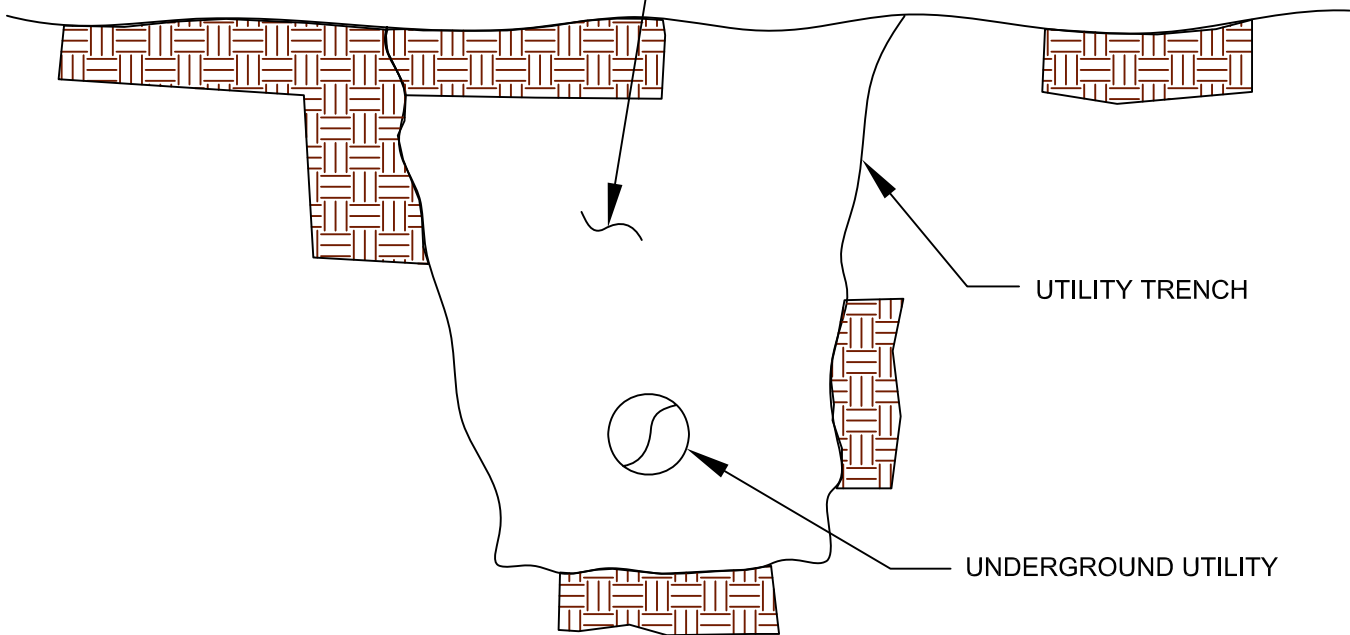
Office / Lab	Address	Office Number / Fax
ECS Southwest LLP - Fort Worth	2621 White Settlement Road Fort Worth, TX 76107	(682)350-2250  (817)847-8616

Tested by	Checked by	Approved by	Date Received
	DKGreen	DKGreen	

## **APPENDIX D – Supplemental Report Documents**

Clay Plug at Utility Trench

REFER TO MEP AND/OR CIVIL DRAWINGS FOR TYPICAL BEDDING MATERIALS AT EXTERIOR FACE OF BUILDING. REPLACE BEDDING MATERIALS WITH SITE CLAY SOIL. EXTEND CLAY 2 FEET FROM BUILDING. PLACE IN 8" MAX. LOOSE LIFTS. COMPACT TO 92% OF STANDARD PROCTOR (ASTM D-698), ABOVE OPTIMUM MOISTURE CONTENT.



**TYPICAL DETAIL  
DIAGRAM**



**CLAY PLUG AT  
UTILITY TRENCH**

ENGINEER	SCALE	NTS
DRAFTSMAN CLL	PROJECT NO.	
REVISIONS	SHEET	1 OF 1
	DATE	11/7/08

# **GC-6.06.D Minority and Women Owned Business Enterprise Compliance**

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**City of Fort Worth**  
**Minority Business Enterprise Specifications**  
**SPECIAL INSTRUCTIONS FOR OFFERORS**

**APPLICATION OF POLICY**

**If the total dollar value of the contract is \$50,000.01 or more, then a MBE subcontracting goal is applicable.**

**POLICY STATEMENT**

It is the policy of the City of Fort Worth to ensure the full and equitable participation by Minority Business Enterprises (MBE) in the procurement of all goods and services. All requirements and regulations stated in the City's current Business Diversity Enterprise Ordinance applies to this bid.

**MBE PROJECT GOALS**

The City's MBE goal on this project is \_\_\_\_\_% of the base bid value of the contract.

**Note: If both MBE and SBE subcontracting goals are established for this project, then an Offeror must submit both a MBE Utilization Form and a SBE Utilization Form to be deemed responsive.**

**COMPLIANCE TO BID SPECIFICATIONS**

On City contracts \$50,000.01 or more where a MBE subcontracting goal is applied, Offerors are required to comply with the intent of the City's Business Diversity Enterprise Ordinance by one of the following:

1. **Meet or exceed the above stated MBE goal through MBE subcontracting participation, or**
2. **Meet or exceed the above stated MBE goal through MBE Joint Venture participation, or;**
3. **Good Faith Effort documentation, or;**
4. **Prime Waiver documentation.**

**SUBMITTAL OF REQUIRED DOCUMENTATION**

The applicable documents **must** be received by the Purchasing Division, within the following times allocated, in order for the entire bid to be considered responsive to the specifications. **The Offeror shall deliver the MBE documentation in person to the appropriate employee of the purchasing division and obtain a date/time receipt. Such receipt shall be evidence that the City received the documentation in the time allocated. A faxed and/or emailed copy will not be accepted.**

<b>1. Subcontractor Utilization Form</b> , if goal is met or exceeded:	received no later than 2:00 p.m., on the second City business day after the bid opening date, exclusive of the bid opening date.
<b>2. Good Faith Effort and Subcontractor Utilization Form</b> , if participation is less than stated goal:	received no later than 2:00 p.m., on the second City business day after the bid opening date, exclusive of the bid opening date.
<b>3. Good Faith Effort and Subcontractor Utilization Form</b> , if no MBE participation:	received no later than 2:00 p.m., on the second City business day after the bid opening date, exclusive of the bid opening date.
<b>4. Prime Contractor Waiver Form</b> , if you will perform all subcontracting/supplier work:	received no later than 2:00 p.m., on the second City business day after the bid opening date, exclusive of the bid opening date.
<b>5. Joint Venture Form</b> , if goal is met or exceeded:	received no later than 2:00 p.m., on the second City business day after the bid opening date, exclusive of the bid opening date.

**FAILURE TO COMPLY WITH THE CITY'S BUSINESS DIVERSITY ENTERPRISE ORDINANCE, WILL RESULT IN THE BID BEING CONSIDERED NON-RESPONSIVE TO SPECIFICATIONS.**

**FAILURE TO SUBMIT THE REQUIRED MBE DOCUMENTATION WILL RESULT IN THE BID BEING CONSIDERED NON-RESPONSIVE. A SECOND FAILURE WILL RESULT IN THE OFFEROR BEING DISQUALIFIED FOR A PERIOD OF ONE YEAR. THREE FAILURES IN A FIVE YEAR PERIOD WILL RESULT IN A DISQUALIFICATION PERIOD OF THREE YEARS.**

**Any questions, please contact the Office of Business Diversity at (817) 392-2674.**





**City of Fort Worth  
Office of Business Diversity  
MBE Subcontractors/Suppliers Utilization Form**

OFFEROR COMPANY NAME:		Check applicable box to describe Offeror's Certification	
PROJECT NAME:		<input type="checkbox"/> M/W/DBE	<input type="checkbox"/> NON-M/W/DBE
		BID DATE	
City's MBE Project Goal:  %	Offeror's MBE Project Commitment:  %	PROJECT NUMBER	

**Identify all subcontractors/suppliers you will use on this project**

Failure to complete this form, in its entirety with requested documentation, and received by the Purchasing Division no later than 2:00 p.m. on the second City business day after bid opening, exclusive of bid opening date, will result in the bid being considered non-responsive to bid specifications.

The undersigned Offeror agrees to enter into a formal agreement with the MBE firm(s) listed in this utilization schedule, conditioned upon execution of a contract with the City of Fort Worth. The intentional and/or knowing misrepresentation of facts is grounds for consideration of disqualification and will result in the bid being considered non-responsive to bid specifications.

**MBEs listed toward meeting the project goal must be located in the six (6) county marketplace at the time of bid or the business has a Significant Business Presence in the Marketplace.** Marketplace is the geographic area of **Tarrant, Dallas, Denton, Johnson, Parker, and Wise counties.**

Prime contractors must identify by tier level of all subcontractors/suppliers. Tier: means the level of subcontracting below the prime contractor/consultant i.e. a direct payment from the prime contractor to a subcontractor is considered 1<sup>st</sup> tier, a payment by a subcontractor to its supplier is considered 2<sup>nd</sup> tier. The prime contractor is responsible to provide proof of payment of all tiered subcontractors identified as a MBE and counting those dollars towards meeting the contract committed goal.

**ALL MBEs MUST BE CERTIFIED BEFORE CONTRACT AWARD.**

**Certification** means those firms, located within the Marketplace, that have been determined to be a bonafide minority business enterprise by the North Central Texas Regional Certification Agency (NCTRCA) and the Dallas/Fort Worth Minority Supplier Development Council (D/FW MSDC).

**If hauling services are utilized**, the Offeror will be given credit as long as the MBE listed owns and operates at least one fully licensed and operational truck to be used on the contract. The MBE may lease trucks from another MBE firm, including MBE owner-operated, and receive full MBE credit. The MBE may lease trucks from non-MBEs, including owner-operated, but will only receive credit for the fees and commissions earned by the MBE as outlined in the lease agreement.

Offerors are required to identify **ALL** subcontractors/suppliers, regardless of status; i.e., **Minority and non-MBEs**. MBE firms are to be listed first, use additional sheets if necessary. Please note that only certified MBEs will be counted to meet an **MBE** goal.

<b>SUBCONTRACTOR/SUPPLIER</b> Company Name Address Telephone/Fax Email Contact Person	T i e r	M B E	W B E	N o n  M B E	Detail Subcontracting Work	Detail Supplies Purchased	Dollar Amount

Offerors are required to identify **ALL** subcontractors/suppliers, regardless of status; i.e., **Minority and non-MBEs**. MBE firms are to be listed first, use additional sheets if necessary. Please note that only certified MBEs will be counted to meet an **MBE** goal.

<b>SUBCONTRACTOR/SUPPLIER</b> Company Name Address Telephone/Fax Email Contact Person	T i e r	M B E	W B E	N o n  M B E	Detail Subcontracting Work	Detail Supplies Purchased	Dollar Amount



Total Dollar Amount of <b>MBE</b> Subcontractors/Suppliers	\$
Total Dollar Amount of <b>Non-MBE</b> Subcontractors/Suppliers	\$
<b>TOTAL DOLLAR AMOUNT OF ALL SUBCONTRACTORS/SUPPLIERS</b>	<b>\$</b>

The Offeror will not make additions, deletions, or substitutions to this certified list without the prior approval of the Office of Business Diversity through the submittal of a **Request for Approval of Change/Addition form**. Any unjustified change or deletion shall be a material breach of contract and may result in debarment in accord with the procedures outlined in the ordinance. The Offeror shall submit a detailed explanation of how the requested change/addition or deletion will affect the committed MBE goal. If the detail explanation is not submitted, it will affect the final compliance determination.

By affixing a signature to this form, the Offeror further agrees to provide, directly to the City upon request, complete and accurate information regarding actual work performed by all subcontractors, including MBE(s) and any special arrangements with MBEs. The Offeror also agrees to allow an audit and/or examination of any books, records and files held by their company. The Offeror agrees to allow the transmission of interviews with owners, principals, officers, employees and applicable subcontractors/suppliers participating on the contract that will substantiate the actual work performed by the MBE(s) on this contract, by an authorized officer or employee of the City. Any intentional and/or knowing misrepresentation of facts will be grounds for terminating the contract or debarment from City work for a period of not less than three (3) years and for initiating action under Federal, State or Local laws concerning false statements. Any failure to comply with this ordinance creates a material breach of the contract and may result in a determination of an irresponsible Offeror and debarment from participating in City work for a period of time not less than one (1) year.

\_\_\_\_\_  
Authorized Signature

\_\_\_\_\_  
Printed Signature

\_\_\_\_\_  
Title

\_\_\_\_\_  
Contact Name/Title (if different)

\_\_\_\_\_  
Company Name

\_\_\_\_\_  
Telephone and/or Fax

\_\_\_\_\_  
Address

\_\_\_\_\_  
E-mail Address

\_\_\_\_\_  
City/State/Zip

\_\_\_\_\_  
Date



## City of Fort Worth Minority Business Enterprise Specifications Prime Contractor Waiver Form

<b>OFFEROR COMPANY NAME:</b>		<b>Check applicable box to describe Offeror's Certification</b>	
<b>PROJECT NAME:</b>		M/W/DBE	NON-M/W/DBE
		<b>BID DATE</b>	
<b>City's MBE Project Goal:</b>  %	<b>Offeror's MBE Project Commitment:</b>  %	<b>PROJECT NUMBER</b>	

If both answers to this form are **YES**, do not complete ATTACHMENT 1C (Good Faith Effort Form). All questions on this form must be completed and a detailed explanation provided, if applicable. If the answer to either question is **NO**, then you must complete ATTACHMENT 1C. This form is only applicable if **both** answers are yes.

**Failure to complete this form in its entirety and be received by the Purchasing Division no later than 2:00 p.m., on the second City business day after bid opening, exclusive of the bid opening date, will result in the bid being considered non-responsive to bid specifications.**

<b>Will you perform this entire contract without subcontractors?</b>		<b>YES</b>
If yes, please provide a detailed explanation that proves based on the size and scope of this project, this is your normal business practice and provide an operational profile of your business.		<b>NO</b>
<b>Will you perform this entire contract without suppliers?</b>		<b>YES</b>
If yes, please provide a detailed explanation that proves based on the size and scope of this project, this is your normal business practice and provide an inventory profile of your business.		<b>NO</b>

The Offeror further agrees to provide, directly to the City upon request, complete and accurate information regarding actual work performed by all subcontractors, including MBE(s) on this contract, the payment thereof and any proposed changes to the original MBE(s) arrangements submitted with this bid. The Offeror also agrees to allow an audit and/or examination of any books, records and files held by their company that will substantiate the actual work performed by the MBEs on this contract, by an authorized officer or employee of the City. Any intentional and/or knowing misrepresentation of facts will be grounds for terminating the contract or debarment from City work for a period of not less than three (3) years and for initiating action under Federal, State or Local laws concerning false statements. Any failure to comply with this ordinance creates a material breach of contract and may result in a determination of an irresponsible Offeror and barred from participating in City work for a period of time not less than one (1) year.

\_\_\_\_\_  
Authorized Signature

\_\_\_\_\_  
Printed Signature

\_\_\_\_\_  
Title

\_\_\_\_\_  
Contact Name (if different)

\_\_\_\_\_  
Company Name

\_\_\_\_\_  
Phone Number                      Fax Number

\_\_\_\_\_  
Address

\_\_\_\_\_  
Email Address

\_\_\_\_\_  
City/State/Zip

\_\_\_\_\_  
Date



2.) Obtain a current (not more than two (2) months old from the bid open date) list of MBE subcontractors and/or suppliers from the City's Office of Business Diversity.

Yes \_\_\_\_\_ Date of Listing \_\_\_\_\_

No

3.) Did you solicit bids from MBE firms, within the subcontracting and/or supplier areas previously listed, at least ten calendar days prior to bid opening by mail, exclusive of the day the bids are opened?

Yes (If yes, attach MBE mail listing to include name of firm and address and a dated copy of letter mailed.)

No

4.) Did you solicit bids from MBE firms, within the subcontracting and/or supplier areas previously listed, at least ten calendar days prior to bid opening by telephone, exclusive of the day the bids are opened?

Yes (If yes, attach list to include name of MBE firm, person contacted, phone number and date and time of contact.)

No

5.) Did you solicit bids from MBE firms, within the subcontracting and/or supplier areas previously listed, at least ten calendar days prior to bid opening by facsimile (fax), exclusive of the day the bids are opened?

Yes (If yes, attach list to include name of MBE firm, fax number and date and time of contact. In addition, if the fax is returned as undeliverable, then that "undeliverable confirmation" received must be printed directly from the facsimile for proper documentation. Failure to submit confirmation and/or "undeliverable confirmation" documentation may render the GFE non-responsive.)

No

6.) Did you solicit bids from MBE firms, within the subcontracting and/or supplier areas previously listed, at least ten calendar days prior to bid opening by email, exclusive of the day the bids are opened?

Yes (If yes, attach email confirmation to include name of MBE firm, date and time. In addition, if an email is returned as undeliverable, then that "undeliverable message" receipt must be printed directly from the email system for proper documentation. Failure to submit confirmation and/or "undeliverable message" documentation may render the GFE non-responsive.)

No

**NOTE: The four methods identified above are acceptable for soliciting bids, and each selected method must be applied to the applicable contract. The Offeror must document that either at least two attempts were made using two of the four methods or that at least one successful contact was made using one of the four methods in order to be deemed responsive to the Good Faith Effort requirement.**

**NOTE: The Offeror must contact the entire MBE list specific to each subcontracting and supplier opportunity to be in compliance with questions 3 thru 6.**

7.) Did you provide plans and specifications to potential MBEs?

Yes

No

8.) Did you provide the information regarding the location of plans and specifications in order to assist the MBEs?

Yes

No

9.) Did you prepare a quotation for the MBEs to bid on goods/services specific to their skill set?  
 Yes (If yes, attach all copies of quotations.)  
 No

10.) Was the contact information on any of the listings not valid?  
 Yes (If yes, attach the information that was not valid in order for the Office of Business Diversity to address the corrections needed.)  
 No

11.) Submit documentation if MBE quotes were rejected. The documentation submitted should be in the forms of an affidavit, include a detailed explanation of why the MBE was rejected and any supporting documentation the Offeror wishes to be considered by the City. In the event of a bona fide dispute concerning quotes, the Offeror will provide for confidential *in-camera* access to an inspection of any relevant documentation by City personnel.

*(Please use additional sheets, if necessary, and attach.)*

Company Name	Telephone	Contact Person	Scope of Work	Reason for Rejection

**ADDITIONAL INFORMATION:**

Please provide additional information you feel will further explain your good and honest efforts to obtain MBE participation on this project.

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The Offeror further agrees to provide, directly to the City upon request, complete and accurate information regarding actual work performed on this contract, the payment thereof and any proposed changes to the original arrangements submitted with this bid. The Offeror also agrees to allow an audit and/or examination of any books, records and files held by their company that will substantiate the actual work performed on this contract, by an authorized officer or employee of the City.

Any intentional and/or knowing misrepresentation of facts will be grounds for terminating the contract or debarment from City work for a period of not less than three (3) years and for initiating action under Federal, State or Local laws concerning false statements. Any failure to comply with this ordinance shall create a material breach of contract and may result in a determination of an irresponsible Offeror and debarment from participating in City work for a period of time not less than one (1) year.



The undersigned certifies that the information provided and the MBE(s) listed was/were contacted in good faith. It is understood that any MBE(s) listed in Attachment 1C will be contacted and the reasons for not using them will be verified by the City's Office of Business Diversity.

\_\_\_\_\_  
Authorized Signature

\_\_\_\_\_  
Printed Signature

\_\_\_\_\_  
Title

\_\_\_\_\_  
Contact Name and Title (if different)

\_\_\_\_\_  
Company Name

\_\_\_\_\_  
Phone Number                      Fax Number

\_\_\_\_\_  
Address

\_\_\_\_\_  
Email Address

\_\_\_\_\_  
City/State/Zip

\_\_\_\_\_  
Date

Office of Business Diversity  
Email: [mwbeoffice@fortworthtexas.gov](mailto:mwbeoffice@fortworthtexas.gov)  
Phone: (817) 392-2674



**CITY OF FORT WORTH**  
**MBE Joint Venture Eligibility Form**  
*All questions must be answered; use "N/A" if not applicable.*

**Name of City project:** \_\_\_\_\_

A joint venture form must be completed on each project

RFP/Bid/Project Number: \_\_\_\_\_

**1. Joint venture information:**

Joint Venture Name:			
Joint Venture Address: <i>(If applicable)</i>			
Telephone:	Facsimile:	E-mail	
Cellular:			
<p><b>Identify the firms that comprise the joint venture:</b></p> <p><i>Please attach extra sheets if additional space is required to provide detailed explanations of work to be performed by each firm comprising the joint venture</i></p>			
<b>MBE firm name:</b>		<b>Non-MBE firm name:</b>	
Business Address:		Business Address:	
City, State, Zip:		City, State, Zip:	
Telephone	E-mail	Telephone	E-mail
Cellular	Facsimile	Cellular	Facsimile
<b>Certification Status:</b>			
<b>Name of Certifying Agency:</b>			

**2. Scope of work performed by the Joint Venture:**

Describe the scope of work of the MBE:	Describe the scope of work of the non-MBE:

**3. What is the percentage of MBE participation on this joint venture that you wish to be counted toward meeting the project goal? \_\_\_\_\_**

**4. Attach a copy of the joint venture agreement.**

**5. List components of ownership of joint venture:** *(Do not complete if this information is described in joint venture agreement)*

Profit and loss sharing:	
Capital contributions, including equipment:	
Other applicable ownership interests:	

**6. Identify by name, race, sex and firm those individuals (with titles) who are responsible for the day-to-day management and decision making of the joint venture:**

Financial decisions (to include Account Payable and Receivable):	
Management decisions: a. Estimating	
b. Marketing and Sales	
c. Hiring and Firing of management personnel	
d. Purchasing of major equipment and/or supplies	
Supervision of field operations	

The City's Office of Business Diversity will review your joint venture submission and will have final approval of the MBE percentage applied toward the goal for the project listed on this form.

**NOTE:**

From and after the date of project award, if any of the participants, the individually defined scopes of work or the dollar amounts/percentages change from the originally approved information, then the participants must inform the City's Office of Business Diversity immediately for approval. Any unjustified change or deletion shall be a material breach of contract and may result in debarment in accord with the procedures outlined in the City's BDE Ordinance.

**AFFIDAVIT**

The undersigned affirms that the foregoing statements are true and correct and include all material information necessary to identify and explain the terms and operation of the joint venture. Furthermore, the undersigned shall agree to provide to the joint venture the stated scope of work, decision-making responsibilities and payments herein.

The City also reserves the right to request any additional information deemed necessary to determine if the joint venture is eligible. Failure to cooperate and/or provide requested information within the time specified is grounds for termination of the eligibility process.

The undersigned agree to permit audits, interviews with owners and examination of the books, records and files of the joint venture by any authorized representatives of the City of Fort Worth. Failure to comply with this provision shall result in the termination of any contract, which may be awarded under the provisions of this joint venture's eligibility and may initiate action under Federal, State and/or Local laws/ordinances concerning false statements or willful misrepresentation of facts.

Name of MBE firm	Name of non-MBE firm
Printed Name of Owner	Printed Name of Owner
Signature of Owner	Signature of Owner
Printed Name of Owner	Printed Name of Owner
Signature of Owner	Signature of Owner
Title	Title
Date	Date

**Notarization**

State of \_\_\_\_\_ County of \_\_\_\_\_

On this \_\_\_\_\_ day of \_\_\_\_\_, 20 \_\_\_\_, before me appeared

\_\_\_\_\_ and \_\_\_\_\_

to me personally known and who, being duly sworn, did execute the foregoing affidavit and did state that they were properly authorized to execute this affidavit and did so as their free act and deed.

Notary Public \_\_\_\_\_  
Print Name

Notary Public \_\_\_\_\_  
Signature

Commission Expires \_\_\_\_\_

(seal)

# GC-6.07 Wage Rates

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**2013 PREVAILING WAGE RATES**  
(Commercial Construction Projects)

<b>CLASSIFICATION DESCRIPTION</b>	<b>Wage Rate</b>
AC Mechanic	\$ 25.24
AC Mechanic Helper	\$ 13.67
Acoustical Ceiling Installer	\$ 16.83
Acoustical Ceiling Installer Helper	\$ 12.70
Bricklayer/Stone Mason	\$ 19.45
Bricklayer/Stone Mason Trainee	\$ 13.31
Bricklayer/Stone Mason Helper	\$ 10.91
Carpenter	\$ 17.75
Carpenter Helper	\$ 14.32
Concrete Cutter/Sawer	\$ 17.00
Concrete Cutter/Sawer Helper	\$ 11.00
Concrete Finisher	\$ 15.77
Concrete Finisher Helper	\$ 11.00
Concrete Form Builder	\$ 15.27
Concrete Form Builder Helper	\$ 11.00
Drywall Mechanic	\$ 15.36
Drywall Helper	\$ 12.54
Drywall Taper	\$ 15.00
Drywall Taper Helper	\$ 11.50
Electrician (Journeyman)	\$ 19.63
Electrician Apprentice (Helper)	\$ 15.64
Electronic Technician	\$ 20.00
Floor Layer	\$ 18.00
Floor Layer Helper	\$ 10.00
Glazier	\$ 21.03
Glazier Helper	\$ 12.81
Insulator	\$ 16.59
Insulator Helper	\$ 11.21
Laborer Common	\$ 10.89
Laborer Skilled	\$ 14.15
Lather	\$ 12.99
Metal Building Assembler	\$ 16.00
Metal Building Assembler Helper	\$ 12.00
Metal Installer (Miscellaneous)	\$ 13.00
Metal Installer Helper (Miscellaneous)	\$ 11.00
Metal Stud Framer	\$ 16.12
Metal Stud Framer Helper	\$ 12.54
Painter	\$ 16.44
Painter Helper	\$ 9.98
Pipefitter	\$ 21.22
Pipefitter Helper	\$ 15.39
Plasterer	\$ 16.17
Plasterer Helper	\$ 12.85
Plumber	\$ 21.98
Plumber Helper	\$ 15.85
Reinforcing Steel Setter	\$ 12.87

Reinforcing Steel Setter Helper	\$	11.08
Roofer	\$	16.90
Roofer Helper	\$	11.15
Sheet Metal Worker	\$	16.35
Sheet Metal Worker Helper	\$	13.11
Sprinkler System Installer	\$	19.17
Sprinkler System Installer Helper	\$	14.15
Steel Worker Structural	\$	17.00
Steel Worker Structural Helper	\$	13.74
Waterproofer	\$	15.00
<b>Equipment Operators</b>		
Concrete Pump	\$	18.50
Crane, Clamsheel, Backhoe, Derrick, D'Line Shovel	\$	19.31
Forklift	\$	16.45
Foundation Drill Operator	\$	22.50
Front End Loader	\$	16.97
Truck Driver	\$	16.77
Welder	\$	19.96
Welder Helper	\$	13.00

The prevailing wage rates shown for Commercial construction projects were based on a salary survey conducted and published by the North Texas Construction Industry (Fall 2012) Independently compiled by the Lane Gorman Trubitt, PLLC Construction Group. The descriptions for the classifications listed are provided on the TEXO's (The Construction Association) website. [www.texoassociation.org/Chapter/wagerates.asp](http://www.texoassociation.org/Chapter/wagerates.asp)



# **GC-6.09 Permits and Utilities**

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January 24, 2023

Mr. Peyton McGee  
Kimley-Horn  
13455 Noel Road  
Two Galleria Office Tower, Suite 700  
Dallas, TX 75240

Via email: [peyton.mcgee@kimley-horn.com](mailto:peyton.mcgee@kimley-horn.com)

RE: City of Fort Worth Infrastructure at Primrose Station – TRWD Crossings

Mr. McGee:

Thank you for submitting plans for the referenced project within Tarrant Regional Water District right of way easement at Brewer Boulevard, City of Fort Worth, Tarrant County, Texas. Construction within TRWD ROW is approved under the following bullet point conditions:

- Improvements must be constructed as indicated on the attached drawings.
- No bore pits within TRWD ROW.
- TRWD inspector must be onsite for any construction activities within TRWD ROW. Please contact the undersigned at [Hayley.Cox@trwd.com](mailto:Hayley.Cox@trwd.com) to schedule.
- A copy of this approval must be kept on the construction site at all times.

Please be reminded that all improvements constructed upon TRWD property must be previously approved by TRWD in writing and are constructed at the sole risk and responsibility of the owner, their successors and assigns. TRWD processes and reviews all Project Submittals on a case-by-case basis and reserves the right to approve or deny any such submittal at its sole discretion. TRWD will not be held liable for any damage to the proposed improvements resulting from our operation and maintenance of Lake Bridgeport and its appurtenant structures. In addition, the Project Owner and/or their contractors will be liable for any damage caused to TRWD's property and structures during this project.

Kind regards,

A handwritten signature in black ink, appearing to read "Hayley Cox", is written over the typed name.

Hayley Cox  
Land Agent



Form 192-3 (11-2020)

**NOTICE OF PROPOSED ERECTION OF  
GAS, SEWER, WATER, ELECTRIC, OR COMMUNICATION FACILITY LINES**

TO: NORTH TEXAS TOLLWAY AUTHORITY  
5900 WEST PLANO PARKWAY  
PLANO, TEXAS 75093

DATE \_\_\_\_\_

Formal notice is hereby given that \_\_\_\_\_ Company,  
proposes to erect \_\_\_\_\_ line  
upon and along the right-of-way of \_\_\_\_\_ in \_\_\_\_\_,  
County, Texas as follows (give location, length, general design, etc.):

The location and description of the proposed line and appurtenances are more fully shown by drawings submitted with this notice.

Construction of this line will begin on or after the \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_\_.

Agency: \_\_\_\_\_  
By (Print): \_\_\_\_\_  
Signature: \_\_\_\_\_  
Job Title: \_\_\_\_\_  
Address: \_\_\_\_\_  
E-mail: \_\_\_\_\_  
Phone: \_\_\_\_\_

# **GR-01 60 00 Product Requirements**

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**CITY OF FORT WORTH  
WATER DEPARTMENT  
STANDARD PRODUCT LIST**

Updated: 03/07/2023

Note: All water or sewer pipe larger than 15 inch diameter shall be approved for use by the Water Department on a project specific basis. Special bedding may be required for some pipes.

Approval	Spec No.	Classification	Manufacturer	Model No.	National Spec	Size
<b>Water &amp; Sewer - Manholes &amp; Bases/Components 33-39-10 (Rev 2/3/16)</b>						
07/23/97	33 05 13	Urethane Hydrophilic Waterstop	Asahi Kogyo K.K.	Adeka Ultra-Seal P-201	ASTM D2240/D412/D792	
04/26/00	33 05 13	Offset Joint for 4" Diam. MH	Hanson Concrete Products	Drawing No. 35-0048-001		
04/26/00	33 05 13	Profile Gasket for 4" Diam. MH.	Press-Seal Gasket Corp.	250-4G Gasket	ASTM C-443/C-361	SS MH
1/26/99	33 05 13	HDPE Manhole Adjustment Rings	Ladtech, Inc	HDPE Adjustment Ring		Traffic and Non-traffic area
5/13/05	33 05 13	Manhole External Wrap	Canusa - CPS	WrapidSeal Manhole Encapsulation System		
<b>Water &amp; Sewer - Manholes &amp; Bases/Fiberglass 33-39-13 (1/8/13)</b>						
1/26/99	33 39 13	Fiberglass Manhole	Fluid Containment, Inc.	Flowtite	ASTM 3753	Non-traffic area
08/30/06	33 39 13	Fiberglass Manhole	L.F. Manufacturing			Non-traffic area
<b>Water &amp; Sewer - Manholes &amp; Bases/Frames &amp; Covers/Rectangular 33-05-13 (Rev 2/3/16)</b>						
*	33 05 13	Manhole Frames and Covers	Western Iron Works, Bass & Hays Foundry	1001		24"x40" WD
<b>Water &amp; Sewer - Manholes &amp; Bases/Frames &amp; Covers/Standard (Round) 33-05-13 (Rev 2/3/16)</b>						
*	33 05 13	Manhole Frames and Covers	Western Iron Works, Bass & Hays Foundry	30024		24" Dia.
*	33 05 13	Manhole Frames and Covers	McKinley Iron Works Inc.	A 24 AM		24" Dia.
08/24/18	33 05 13	Manhole Frames and Covers	Neenah Foundry	R-1272	ASTM A48 & AASHTO M306	24" Dia.
08/24/18	33 05 13	Manhole Frames and Covers	Neenah Foundry	R- 165-LM (Hinged)	ASTM A48 & AASHTO M306	24" Dia.
08/24/18	33 05 13	Manhole Frames and Covers	Neenah Foundry	NF 1274	ASTM A48 & AASHTO M306	30" Dia.
08/24/18	33 05 13	Manhole Frames and Covers	Neenah Foundry	R-1743-LM (Hinged)	ASTM A48 & AASHTO M306	30" dia.
	33 05 13	Manhole Frames and Covers	Sigma Corporation	MH-144N		
	33 05 13	Manhole Frames and Covers	Sigma Corporation	MH-143N		
	33 05 13	Manhole Frames and Covers	Pont-A-Mousson	GTS-STD		24" dia.
	33 05 13	Manhole Frames and Covers	Neenah Casting			24" dia.
10/31/06	33 05 13	Manhole Frames and Covers (Hinged)	Powersal	Hinged Ductile Iron Manhole	ASTM A536	24" Dia.
7/25/03	33 05 13	Manhole Frames and Covers	Saint-Gobain Pipelines (Pamrex/rexus)	RE32-R8FS		30" Dia.
01/31/06	33 05 13	30" Dia. MH Ring and Cover	East Jordan Iron Works	V1432-2 and V1483 Designs	AASHTO M306-04	30" Dia.
11/02/10	33 05 13	30" Dia. MH Ring and Cover	Sigma Corporation	MH1651FWN & MH16502		30" Dia
07/19/11	33 05 13	30" Dia. MH Ring and Cover	Star Pipe Products	MH32FTWSS-DC		30" Dia
08/10/11	33 05 13	30" Dia. MH Ring and Cover	Accucast	220700 Heavy Duty with Gasket Ring		30" Dia
10/14/13	33 05 13	30" Dia. MH Ring and Cover (Hinged & Lockable)	East Jordan Iron Works	30" ERGO XL Assembly with Cam Lock/MPIC/T-Gasket	ASSHTO M105 & ASTM A536	30" Dia
06/01/17	34 05 13	30" Dia. MH Ring and Cover (Hinged & Lockable) CI	SIP Industries	2280 (32")	ASTM A 48	30" Dia.
09/16/19	33 05 13	30" Dia. MH Ring and Cover	Composite Access Products, L.P.	CAP-ONE-30-FTW, Composite, w/ Lock w/o Hing		30" Dia.
10/07/21	34 05 13	30" Dia. MH Ring and Cover	Trumbull Manufacturing	32"(30") Frame and Cover		30" Dia.
<b>Water &amp; Sewer - Manholes &amp; Bases/Frames &amp; Covers/Water Tight &amp; Pressure Tight 33-05-13 (Rev 2/3/16)</b>						
*	33 05 13	Manhole Frames and Covers	Pont-A-Mousson	Pamtight		24" Dia.
*	33 05 13	Manhole Frames and Covers	Neenah Casting			24" Dia.
*	33 05 13	Manhole Frames and Covers	Western Iron Works,Bass & Hays Foundry	300-24P		24" Dia.
*	33 05 13	Manhole Frames and Covers	McKinley Iron Works Inc.	WPA24AM		24" Dia.
03/08/00	33 05 13	Manhole Frames and Covers	Accucast	RC-2100	ASTM A 48	24" Dia.
04/20/01	33 05 13	Manhole Frames and Covers	(SIP)Serampore Industries Private Ltd.	300-24-23.75 Ring and Cover	ASTM A 48	24" Dia.
<b>Water &amp; Sewer - Manholes &amp; Bases/Precast Concrete (Rev 1/8/13)</b>						
*	33 39 10	Manhole, Precast Concrete	Hydro Conduit Corp	SPL Item #49	ASTM C 478	48"
*	33 39 10	Manhole, Precast Concrete	Wall Concrete Pipe Co. Inc.		ASTM C-443	48"
09/23/96	33 39 10	Manhole, Precast Concrete	Concrete Product Inc.	48" I.D. Manhole w/ 32" Cone	ASTM C 478	48" w/32" cone
05/08/18	33 39 10	Manhole, Precast Concrete	The Turner Company	48", 60" I.D. Manhole w/ 32" Cone	ASTM C 478	48", 60"
10/27/06	33 39 10	Manhole, Precast Concrete	Oldcastle Precast Inc.	48" I.D. Manhole w/ 24" Cone	ASTM C 478	48" Diam w 24" Ring
06/09/10	33 39 10	Manhole, Precast (Reinforced Polymer)Concrete	US Composite Pipe	Reinforced Polymer Concrete	ASTM C-76	48" to 72"
09/06/19	33 39 20	Manhole, Precast Concrete	Forterra Pipe and Precast	60" & 72" I.D. Manhole w/32" Cone	ASTM C-76	60" & 72"
10/07/21	33 39 20	Manhole, Precast Concrete	Forterra Pipe and Precast	48" I.D. Manhole w/32" Cone	ASTM C-77	48"
10/07/21	33 39 20	Manhole, Precast (Reinforced Polymer) Concrete	Armorock	48" & 60" I.D. Manhole w/32" Cone		48" & 60"
10/07/21	33 39 20	Manhole, Precast (Hybrid) Polymer & PVC	Predl Systems	48" & 60" I.D. Manhole w/32" Cone		48" & 60" Non Traffic Areas
03/07/23	33 39 20	Manhole, Precast Concrete	AmeriTex Pipe and Products, LLC	48" & 60" I.D. Manhole w/32" Cone	ASTM C-478; ASTM C-923; ASTM C-443	
03/07/23	33 39 20	Manhole, Precast (Reinforced Polymer) Concrete	P3 Polymers, RockHardscp	48" & 60" I.D. Manhole w/32" Cone		
04/28/07		Manhole, Precast (Reinforced Polymer) Concrete	Amitech USA	Meyer Polycrete Pipe		
<b>Water &amp; Sewer - Manholes &amp; Bases/Rehab Systems/Cementitious</b>						
*	E1-14	Manhole Rehab Systems	Quadex			
04/23/01	E1-14	Manhole Rehab Systems	Standard Cement Materials, Inc.	Reliner MSP		
	E1-14	Manhole Rehab Systems	AP/M Permaform			
4/20/01	E1-14	Manhole Rehab System	Strong Company	Strong Seal MS2A Rehab System		
5/12/03	E1-14	Manhole Rehab System (Liner)	Triplex Lining System	MH repair product to stop infiltration	ASTM D5813	
08/30/06		General Concrete Repair	FlexKrete Technologies	Vinyl Polyester Repair Product		Misc. Use

\* From Original Standard Products List



**CITY OF FORT WORTH  
WATER DEPARTMENT  
STANDARD PRODUCT LIST**

Updated: 03/07/2023

Note: All water or sewer pipe larger than 15 inch diameter shall be approved for use by the Water Department on a project specific basis. Special bedding may be required for some pipes.

Approval	Spec No.	Classification	Manufacturer	Model No.	National Spec	Size
<b>Water &amp; Sewer - Manholes &amp; Bases/Rehab Systems/NonCementitious</b>						
05/20/96	E1-14	Manhole Rehab Systems	Sprayroc	Spray Wall Polyurethane Coating	ASTM D639/D790	
12/14/01		Coating for Corrosion protection(Exterior)	ERTECH	Series 2030 and 2100 (Asphatic Emulsion)		Structures Only
01/31/06		Coatings for Corrosion Protection	Chesterton	Arc 791, SIHB, S1, S2	Acid Resistance Test	Sewer Applications
8/28/2006		Coatings for Corrosion Protection	Warren Environmental	S-301 and M-301		Sewer Applications
03/19/18	33 05 16, 33 39 10, 33 39 20	Coating for Corrosion protection(Exterior)	Sherwin Williams	RCC&C Dampproofing Non-Fibered Spray Grade (Asphatic Emulsion)		For Exterior Coating of Concrete Structures Only
<b>Water &amp; Sewer - Manhole Inserts - Field Operations Use Only (Rev 2/3/16)</b>						
*	33 05 13	Manhole Insert	Knutson Enterprises	Made to Order - Plastic	ASTM D 1248	For 24" dia.
*	33 05 13	Manhole Insert	South Western Packaging	Made to Order - Plastic	ASTM D 1248	For 24" dia.
*	33 05 13	Manhole Insert	Noflow-Inflow	Made to Order - Plastic	ASTM D 1248	For 24" dia.
09/23/96	33 05 13	Manhole Insert	Southwestern Packing & Seals, Inc.	LifeSaver - Stainless Steel		For 24" dia.
09/23/96	33 05 13	Manhole Insert	Southwestern Packing & Seals, Inc.	TetherLok - Stainless Steel		For 24" dia
<b>Water &amp; Sewer - Pipe Casing Spacers 33-05-24 (07/01/13)</b>						
11/04/02		Steel Band Casing Spacers	Advanced Products and Systems, Inc.	Carbon Steel Spacers, Model SI		
02/02/93		Stainless Steel Casing Spacer	Advanced Products and Systems, Inc.	Stainless Steel Spacer, Model SSI		
04/22/87		Casing Spacers	Cascade Waterworks Manufacturing	Casing Spacers		
09/14/10		Stainless Steel Casing Spacer	Pipeline Seal and Insulator	Stainless Steel Casing Spacer		Up to 48"
09/14/10		Coated Steel Casin Spacers	Pipeline Seal and Insulator	Coated Steel Casin Spacers		Up to 48"
05/10/11		Stainless Steel Casing Spacer	Powerseal	4810 Powerchock		Up to 48"
03/19/18		Casing Spacers	BWM	SS-12 Casing Spacer(Stainless Steel)		
03/19/18		Casing Spacers	BWM	FB-12 Casing Spacer (Coated Carbon Steel) for Non_pressure Pipe and Grouted Casing		
03/29/22	33 05 13	Casing Spacers	CCI Pipeline Systems	CSC12, CSS12		
<b>Water &amp; Sewer - Pipes/Ductile Iron 33-11-10(1/8/13)</b>						
*	33 11 10	Ductile Iron Pipe	Griffin Pipe Products, Co.	Super Bell-Tite Ductile Iron Pressure Pipe,	AWWA C150, C151	3" thru 24"
08/24/18	33 11 10	Ductile Iron Pipe	American Ductile Iron Pipe Co.	American Fastite Pipe (Bell Spigot)	AWWA C150, C151	4" thru 30"
08/24/18	33 11 10	Ductile Iron Pipe	American Ductile Iron Pipe Co.	American Flex Ring (Restrained Joint)	AWWA C150, C151	4" thru 30"
*	33 11 10	Ductile Iron Pipe	U.S. Pipe and Foundry Co.		AWWA C150, C151	
*	33 11 10	Ductile Iron Pipe	McWane Cast Iron Pipe Co.		AWWA C150, C151	
<b>Water &amp; Sewer - Utility Line Marker (08/24/2018)</b>						
<b>Sewer - Coatings/Epoxy 33-39-60 (01/08/13)</b>						
02/25/02		Epoxy Lining System	Sauereisen, Inc	SewerGard 210RS	LA County #210-L33	
12/14/01		Epoxy Lining System	Ertech Technical Coatings	Ertech 2030 and 2100 Series		
04/14/05		Interior Ductile Iron Pipe Coating	Induron	Protecto 401	ASTM B-117	Ductile Iron Pipe Only
01/31/06		Coatings for Corrosion Protection	Chesterton	Arc 791, SIHB, S1, S2	Acid Resistance Test	Sewer Applications
8/28/2006		Coatings for Corrosion Protection	Warren Environmental	S-301 and M-301		Sewer Applications
<b>Sewer - Coatings/Polyurethane</b>						
<b>Sewer - Combination Air Valves</b>						
05/25/18	33-31-70	Air Release Valve	A.R.I. USA, Inc.	D025LTP02(Composite Body)		2"
<b>Sewer - Pipes/Concrete</b>						
*	E1-04	Conc. Pipe, Reinforced	Wall Concrete Pipe Co. Inc.		ASTM C 76	
*	E1-04	Conc. Pipe, Reinforced	Hydro Conduit Corporation	Class III T&G, SPL Item #77	ASTM C 76	
*	E1-04	Conc. Pipe, Reinforced	Hanson Concrete Products	SPL Item #95-Manhole, #98- Pipe	ASTM C 76	
*	E1-04	Conc. Pipe, Reinforced	Concrete Pipe & Products Co. Inc.		ASTM C 76	
<b>Sewer - Pipe Enlargment System (Method)33-31-23 (01/18/13)</b>						
		PIM System	PIM Corporation	Polyethylene	PIM Corp., Piscata Way, N.J.	Approved Previously
		McConnell Systems	McLat Construction	Polyethylene	Houston, Texas	Approved Previously
		TRS Systems	Trenchless Replacement System	Polyethylene	Calgary, Canada	Approved Previously
<b>Sewer - Pipe/Fiberglass Reinforced/ 33-31-13(1/8/13)</b>						
7/21/97	33 31 13	Cent. Cast Fiberglass (FRP)	Hobas Pipe USA, Inc.	Hobas Pipe (Non-Pressure)	ASTM D3262/D3754	
03/22/10	33 31 13	Fiberglass Pipe (FRP)	Ameron	Bondstrand RPMP Pipe	ASTM D3262/D3754	
04/09/21	33 31 13	Glass-Fiber Reinforced Polymer Pipe (FRP)	Thompson Pipe Group	Thompson Pipe (Flowtite)	ASTM D3262/D3754	
03/07/23	33 31 13	Fiberglass Pipe (FRP)	Future Pipe Industries	Fiberstrong FRP	ASTM D3262, ASTM D3681, ASTM D4161, AWWA M45	
<b>Sewer - Pipe/Polymer Pipe</b>						
4/14/05		Polymer Modified Concrete Pipe	Amitech USA	Meyer Polycrete Pipe	ASTM C33, A276, F477	8" to 102", Class V
06/09/10	E1-9	Reinforced Polymer Concrete Pipe	US Composite Pipe	Reinforced Polymer Concrete Pipe	ASTM C-76	
<b>Sewer - Pipes/HDPE 33-31-23(1/8/13)</b>						

\* From Original Standard Products List





**CITY OF FORT WORTH  
WATER DEPARTMENT  
STANDARD PRODUCT LIST**

Updated: 03/07/2023

Note: All water or sewer pipe larger than 15 inch diameter shall be approved for use by the Water Department on a project specific basis. Special bedding may be required for some pipes.

Approval	Spec No.	Classification	Manufacturer	Model No.	National Spec	Size
*		High-density polyethylene pipe	Phillips Driscopipe, Inc.	Opticore Ductile Polyethylene Pipe	ASTM D 1248	8"
*		High-density polyethylene pipe	Plexco Inc.		ASTM D 1248	8"
*		High-density polyethylene pipe	Polly Pipe, Inc.		ASTM D 1248	8"
		High-density polyethylene pipe	CSR Hydro Conduit/Pipeline Systems	McConnell Pipe Enlargement	ASTM D 1248	
<b>Sewer - Pipes/PVC (Pressure Sewer) 33-11-12 (4/1/13)</b>						
12/02/11	33-11-12	DR-14 PVC Pressure Pipe	Pipelife Jetstream	PVC Pressure Pipe	AWWA C900	4" thru 12"
10/22/14	33-11-12	DR-14 PVC Pressure Pipe	Royal Building Products	Royal Seal PVC Pressure Pipe	AWWA C900	4" thru 12"
<b>Sewer - Pipes/PVC* 33-31-20 (7/1/13)</b>						
*	33-31-20	PVC Sewer Pipe	J-M Manufacturing Co., Inc. (JM Eagle)	SDR-26	ASTM D 3034	4" - 15"
12/23/97*	33-31-20	PVC Sewer Pipe	Diamond Plastics Corporation	SDR-26	ASTM D 3034	4" thru 15"
*	33-31-20	PVC Sewer Pipe	Lamson Vylon Pipe		ASTM F 789	4" thru 15"
01/18/18	33-31-20	PVC Sewer Pipe	Vinyltech PVC Pipe	Gravity Sewer	ASTM D3034	4" thru 15"
11/11/98	33-31-20	PVC Sewer Pipe	Diamond Plastics Corporation	"S" Gravity Sewer Pipe	ASTM F 679	18" to 27"
*	33-31-20	PVC Sewer Pipe	J-M Manufacturing Co., Inc. (JM Eagle)	SDR 26/35 PS 115/46	ASTM F 679	18" - 28"
09/11/12	33-31-20	PVC Sewer Pipe	Pipelife Jet Stream	SDR-26 and SDR-35	ASTM F-679	18"
05/06/05	33-31-20	PVC Solid Wall Pipe	Diamond Plastics Corporation	SDR 26/35 PS 115/46	ASTM F-679	18" to 48"
04/27/06	33-31-20	PVC Sewer Fittings	Harco	SDR-26 and SDR-35 Gasket Fittings	ASTM D-3034, D-1784, etc	4" - 15"
*	33-31-20	PVC Sewer Fittings	Plastic Trends, Inc.(Westlake)	Gasketed PVC Sewer Main Fittings	ASTM D 3034	
3/19/2018	33 31 20	PVC Sewer Pipe	Pipelife Jet Stream	SDR 35	ASTM F679	18"- 24"
3/19/2018	33 31 20	PVC Sewer Pipe	Pipelife Jet Stream	SDR 26	ASTM D3034	4"- 15"
3/29/2019	33 31 20	Gasketed Fittings (PVC)	GPk Products, Inc.	SDR 26	ASTM D3034/F-679	4"- 15"
10/21/2020	33 31 20	PVC Sewer Pipe	NAPCO(Westlake)	SDR 26	ASTM D3034	4" - 15"
10/22/2020	33 31 20	PVC Sewer Pipe	Sanderson Pipe Corp.	SDR 26	ASTM D3034	4"- 15"
10/21/2020	33 31 20	PVC Sewer Pipe	NAPCO(Westlake)	SDR 26/35 PS 115/46	ASTM F-679	18"- 36"
<b>Sewer - Pipes/Rehab/CIPP 33-31-12 (01/18/13)</b>						
*		Cured in Place Pipe	Insituform Texark, Inc		ASTM F 1216	
05/03/99		Cured in Place Pipe	National Envirotech Group	National Liner, (SPL) Item #27	ASTM F-1216/D-5813	
05/29/96		Cured in Place Pipe	Reynolds Inc/Inliner Technology (Inliner USA)	Inliner Technology	ASTM F 1216	
<b>Sewer - Pipes/Rehab/Fold &amp; Form</b>						
*		Fold and Form Pipe	Cullum Pipe Systems, Inc.			
11/03/98		Fold and Form Pipe	Insituform Technologies, Inc.	Insituform "NuPipe"	ASTM F-1504	
		Fold and Form Pipe	American Pipe & Plastics, Inc.			Demo. Purpose Only
12/04/00		Fold and Form Pipe	Ultraliner	Ultraliner PVC Alloy Pipeliner	ASTM F-1504, 1871, 1867	
06/09/03		Fold and Form Pipe	Miller Pipeline Corp.	EX Method	ASTM F-1504, F-1947	Up to 18" diameter
<b>Sewer - Pipes/Open Profile Large Diameter</b>						
09/26/91	E100-2	PVC Sewer Pipe, Ribbed	Lamson Vylon Pipe	Carlton Vylon H.C. Closed Profile Pipe,	ASTM F 679	18" to 48"
09/26/91	E100-2	PVC Sewer Pipe, Ribbed	Extrusion Technologies, Inc.	Ultra-Rib Open Profile Sewer Pipe	ASTM F 679	18" to 48"
	E100-2	PVC Sewer Pipe, Ribbed	Uponor ETI Company			
11/10/10	(E100-2)	Polypropylene (PP) Sewer Pipe, Double Wall	Advanced Drainage Systems (ADS)	SaniTite HP Double Wall (Corrugated)	ASTM F 2736	24"-30"
11/10/10	(E100-2)	Polypropylene (PP) Sewer Pipe, Triple Wall	Advanced Drainage Systems (ADS)	SaniTite HP Triple Wall Pipe	ASTM F 2764	30" to 60"
05/16/11		Steel Reinforced Polyethylene Pipe	ConTech Construction Products	Durmaxx	ASTM F 2562	24" to 72"

\* From Original Standard Products List



**CITY OF FORT WORTH  
WATER DEPARTMENT  
STANDARD PRODUCT LIST**

Updated: 03/07/2023

Note: All water or sewer pipe larger than 15 inch diameter shall be approved for use by the Water Department on a project specific basis. Special bedding may be required for some pipes.

Approval	Spec No.	Classification	Manufacturer	Model No.	National Spec	Size
<b>Water - Appurtenances 33-12-10 (07/01/13)</b>						
01/18/18	33-12-10	Double Strap Saddle	Romac	202NS Nylon Coated	AWWA C800	1"-2" SVC, up to 24" Pipe
08/28/02		Double Strap Saddle	Smith Blair	#317 Nylon Coated Double Strap Saddle		
07/23/12	33-12-10	Double Strap Service Saddle	Mueller Company	DR2S Double (SS) Strap DI Saddle	AWWA C800	1"-2" SVC, up to 24" Pipe
03/07/23	33-12-10	Double Strap Service Saddle	Powerseal	3450AS, Incl. Corp. Stop, Dbl Strap, Stainless	NSF ANSI 372	1"-2" SVC, up to 24" Pipe
10/27/87		Curb Stops-Ball Meter Valves	McDonald	6100M,6100MT & 610MT		3/4" and 1"
10/27/87		Curb Stops-Ball Meter Valves	McDonald	4603B, 4604B, 6100M, 6100TM and 6101M		1½" and 2"
5/25/2018	33-12-10	Curb Stops-Ball Meter Valves	Ford Meter Box Co., Inc.	FB600-7NL, FB1600-7-NL, FV23-777-W-NL, L22-77NL	AWWA C800	2"
5/25/2018	33-12-10	Curb Stops-Ball Meter Valves	Ford Meter Box Co., Inc.	FB600-6-NL, FB1600-6-NL, FV23-666-W-NL, L22-66NL	AWWA C800	1-1/2"
5/25/2018	33-12-10	Curb Stops-Ball Meter Valves	Ford Meter Box Co., Inc.	FB600-4-NL, FB1600-4-NL, B11-444-WR-NL, B22444-WR-NL, L28-44NL	AWWA C800	1"
5/25/2018	33-12-10	Curb Stops-Ball Meter Valves	Mueller Co., Ltd.	B-25000N, B-24277N-3, B-20200N-3, H-15000N, H-1552N, H142276N	AWWA C800, ANSF 61, ANSI/NSF 372	2"
5/25/2018	33-12-10	Curb Stops-Ball Meter Valves	Mueller Co., Ltd.	B-25000N, B-20200N-3, B-24277N-3, H-15000N, H-14276N, H-15525N	AWWA C800, ANSF 61, ANSI/NSF 372	1-1/2"
5/25/2018	33-12-10	Curb Stops-Ball Meter Valves	Mueller Co., Ltd.	15530N	ANSI/NSF 372	1"
01/26/00		Coated Tapping Saddle with Double SS Straps	JCM Industries, Inc.	#406 Double Band SS Saddle		1"-2" Taps on up to 12"
0/5/21/12	33-12-25	Tapping Sleeve (Coated Steel)	JCM Industries, Inc.	412 Tapping Sleeve ESS	AWWA C-223	Up to 30" w/12" Out
03/29/22	33-12-25	Tapping Sleeve (Coated or Stainless Steel)	JCM Industries, Inc.	415 Tapping Sleeve	AWWA C-223	Concrete Pipe Only
05/10/11		Tapping Sleeve (Stainless Steel)	Powerseal	3490AS (Flange) & 3490MJ		4"-8" and 16"
02/29/12	33-12-25	Tapping Sleeve (Coated Steel)	Romac	FTS 420	AWWA C-223	Up to 42" w/24" Out
02/29/12	33-12-25	Tapping Sleeve (Stainless Steel)	Romac	SST Stainless Steel	AWWA C-223	Up to 24" w/12" Out
02/29/12	33-12-25	Tapping Sleeve (Stainless Steel)	Romac	SST III Stainless Steel	AWWA C-223	Up to 30" w/12" Out
05/10/11		Joint Repair Clamp	Powerseal	3232 Bell Joint Repair Clamp		4" to 30"
		Plastic Meter Box w/Composite Lid	DFW Plastics Inc.	DFW37C-12-IEPAF FTW		
		Plastic Meter Box w/Composite Lid	DFW Plastics Inc.	DFW39C-12-IEPAF FTW		
08/30/06		Plastic Meter Box w/Composite Lid	DFW Plastics Inc.	DFW65C-14-IEPAF FTW		Class "A"
		Concrete Meter Box	Bass & Hays	CMB37-B12 1118 LID-9		
		Concrete Meter Box	Bass & Hays	CMB-18-Dual 1416 LID-9		
		Concrete Meter Box	Bass & Hays	CMB65-B65 1527 LID-9		
<b>Water - Bolts, Nuts, and Gaskets 33-11-05 (01/08/13)</b>						
<b>Water - Combination Air Release 33-31-70 (01/08/13)</b>						
*	E1-11	Combination Air Release Valve	GA Industries, Inc.	Empire Air and Vacuum Valve, Model 935	ASTM A 126 Class B, ASTM A	1" & 2"
*	E1-11	Combination Air Release Valve	Multiplex Manufacturing Co.	Crispin Air and Vacuum Valves, Model No.		1/2", 1" & 2"
*	E1-11	Combination Air Release Valve	Valve and Primer Corp.	APCO #143C, #145C and #147C		1", 2" & 3"
<b>Water - Dry Barrel Fire Hydrants 33-12-40 (01/15/14)</b>						
10/01/87	E-1-12	Dry Barrel Fire Hydrant	American-Darling Valve	Drawing Nos. 90-18608, 94-18560	AWWA C-502	
03/31/88	E-1-12	Dry Barrel Fire Hydrant	American Darling Valve	Shop Drawing No. 94-18791	AWWA C-502	
09/30/87	E-1-12	Dry Barrel Fire Hydrant	Clow Corporation	Shop Drawing No. D-19895	AWWA C-502	
01/12/93	E-1-12	Dry Barrel Fire Hydrant	American AVK Company	Model 2700	AWWA C-502	
08/24/88	E-1-12	Dry Barrel Fire Hydrant	Clow Corporation	Drawings D20435, D20436, B20506	AWWA C-502	
	E-1-12	Dry Barrel Fire Hydrant	ITT Kennedy Valve	Shop Drawing No. D-80783FW	AWWA C-502	
09/24/87	E-1-12	Dry Barrel Fire Hydrant	M&H Valve Company	Shop Drawing No. 13476	AWWA C-502	
10/14/87	E-1-12	Dry Barrel Fire Hydrant	Mueller Company	Shop Drawings No. 6461 A-423 Centurion	AWWA C-502	
01/15/88	E1-12	Dry Barrel Fire Hydrant	Mueller Company	A-423 Super Centurion 200	AWWA C-502	
10/09/87	E-1-12	Dry Barrel Fire Hydrant	U.S. Pipe & Foundry	Shop Drawing No. 960250	AWWA C-502	
09/16/87	E-1-12	Dry Barrel Fire Hydrant	American Flow Control (AFC)	Waterous Pacer WB67	AWWA C-502	
08/12/16	33-12-40	Dry Barrel Fire Hydrant	EJ (East Jordan Iron Works)	WaterMaster 5CD250		
<b>Water - Meters</b>						
02/05/93	E101-5	Detector Check Meter	Ames Company	Model 1000 Detector Check Valve	AWWA C550	4" - 10"
08/05/04		Magnetic Drive Vertical Turbine	Hersey	Magnetic Drive Vertical	AWWA C701, Class 1	3/4" - 6"

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**CITY OF FORT WORTH  
WATER DEPARTMENT  
STANDARD PRODUCT LIST**

Updated: 03/07/2023

Note: All water or sewer pipe larger than 15 inch diameter shall be approved for use by the Water Department on a project specific basis. Special bedding may be required for some pipes.

Approval	Spec No.	Classification	Manufacturer	Model No.	National Spec	Size
<b>Water - Pipes/PVC (Pressure Water) 33-31-70 (01/08/13)</b>						
01/18/18	33-11-12	PVC Pressure Pipe	Vinyltech PVC Pipe	DR14	ASTM D1784	4"-12"
3/19/2018	33 11 12	PVC Pressure Pipe	Pipelife Jet Stream	DR14	AWWA C900	4"-12"
3/19/2018	33 11 12	PVC Pressure Pipe	Pipelife Jet Stream	DR18	AWWA C900	16"-24"
5/25/2018	33 11 12	PVC Pressure Pipe	Diamond Plastics Corporation	DR 14	AWWA C900	4"-12"
5/25/2018	33 11 12	PVC Pressure Pipe	Diamond Plastics Corporation	DR 18	AWWA C900	16"-24"
12/6/2018	33 11 12	PVC Pressure Pipe	J-M Manufacturing Co., Inc d/b/a JM Eagle	DR 14	AWWA C900-16 UL 1285 ANSI/NSF 61 FM 1612	4"-28"
12/6/2018	33 11 12	PVC Pressure Pipe	J-M Manufacturing Co., Inc d/b/a JM Eagle	DR 18	AWWA C900-16 UL 1285	16"-24"
9/6/2019	33 11 12	PVC Pressure Pipe	Underground Solutions Inc.	DR14 Fusible PVC	AWWA C900	4" - 8"
9/6/2019	33 11 12	PVC Pressure Pipe	NAPCO(Westlake)	DR18	AWWA C900	16" - 24"
9/6/2019	33 11 12	PVC Pressure Pipe	NAPCO(Westlake)	DR14	AWWA C900	4" - 12"
9/6/2019	33 11 12	PVC Pressure Pipe	Sanderson Pipe Corp.	DR14	AWWA C900	4" - 12"
<b>Water - Pipes/Valves &amp; Fittings/Ductile Iron Fittings 33-11-11 (01/08/13)</b>						
07/23/92	E1-07	Ductile Iron Fittings	Star Pipe Products, Inc.	Mechanical Joint Fittings	AWWA C153 & C110	
*	E1-07	Ductile Iron Fittings	Griffin Pipe Products, Co.	Mechanical Joint Fittings	AWWA C 110	
*	E1-07	Ductile Iron Fittings	McWane/Tyler Pipe/ Union Utilities Division	Mechanical Joint Fittings, SSB Class 350	AWWA C 153, C 110, C 111	
08/11/98	E1-07	Ductile Iron Fittings	Sigma, Co.	Mechanical Joint Fittings, SSB Class 351	AWWA C 153, C 110, C 112	
02/26/14	E1-07	MJ Fittings	Accucast	Class 350 C-153 MJ Fittings	AWWA C153	4"-12"
05/14/98	E1-07	Ductile Iron Joint Restraints	Ford Meter Box Co./Uni-Flange	Uni-Flange Series 1400	AWWA C111/C153	4" to 36"
05/14/98	E1-24	PVC Joint Restraints	Ford Meter Box Co./Uni-Flange	Uni-Flange Series 1500 Circle-Lock	AWWA C111/C153	4" to 24"
11/09/04	E1-07	Ductile Iron Joint Restraints	One Bolt, Inc.	One Bolt Restrained Joint Fitting	AWWA C111/C116/C153	4" to 12"
02/29/12	33-11-11	Ductile Iron Pipe Mechanical Joint Restraint	EBAA Iron, Inc.	Megalug Series 1100 (for DI Pipe)	AWWA C111/C116/C153	4" to 42"
02/29/12	33-11-11	PVC Pipe Mechanical Joint Restraint	EBAA Iron, Inc.	Megalug Series 2000 (for PVC Pipe)	AWWA C111/C116/C153	4" to 24"
08/05/04	E1-07	Mechanical Joint Retainer Glands(PVC)	Sigma, Co.	Sigma One-Lok SLC4 - SLC10	AWWA C111/C153	4" to 10"
03/06/19	33-11-11	Mechanical Joint Retainer Glands(PVC)	Sigma, Co.	Sigma One-Lok SLCS4 - SLCS12	AWWA C111/C153	4" to 12"
08/05/04	E1-07	Mechanical Joint Retainer Glands(PVC)	Sigma, Co.	Sigma One-Lok SLCE	AWWA C111/C153	12" to 24"
08/10/98	E1-07	MJ Fittings(DIP)	Sigma, Co.	Sigma One-Lok SLDE	AWWA C153	4" - 24"
10/12/10	E1-24	Interior Restrained Joint System	S & B Technical Products	Bulldog System (Diamond Lok 21 & JM)	ASTM F-1624	4" to 12"
08/16/06	E1-07	Mechanical Joint Fittings	SIP Industries(Serampore)	Mechanical Joint Fittings	AWWA C153	4" to 24"
11/07/16	33-11-11	Mechanical Joint Retainer Glands	Star Pipe Products, Inc.	PVC Stargrip Series 4000	ASTM A536 AWWA C111	
11/07/16	33-11-11	Mechanical Joint Retainer Glands	Star Pipe Products, Inc.	DIP Stargrip Series 3000	ASTM A536 AWWA C111	
03/19/18	33-11-11	Mechanical Joint Retainer Glands	SIP Industries(Serampore)	EZ Grip Joint Restraint (EZD) Black For DIP	ASTM A536 AWWA C111	3"-48"
03/19/18	33-11-11	Mechanical Joint Retainer Glands	SIP Industries(Serampore)	EZ Grip Joint Restraint (EZD) Red for C900 DR14 PVC Pipe	ASTM A536 AWWA C111	4"-12"
03/19/18	33-11-11	Mechanical Joint Retainer Glands	SIP Industries(Serampore)	EZ Grip Joint Restraint (EZD) Red for C900 DR18 PVC Pipe	ASTM A536 AWWA C111	16"-24"
<b>Water - Pipes/Valves &amp; Fittings/Resilient Seated Gate Valve* 33-12-20 (05/13/15)</b>						
		Resilient Wedge Gate Valve w/no Gears	American Flow Control	Series 2500 Drawing # 94-20247		16"
12/13/02		Resilient Wedge Gate Valve	American Flow Control	Series 2530 and Series 2536	AWWA C515	30" and 36"
08/31/99		Resilient Wedge Gate Valve	American Flow Control	Series 2520 & 2524 (SD 94-20255)	AWWA C515	20" and 24"
05/18/99		Resilient Wedge Gate Valve	American Flow Control	Series 2516 (SD 94-20247)	AWWA C515	16"
10/24/00	E1-26	Resilient Wedge Gate Valve	American Flow Control	Series 2500 (Ductile Iron)	AWWA C515	4" to 12"
08/05/04		Resilient Wedge Gate Valve	American Flow Control	42" and 48" AFC 2500	AWWA C515	42" and 48"
05/23/91	E1-26	Resilient Wedge Gate Valve	American AVK Company	American AVK Resilient Seated GV	AWWA C509	4" to 12"
01/24/02	E1-26	Resilient Wedge Gate Valve	American AVK Company			20" and smaller
*	E1-26	Resilient Seated Gate Valve	Kennedy			4" - 12"
*	E1-26	Resilient Seated Gate Valve	M&H			4" - 12"
*	E1-26	Resilient Seated Gate Valve	Mueller Co.			4" - 12"
11/08/99		Resilient Wedge Gate Valve	Mueller Co.	Series A2361 (SD 6647)	AWWA C515	16"
01/23/03		Resilient Wedge Gate Valve	Mueller Co.	Series A2360 for 18"-24" (SD 6709)	AWWA C515	24" and smaller
05/13/05		Resilient Wedge Gate Valve	Mueller Co.	Mueller 30" & 36", C-515	AWWA C515	30" and 36"
01/31/06		Resilient Wedge Gate Valve	Mueller Co.	Mueller 42" & 48", C-515	AWWA C515	42" and 48"
01/28/88	E1-26	Resilient Wedge Gate Valve	Clow Valve Co.		AWWA C509	4" - 12"
10/04/94		Resilient Wedge Gate Valve	Clow Valve Co.	16" RS GV (SD D-20995)	AWWA C515	16"
11/08/99	E1-26	Resilient Wedge Gate Valve	Clow Valve Co.	Clow RW Valve (SD D-21652)	AWWA C515	24" and smaller
11/29/04		Resilient Wedge Gate Valve	Clow Valve Co.	Clow 30" & 36" C-515	AWWA C515	30" and 36" (Note 3)
11/30/12		Resilient Wedge Gate Valve	Clow Valve Co.	Clow Valve Model 2638	AWWA C515	24" to 48" (Note 3)
05/08/91	E1-26	Resilient Seated Gate Valve	Stockham Valves & Fittings		AWWA C 509, ANSI 420 - stem,	4" - 12"
*	E1-26	Resilient Seated Gate Valve	U.S. Pipe and Foundry Co.	Metroseal 250, requirements SPL #74		3" to 16"
10/26/16	33-12-20	Resilient Seated Gate Valve	EJ (East Jordan Iron Works)	EJ FlowMaster Gate Valve & Boxes		
08/24/18		Matco Gate Valve	Matco-Norca	225 MR	AWWA/ANSI C115/An21.15	4" to 16"

\* From Original Standard Products List



**CITY OF FORT WORTH  
WATER DEPARTMENT  
STANDARD PRODUCT LIST**

Updated: 03/07/2023

Note: All water or sewer pipe larger than 15 inch diameter shall be approved for use by the Water Department on a project specific basis. Special bedding may be required for some pipes.

Approval	Spec No.	Classification	Manufacturer	Model No.	National Spec	Size
<b>Water - Pipes/Valves &amp; Fittings/Rubber Seated Butterfly Valve 33-12-21 (07/10/14)</b>						
*	E1-30	Rubber Seated Butterfly Valve	Henry Pratt Co.		AWWA C-504	24"
*	E1-30	Rubber Seated Butterfly Valve	Mueller Co.		AWWA C-504	24"and smaller
1/11/99	E1-30	Rubber Seated Butterfly Valve	Dezurik Valves Co.		AWWA C-504	24" and larger
06/12/03	E1-30	Valmatic American Butterfly Valve	Valmatic Valve and Manufacturing Corp.	Valmatic American Butterfly Valve.	AWWA C-504	Up to 84" diameter
04/06/07	E1-30	Rubber Seated Butterfly Valve	M&H Valve	M&H Style 4500 & 1450	AWWA C-504	24" to 48"
03/19/18	33 12 21	Rubber Seated Butterfly Valve	G. A. Industries (Golden Anderson)	AWWA C504 Butterfly Valve	AWWA C-504	30"-54"
<b>Water - Polyethylene Encasement 33-11-10 (01/08/13)</b>						
05/12/05	E1-13	Polyethylene Encasement	Flexsol Packaging	Fulton Enterprises	AWWA C105	8 mil LLD
05/12/05	E1-13	Polyethylene Encasement	Mountain States Plastics (MSP) and AEP Ind.	Standard Hardware	AWWA C105	8 mil LLD
05/12/05	E1-13	Polyethylene Encasement	AEP Industries	Bullstrong by Cowtown Bolt & Gasket	AWWA C105	8 mil LLD
09/06/19	33-11-11	Polyethylene Encasement	Northtown Products Inc.	PE Encasement for DIP	AWWA C105	8 mil LLD
<b>Water - Sampling Station</b>						
03/07/23	33 12 50	Water Sampling Station	Eclipse	Number 88 , 12-inch Depth of Bury		As shown in spec, 33 12 50
<b>Water - Automatic Flusher</b>						
10/21/20		Automated Flushing System	Mueller Hydroguard	HG2-A-IN--2-PVC-018-LPLG(Permanent)		
04/09/21		Automated Flushing System	Kupferle Foundry Company	Eclipse #9800we		
04/09/21		Automated Flushing System	Kupferle Foundry Company	Eclipse #9700 (Portable)		