



**SAN JACINTO RIVER AUTHORITY  
PURCHASING DEPARTMENT**

1577 Dam Site Road  
Conroe, TX 77304  
Attn: Grady B. Garrow, CPPB  
936-588-7181  
ggarrow@sjra.net

**HIGHLANDS DIVISION  
SIPHON 7 IMPROVEMENTS – PHASE 1  
RELEASED FOR PROPOSALS SPECIFICATIONS**

Date Issued: June 8, 2018

Due Date & Time: July 12, 2018 at 2:00 PM CST

SJRA PROJECT NO. HDPM0003.1081.2o001  
COMPETITIVE SEALED PROPOSAL NO. 18-0036  
CONTRACT NO. 18-0036

Texas Water Engineering, PLLC.  
19901 Southwest Freeway  
Sugarland, Texas 77479  
Texas Registered Engineering Firm F-8482



**Disclosure Requirements**

Chapter 176 of the Texas Local Government Code mandates the public disclosure of certain information concerning persons doing business or seeking to do business with the San Jacinto River Authority, including affiliations and business and financial relationships such persons may have with San Jacinto River Authority officers. An explanation of the requirements of Chapter 176, applicable forms and a complete text of the new law are available at: <http://www.sjra.net>. If you are unable to obtain such information online, please contact the San Jacinto River Authority Purchasing Department, 1577 Dam Site Road, Conroe, Texas 77304 or call (936) 588-3111.

**BY DOING BUSINESS OR SEEKING TO DO BUSINESS WITH THE SAN JACINTO RIVER AUTHORITY, YOU ACKNOWLEDGE THAT YOU HAVE BEEN NOTIFIED OF THE REQUIREMENTS OF CHAPTER 176 OF THE TEXAS LOCAL GOVERNMENT CODE AND THAT YOU ARE SOLELY RESPONSIBLE FOR COMPLYING WITH THEM.**

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**SECTION 00 11 13**

**INVITATION TO SUBMIT PROPOSALS**

**GENERAL NOTICE**

The San Jacinto River Authority is requesting Competitive Sealed Proposals (CSP) for the Construction of the following project in Harris County, Texas:

CSP No. 18-0036 – Siphon 7 Improvements – Phase 1

**PROJECT DESCRIPTION**

Siphon 7 Improvements – Phase 1 Project, hereafter called “Project” is located at the intersection of the San Jacinto River Authority’s Main Canal and FM 2100 in Crosby, Texas. The Project will accommodate the future widening of FM 2100. Generally, the Project includes:

- Demolition of existing siphon intake and discharge structures and angled pipe segments of a 60-inch diameter reinforced concrete pipe.
- Installation of a temporary cofferdam around the work areas to maintain full canal flow capacity of 60 MGD.
- Rehabilitation of existing 60-inch diameter reinforced concrete pipe for use as a temporary bypass pipe that will remain in service until the completion of the road widening of FM 2100 (by others).
- Installation of new 60-inch diameter steel temporary bypass pipe that will remain in service until the completion of the road widening of FM 2100 (by others).
- Siphon area associated canal levee earth work, riprap and geotextile placement, and hydro-mulching of all disturbed areas.

CSP No. 18-0036 includes four (4) separate Proposal Options. Offerors may choose to provide a Proposal for one or more of the Proposal Options. For each Option that Offeror elects to provide a proposal for, Offeror shall include a separate specific Care of Water plan in accordance with Specification Section 01 57 23.02 – Control of Ground and Surface Water. Each Proposal Option will be independently evaluated and scored to determine overall Highest Ranked CSP No. 18-0036 Offeror and preferred Proposal Option based on the criteria set forth in Specification Section 00 21 13.02 – Instructions to Offerors.

The Proposal Options include the following:

Proposal Option No. 1: Install 48-inch (minimum inner diameter) HDPE pipe to slipline and extend existing 60-inch RCP bypass pipe. Install new 60-inch steel pipe along southern side of SJRA’s easement.

Proposal Option No. 2: Extend existing 60-inch RCP bypass pipe and install a geopolymer mortar liner inside existing 60-inch RCP bypass pipe and extensions. Install new 60-inch steel pipe along southern side of SJRA’s easement.



Proposal Option No. 3: Install 48-inch (minimum inner diameter) HDPE pipe to slipline and extend existing 60-inch RCP bypass pipe. Install new 60-inch steel pipe along northern side of SJRA's easement.

Proposal Option No. 4: Extend existing 60-inch RCP bypass pipe and install geopolymer mortar liner inside existing 60-inch RCP bypass pipe and extensions. Install new 60-inch steel pipe along northern side of SJRA's easement.

Competitive Sealed Proposals must be delivered to the San Jacinto River Authority, G&A Building, 3<sup>rd</sup> Floor Receptionist, 1577 Dam Site Road, Conroe, TX 77304 no later than 2:00 PM (CST) on July 12, 2018. Proposals will be publicly opened and read aloud at this time. Address proposals to:

Grady B. Garrow, CPPB  
San Jacinto River Authority  
Purchasing Department  
1577 Dam Site Road  
Conroe, TX 77304

A mandatory Pre-Submittal Conference will be held at Highlands Division, 1108 E. Canal, Highlands, TX 77562, at 10:00 AM (CST) on June, 21, 2018. Proposals will not be accepted from Offering Firms which fail to attend the Pre-Submittal Conference.

A complete set of CSP Documents may be accessed via the Brazos Valley Online Bidding System (<http://brazosbid.cstx.gov>). A one-time registration is required in order to view or download CSP Documents and receive automatic notification of Addenda.

Attendance at the Pre-Submittal Conference may be the only opportunity for Offerors to see the existing conditions of the site prior to Proposal due date.

The SJRA reserves the right to reject any or all Proposals and to waive informalities and irregularities.

Any contract or contracts awarded under this Invitation to Submit Proposals are expected to be funded in part by a loan or grant from the Texas Water Development Board. Neither the State of Texas, nor any of its departments, agencies, or employees are or will be a party to this Invitation to Submit Proposals or any resulting contract.

**END OF SECTION**

**SECTION 00 21 13.02CT**

**INSTRUCTIONS TO OFFERORS  
(COMPETITIVE SEALED PROPOSALS)**

**1. Overview of Competitive Sealed Proposal Process.**

The objective of the Competitive Sealed Proposal (CSP) process is to competitively procure goods and services with the firm whose Proposal provides the best value for the Owner (SJRA). Proposals will be received, publicly opened, and the names and monetary Proposals of Offerors read aloud. Subsequently, the Proposals will be ranked according to the criteria described in this CSP Document. Both cost and non-cost factors will be evaluated and scored. One or more Offerors may be invited back for discussions or to present their Proposal to the SJRA before the final rankings are made.

CSP No. 18-0036 includes four (4) separate Proposal Options. Offerors may choose to provide a Proposal for one or more of the Proposal Options. For each Option that Offeror elects to provide a proposal for, Offeror shall include a separate specific Care of Water plan in accordance with Specification Section 01 57 23.02 – Control of Ground and Surface Water. Each Proposal Option will be independently evaluated and scored to determine overall Highest Ranked CSP No. 18-0036 Offeror and preferred Proposal Option based on the criteria set forth in this specification.

The Proposal Options include the following:

Proposal Option No. 1: Install 48-inch (minimum inner diameter) HDPE pipe to slipline and extend existing 60-inch RCP bypass pipe. Install new 60-inch steel pipe along southern side of SJRA's easement.

Proposal Option No. 2: Extend existing 60-inch RCP bypass pipe and install a geopolymer mortar liner inside existing 60-inch RCP bypass pipe and extensions. Install new 60-inch steel pipe along southern side of SJRA's easement.

Proposal Option No. 3: Install 48-inch (minimum inner diameter) HDPE pipe to slipline and extend existing 60-inch RCP bypass pipe. Install new 60-inch steel pipe along northern side of SJRA's easement.

Proposal Option No. 4: Extend existing 60-inch RCP bypass pipe and install geopolymer mortar liner inside existing 60-inch RCP bypass pipe and extensions. Install new 60-inch steel pipe along northern side of SJRA's easement.

The SJRA may enter into contract negotiations with the highest ranked firm for the completion of the Work. If the negotiations with the highest ranked firm are unsuccessful, the SJRA will formally close negotiations with this firm and initiate contract negotiations with the next highest ranked firm. Upon Standard Form of Agreement between both parties, a Contractor-executed Contract may be recommended for approval by the SJRA Board of Directors or the SJRA General

Manager, as applicable. Upon approval, the Contract will be executed by the General Manager of the SJRA.

## **2. Defined Terms.**

2.1. Definitions for the following terms used in these Instructions do not replace definitions for similar terms that may be contained within other sections of the Contract Documents.

2.2. Certain additional terms used in these Instructions to Offerors have the meanings indicated below and are applicable to both the singular and plural thereof.

- 2.2.1. Addendum or Addenda- Additions, deletions, and/or changes to any part of the CSP issued in writing by the Owner prior to Proposal due date and time.
- 2.2.2. Apparent Best Value Offeror- the Offering Firm whose Proposal for completion of the Work provides the best value for the Owner as defined by the ranking detailed in Article 12 of Instructions to Offerors.
- 2.2.3. Board of Directors – The governing body of the SJRA comprised of seven (7) directors appointed to six (6) year terms by the Governor of the state of Texas.
- 2.2.4. Contract Negotiations- Discussions which take place between the Owner and the Apparent Best Value Offeror in an effort to reach Standard Form of Agreement on contract scope of work, cost, and other contractual requirements.
- 2.2.5. Contractor – The successful Offeror to this CSP who enters into a contractual relationship with the Owner for completion of the Work, following any contract approval by the SJRA Board of Directors or the SJRA General Manager, as applicable.
- 2.2.6. CSP Document- abbreviation of the Competitive Sealed Proposals Document, the document used to request Competitive Sealed Proposals for the procurement of goods and services as authorized under Government Code Chapter 2269, Subchapter D.
- 2.2.7. Engineer's Opinion of Probable Construction Cost – Engineer's opinion of project construction cost to Owner developed by the Principal Architect/Engineer. Actual contract amount may vary significantly.
- 2.2.8. Issuing Office - The location from which the CSP Documents are issued. For this project the issuing office is San Jacinto River Authority, 1577 Dam Site Road Conroe, Texas 77304.
- 2.2.9. Offeror, Offering Firm- Firm which responds to a CSP by submitting a Proposal directly to Owner. Offeror and Offering Firm shall have the same meaning in the Instructions to Offerors.
- 2.2.10. Owner - The San Jacinto River Authority (SJRA).
- 2.2.11. Proposal- Offeror's submittal which conforms to the requirements set forth in this CSP.
- 2.2.12. Proposal Form- As detailed in the requirements of this CSP, contains unit pricing for all parts of the Work and their aggregate as detailed and affirmed

on the Proposal Form and may include additional forms supplied by Offeror and or the Owner that relate to the Offeror's proposed cost for completing the Work.

- 2.2.13. SJRA- San Jacinto River Authority, a government agency whose mission is to develop, conserve, and protect the water resources of the San Jacinto River basin.
- 2.2.14. Statement of Qualifications, (SOQ) - Offeror submitted documents which describe the Offering Firm's qualifications for performing the Work and contain no pricing or cost data. Requirements for the Statement of Qualifications (SOQ) are set forth in Article 9 and Article 11 of the Instructions to Offerors (this CSP).
- 2.2.15. Subcontractor - Any contractor hired by the Contractor to furnish services, or goods and services, specified in this CSP.
- 2.2.16. Successful Offeror - The Firm who has completed negotiations with the Owner and, following any approval by the SJRA Board of Directors or the SJRA General Manager, as applicable, is selected to enter into a Contract with the owner to complete the work.
- 2.2.17. Supplier- Any supplier of materials and/or equipment to Contractor for the Project.

### 3. Schedule.

CSP Documents Posted on Website:	June 8, 2018
Legal Advertisements:	June 8, 2018 June 15, 2018
Pre-Proposal Conference (Mandatory):	June 21, 2018, 10:00 AM (CST)
Deadline for Questions and Inquiries:	June 28, 2018, 10:00 AM (CST)
Proposal Submission Deadline:	July 12, 2018, 2:00 PM (CST)
Anticipated Construction Start:	September 2018

### 4. Competitive Sealed Proposal Documents/Copies.

4.1. This Request for Competitive Sealed Proposals (CSP) consists of the following documents:

- 4.1.1. Invitation to Submit Proposals (00 11 13);
- 4.1.2. Instructions to Offerors (00 21 13.02);
- 4.1.3. Proposal Form (00 41 00.02);
- 4.1.4. Statement of Qualifications (00 21 13.03);
- 4.1.5. All Contract Documents referenced in this CSP;
- 4.1.6. Addenda to this CSP issued by the SJRA Purchasing Department;
- 4.1.7. Any attached forms; and
- 4.1.8. Proposal Security (Offeror's Bond)

4.2. A complete set of CSP Documents may be accessed at the Brazos Valley Online Bidding System (<http://brazosbid.cstx.gov>). Interested parties that are not already

registered on the Brazos Valley Online Bidding System website site must register as a “New Vendor” in order to download the CSP Document(s) and receive automatic notification of Addenda.

- 4.3. Complete sets of CSP Documents must be used in preparing Proposals; neither Owner nor Principal Architect/Engineer assumes any responsibility for errors or misinterpretations resulting from the use of incomplete sets of CSP Documents.
- 4.4. Owner and Principal Architect/Engineer, in making copies of CSP Documents available on the above terms, do so only for the purpose of obtaining Proposals for the Work and do not confer a license or grant for any other use.

**5. TWDB Requirements (TWDB-0552 – Supplemental Conditions)**

- 5.1. This contract is contingent upon release of funds from the Texas Water Development Board.
- 5.2. Any contract or contracts awarded under these Instructions to Offerors are expected to be funded in part by a loan from the Texas Water Development Board. Neither the State of Texas, nor any of its departments, agencies, or employees are or will be a part to these Instructions to Offerors or any resulting contract.

**6. Competitive Sealed Proposal Process\Contract Documents.**

- 6.1. All questions about the Competitive Sealed Proposal Process or the meaning or intent of the Contract Documents are to be directed to the SJRA Purchasing Department.

Contact: Grady B. Garrow, CPPB  
Buyer, San Jacinto River Authority  
ggarrow@sjra.net  
936-588-7181

- 6.2. Any questions submitted via the Brazos Valley Online Bidding System website on the appropriate webpage for submitting questions shall be the equivalent of contacting the SJRA Purchasing Department directly (via phone or email).
- 6.3. Interpretations or clarifications considered necessary by Owner in response to such questions will be issued by Addenda and posted on the Brazos Valley Online Bidding website, [www.brazosbid.cstx.gov](http://www.brazosbid.cstx.gov) .

**7. Pre-Submittal Conference.**

- 7.1. A single mandatory Pre-Submittal Conference will be conducted at the offices of the San Jacinto River Authority, Highlands Division, 1108 E. Canal, Highlands, TX 77562, (936-828-3980) at 10:00 AM (CST), June 21, 2018. Representatives of

Owner and Principal Architect/Engineer will be present to discuss the project. Proposals will not be accepted from offering firms which fail to attend the pre-submittal conference.

- 7.2. All questions about the meaning or intent of the Competitive Sealed Proposal and Contract Documents are to be directed to the SJRA Purchasing Department. The SJRA Purchasing Department will address all questions as Owner considers necessary in response to inquiries arising at the conference through written Addenda and posted on the Brazos Valley Online Bidding System website: <http://brazosbid.cstx.gov>. Oral statements may not be relied upon and will not be binding or legally effective.

## **8. Estimated Budget.**

- 8.1. An Engineer's Opinion of Probable Construction Cost (project cost estimate) has been generated by the Principal Architect/Engineer. If an award is made, the actual contract amount may vary.
- 8.2. The Engineer's Opinion of Probable Construction Cost for project Proposal Option 1 is \$1,667,050.00. Construction cost estimates for other proposal options may vary.

## **9. Basis for Ranking of Proposals.**

- 9.1 The Owner will consider the qualifications (Statement of Qualifications) of the Offerors and their respective proposed Contract Price(s) (Proposal Form) when evaluating Proposals to determine which Offeror, in the sole opinion of the Owner, will provide the best value to the Owner. All procurements shall conform to Chapter 2269 of the State of Texas Government Code. The Proposals will be evaluated using the following criteria and weighting:

- 9.1.1. Proposed Project Cost: The Offeror's Proposed Cost of Performing the Work shall be indicated as the "Total Proposal Price" (indicated as "E" on the Proposal Form (Specification Section 00 41 00.02). The Owner has established an internal budget for this Project. The Total Proposal Price is defined per the Proposal Form to include the cost(s) of the proposed Total Base Items ("A"). The Total Proposal Price may and at the Owner's sole discretion, be inclusive of the individual or collective costs associated with the Offeror's Total Extra unit Price Items ("B"), Total Cash Allowances ("C"), and Total Alternate Items ("D") costs. For example: Total Proposal Option Price ("E") = A + B + C + D.

The Owner will evaluate the Total Proposal Price (including any requested costs for Extra Unit Price Items, Cash Allowances and Alternate Items, as identified, that the Owner can award with their available budget at the time

Contract is negotiated. Attach the Proposal Form and all information/documents required to be submitted with the Proposal.

Offeror may submit Proposal(s) for one or more of this Request for Proposal's indicated Proposal Options for which Offeror indicates an interest in performing the Work. Each proposal submitted will be evaluated and ranked. Such evaluation shall include, but is not limited to, Offeror's compliance with the request for providing Proposal Option documentation, as well as an Owner (solely) determined best value evaluation. The Proposal price associated with the Offeror's highest ranked Proposal Option shall be used to determine Offeror's Total Proposal Price. Proposed Project Cost Weighting Points are used to determine the Highest Ranked Offeror and preferred Proposal Option (see table – Section 9.2).

- 9.1.2. Experience/Past Performance of Offeror with Similar Projects: Offeror can provide one set of Statement of Qualifications that will be evaluated and ranked for all Proposal Options the Offeror submits proposals for. Provide general information about the Organization as required in Table 1 and Table 2 of Specification Section 00 21 13.03 Statement of Qualifications (SOQ). Provide any additional information as required by the Construction Experience section of Table 2. Describe the Organizational structure and the qualifications of the management team as it relates to this Project in Table 3. Provide a narrative format as described in Table 4, describe Offeror's experience as a general contractor and describe the Organization's operating philosophy and approach to constructing, completing, and commissioning Projects. Describe the Organization's approach to managing Subcontractors and Suppliers (Table 11), quality management and construction contract administration. Limit the narrative portion responding to this criterion to 10 pages in length. Provide a list of Projects completed by the Organization in the last five (5) years using copies of Table 5.

Experience should include, as a minimum, the satisfactory completion of at least two (2) direct bore and jack, single pass tunneling or other similar type non-sleeved pipe installation Projects, at least one shall include use of steel pipe, and at least two (2) slip-line or cased pipe installation Projects for proposed key personnel. A higher point score will be given to Offerors whose proposed key personnel have obtained the given minimum experience within the last five (5) years.

Offeror must demonstrate experience in the construction of Projects of similar construction cost and/or techniques and describe how they intend to provide the needed experience and expertise. Submit descriptions of Projects on which proposed key personnel have experience by submitting completed copies of the attached Table 12, with at least one Project for each of the key individuals. If Offeror does not have specific experience with

Projects of this type and magnitude, the Offeror may describe its proposed approach and how its experience with other Projects enhances its capability to successfully complete this Project. Offeror may submit photographs, Project descriptive narratives, letters of recommendation, Project awards, and references to demonstrate experience in constructing a Project which meets the Owner's expectations for a quality Project constructed on time and within budget (Tables 13 and 14). This narrative is not to exceed one (1) page in length.

Provide information to demonstrate the ability of the Organization to complete Projects within budget and on time. Offerors are to provide a tabulation of all Projects completed by the Organization within the last five (5) years on Tables 13 and 14 to demonstrate performance in these areas. Comments may be added to the tabulations to indicate the reasons for amending the contract amounts or completion dates. Provide narrative information to indicate the number of Projects and dollar volume currently under contract by the Organization and the projected completion date of each active Project. Describe how the resources dedicated to these assignments will impact Offeror's ability to effectively execute the construction of this Project. Provide an estimate of the amount of the Project that will be done using in-house resources and the amount to be performed by Subcontractors and Suppliers. This narrative is not to exceed five (5) pages in length.

- 9.1.3. Experience and Qualifications of Proposed Key Personnel with Similar Projects: Offeror can provide one set of Statement of Qualifications that will be evaluated and ranked for all Proposal Options the Offeror submits proposals for. Provide information on the managerial structure and the key personnel that will be actively working on this Project in Tables 6 through 10 and Table 12. Key personnel include the Project Manager, Project Superintendent, Safety Manager, and Quality Control Manager. If more than one of these key roles are to be filled by one individual, this information is to be provided with the list of proposed individuals. The Offeror is to provide a list of individuals from which the individual for any given position may be selected if the Offeror is not able to commit to one individual for the Project at the time the Proposal is submitted. Qualifications of these individuals will be considered in evaluating the qualifications of the Offeror. The Proposal must provide the services of the proposed key personnel for the life of the Project as a condition of qualification. Failure to provide the proposed key Personnel may result in the disqualification of the Offeror and may void the award of the Contract.

Provide the resumes (not to exceed one page for each) of proposed key personnel with the SOQ describing their education and experience in Table 6. Include more detailed information on Projects on which they have had significant involvement in the last five (5) years, or that demonstrate their



experience with similar Projects. This list is to include the name and a current telephone number for references of each of these Project assignments. Offerors are to include a list of the current Project assignments for each of the individuals proposed, the anticipated completion date for this assignment and the percentage of the time they will have available to devote to this Project. The Project Superintendent must be dedicated to this Project full time for the duration of the Project.

- 9.1.4. Care of Water: For **each** Proposal Option submitted, the Offeror shall provide a separate care of water plan. The plan shall include an attached narrative and/or examples of how all potential sources of water infiltration (i.e. from the SJRA canal, Harris County/TxDOT roadside ditches, rain water, ground water, etc.) into the construction site will be maintained throughout the Project. This narrative shall include a description of the proposed dewatering system, if it will be designed, constructed or maintained by a Subcontractor, how the system will be installed, a maintenance plan for the dewatering system, and a proposed mitigation plan should the excavation dewatering system malfunction or otherwise be insufficient to maintain a dry work environment. Additionally, the plan of the proposed dewatering system should include a narrative of the proposed contractor's means and method of controlling water during the installation of the cofferdam system, the method used in the initial dewatering of the excavation site, establishment of the permanent dewatering system, and the removal of the dewatering system and cofferdams upon completion of the project. The Care of Water plan must also identify/explain how the full SJRA canal flow of 60 MGD will be maintained at all times throughout construction, including the use of any pumping or other water conveyance methods. The Care of Water Plan shall be in compliance with all aspects of Specification Section 01 57 23.02 - Control of Ground Water and Surface Water. Failure to provide the proposed Care of Water plan may result in the disqualification of the Offeror and may void the award of the Contract.

The Offeror's Care of Water plan for each Proposal Option will be individually evaluated. Such evaluation shall include, but is not limited to, Offeror's compliance with request(s) for providing Proposal Option documentation, as well as an Owner (solely) determined best value evaluation.

If more than 20% (of the contract amount) of the "Care of Water" for the total project is to be performed by a Subcontractor, provide pertinent details of the company, key personnel, and any experience (including examples) with **similar** type projects. The experience of your Subcontractor's company and key personnel will be considered in evaluating the qualifications of the Offeror.

- 9.1.5. Financial Management (Stability): Provide the past two (2) years of available

financial statements, preferably audited, with this Proposal. Provide financial statements showing the name and address of the firm preparing the financial statements and the date of preparation. Offerors may choose to report on the financial stability of their Organization to demonstrate that they have the ability to complete the Project in a manner that will not impose undue efforts on the part of the Owner to evoke bonds to complete the Project or meet financial obligations. Describe the Offeror’s systems and philosophy for financial management of the Project. Describe Offeror’s systems and philosophy for contracting with Subcontractors and Suppliers and managing payments and retainage. Provide other information if desired to demonstrate solid financial management practices that will enhance completion of the Project. This narrative is not to exceed two (2) pages in length.

**This is a Pass or Fail. Any Offeror receiving a score of “Fail”, will be automatically disqualified.**

9.2. Table of criteria and weighting for the ranking of Offeror’s Proposals. Each Proposal Option submitted will be ranked individually based on the following weighting.

<b>Rating Category</b>	<b>Description</b>	<b>Weighting Points</b>
9.1.1	Proposed Project Cost (E=A+B+C+D)	50
9.1.2	Experience/Past Performance of Offeror with Similar Projects	15
9.1.3	Experience and Qualifications of Proposed Key Personnel with Similar Projects	15
9.1.4	Care of Water	20
9.1.5	Financial Management (Stability)	Pass/Fail
<b>Total</b>		<b>100</b>

**10. Proposal Form.**

- 10.1. A Proposal Form (00 41 00.02) is included with the CSP Documents; additional copies may be obtained at <http://www.sjra.net> (Purchasing Tab) or directly at <http://brazosbid.cstx.gov>. Interested parties that are not already registered on the Brazos Valley Online Bidding System website must register as a “New Vendor” to download the CSP Document(s) and receive automatic notification of Addenda.
- 10.2. All blanks on the Proposal Form must be completed in ink, by hand, or electronically printed. Offeror may submit a proposal for one or more Proposal Options.
- 10.3. The Proposal price shall include such amount as the Offeror deems proper for overhead and profit.

**11. Offering Firm’s Statement of Qualifications (SOQ).**

- 11.1. SOQs shall not exceed fifteen (15) pages, **including** transmittal letters and narratives, and **excluding** completed SOQ tables and attachments, care of water plans for additional proposal options (if more than one option is proposed), covers and plain section dividers. SOQs shall be printed on single side 8 ½” by 11” pages with not less than 1 inch margins, not less than 1.25 line spacing and not less than 11 point font.
- 11.2. The SOQ must be submitted with the Proposal and include, as a minimum, the information as described in Article 9, Basis for Ranking of Proposals. Failure to submit the required information in the SOQ may result in the Owner considering the Proposal non-responsive and result in rejection of the Proposal by Owner. Offerors may be required to provide supplemental information if requested by the Owner to clarify, enhance or supplement the information provided in the SOQ.
- 11.3. Offerors must provide requested SOQ information using the tables provided in specification section 00 21 13.03 - Statement of Qualifications. A copy of these tables will be made available in Microsoft Word to assist with the preparation of the SOQ. Information in these tables must be provided completely and in detail. The information in these tables will be used to make direct comparisons with the information provided by other Offerors. Failure to include the information completely and clearly may result in lower scores in the evaluations. Information that cannot be totally incorporated in the table may be included in an appendix to the table. Appendices must be clearly referenced by appendix number in the table, and the appended material must include the appendix number on every sheet of the appendix. The appendix must include only the information that responds to the question or item number to which the appended information applies. The required tables are listed below:

Table 1	General Information
Table 2	Organizational Experience
Table 3	Organizational Structure
Table 4	Project Experience and Resources
Table 5	Current Projects and Projects Completed within the last 5 Years
Table 6	Proposed Key Personnel
Table 7	Proposed Project Managers
Table 8	Proposed Project Superintendent
Table 9	Proposed Project Safety Manager
Table 10	Proposed Quality Control Manager

Table 11	Subcontractors and Suppliers
Table 12	Project information for Key Personnel
Table 13	Demonstration of Budget Performance
Table 14	Demonstration of On-time Performance

- 11.4. Offerors may provide supplemental information to the SOQs using AIA, AGC or other industry standard SOQ tables and / or Offerors may submit additional information such as organizational brochures or other marketing information to help demonstrate their ability to provide best value to the Owner. This information may not be submitted as a substitute to the information specifically requested in this Section, or in the SOQ tables. If this information is to be included as an appendix to the information requested in Article 11.3. (above), the appendix must specify the paragraph or section to which the appendix applies and the paragraph or section must accurately reference the appendix.

## **12. Ranking of Offeror's Proposals.**

- 12.1. The Owner will consider the qualifications (Statement of Qualifications) of the Offerors and Offeror's proposed Subcontractors, Suppliers and consultants, in addition to the proposed cost(s) (Proposal Form) when evaluating Proposals to determine which Proposal offers the best value to the Owner. Owner will rank each of the Offeror's Proposal Options based on the criteria and criteria weighting described in Article 9, Basis for Ranking of Proposals.
- 12.2. Evaluation and ranking of the Proposals will be completed no later than the 45th calendar day from the date of Proposal opening. Offerors are requested not to withdraw their Proposals within ninety (90) calendar days from the date on which Proposals are opened. Proposal Security of the highest ranking firms will be held by the Owner until contract negotiations are finalized.
- 12.3. In evaluating Proposals, Owner will consider the selection criteria set forth in Article 9 of these Instructions to Offerors and whether or not the Proposals comply with the prescribed requirements, and such options, alternates, unit prices and other data, as may be requested by Owner.
- 12.4. Owner 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 General Conditions. Owner may also 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 recommendation of award to Owner's Board of Directors or its General Manager, as applicable.

- 12.5. Owner may conduct such investigations as Owner deems necessary to assist in the evaluation of any Proposal and to establish the responsibility, qualifications and financial ability of Offerors, proposed Subcontractors, Suppliers and other persons and organizations to perform and furnish the Work in accordance with the Contract Documents to Owner's satisfaction within the prescribed time.
- 12.6. The Owner, at its discretion, may also choose to conduct interviews with the top-ranking Offerors to provide Offerors a better opportunity to demonstrate they can provide the best value to the Owner for this Project. Should the Owner choose to conduct interviews with the top-ranking Offerors, they will be notified of:
  - 12.6.1. The time and place for the interview.
  - 12.6.2. Interview format and agenda.
  - 12.6.3. Questions to prepare for the interview.
  - 12.6.4. Individuals that are expected to participate in the interview.

Failure to participate in the interview may result in disqualification from consideration for the project.

### **13. Award of Contract.**

- 13.1. It is the intent of the San Jacinto River Authority to award this contract to the Offering Firm whose Proposal for completion of the Work provides the best value for the Owner after consideration of the Proposal Options and relative importance of costs and other evaluation factors described in the Basis for Ranking Proposals set forth in Article 9 of these Instructions to Offerors.
- 13.2. The Owner reserves the right to adopt the most advantageous interpretation of the Proposals submitted in the case of ambiguity or lack of clearness in stating Proposal Prices, to reject any or all Proposals, and/or to waive informalities.
- 13.3. Owner reserves the right to reject any or all Proposals, including without limitation the rights to reject any or all nonconforming, nonresponsive, unbalanced, or conditional Proposals and to reject the Proposal of any Offeror if Owner determines that an award to that Offeror would not provide the best value for the Owner, whether because the Proposal is not responsive or the Offeror is unqualified or of doubtful financial ability or fails to meet any other pertinent standard or criteria established by Owner.
- 13.4. Owner also reserves the right to waive all informalities not involving price, time or changes in the Work and to negotiate contract terms with the Apparent Best

Value Offeror. 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. Discrepancies between words and figures will be resolved in favor of the words.

- 13.5. The qualifications of a firm shall not deprive the Owner of the right to accept a Proposal, which in its judgment offers the best value to the Owner. In addition, the Owner reserves the right to reject any Proposal where circumstances and developments have, in the opinion of the Owner, changed the qualifications or responsibility of the firm.
- 13.6. Material misstatements in the information submitted for evaluation may be ground for rejection of Offeror's Proposal. Any such misstatement, if discovered after award of the contract to such firm, may be grounds for immediate termination of the contract. Additionally, the Offeror will be liable to the Owner for any costs or damages to the Owner resulting from such misstatements, including costs and attorney's fees for collecting such costs and damages.
- 13.7. If the Contract is to be awarded, it will be awarded to the Apparent Best Value Offeror following successful Contract Negotiations and following any required approval by the SJRA Board of Directors or the SJRA General Manager, as applicable.
- 13.8. If Contract Negotiations with the Apparent Best Value Offeror are unsuccessful, The Owner will formally close Contract Negotiations with this Firm and attempt to open Contract Negotiations with the next highest-ranked firm according to the selection criteria set forth in Article 9 of these Instructions to Offerors.
- 13.9. If the Contract is to be awarded, Owner will notify Successful Offeror of intent to submit contract for approval by SJRA's Board of Directors within ninety (90) Calendar days after the day of the Proposal opening. Following approval by the SJRA's Board of Directors or the SJRA General Manager, as applicable, the General Manager of the SJRA may execute the contract.
- 13.10. The Offeror may submit exceptions or alternatives not in accordance with the terms and conditions of the Contract Documents, or for Work that is not in strict compliance with the Contract Documents. In such event, Offeror must describe the intent and substance of the changes in the Proposal in adequate detail so they are clearly identifiable and understandable. Alternates will not be considered in the ranking and evaluation of the Proposals. Upon selection of the Proposal that offers the best value to the Owner, the Owner and Principal Architect/Engineer may consider proposed alternates in negotiating a final Contract scope, time/schedule and price.

- 13.11. Addenda may be issued to clarify, correct, or change the Contract Documents, prior Addenda or the related supplemental data as deemed advisable by Owner or Principal Architect/Engineer.

**14. Interpretation and Addenda.**

- 14.1. All questions about the meaning or intent of the Competitive Sealed Proposal and Contract Documents are to be directed to the SJRA Purchasing Department in writing. Interpretations or clarifications considered necessary by Owner's Representative in response to such questions will be issued by written Addenda and posted on the Brazos Valley Online Bidding System website, <http://brazosbid.cstx.gov>.

Contact: Grady B. Garrow, CPPB  
Buyer, San Jacinto River Authority  
ggarrow@sjra.net  
936-588-7181

Any questions submitted via Brazos Valley Online Bidding System website on the appropriate webpage for submitting questions shall be the equivalent of contacting the SJRA Purchasing Department directly (via phone or email).

- 14.2. To properly qualify their Proposal, each Offeror shall, prior to submitting their Proposal, check the receipt of all Addenda and acknowledge such receipt on the Proposal Form and on the acknowledgement line of the Addendum Cover page. Proposals submitted without such acknowledgment of all issued Addenda and letters of clarification may cause Proposal to be considered non-responsive. Such Addenda and letters of clarification shall become a part of the executed contract and modify the contract documents accordingly.
- 14.3. Questions received after the deadline for Questions and Inquiries may not be answered.
- 14.4. Only questions answered by formal written Addenda issued by Owner will be binding. Oral and other interpretations or clarifications will be without legal effect.
- 14.5. Addenda may be issued to clarify, correct, or change the Contract Documents, Addenda or the related supplemental data as deemed advisable by Owner or Principal Architect/Engineer. Addenda may also be issued to modify the CSP Documents as deemed advisable by Owner or Principal Architect/Engineer.
- 14.6. Notification of addenda will be by default via the Brazos Valley Online Bidding System (<http://brazosbid.cstx.gov>), provided that the Offeror has registered on the Brazos Valley Website and downloaded from the site the CSP Documents.

- 14.7. The Owner will not be responsible or held liable for any failure of the Brazos Valley Online Bidding System notification to reach Offeror. Offerors are encouraged to visit the webpage where the CSP Documents are issued until the legal limit for filing addenda (48 hours prior to Proposal due date and time) has passed to ensure receipt of all addenda.

## **15. Confidentiality of Proposal Information.**

All materials submitted to the SJRA and upon receipt by the SJRA become public property and are subject to the Texas Public Information Act, Government Code Chapter 552. If an Offeror does not desire proprietary Information in the SOQ to be disclosed, each page must be identified and marked proprietary at the time of submittal. The SJRA will, to the extent provided by law, endeavor to protect such information from disclosure. The final decision as to what information must be disclosed, however, lies with the Texas Attorney General. Failure to identify proprietary information will result in all unmarked sections being deemed non-proprietary and available upon public request. Proposers shall not be permitted to mark entire Proposal as proprietary.

## **16. Examination of Contract Documents and Site.**

- 16.1. It is the responsibility of each Offeror before submitting a Proposal:

- 16.1.1. To examine thoroughly the Contract Documents and other related data identified in the CSP Documents (including "technical data" referred to below);
- 16.1.2. To visit the site to become familiar with and satisfy Offeror as to the general, local and site conditions that may affect cost, progress, performance or furnishing of the Work;
- 16.1.3. To consider federal, state and local Laws and Regulations that may affect cost, progress, performance or furnishing of the Work;
- 16.1.4. To study and carefully correlate Offeror's knowledge and observations with the Contract Documents and such other related data; and
- 16.1.5. To promptly notify The SJRA Purchasing Department of all conflicts, errors, ambiguities or discrepancies which Offeror has discovered in or between the Contract Documents and such other related documents.

- 16.2. Reference is made to the General Conditions Article 4 and Contract Specification Section 00 31 19 – Existing Condition Information for identification of:

- 16.2.1. Reports of explorations and tests of subsurface conditions at or contiguous to the site which have been utilized by Principal Architect/Engineer in preparation of the Contract Documents. While such reports are intended to be an accurate record of the conditions at



- the specific boring locations on the date taken, it is not a guarantee of specific Site conditions which may vary between boring locations and over time, and Offerors may not rely upon the general accuracy of the "technical data" contained in such reports and upon other data, interpretations, opinions or information contained in such reports or otherwise relating to the subsurface conditions at the site, nor upon the completeness thereof for the purposes of preparing a Proposal for construction.
- 16.2.2. Copies of such reports will be made available by Owner to any Offeror on request. Such reports are not part of the Contract Documents. Offeror is responsible for any interpretation or conclusion drawn from any "technical data" or any such data, interpretations, opinions or information. Offeror acknowledges that Owner and Principal Architect/Engineer disclaim any responsibility for the accuracy, correctness, completeness, suitability, and sufficiency of such reports and for Offeror's interpretation of such reports.
- 16.3. Information and data shown or indicated in the Contract Documents with respect to existing Underground Facilities at or contiguous to the site are based upon information and data furnished to Owner and Principal Architect/Engineer by Owners of such Underground Facilities or others, and Owner and Principal Architect/Engineer do not assume and expressly disclaim responsibility for the accuracy or completeness thereof or for Offeror's interpretation of such information and data. The Contractor is advised to coordinate closely with Owner, Principal Architect/Engineer and Utility Operator(s) prior to the commencement of any underground construction activities.
- 16.4. Provisions concerning responsibilities for the adequacy of data furnished to prospective Offerors with respect to subsurface conditions, other physical conditions and Underground Facilities, and possible changes in the Contract Documents due to differing or unanticipated conditions appear in Article 6 of the Standard Form of Agreement and Article 4.2 of the General Conditions.
- 16.5. Before submitting a Proposal, each Offeror will be responsible for obtaining such additional or supplementary examinations, investigations, explorations, tests, studies and data concerning conditions (surface, subsurface and underground facilities) at or contiguous to the site or otherwise, which may affect cost, progress, performance or furnishing of the Work, or which relate to any aspect of the means, methods, techniques, sequences or procedures of construction to be employed by Offeror and safety precautions and programs incident thereto or which Offeror deems necessary to determine its Proposal for performing and furnishing the Work in accordance with the time, price and other terms and conditions of the Contract Documents.
- 16.6. On request, the SJRA Purchasing Department may provide each Offeror access to the site to conduct such examinations, investigations, explorations, tests and

studies, as each Offeror deems necessary for submission of a Proposal. Offeror must fill any resultant holes and clean up and restore the site to its former condition upon completion of such explorations, investigations, tests and studies.

- 16.7. 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 Owner unless otherwise provided in the Contract Documents.
- 16.8. Reference is made to Specification Section 01 11 13 - Work Covered By Contract Documents for the identification of the general nature of Work that is to be performed at the site by the Owner or others (such as utilities and other prime Contractors) that relates to the Work for which a Proposal is to be submitted. On request, Owner may provide to each Offeror for examination access to or copies of Contract Documents (other than portions thereof related to price) for such Work.
- 16.9. The submission of a Proposal will constitute an incontrovertible representation by Offeror that Offeror has complied with every requirement of this Article 16, that without exception the Proposal 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, that Offeror has given Owner or Principal Architect/Engineer written notice of all conflicts, errors, ambiguities and discrepancies that Offeror has discovered in the Contract Documents and the written resolutions thereof by Principal Architect/Engineer is acceptable to Offeror, and that the Contract Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performing and furnishing the Work.
- 16.10. Effective January 1, 2016, Texas Government Code Section 2252.908 requires persons who enter into contract with a government entity to submit a disclosure of interested parties (Form 1295) to the government entity or state agency at the time business entity submits the signed contract to the government entity or state agency. Use the following link to access filing instructions:  
[https://www.ethics.state.tx.us/whatsnew/elf\\_info\\_form1295.htm](https://www.ethics.state.tx.us/whatsnew/elf_info_form1295.htm).

## **17. Proposal Security.**

- 17.1. Each Proposal must be accompanied by Proposal Security made payable to the Owner in the amount not less than five percent (5%) of the total Proposal Amount for the Proposal Option with the highest proposal price, including any Cash Allowances and Alternates, and shall be in the form of a cashier's check or Offeror's Bond.
- 17.2. Offeror's Bond must be on the form provided within the Contract Documents (CSP) and must bear the impressed seal of the Surety, and be signed by the Offeror and an authorized individual of the Surety. Bonds will only be accepted from Sureties authorized to execute a bond order and in accordance with state law.
- 17.3. The Proposal Security of Successful Offeror will be retained until such Offeror has executed the Standard Form of Agreement, furnished the required contract securities and met the other conditions contained in Specification Section 00 41 00.02 – Proposal Form, whereupon the Proposal Security will be returned. If the Offeror fails to execute and deliver the Standard Form of Agreement and furnish the required contract security within ten (10) Calendar days after the SJRA Board of Directors has approved a contract award, Owner may annul its award and the Proposal Security of that Offeror will be forfeited. The Proposal Security of other Offerors whom Owner believes to have a reasonable chance of receiving the award may be retained by Owner until the earlier of the seventh day after the Effective Date of the Standard Form of Agreement or the ninety-first day after the Proposal opening, whereupon Proposal Security furnished by such Offerors will be returned. Proposal Security, if submitted in the form of cashier's check, submitted with Proposals which are not competitive will be returned within ten (10) Calendar days after the Proposal opening.

## **18. Contract Times.**

The number of Calendar days within which, or the dates by which, the Work is to reach Substantial and Final Completion are set forth in Specification Section 00 52 00 – Standard Form of Standard Form of Agreement between Owner and Contractor.

## **19. Substitutes and "Or-Equal" Items.**

The Contract, if awarded, will be on the basis of goods and services described in the Drawings or specified in the Specifications with consideration for possible substitute or "or equivalent" items. Whenever it is indicated in the Drawings or specified in the Specifications that a Substitute or "or-equal"/"or equivalent" item of material or equipment may be furnished or used by Contractor if acceptable to Principal Architect/Engineer and Owner, application for such acceptance may be prior to Contract award in accordance with Texas Government Code 2269.155. See section 6.02.5 in the General Conditions of the Contract for more information.

## **20. Subcontractors, Suppliers and Others.**

- 20.1. If the Owner requests the identity of certain Subcontractors, Suppliers or other persons or organizations (including those who are to furnish the principal items of material and equipment) to be submitted to Owner, Apparent Best Value Offeror, and any other Offerors so requested, shall within five (5) Calendar days from request submit to Owner a list of all such Subcontractors, Suppliers or other persons or organizations proposed for those portions of the Work for which such identification is requested. Such list shall be accompanied by an experience statement with pertinent information regarding similar projects and other evidence of qualification for each such Subcontractor, Supplier, person or organization if requested by Owner. If the Owner or Principal Architect/Engineer, after due investigation, has reasonable objection to any proposed Subcontractor, Supplier, other person or organization, Owner may, before giving notice of its intent to recommend Award to Owner's Board of Directors, request that Apparent Best Value Offeror submit an acceptable substitute without an increase in price.

If Apparent Best Value Offeror declines to make any such substitution, Owner may formally close contract negotiations with Offeror and enter into contract negotiations with the next most highly-ranked Offeror that proposes to use acceptable Subcontractors, Suppliers and other persons and organizations. The declining to make requested substitutions will not constitute grounds for sacrificing the Proposal Security of any Offeror. Any Subcontractor, Supplier, other person or organization listed and to whom Owner or Principal Architect/Engineer does not make written objection prior to giving notice of its intent to recommend Award to Owner's Board of Directors will be deemed acceptable to Owner and Principal Architect/Engineer subject to revocation of such acceptance after the Effective Date of the Standard Form of Agreement as provided in Article 6.04 of the General Conditions.

- 20.2. No Contractor shall be required to employ any Subcontractor, Supplier, other person or organization against whom Contractor has reasonable objection.

## **21. Preparation of Proposals.**

- 21.1. Prepare one (1) unbound original of the complete Proposal Package, including the completed Proposal Form 00 41 00.02. Clearly mark this package with the word "Original". Prepare one (1) bound copy with original signatures, and one (1) electronic copy on Compact Disc (CD) or flash drive (in .pdf format) of the completed Proposal with original signatures, Statement of Qualifications 00 21 13.03, and full set of Financials.
- 21.2. An Original Proposal is the Proposal containing the Original Signature of a person authorized to sign on behalf of the Offering Firm.

- 21.3. Proposals shall be enclosed in an opaque sealed Envelope (or Package), marked with CSP No. 18-0036 – Siphon 7 Improvements – Phase 1 and address of Offering Firm.
- 21.4. Each Original Proposal submitted by an Offeror shall contain the following:
  - 21.4.1. Offerors Statement of Qualifications (SOQ; 00 21 13.03);
  - 21.4.2. Completed Proposal Form (00 41 00.02);
  - 21.4.3. Completed Certification of Proposal (00 41 00.02);
  - 21.4.4. Completed Felony Conviction Notice Form (00 41 00.02)
  - 21.4.5. Form of Business (00 45 20);
  - 21.4.6. Proposal Security (Offeror's Bond 00 43 13);
  - 21.4.7. Resolution of Contractor (00 45 43);
  - 21.4.8. Conflict of interest Forms (Form CIQ; 00 45 10) shall be submitted under a separate cover and not included in the sealed Proposal;
  - 21.4.9. Texas Water Development Board Forms ED-103, ED-104, and TWDB-0459;
  - 21.4.10. One (1) Compact Disc (CD) or flash drive with a Completed Proposal with Original signatures, Statement of Qualifications (SOQ) and a full set of Financials; and
  - 21.4.11. Any other Documentation required by the terms of this Competitive Sealed Proposal.
- 21.5. Conflict of Interest Questionnaire, Specification Section 00 45 10 of Contract shall be submitted under separate cover. If Offering Firm affirms that there are no Conflicts of Interest, Offeror shall indicate so by writing name of firm and "No Conflicts" on CIQ form and signing form.
- 21.6. Proposals submitted by corporations must be executed in the corporate name by the president or a vice-president (or other corporate officer accompanied by evidence of authority to sign) and the corporate seal must be affixed and attested by the secretary or an assistant secretary. The corporate address and state of incorporation must be shown below the signature.
- 21.7. Submitted Proposals by partnerships must be executed in the partnership name and signed by a partner, whose title must appear under the signature and the official address of the partnership must be shown below the signature.
- 21.8. All names must be typed or printed in ink below the signature.
- 21.9. The Proposal shall contain an acknowledgment of receipt of all Addenda (the numbers of which must be filled in on the Proposal Form).
- 21.10. The address and telephone number for communications regarding the Proposal must be shown.

- 21.11. Evidence of authority to conduct business as an out-of-state corporation in the state where the Work is to be performed shall be provided in accordance with Specification Section 00 41 00.02 – Proposal Form. State Contractor license number, if any, must also be shown.

## **22. Submission of Proposals.**

- 22.1. Proposals shall be submitted at the time and place indicated in the Invitation to Submit Proposals (00 11 13) and accompanied by the Proposal Security and other required documents.
- 22.2. If the Proposal is sent through the mail or other delivery system the sealed envelope shall be enclosed in a separate envelope with the notation "SEALED PROPOSAL ENCLOSED" on the face of it. Proposals not received by the time or at the location specified will be returned unopened to the Offeror.
- 22.3. The clock used by the Owner at the place used for receiving Proposals shall conclusively determine the time that Proposals are received.
- 22.4. Proposals sent by facsimile or electronic mail or delivered to any other location other than the address provided in the Invitation to Offerors will NOT be accepted.

## **23. Modification and Withdrawal of Proposals.**

- 23.1. Proposals may be modified or withdrawn by a document duly executed (in the same manner that a Proposal must be executed) and delivered to the place where Proposals are to be submitted prior to the date and time for the opening of Proposals.
- 23.2. If, within twenty-four (24) hours after Proposals are opened, any Offeror files a duly signed written notice with Owner and promptly thereafter demonstrates to the reasonable satisfaction of Owner that there was a material or substantial mistake in the preparation of its Proposal, that Offeror may withdraw its Proposal. The Proposal Security may be retained by the Owner if Offeror cannot clearly demonstrate to the Owner evidence of a material or substantial mistake in its Proposal. Thereafter, that Offeror may be disqualified from responding to a reissued CSP for the Work to be furnished under these Contract Documents.

## **24. Opening of Proposals.**

Proposals will be opened and (unless obviously non-responsive) the names and Monetary Proposals of Offering Firms read aloud at a public opening. An abstract of the Proposals will be made available no later than the seventh day after the Contract is awarded.

**25. Proposals to Remain Subject to Acceptance.**

All Proposals will remain subject to acceptance for ninety (90) Calendar days after the date of the opening, but Owner may, in its sole discretion, release any Proposal and return the Proposal Security prior to that date.

**26. Prevailing Wage Rates.**

Contractors for this Project must pay no less than the prevailing wage rates for the area established by the San Jacinto River Authority and included in Specification Section 00 73 43 – Wage Scale for Construction.

**27. Liquidated Damages or Economic Disincentives.**

Provisions for liquidated damages or economic disincentives are set forth in Specification Section 00 52 00 – Standard Form of Standard Form of Agreement between Owner and Contractor and Specification Section 00 72 00 – General Conditions of the Contract.

**28. Contract Security and Insurance.**

Article 5 of the General Conditions sets forth Owner's requirements as to insurance and Performance and Payment Bonds. When the Successful Offeror delivers the original, hard copy executed Standard Form of Agreement to Owner, it must be accompanied by evidence of insurance and unsigned Performance and Payment Bonds as required by Article 5 of the General Conditions, unless prior written approval of Contractor's evidence of insurance and unsigned performance and payment Bond forms has been received from the SJRA Purchasing Department. Such evidence of insurance shall include, without limitation, all required certificates and endorsements, evidencing all required coverages, limits of liability, additional insured status, waivers of subrogation and other insurance requirements.

**29. Conflict of Interest and Disclosure of Interested Parties.**

29.1. Chapter 176 of the Texas Local Government Code mandates the public disclosure of certain information concerning persons doing business or seeking to do business with the San Jacinto River Authority, including affiliations and business and financial relationships such persons may have with San Jacinto River Authority officers. An explanation of the requirements of Chapter 176, applicable forms and a complete text of the law are available at: <http://www.ethics.state.tx.us/forms/CIQ.pdf>.

BY DOING BUSINESS OR SEEKING TO DO BUSINESS WITH THE SAN JACINTO RIVER AUTHORITY, YOU ACKNOWLEDGE THAT YOU HAVE BEEN NOTIFIED OF THE REQUIREMENTS OF CHAPTER 176 OF THE

TEXAS LOCAL GOVERNMENT CODE AND THAT YOU ARE RESPONSIBLE FOR COMPLYING WITH THEM.

- 29.2. Texas Government Code Section 2252.908 requires persons who enter into a Contract with a government entity to submit a disclosure of interested parties (Form 1295) to the government entity or state agency at the time business entity submits the signed contract to the government entity or state agency. Use the following link to access filing instructions:  
[https://www.ethics.state.tx.us/whatsnew/elf\\_info\\_form1295.htm](https://www.ethics.state.tx.us/whatsnew/elf_info_form1295.htm).

### **30. Taxes.**

Owner is exempt from payment of sales and use taxes of the State of Texas and of cities and counties thereof, on all goods and services to be incorporated into the Work. Said taxes shall not be included in the Proposal.

- 30.1. Owner will furnish the required certificates of tax exemption to Contractor for use in the purchase of goods to be incorporated into the Work.
- 30.2. Owner's exemption does not apply to construction tools, machinery, equipment, or other property purchased by or leased by Contractor, or to goods not incorporated into the Work., except to the extent the exemption referred to in Paragraph 19.4 applies to the Project to exempt taxes on any such items.
- 30.3. If the project is construction of a water or wastewater system certified by the Texas Commission on environmental Quality as a regional system, equipment, services and supplies used solely to construct the Project are exempted from taxes imposed by Chapter 151, Limited Sales, Excise and Use Tax, Texas Tax Code. Said taxes shall not be included in the Proposal. Owner will furnish any required certificates of tax exemption to Contractor.

### **31. Verification Company Does not Boycott Israel**

Pursuant to Section 2270.002 of the Texas Government Code, the Contractor shall be required to execute contemporaneous with its execution of the Standard Form of Agreement a verification that Contractor does not Boycott Israel and Contractor will not Boycott Israel during the term of this Standard Form of Agreement. "Boycott Israel" as used herein means refusing to deal with, terminating business activities with, or otherwise taking any action that is intended to penalize, inflict economic harm on, or limit commercial relations specifically with Israel, or with a person or entity doing business in Israel or in an Israeli-controlled territory, but does not include an action made for ordinary business purposes.

### **32. Signing of Standard Form of Agreement.**



SJRA's Purchasing Department will transmit to the Successful Offeror the required number of unsigned counterparts of the Standard Form of Agreement with all other written Contract Documents attached. Contractor shall deliver original, hard copies of the required number of counterparts of the Standard Form of Agreement and written Contract Documents signed by Contractor, unsigned Bond forms, evidence of insurance as set out in Section 27 above, signed disclosure of interested parties (Form 1295), signed Conflict of interest Questionnaire, and signed and notarized Verification Company Does Not Boycott Israel, to SJRA Purchasing Department ten (10) Calendar days prior to the SJRA Board of Directors Meeting for which a contract award is anticipated. Notwithstanding the foregoing, the Standard Form of Agreement may be executed using electronic signatures at the option and in the discretion of Owner, and, in such event, the provisions of the Uniform Electronic Transaction Act, Chapter 332, Texas Business and Commerce Code, as amended, and any applicable policies and procedures of Owner regarding electronic signatures shall apply. However, the requirements of this Section 31 apply regardless of whether or not the Standard Form of Agreement is also executed using electronic signatures or transmitted electronically. Following and subject to award, the Owner shall deliver one (1) fully signed counterpart of the Standard Form of Agreement to Contractor. Within three (3) Calendar days of Contractor's receipt of the fully executed Standard Form of Agreement, the Contractor shall deliver the original, hard copy fully executed Bonds to SJRA Purchasing Department.

**END OF SECTION**

TABLE 1 – GENERAL INFORMATION				
Organization Doing Business As:				
Business Address of Principle Office:				
Main Telephone Number:				
Fax Number:				
Web Site Address:				
Form of Business (check one):	<input type="checkbox"/> Corporation	<input type="checkbox"/> Partnership	<input type="checkbox"/> Individual	<input type="checkbox"/> Joint Venture
IF A CORPORATION				
Date of Incorporation:				
State of Incorporation:				
Chief Executive Manager's Name:				
President's Name:				
Vice President's Name(s):				
Secretary's Name:				
Treasurer's Name:				
IF A PARTNERSHIP				
Date of Organization:				
General or Limited Partnership?:				
IF AN INDIVIDUAL				
Name:				
Business Address:				
IF A JOINT VENTURE				
Name of Lead Joint Venture Manager:				
Name of Firm:				
Joint Venture Partner Manager(s):				
Name of Firm(s):				
Individuals Not Listed Above Having Significant Business Control:				
Indicators of Organization Size:				
Current Number Full Time Employees:		Estimate of Current Year's Revenue:		
Average Number of Projects per Year:		Average Project Construction Cost:		

TABLE 2 – ORGANIZATIONAL EXPERIENCE		
Organization Doing Business As:		
Business Address of Principle Office:		
Main Telephone Number:		
Fax Number:		
Web Site Address:		
Organization Doing Business As:		
ORGANIZATIONAL HISTORY		
List of names that this organization has operated under over the history of the organization, including the names of related companies presently doing business:		
Names of Organization:	From Date	To Date
List of companies, firms or organizations that own any part of the organization.		
Name of Companies, Firms or Organization:	Percent Ownership	
CONSTRUCTION EXPERIENCE		
1.	Years experience in projects similar to the proposed project:	
	As a General Contractor:	As a Joint Venture Partner:
2.	Has this or a predecessor organization ever defaulted on a project or failed to complete any work awarded to it? If yes provide full details in a separate attachment. (Attachment # _____)	
3.	Has this or a predecessor organization been released from a bid or proposal in the past ten years? If yes provide full details in a separate attachment. (Attachment # _____)	
4.	Has this or a predecessor organization ever been disqualification as a bidder or Offeror by any local, state, or federal agency within the last five (5) years? If yes provide full details in a separate attachment. (Attachment # _____)	
5.	Is this organization or your proposed surety currently in any litigation or contemplating litigation? If yes provide full details in a separate attachment. (Attachment # _____)	
6.	Has this or a predecessor organization ever refused to construct or refused to provide materials defined in the contract documents? If yes provide full details in a separate attachment. (Attachment # _____)	

TABLE 3 – ORGANIZATIONAL STRUCTURE	
Organization Doing Business As:	
PROPOSED PROJECT ORGANIZATION	
1. Provide a brief description of the managerial structure of the organization and illustrate with an organizational chart. Include the title and names of key personnel. Include this chart as an attachment to this description. (Attachment No. _____)	
2. Provide a brief description of the experience and qualifications of the organization's management team, including officers that will be directly involved in the project. Describe the individuals that are authorized to execute Contract Documents, Change Orders or receive payment for the organization. Include a copy of a board resolution or other documentation as appropriate for the structure of the company authorizing these individuals to conduct business on behalf of the organization. (Attachment No. _____)	
SURETY REFERENCES	



TABLE 5 – CURRENT PROJECTS AND PROJECTS COMPLETED WITHIN THE LAST 5 YEARS									
1	Project Owner:	Project Name:							
General Description of Project:		Date Project		Project Superintendent		Safety Manager		Quality Control Manager	
Project Cost:		Date Project		Project Superintendent		Safety Manager		Quality Control Manager	
Key Project Personnel:		Project Manager		Project Superintendent		Safety Manager		Quality Control Manager	
Name:		Title/Position		Telephone		E-mail			
Reference contact information (listing names indicates approval to contacting the names individuals as a reference)									
Owner:		Name		Title/Position		Telephone		E-mail	
Designer:		Name		Title/Position		Telephone		E-mail	
Construction Manager:		Name		Title/Position		Telephone		E-mail	
2	Project Owner:	Project Name:							
General Description of Project:		Date Project		Project Superintendent		Safety Manager		Quality Control Manager	
Project Cost:		Date Project		Project Superintendent		Safety Manager		Quality Control Manager	
Key Project Personnel:		Project Manager		Project Superintendent		Safety Manager		Quality Control Manager	
Name:		Title/Position		Telephone		E-mail			
Reference contact information (listing names indicates approval to contacting the names individuals as a reference)									
Owner:		Name		Title/Position		Telephone		E-mail	
Designer:		Name		Title/Position		Telephone		E-mail	
Construction Manager:		Name		Title/Position		Telephone		E-mail	
3	Project Owner:	Project Name:							
General Description of Project:		Date Project		Project Superintendent		Safety Manager		Quality Control Manager	
Project Cost:		Date Project		Project Superintendent		Safety Manager		Quality Control Manager	
Key Project Personnel:		Project Manager		Project Superintendent		Safety Manager		Quality Control Manager	
Name:		Title/Position		Telephone		E-mail			
Reference contact information (listing names indicates approval to contacting the names individuals as a reference)									
Owner:		Name		Title/Position		Telephone		E-mail	
Designer:		Name		Title/Position		Telephone		E-mail	
Construction Manager:		Name		Title/Position		Telephone		E-mail	

**TABLE 6 – PROPOSED KEY PERSONNEL**

Organization Doing Business As: _____		
<b>PROPOSED PROJECT ORGANIZATION</b>		
1. Provide a brief description of the managerial structure of the organization and illustrate with an organizational chart. Include the title and names of key personnel. Include this chart as an attachment to this description. See attachment No.		
2. Provide a brief description of the managerial structure proposed for this project and illustrate with an organizational chart. Include the title and names of proposed key personnel and alternates. Include this chart as an attachment to this description. See attachment No.		
<b>EXPERIENCE OF KEY PERSONNEL</b>		
3. Provide information on the key personnel proposed for this project that will provide the following key functions. Provide information for candidates for each of these positions on the pages for each of these key personnel. Also provide biographical information for each primary and alternate candidate as an attachment. The biographical information must include the following as a minimum: technical experience, managerial experience, education and formal training, work history which describes project experience, including the roles and responsibilities for each assignment, and primary language. Additional information highlighting experience which makes them the best candidate for the assignment should also be included.		
Role	Primary candidate	Alternate candidate
Project Manager		
Project Superintendent		
Project Safety Manager		
Quality Control Manager		
4. If key personnel are to fulfill more than one of the roles listed above, provide a written narrative describing how much time will be devoted to each function, their qualifications to fulfill each role and the percentage of their time that will be devoted to each role. If the individual is not to be devoted solely to this project, indicate how time it to be divided between this project and their other assignments.		

TABLE 7 – PROPOSED PROJECT MANAGERS				
Organization Doing Business As:				
<b>PRIMARY CANDIDATE</b>				
1.	Name of Individual:			
	Years of Experience as Project Manager:			
	Years of Experience With This Organization:			
	Number of Similar Projects as Project Manager:			
	Number of Similar Projects in Other Positions:			
	Current Project Assignments:			
	Name of Assignment:		Percent of Time Used for This Project:	Estimated Project Completion Date:
2. Reference contact information (listing names indicates approval to contacting the names individuals as a reference)				
Name:		Name:		
Title/ Position:		Title/ Position:		
Organization:		Organization:		
Telephone:		Telephone:		
E-mail:		E-mail:		
Project:		Project:		
Candidate's Role on Project:		Candidate's Role on Project:		
<b>ALTERNATE CANDIDATE</b>				
3.	Name of Individual:			
	Years of Experience as Project Manager:			
	Years of Experience With This Organization:			
	Number of Similar Projects as Project Manager:			
	Number of Similar Projects in Other Positions:			
	Current Project Assignments:			
	Name of Assignment:		Percent of Time Used for This Project:	Estimated Project Completion Date:
4. Reference contact information (listing names indicates approval to contacting the names individuals as a reference)				
Name:		Name:		
Title/ Position:		Title/ Position:		
Organization:		Organization:		
Telephone:		Telephone:		
E-mail:		E-mail:		
Project:		Project:		
Candidate's Role on Project:		Candidate's Role on Project:		



TABLE 8 – PROPOSED PROJECT SUPERINTENDENT				
Organization Doing Business As:				
<b>PRIMARY CANDIDATE</b>				
1.	Name of Individual:			
	Years of Experience as Project Superintendent:			
	Years of Experience With This Organization:			
	Number of Similar Projects as Project Superintendent:			
	Number of Similar Projects in Other Positions:			
	Current Project Assignments:			
	Name of Assignment:		Percent of Time Used for This Project:	Estimated Project Completion Date:
2. Reference contact information (listing names indicates approval to contacting the names individuals as a reference)				
Name:		Name:		
Title/ Position:		Title/ Position:		
Organization:		Organization:		
Telephone:		Telephone:		
E-mail:		E-mail:		
Project:		Project:		
Candidate's Role on Project:		Candidate's Role on Project:		
<b>ALTERNATE CANDIDATE</b>				
3.	Name of Individual:			
	Years of Experience as Project Superintendent:			
	Years of Experience With This Organization:			
	Number of Similar Projects as Project Superintendent:			
	Number of Similar Projects in Other Positions:			
	Current Project Assignments:			
	Name of Assignment:		Percent of Time Used for This Project:	Estimated Project Completion Date:
4. Reference contact information (listing names indicates approval to contacting the names individuals as a reference)				
Name:		Name:		
Title/ Position:		Title/ Position:		
Organization:		Organization:		
Telephone:		Telephone:		
E-mail:		E-mail:		
Project:		Project:		
Candidate's Role on Project:		Candidate Role on Project:		

TABLE 9 – PROPOSED PROJECT SAFETY MANAGER				
Organization Doing Business As:				
PRIMARY CANDIDATE				
1.	Name of Individual:			
	Years of Experience as Project Safety Manager:			
	Years of Experience With This Organization:			
	Number of Similar Projects as Project Safety Manager:			
	Number of Similar Projects in Other Positions:			
	Current Project Assignments:			
	Name of Assignment:		Percent of Time Used for This Project:	Estimated Project Completion Date:
2. Reference contact information (listing names indicates approval to contacting the names individuals as a reference)				
Name:		Name:		
Title/ Position:		Title/ Position:		
Organization:		Organization:		
Telephone:		Telephone:		
E-mail:		E-mail:		
Project:		Project:		
Candidate's Role on Project:		Candidate's Role on Project:		
ALTERNATE CANDIDATE				
3.	Name of Individual:			
	Years of Experience as Project Safety Manager:			
	Years of Experience With This Organization:			
	Number of Similar Projects as Project Safety Manager:			
	Number of Similar Projects in Other Positions:			
	Current Project Assignments:			
	Name of Assignment:		Percent of Time Used for This Project:	Estimated Project Completion Date:
4. Reference contact information (listing names indicates approval to contacting the names individuals as a reference)				
Name:		Name:		
Title/ Position:		Title/ Position:		
Organization:		Organization:		
Telephone:		Telephone:		
E-mail:		E-mail:		
Project:		Project:		
Candidate's Role on Project:		Candidate's Role on Project:		

TABLE 10 – PROPOSED QUALITY CONTROL MANAGER				
Organization Doing Business As:				
<b>PRIMARY CANDIDATE</b>				
1.	Name of Individual:			
	Years of Experience as Quality Control Manager:			
	Years of Experience With This Organization:			
	Number of Similar Projects as Quality Control Manager:			
	Number of Similar Projects in Other Positions:			
	Current Project Assignments:			
	Name of Assignment:		Percent of Time Used for This Project:	Estimated Project Completion Date:
2. Reference contact information (listing names indicates approval to contacting the names individuals as a reference)				
Name:		Name:		
Title/ Position:		Title/ Position:		
Organization:		Organization:		
Telephone:		Telephone:		
E-mail:		E-mail:		
Project:		Project:		
Candidate's Role on Project:		Candidate's Role on Project:		
<b>ALTERNATE CANDIDATE</b>				
3.	Name of Individual:			
	Years of Experience as Quality Control Manager:			
	Years of Experience With This Organization:			
	Number of Similar Projects as Quality Control Manager:			
	Number of Similar Projects in Other Positions:			
	Current Project Assignments:			
	Name of Assignment:		Percent of Time Used for This Project:	Estimated Project Completion Date:
4. Reference contact information (listing names indicates approval to contacting the names individuals as a reference)				
Name:		Name:		
Title/ Position:		Title/ Position:		
Organization:		Organization:		
Telephone:		Telephone:		
E-mail:		E-mail:		
Project:		Project:		
Candidate's Role on Project:		Candidate's Role on Project:		



TABLE 12 – PROJECT INFORMATION FOR KEY PERSONNEL			
Project Owner:		Project Name:	
General Description of Project:			
PROJECT BUDGET AND SCHEDULE PERFORMANCE			
Budget history		Schedule performance	
Amount	% of Bid Amount		Days
Bid :		Notice to Proceed:	
Change Orders		Contract Substantial Completion Date at Notice to Proceed:	
Owner Enhancements:		Contract Final Completion Date at Notice to Proceed:	
Unforeseen Conditions:		Change Order Authorized Substantial Completion Date:	
Design Issues:		Change Order authorized Final Completion Date:	
Total:		Actual / Estimated Substantial Completion Date:	
Final Cost:		Actual / Estimated Final completion Date:	
KEY PROJECT PERSONNEL			
Project Manager		Quality Control Manager	
Name:		Safety Manager	
Percentage of Time Devoted to The project:		Project Superintendent	
Proposed for This Project:			
Did Individual Start and Complete The Project?:			
If Not, Who Started or Completed the Project in Their Place:			
Reason for Change:			
Reference Contract information (Listing names indicates approval to contact the named individuals as a reference)			
Name	Title/ Position	Organization	Telephone E-mail
Owner:			
Designer:			
Construction Manager:			
Surety:			
ISSUES / DISPUTES RESOLVED OR PENDING RESOLUTION BY ARBITRATION, LITIGATION OR DISPUTE REVIEW BOARDS:			
Number of Issues Resolved:	Total Amount Involved in Resolved Issues:	Number of Issues Pending:	Total Amount Involved in Resolved Issues:





**Affidavits**

One of the following four affidavits shall be executed and provided with this information. The individual signing the affidavit shall attach evidence of their authority to bind the Organization to an agreement.

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AFFIDAVIT FOR CORPORATION

State \_\_\_\_\_ §

County of \_\_\_\_\_ §

\_\_\_\_\_, being duly sworn deposes and says  
(Name)

That he is \_\_\_\_\_ of the Corporation submitting the  
(Title)

foregoing qualification form and related information; that he has read such documents; and that such documents are true and correct and contain no material misrepresentations; and that he is authorized to make this affidavit on behalf of the Corporation.

\_\_\_\_\_  
Signature

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

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

My commission expires: \_\_\_\_\_

AFFIDAVIT FOR PARTNERSHIP

State \_\_\_\_\_ §

County of \_\_\_\_\_ §

\_\_\_\_\_, being duly sworn deposes and says  
(Name)

That he is \_\_\_\_\_ of the Company submitting the  
(Title)

foregoing qualification form and related information; that he has read such documents; and that such documents are true and correct and contain no material misrepresentations; and that he is authorized to make this affidavit on behalf of the Partnership.

\_\_\_\_\_  
Signature

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

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

My commission expires: \_\_\_\_\_

AFFIDAVIT FOR INDIVIDUAL

State \_\_\_\_\_ §

County of \_\_\_\_\_ §

(Name) \_\_\_\_\_, being duly sworn deposes and says

That he is \_\_\_\_\_ of the company submitting the  
(Title)

foregoing qualification form and related information; that he has read such documents; and that such documents are true and correct and contain no material misrepresentations.

\_\_\_\_\_  
Signature

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

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

My commission expires: \_\_\_\_\_

AFFIDAVIT FOR JOINT VENTURE STATEMENT

We the undersigned do hereby give notice to our agreement to bid as a joint venture on the Project.

\_\_\_\_\_  
Name of Joint Venture

\_\_\_\_\_  
Name of firm

\_\_\_\_\_  
Signature

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

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

My commission expires: \_\_\_\_\_

\_\_\_\_\_  
Name of firm

\_\_\_\_\_  
Signature

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

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

My commission expires: \_\_\_\_\_

**END OF SECTION**

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**SECTION 00 31 19**

EXISTING CONDITION INFORMATION

**1.1 SUMMARY**

A. Section Includes:

1. Subsurface Investigation Report
2. Underground Facilities Reports
3. Existing Structures
4. Offeror Responsibilities

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

1. Document 00 31 32 – Geotechnical Information
2. Document 00 31 32.10 – Trench Safety Geotechnical Information

**1.2 MEASUREMENT AND PAYMENT (NOT USED)**

**1.3 SUBMITTALS (NOT USED)**

**1.4 EXISTING CONDITION INFORMATION**

A. In the design and preparation of Contract Documents for this Project, the SJRA and Principal Architect/Engineer have used information with respect to Underground Facilities and existing structures at or contiguous to the site, based on data furnished to the SJRA or Principal Architect/Engineer by owners of the Underground Facilities, as noted in reports listed below.

B. A hard copy of each report will be made available as information only to Offerors at:

San Jacinto River Authority  
Purchasing Department  
1577 Dam Site Road  
Conroe, TX 77304

C. Neither the SJRA nor Principal Architect/Engineer is responsible for the accuracy or completeness of any such information or data.

**1.5 REPORTS**

A. Report No. G134-15 on Geotechnical Investigation, prepared by Aviles Engineering Corporation, entitled Highlands Canal System Improvements Program Siphon No. 7 Improvements Harris County, Texas, dated September 2015.

B. Siphon 7 Dive Inspection Report, prepared by International Diving Services, LLC, dated 2008.

- C. Siphon 7 Inspection Report, prepared by V&A Consulting Engineers, Inc., dated June 2018.
- D. Siphon 7 Flow Test Memorandum, prepared by Texas Water Engineering, PLLC, dated June 2018.
- E. Executed Temporary Construction Easement Agreement.

## **1.6 EXISTING STRUCTURES**

- A. Contract Documents indicate physical conditions in or relating to existing surface and subsurface structures which are at or contiguous to the site that were known to, and have been used by, the SJRA and Principal Architect/Engineer in preparation of Contract documents.

## **1.7 OFFEROR RESPONSIBILITIES**

- A. Offeror shall have full responsibility for reviewing and verifying information and data, for locating underground facilities and existing structures shown or indicated in the Contract Documents, and for coordination of the Work with the owners of such underground facilities and existing structures during construction.

**END OF SECTION**

**SECTION 00 31 24**

**ENVIRONMENTAL INFORMATION**

**PART 1 - GENERAL**

**1.1 SUMMARY**

- A. Section Includes:
1. Site Investigation Reports
  2. Reports
  3. Offeror Responsibilities
- B. Related Specification Sections include but are not necessarily limited to:
1. Document 00 31 32 – Geotechnical Information
  2. Document 00 31 32.10 – Trench Safety Geotechnical Information

**1.2 MEASUREMENT AND PAYMENT (NOT USED)**

**1.3 SUBMITTALS (NOT USED)**

**1.4 SITE INVESTIGATION REPORTS**

- A. In the design and preparation of Contract Documents for this Project, the SJRA and Principle Architect/Engineer have used information in environmental site assessment reports for the investigation and analysis of soils and subsurface conditions at the Project site.
- B. A hard copy of each report will be made available as information only to Offerors at:

San Jacinto River Authority  
Purchasing Department  
1577 Dam Site Road  
Conroe, TX 77304

- C. Neither the SJRA nor Principal Architect/Engineer is responsible for accuracy or completeness of any information or data.

**1.5 REPORTS**

- A. Environmental Assessment Surveys
1. Texas Water Development Board Financial Assistance Programs Environmental Assessment, prepared by Freese and Nichols Inc.

**1.6 OFFEROR RESPONSIBILITIES**

- A. Offeror shall take full responsibility for interpretation and use of information contained in above listed reports for bidding and construction purposes.



B. Offeror may perform additional investigations as Offeror deems appropriate.

**PART 2 - PRODUCTS (NOT USED)**

**PART 3 - EXECUTION (NOT USED)**

**END OF SECTION**

**SECTION 00 31 32**

**GEOTECHNICAL INFORMATION**

**PART 1 - GENERAL**

**1.1 SUMMARY**

- A. Section Includes:
1. Site Investigation Reports
  2. Geotechnical Reports
  3. Offeror Responsibilities
- B. Related Specification Sections include but are not necessarily limited to:
1. Section 00 31 24 – Environmental Information
  2. Section 00 31 32.10 – Trench Safety Geotechnical Information

**1.2 MEASUREMENT AND PAYMENT (NOT USED)**

**1.3 SUBMITTALS (NOT USED)**

**1.4 SITE INVESTIGATION REPORTS**

- A. In the design and preparation of Contract Documents for this Project, the SJRA and Principle Architect/Engineer have used information in environmental site assessment reports for the investigation and analysis of soils and subsurface conditions at the Project site.
- B. A hard copy of each report will be made available as information only to Offerors at:

San Jacinto River Authority  
Purchasing Department  
1577 Dam Site Road  
Conroe, TX 77304

- C. Neither the SJRA nor Design Consultant is responsible for accuracy or completeness of any information or data.

**1.5 GEOTECHNICAL REPORTS**

- A. Report No. G134-15 on Geotechnical Investigation, prepared by Aviles Engineering Corporation, entitled Highlands Canal System Improvements Program Siphon No. 7 Improvements Harris County, Texas, dated September 2015.

**1.6 OFFEROR RESPONSIBILITIES**

- A. Offeror shall take full responsibility for interpretation and use of information contained in above listed reports for its bidding and construction purposes.
- B. Offeror may perform additional soils investigations as Offeror deems appropriate.

**PART 2 - PRODUCTS (NOT USED)**

**PART 3 - EXECUTION (NOT USED)**

**END OF SECTION**

**SECTION 00 31 32.10**

**TRENCH SAFETY GEOTECHNICAL INFORMATION**

**PART 1 - GENERAL**

**1.1 SUMMARY**

- A. Trench Safety Geotechnical Information: Geotechnical Information obtained for use in design of the trench safety system can be found in the report listed below.
- B. A hard copy of each report will be made available as information only to Offerors at:

San Jacinto River Authority  
Purchasing Department  
1577 Dam Site Road  
Conroe, TX 77304

- C. Report No. G134-15 on Geotechnical Investigation, prepared by Aviles Engineering Corporation, entitled Highlands Canal System Improvements Program Siphon No. 7 Improvements Harris County, Texas, dated September 2015.

**1.2 MEASUREMENT AND PAYMENT**

- A. No separate payment will be made for this item. Include cost in associated items for this project.

**1.3 SUBMITTALS (NOT USED)**

**PART 2 - NOT USED**

**PART 3 - NOT USED**

**END OF SECTION**

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**SECTION 00 41 00.02**

PROPOSAL FORM

To: **The San Jacinto River Authority**  
**1577 Dam Site Road**  
**G & A Building, 3<sup>rd</sup> Floor Receptionist**  
**Conroe, Texas 77304**

Project: Siphon 7 Improvements – Phase 1  
CSP No.: 18-0036  
Project No.: SJRA Project No. HDPM0003.1081.2o001  
Offeror: \_\_\_\_\_  
(Print or type full name of proprietorship, partnership, corporation, or joint venture)

**1.0 OFFER**

- A. Total Proposal Price:** The undersigned Offeror proposes and agrees, if this Proposal is accepted, to enter into an Agreement with Owner in the form included in the Contract Documents to perform all Work as specified or indicated in Contract Documents for the Contract Amount indicated in this Proposal or as modified by a Change Order or Change Directive.
- B. Proposal Security:** Included with the Proposal is a Proposal Security in the amount of 5 percent of the Total Proposal Price for the Proposal Option with the highest cost (if more than one proposal option is submitted) subject to terms described in Specification Section 00 21 13.02 – Instructions to Offerors.
- C. Period for Proposal Acceptance:** Offeror accepts all of the terms and conditions of the Request for Proposals and Instructions to Offerors, including without limitation those dealing with the disposition of required Bonds. This offer shall remain open to acceptance and is irrevocable for 90 days after Proposal Date (opening). That period may be extended by mutual written agreement of the SJRA and Offeror.
- D. Liquidated Damages:** Offeror accepts the provisions of the Agreement as to liquidated damages in the event of its failure to complete Work in accordance with the schedule set forth in the Agreement.
- E. Addenda:** Offeror hereby acknowledges it has received, examined and carefully studied all Addenda and all Addenda have been considered and all related costs are included in the Total Proposal Price. Offeror hereby acknowledges receipt of the following Addenda:

Addendum No.	Addendum Date	Signature Acknowledging Receipt

**F. Proposal Supplements:** The following documents shall be provided with the proposal:

- Offeror’s Statement of Qualifications (SOQ – 00 21 13.03).
- Completed Certification of Proposal
- Completed Felony Conviction Notice Form
- Form of Business (00 45 20)
- Proposal Security (Offeror’s Bond 00 43 13)
- Resolution of Contractor (00 45 43)
- ED-103 Contractor’s Act of Assurance (TWDB Form)
- ED-104 Contractor’s Resolution on Authorized Assurance (TWDB Form)
- TWDB-0459 Vendor Compliance with Reciprocity on Non-Resident Bidders (TWDB Form)
- One (1) CD or flash drive with a Completed Proposal with Original signatures, Statement of Qualifications (SOQ) and a full set of Financials.

**G. Conflict of Interest Forms:**

Conflict of Interest Forms (Form CIQ) shall be submitted under separate cover and not be included in the sealed proposal.

**2.0 CONTRACT TIME**

A. If Proposal is accepted, Contractor shall achieve Substantial Completion of the Work within 210 calendar days after the date when the Contract Time Requirements commence to run as provided in Article 2.3 of the General Conditions, and Contractor shall achieve Final Completion within 240 calendar days after the date required for Substantial Completion of the Work, subject to adjustments of Contract Time Requirements as provided in the Contract.

**3.0 OFFEROR REPRESENTATIONS**

- A. Offeror is familiar with and is satisfied as to all federal, state and local laws and regulations that may affect cost, progress, performance and furnishing of the Work.
- B. Offeror has visited the Site and become familiar with and is satisfied as to the general, local and Site conditions that may affect cost, progress, performance and furnishing of the Work.
- C. Offeror has carefully studied all: (1) reports of explorations and tests of subsurface conditions at or contiguous to the Site and all drawings of physical conditions in or

- relating to existing surface or subsurface structures at or contiguous to the Site and (2) Hazardous Conditions identified in reports and drawings provided to Offeror or available for Offeror review. Offeror understands that neither Owner nor Principal Architect/Engineer is responsible for the accuracy of these documents and they are not part of the Contract Documents.
- D. Offeror has obtained and carefully studied all additional or supplementary examinations, investigations, explorations, tests, studies and data concerning conditions including surface, subsurface and Underground Improvements at or contiguous to the Site which may affect cost, progress, performance or furnishing of the Work or which relate to any aspect of the means, methods, techniques, sequences, and procedures of construction to be employed by Offeror, including applying the specific means, methods, techniques, sequences, and procedures of construction expressly required by the Contract Documents to be employed by Offeror, and safety precautions and programs incident thereto.
- E. Offeror does not consider that any further examinations, investigations, explorations, tests, studies, or data are necessary for the determination of this Proposal for performance of the Work at the Contract Amount proposed, within the Contract Time Requirements proposed and in accordance with the terms and conditions of the Contract Documents. Offeror shall make no claims against the Owner and shall bear all risk of losses, if any, resulting on account of the amount and character of the Work, or because the conditions under which the Work must be done vary or differ from conditions or information contained in the Contract Documents, or are different from what were estimated or anticipated by it.
- F. Offeror is aware of the general nature of work to be performed by Owner and others at the Site that relates to the Work as indicated in the Contract Documents.
- G. Offeror has correlated the information known to Offeror, information and observations obtained from visits to the Site, reports and drawings identified in the Contract Documents, and all additional examinations, investigations, explorations, tests, studies, and data with the Contract Documents.
- H. Offeror has given Owner written notice of all conflicts, errors, ambiguities, or discrepancies that Offeror has discovered in the Contract Documents, and the written resolution thereof by Owner are acceptable to Offeror.
- I. The Contract Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performing and furnishing the Work for which this Proposal is submitted.
- J. Supersession: The Owner and the Contractor Agree that Texas Water Development Board ("TWDB") Supplemental Conditions have been fully incorporated and accounted for in and are a part of the Proposal Documents, and Contract Documents.



- K. Privity of Contract: Funding for this contract is expected to be provided in part by the Texas Water Development Board. Neither the State of Texas, nor any of its departments, agencies, or employees, including but not limited to the TWDB, is or will be, a party to this contract or any lower tier contract. This contract is subject to applicable provisions 31 TAC Chapter 363 in effect on the date of this contract.
- L. Laws to be Observed: In the performance of the Contract, the Contractor must comply with all applicable federal, state, and local laws, ordinances and regulations, including but not limited to laws concerned with labor, safety, minimum wages, and the environment. The Contractor will make himself familiar with and shall at all times observe and comply with all federal, state, and local laws, ordinances and regulations which in any manner affect the conduct of the work, and shall Indemnify and save harmless the Owner, Texas Water Development Board and its representatives against any claim arising from violation of any such law, ordinance or regulation by himself or by his subcontractor or by his employees.
- M. Review by Owner and TWDB:
- (a) The Owner and authorized representatives, agents and employees of the Owner and TWDB shall at all times have access to and be permitted to observe and review all work, materials, equipment, payrolls, personnel records, employment conditions, material invoices, books and accounting records, subcontracts, purchase orders, and all other relevant data, documents and records pertaining to this Contract.
- (b) Any such inspection or review by the TWDB shall not subject the TWDB or State of Texas to any action for damages.
- N. Offeror will submit written evidence of its authority to do business in the state where the Project is located with its Proposal, Specification Section 00 45 20 – Form of Business.
- O. Offeror further represents that this Proposal 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 agreement or rules of any group, association, organization or corporation; Offeror has not directly or indirectly induced or solicited any other Offeror to submit a false or sham Proposal; Offeror has not solicited or induced any individual or entity to refrain from submitting a Proposal; and Offeror has not sought by collusion to obtain for itself any advantage over any other Offeror or over Owner.

#### **4.0 DEFINED TERMS:**

- A. Terms defined in this Proposal, if any, shall be for the purposes of this Proposal. Terms with initial capital letters not defined herein shall have the meaning assigned to them in the other Proposal Documents or Contract Documents.

**5.0 PROPOSAL FORM:**

CSP No. 18-0036 includes four (4) separate Proposal Options. Offerors may choose to provide a Proposal for one or more of the Proposal Options. For each Option that Offeror elects to provide a proposal for, Offeror shall include a separate specific Care of Water plan in accordance with Specification Section 01 57 23.02 – Control of Ground and Surface Water. Each Proposal Option will be independently evaluated and scored to determine overall Highest Ranked CSP No. 18-0036 Offeror and preferred Proposal Option based on the criteria set forth in Specification Section 00 21 13.02 – Instructions to Offerors.

The Proposal Options include the following:

Proposal Option No. 1: Install 48-inch (minimum inner diameter) HDPE pipe to slipline and extend existing 60-inch RCP bypass pipe. Install new 60-inch steel pipe along southern side of SJRA's easement.

Proposal Option No. 2: Extend existing 60-inch RCP bypass pipe and install a geopolymer mortar liner inside existing 60-inch RCP bypass pipe and extensions. Install new 60-inch steel pipe along southern side of SJRA's easement.

Proposal Option No. 3: Install 48-inch (minimum inner diameter) HDPE pipe to slipline and extend existing 60-inch RCP bypass pipe. Install new 60-inch steel pipe along northern side of SJRA's easement.

Proposal Option No. 4: Extend existing 60-inch RCP bypass pipe and install geopolymer mortar liner inside existing 60-inch RCP bypass pipe and extensions. Install new 60-inch steel pipe along northern side of SJRA's easement.

**TOTAL PROPOSAL PRICE HAS BEEN CALCULATED BY OFFEROR, USING THE FOLLOWING COMPONENT PRICES AND PROCESS (PRINT OR TYPE NUMERICAL AMOUNTS):**

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**SAN JACINTO RIVER AUTHORITY**  
**Siphon 7 Improvements – Phase 1**  
**PROPOSAL FORM**

**A1. PROPOSAL OPTION NO. 1: 48-INCH (I.D.) HDPE PIPE SLIPLINE OF EXISTING 60-INCH RCP, NEW 60-INCH STEEL PIPE ON SOUTHERN SIDE OF EASEMENT**

Item No.	Spec. Reference	Description	Qty.	Unit	Unit Price (this column controls)	Proposal Price
1	01 71 13	Mobilization: 5% (Maximum) of total proposal price. See Specification Section 01 71 13 – Mobilization for measurement and payment. For _____dollars and _____cents per LUMP SUM.	1	LS	\$ _____	\$ _____
2	01 55 26, 01 57 13.02, 10 14 53	Installation of stabilized construction access and traffic control as shown on Drawings, complete in place and maintained during entire project. For _____dollars and _____cents per LUMP SUM.	1	LS	\$ _____	\$ _____
3	01 57 23	Installation of silt fence (filter fabric fence), as shown on the Drawings, complete in place, maintained during entire project, and removed at final completion of project. For _____dollars and _____cents per LUMP SUM.	1	LS	\$ _____	\$ _____
4	01 56 39	Installation of tree protection, as shown on the Drawings, complete in place, maintained during entire project, and removed at final completion of project. For _____dollars and _____cents per LUMP SUM.	1	LS	\$ _____	\$ _____
5	31 41 00	Trench Safety	1	LS	\$ _____	\$ _____

6	Division 31	Grade canal and project site as shown on the Drawings and compact all fill areas to 95% standard proctor density in applicable specified lifts. (Includes the installation of crushed concrete base material to show future cofferdam limits, and import of select fill material, if necessary). For _____dollars and _____cents per LUMP SUM.	1	LS	\$ _____	\$ _____
7	02 41 13.13	Removal of existing reinforced concrete headwall structures and associated reinforced concrete pipe as shown on Drawings. For _____dollars and _____cents per LUMP SUM.	1	LS	\$ _____	\$ _____
8	01 74 23 32 92 13	Hydromulch, seeding, and restoration of all disturbed areas. For _____dollars and _____cents per LUMP SUM.	1	LS	\$ _____	\$ _____
9	Division 31 33 11 15	Installation of 48-inch minimum inner diameter, high-density polyethylene (HDPE) pipe or approved equal for proposed siphon pipe as shown on Drawings, including but not limited to slip-lining, excavation, shoring, backfill, fittings, post installation inspection, and all other incidentals, complete in place. For _____dollars and _____cents per LUMP SUM.	1	LS	\$ _____	\$ _____

10	Division 31 33 05 23.19 33 11 13.02	Installation of <b>Southern</b> 60-inch nominal diameter, steel siphon pipe as shown on Drawings, including but not limited to jacking, excavation, shoring, backfill, fittings, post-installation inspection, and all other incidentals, complete in place. For  _____dollars and _____cents per LUMP SUM.	1	LS	\$ _____	\$ _____
11	31 37 01	Installation of 18-inch thick broken concrete riprap (as specified) as shown in the Drawings, including geotextile, placement of material, and any backfill necessary, complete in place. For  _____dollars and _____cents per LUMP SUM.	1	LS	\$ _____	\$ _____
12	01 57 23.02	Care of Water, including but not limited to control of ground, surface, and canal water or any other water encountered throughout the contract duration, as detailed in Specification Section 01 57 23.02 – Control of Ground Water and Surface Water and all applicable notes on Drawings, complete in place. <b>The minimum cost for this item shall be equal or greater than \$250,000.</b> For  _____dollars and _____cents per LUMP SUM.	1	LS	\$ _____	\$ _____
<b><u>A1. Total for Proposal Option No. 1:</u></b>					\$ _____	

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**SAN JACINTO RIVER AUTHORITY**  
**Siphon 7 Improvements – Phase 1**  
**PROPOSAL FORM**

**A2. PROPOSAL OPTION NO. 2: EXTENSION AND GEOPOLYMER MORTAR LINING OF EXISTING 60-INCH RCP, NEW 60-INCH STEEL PIPE ON SOUTHERN SIDE OF EASEMENT**

Item No.	Spec. Reference	Description	Qty.	Unit	Unit Price (this column controls)	Proposal Price
1	01 71 13	Mobilization: 5% (Maximum) of total proposal price. See Specification Section 01 71 13 – Mobilization for measurement and payment. For _____dollars and _____cents per LUMP SUM.	1	LS	\$ _____	\$ _____
2	01 55 26, 01 57 13.02, 10 14 53	Installation of stabilized construction access and traffic control as shown on Drawings, complete in place and maintained during entire project. For _____dollars and _____cents per LUMP SUM.	1	LS	\$ _____	\$ _____
3	01 57 23	Installation of silt fence (filter fabric fence), as shown on the Drawings, complete in place, maintained during entire project, and removed at final completion of project. For _____dollars and _____cents per LUMP SUM.	1	LS	\$ _____	\$ _____
4	01 56 39	Installation of tree protection, as shown on the Drawings, complete in place, maintained during entire project, and removed at final completion of project. For _____dollars and _____cents per LUMP SUM.	1	LS	\$ _____	\$ _____
5	31 41 00	Trench Safety	1	LS	\$ _____	\$ _____

6	Division 31	Grade canal and project site as shown on the Drawings and compact all fill areas to 95% standard proctor density in applicable specified lifts. (Includes the installation of crushed concrete base material to show future cofferdam limits, and import of select fill material, if necessary). For  _____dollars and _____cents per LUMP SUM.	1	LS	\$ _____	\$ _____
7	02 41 13.13	Removal of existing reinforced concrete headwall structures and associated reinforced concrete pipe as shown on Drawings. For  _____dollars and _____cents per LUMP SUM.	1	LS	\$ _____	\$ _____
8	01 74 23 32 92 13	Hydromulch, seeding, and restoration of all disturbed areas. For  _____dollars and _____cents per LUMP SUM.	1	LS	\$ _____	\$ _____
9	Division 31 33 11 16	Installation of Geopolymer mortar lining of existing 60-inch reinforced concrete bypass pipe, and pipe extensions, including all fittings, gaskets, etc. as shown on Drawings. Complete in place. For  _____dollars and _____cents per LUMP SUM.	1	LS	\$ _____	\$ _____

10	Division 31 33 05 23.19 33 11 13.02	Installation of <b>Southern</b> 60-inch nominal diameter, steel siphon pipe as shown on Drawings, including but not limited to jacking, excavation, shoring, backfill, fittings, post-installation inspection, and all other incidentals, complete in place. For  _____dollars and _____cents per LUMP SUM.	1	LS	\$ _____	\$ _____
11	31 37 01	Installation of 18-inch thick broken concrete riprap (as specified) as shown in the Drawings, including geotextile, placement of material, and any backfill necessary, complete in place. For  _____dollars and _____cents per LUMP SUM.	1	LS	\$ _____	\$ _____
12	01 57 23.02	Care of Water, including but not limited to control of ground, surface, and canal water or any other water encountered throughout the contract duration, as detailed in Specification Section 01 57 23.02 – Control of Ground Water and Surface Water and all applicable notes on Drawings, complete in place. <b>The minimum cost for this item shall be equal or greater than \$250,000.</b> For  _____dollars and _____cents per LUMP SUM.	1	LS	\$ _____	\$ _____
<b><u>A2. Total for Proposal Option No. 2:</u></b>					\$ _____	

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**SAN JACINTO RIVER AUTHORITY**  
**Siphon 7 Improvements – Phase 1**  
**PROPOSAL FORM**

**A3. PROPOSAL OPTION NO. 3: 48-INCH (I.D.) HDPE PIPE SLIPLINE OF EXISTING 60-INCH RCP, NEW 60-INCH STEEL PIPE ON NORTHERN SIDE OF EASEMENT**

Item No.	Spec. Reference	Description	Qty.	Unit	Unit Price (this column controls)	Proposal Price
1	01 71 13	Mobilization: 5% (Maximum) of total proposal price. See Specification Section 01 71 13 – Mobilization for measurement and payment. For _____dollars and _____cents per LUMP SUM.	1	LS	\$ _____	\$ _____
2	01 55 26, 01 57 13.02, 10 14 53	Installation of stabilized construction access and traffic control as shown on Drawings, complete in place and maintained during entire project. For _____dollars and _____cents per LUMP SUM.	1	LS	\$ _____	\$ _____
3	01 57 23	Installation of silt fence (filter fabric fence), as shown on the Drawings, complete in place, maintained during entire project, and removed at final completion of project. For _____dollars and _____cents per LUMP SUM.	1	LS	\$ _____	\$ _____
4	01 56 39	Installation of tree protection, as shown on the Drawings, complete in place, maintained during entire project, and removed at final completion of project. For _____dollars and _____cents per LUMP SUM.	1	LS	\$ _____	\$ _____
5	31 41 00	Trench Safety	1	LS	\$ _____	\$ _____

6	Division 31	Grade canal and project site as shown on the Drawings and compact all fill areas to 95% standard proctor density in applicable specified lifts. (Includes the installation of crushed concrete base material to show future cofferdam limits, and import of select fill material, if necessary). For  _____dollars and _____cents per LUMP SUM.	1	LS	\$ _____	\$ _____
7	02 41 13.13	Removal of existing reinforced concrete headwall structures and associated reinforced concrete pipe as shown on Drawings. For  _____dollars and _____cents per LUMP SUM.	1	LS	\$ _____	\$ _____
8	01 74 23 32 92 13	Hydromulch, seeding, and restoration of all disturbed areas. For  _____dollars and _____cents per LUMP SUM.	1	LS	\$ _____	\$ _____
9	Division 31 33 11 15	Installation of 48-inch minimum inner diameter, high-density polyethylene (HDPE) pipe or approved equal for proposed siphon pipe as shown on Drawings, including but not limited to slip-lining, excavation, shoring, backfill, fittings, post installation inspection, and all other incidentals, complete in place. For  _____dollars and _____cents per LUMP SUM.	1	LS	\$ _____	\$ _____

10	Division 31 33 05 23.19 33 11 13.02	Installation of <b>Northern</b> 60-inch nominal diameter, steel siphon pipe as shown on Drawings, including but not limited to jacking, excavation, shoring, backfill, fittings, post-installation inspection, and all other incidentals, complete in place. For _____ dollars and _____ cents per LUMP SUM.	1	LS	\$ _____	\$ _____
11	31 37 01	Installation of 18-inch thick broken concrete riprap (as specified) as shown in the Drawings, including geotextile, placement of material, and any backfill necessary, complete in place. For _____ dollars and _____ cents per LUMP SUM.	1	LS	\$ _____	\$ _____
12	01 57 23.02	Care of Water, including but not limited to control of ground, surface, and canal water or any other water encountered throughout the contract duration, as detailed in Specification Section 01 57 23.02 – Control of Ground Water and Surface Water and all applicable notes on Drawings, complete in place. <b>The minimum cost for this item shall be equal or greater than \$250,000.</b> For _____ dollars and _____ cents per LUMP SUM.	1	LS	\$ _____	\$ _____
<b><u>A3. Total for Proposal Option No. 3:</u></b>					\$ _____	

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**SAN JACINTO RIVER AUTHORITY**  
**Siphon 7 Improvements – Phase 1**  
**PROPOSAL FORM**

**A4. PROPOSAL OPTION NO. 4: EXTENSTION AND GEOPLOYMER MORTAR LINING OF EXISTING 60-INCH RCP, NEW 60-INCH STEEL PIPE ON NORTHERN SIDE OF EASEMENT**

Item No.	Spec. Reference	Description	Qty.	Unit	Unit Price (this column controls)	Proposal Price
1	01 71 13	Mobilization: 5% (Maximum) of total proposal price. See Specification Section 01 71 13 – Mobilization for measurement and payment. For _____dollars and _____cents per LUMP SUM.	1	LS	\$ _____	\$ _____
2	01 55 26, 01 57 13.02, 10 14 53	Installation of stabilized construction access and traffic control as shown on Drawings, complete in place and maintained during entire project. For _____dollars and _____cents per LUMP SUM.	1	LS	\$ _____	\$ _____
3	01 57 23	Installation of silt fence (filter fabric fence), as shown on the Drawings, complete in place, maintained during entire project, and removed at final completion of project. For _____dollars and _____cents per LUMP SUM.	1	LS	\$ _____	\$ _____
4	01 56 39	Installation of tree protection, as shown on the Drawings, complete in place, maintained during entire project, and removed at final completion of project. For _____dollars and _____cents per LUMP SUM.	1	LS	\$ _____	\$ _____
5	31 41 00	Trench Safety	1	LS	\$ _____	\$ _____

6	Division 31	Grade canal and project site as shown on the Drawings and compact all fill areas to 95% standard proctor density in applicable specified lifts. (Includes the installation of crushed concrete base material to show future cofferdam limits, and import of select fill material, if necessary). For  _____dollars and _____cents per LUMP SUM.	1	LS	\$ _____	\$ _____
7	02 41 13.13	Removal of existing reinforced concrete headwall structures and associated reinforced concrete pipe as shown on Drawings. For  _____dollars and _____cents per LUMP SUM.	1	LS	\$ _____	\$ _____
8	01 74 23 32 92 13	Hydromulch, seeding, and restoration of all disturbed areas. For  _____dollars and _____cents per LUMP SUM.	1	LS	\$ _____	\$ _____
9	Division 31 33 11 16	Installation of Geopolymer mortar lining of existing 60-inch reinforced concrete bypass pipe, and pipe extensions, including all fittings, gaskets, etc. as shown on Drawings. Complete in place. For  _____dollars and _____cents per LUMP SUM.	1	LS	\$ _____	\$ _____

10	Division 31 33 05 23.19 33 11 13.02	Installation of <b>Northern</b> 60-inch nominal diameter, steel siphon pipe as shown on Drawings, including but not limited to jacking, excavation, shoring, backfill, fittings, post-installation inspection, and all other incidentals, complete in place. For  _____dollars and _____cents per LUMP SUM.	1	LS	\$ _____	\$ _____
11	31 37 01	Installation of 18-inch thick broken concrete riprap (as specified) as shown in the Drawings, including geotextile, placement of material, and any backfill necessary, complete in place. For  _____dollars and _____cents per LUMP SUM.	1	LS	\$ _____	\$ _____
12	01 57 23.02	Care of Water, including but not limited to control of ground, surface, and canal water or any other water encountered throughout the contract duration, as detailed in Specification Section 01 57 23.02 – Control of Ground Water and Surface Water and all applicable notes on Drawings, complete in place. <b>The minimum cost for this item shall be equal or greater than \$250,000.</b> For  _____dollars and _____cents per LUMP SUM.	1	LS	\$ _____	\$ _____
<b><u>A4. Total for Proposal Option No. 4:</u></b>					\$ _____	

**B. EXTRA UNIT PRICE ITEMS (NOT USED)**

**C. CASH ALLOWANCES (NOT USED)**

**D. ALTERNATE ITEMS (NOT USED)**

**E1. TOTAL PROPOSAL PRICE OPTION NO. 1:**  
**(Add Totals for Items A1., B., and C., and D.)**

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

**E2. TOTAL PROPOSAL PRICE OPTION NO. 2:**  
**(Add Totals for Items A2., B., and C., and D.)**

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

**E3. TOTAL PROPOSAL PRICE OPTION NO. 3:**  
**(Add Totals for Items A3., B., and C., and D.)**

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

**E4. TOTAL PROPOSAL PRICE OPTION NO. 4:**  
**(Add Totals for Items A4., B., and C., and D.)**

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

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**6.0 SIGNATURES:** By signing this Document, I agree that I have received and reviewed all Bid Documents, Contract Documents and Addenda and considered all costs associated with the Bid Documents, Contract Documents and Addenda in calculating the Total Proposal Price.

Offeror: \_\_\_\_\_  
(Print or type full name of your proprietorship, partnership, corporation, or joint venture.\*)

\*\* By: \_\_\_\_\_  
Signature Date

Name: \_\_\_\_\_  
(Print or type name) Title

Doing Business as: \_\_\_\_\_

Business Address: \_\_\_\_\_  
(Mailing)  
\_\_\_\_\_  
(Street, if different)

Telephone and Fax Number: \_\_\_\_\_  
(Print or type numbers)

\* If Proposal is a joint venture, add additional Proposal Form signature sheets for each member of the joint venture.

\*\* Offeror certifies that the only person or parties interested in this offer as principals are those named above. Offeror has not directly or indirectly entered into any agreement, participated in any collusion, or otherwise taken any action in restraint of free competitive Proposing.

Note: This document constitutes a Governmental record, as defined by § 37.01 of the Texas Penal Code. Submission of a false Governmental record is a criminal offense as provided in § 37.10 of the Texas Penal Code.

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**7.0 CERTIFICATION OF PROPOSAL**

The undersigned affirms that they are duly authorized to execute this Proposal, that this Proposal has not been prepared in collusion with any other Offeror, and that the contents of this Proposal have not been communicated to any other Offeror prior to the official opening of this Proposal. Additionally, the undersigned affirms that the Offeror is willing to sign the attached SJRA Agreement (if applicable).

Signed By: \_\_\_\_\_ Title: \_\_\_\_\_

Typed Name: \_\_\_\_\_ Company Name: \_\_\_\_\_

Phone No.: \_\_\_\_\_ Fax No.: \_\_\_\_\_

Email: \_\_\_\_\_

Proposal Address: \_\_\_\_\_  
P.O. Box or Street                      City                      State                      Zip

Order Address: \_\_\_\_\_  
P.O. Box or Street                      City                      State                      Zip

Remit to Address: \_\_\_\_\_  
P.O. Box or Street                      City                      State                      Zip

Federal Tax ID No.: \_\_\_\_\_

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

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**SECTION 00 43 13**  
**OFFEROR'S BOND**

THAT WE, \_\_\_\_\_, as Principal,  
(Offeror)  
("Offeror"), and the other subscriber hereto, \_\_\_\_\_, as Surety, do hereby  
acknowledge ourselves to be held and firmly bound to the San Jacinto River Authority, a political sub-division of the  
State of Texas, in the sum of \_\_\_\_\_ Dollars  
(\$ \_\_\_\_\_) (an amount equal to five (5) percent of the Total Bid Price (for Proposal Option with  
highest price), including Cash Allowances and Alternates, if any, for the payment of which sum, well and truly to be  
made to the San Jacinto River Authority and its successors, the Offeror and Surety do bind themselves, their heirs,  
executors, administrators, successors, and assigns, jointly and severally.

THE CONDITIONS OF THIS OBLIGATION ARE SUCH THAT:

WHEREAS, the Offeror has submitted on or about this day a proposal offering to perform the following:

\_\_\_\_\_  
\_\_\_\_\_  
(Project Name, Location and Number)  
in accordance with the Drawings, Specifications, and terms and conditions related thereto to which reference is  
hereby made.

**NOW, THEREFORE**, if the Offeror's offer as stated in the Section 00 41 00.02 – Proposal Form is accepted  
by the San Jacinto River Authority, and the Offeror executes and returns to the San Jacinto River Authority Section  
00 52 00 – Standard Form of Agreement between Owner and Contractor, required by the San Jacinto River Authority,  
on the forms prepared by the San Jacinto River Authority, for the Work and also executes and returns the same  
number of the Performance, Payment and Maintenance Bonds (such bonds to be executed by a Corporate Surety  
authorized by the State Board of Insurance to conduct insurance business in the State of Texas, and having an  
underwriting limitation in at least the amount of the bond) and other submittals as required, in connection with the  
Work, within the Contract Time, then this obligation shall become null and void; otherwise it is to remain in full force  
and effect.

If Offeror is unable to or fails to perform the obligations undertaken herein, the undersigned Offeror and  
Surety shall be liable to the San Jacinto River Authority for the full amount of this obligation which is hereby  
acknowledged as the amount of damages which will be suffered by the San Jacinto River Authority on account of the  
failure of such Offeror to perform such obligations, the actual amount of such damages being difficult to ascertain.

Notices required or permitted hereunder shall be in writing and shall be deemed delivered when actually  
received or, if earlier, on the third day following deposit in a United States Postal Service post office or receptacle,  
with proper postage affixed (certified mail, return receipt requested), addressed to the respective other Party at the  
address prescribed in the Contract documents, or at such other address as the receiving Party may hereafter  
prescribe by written notice to the sending Party.

**IN WITNESS THEREOF**, the Offeror and Surety have signed and sealed this instrument on the respective  
dates written below their signatures and have attached current Power of Attorney.

ATTEST, SEAL: (if a corporation)  
WITNESS: (if not a corporation)

\_\_\_\_\_  
(Name of Offeror)

By: \_\_\_\_\_  
Name:  
Title:

By: \_\_\_\_\_  
Name:  
Title:  
Date:

ATTEST/SURETY WITNESS: (SEAL)

(Full Name of Surety)

(Address of Surety for Notice)

(Telephone Number of Surety)

By: \_\_\_\_\_  
Name:  
Title:  
Date:

By: \_\_\_\_\_  
Name:  
Title:  
Date:

**END OF SECTION**

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**SECTION 00 45 10**

**CONFLICT OF INTEREST QUESTIONNAIRE**

Local Government Code Chapter 176 requires Offerors with the San Jacinto River Authority (“SJRA”) to file a Conflict of Interest Questionnaire with the SJRA.

The Conflict of Interest Questionnaire is available for downloading on the Texas Ethics Commission’s website at: <http://www.ethics.state.tx.us/forms/CIQ.pdf>. The completed Conflict of Interest Questionnaire will be posted on the SJRA website. Also you will find a list of the SJRA Local Government Officers on the SJRA website.

For your convenience the CIQ form is attached as part of this document. Although the SJRA has provided this document for the Offeror’s convenience, it is the Offeror’s responsibility to submit the latest version of the CIQ form as promulgated by the Texas Ethics Commission.

The Failure of any Offeror to comply with this law is a Class C misdemeanor.

**END OF SECTION**

# CONFLICT OF INTEREST QUESTIONNAIRE

For vendor doing business with local governmental entity

## FORM CIQ

This questionnaire reflects changes made to the law by H.B. 23, 84th Leg., Regular Session.

This questionnaire is being filed in accordance with Chapter 176, Local Government Code, by a vendor who has a business relationship as defined by Section 176.001(1-a) with a local governmental entity and the vendor meets requirements under Section 176.006(a).

By law this questionnaire must be filed with the records administrator of the local governmental entity not later than the 7th business day after the date the vendor becomes aware of facts that require the statement to be filed. See Section 176.006(a-1), Local Government Code.

A vendor commits an offense if the vendor knowingly violates Section 176.006, Local Government Code. An offense under this section is a misdemeanor.

### OFFICE USE ONLY

Date Received

**1** Name of vendor who has a business relationship with local governmental entity.

**2**  Check this box if you are filing an update to a previously filed questionnaire. (The law requires that you file an updated completed questionnaire with the appropriate filing authority not later than the 7th business day after the date on which you became aware that the originally filed questionnaire was incomplete or inaccurate.)

**3** Name of local government officer about whom the information is being disclosed.

\_\_\_\_\_  
Name of Officer

**4** Describe each employment or other business relationship with the local government officer, or a family member of the officer, as described by Section 176.003(a)(2)(A). Also describe any family relationship with the local government officer. Complete subparts A and B for each employment or business relationship described. Attach additional pages to this Form CIQ as necessary.

A. Is the local government officer or a family member of the officer receiving or likely to receive taxable income, other than investment income, from the vendor?

Yes       No

B. Is the vendor receiving or likely to receive taxable income, other than investment income, from or at the direction of the local government officer or a family member of the officer AND the taxable income is not received from the local governmental entity?

Yes       No

**5** Describe each employment or business relationship that the vendor named in Section 1 maintains with a corporation or other business entity with respect to which the local government officer serves as an officer or director, or holds an ownership interest of one percent or more.

**6**  Check this box if the vendor has given the local government officer or a family member of the officer one or more gifts as described in Section 176.003(a)(2)(B), excluding gifts described in Section 176.003(a-1).

**7**

\_\_\_\_\_  
Signature of vendor doing business with the governmental entity

\_\_\_\_\_  
Date

**SECTION 00 45 20**  
**FORM OF BUSINESS**

Please mark the box describing your firm's form of business, fill in the requested information, and include the relevant attachments.

**Corporation**

Corporate Name: \_\_\_\_\_  
State of Incorporation: \_\_\_\_\_  
Mailing Address: \_\_\_\_\_  
Type of Corporation: \_\_\_\_\_

Certificate of Assumed Name, if operating under a name different than that on the corporate charter (the Certificate must have been issued within the past 10 years to be valid)

\*Certificate of Good Standing

\*Certificate of Existence (if non-Texas corporation, Certificate of Authority)

**Partnership/Joint Venture**

Partnership/Joint Venture Name: \_\_\_\_\_  
Mailing Address: \_\_\_\_\_  
Type of Partnership/Joint Venture: \_\_\_\_\_

Copy of the Partnership or Joint Venture Agreement, **or**  
Affidavit with the name of the partnership or joint venture, the names of the individual partners or participants in the joint venture, and a statement that the partnership or joint venture is in existence

Certificate of Assumed Name, (the Certificate must have been issued within the past 10 years to be valid)

If firm is a limited partnership, the Certificate of Limited Partnership

If any partner or joint venturer is a corporation, the above information relating to corporation must be included as to each sum partner or joint venturer.

**Sole Proprietorship**

Name: \_\_\_\_\_  
Mailing Address: \_\_\_\_\_

Certificate of Assumed Name, if operating under a name different than that of the sole proprietor (the Certificate must have been issued within the past 10 years to be valid)

*\* Must be furnished upon request of the SJRA and must be less than 90 days old.*

**END OF SECTION**



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**SECTION 00 45 43**  
**RESOLUTION OF CONTRACTOR**

\_\_\_\_\_, (“Contractor”),  
(Name of Contractor, e.g., “Biz. Inc.”, “Biz LLP”)

is a \_\_\_\_\_,  
(Type of Organization, e.g.: Corporation, Limited Partnership, Limited Liability Partnership, Limited Liability Company, etc.)

which is bound by acts of \_\_\_\_\_,  
(Name and Form of Governing Entity, e.g., “Biz Inc. Board of Directors”, “Bill Smith, GP”, etc.)

(“Governing Entity”).

On the . day of \_\_\_\_\_, 20\_\_\_\_, the Governing Entity resolved, in accordance with all documents, rules, and laws applicable to the Contractor, that

\_\_\_\_\_, is authorized to act as the  
(Contractor’s Representative)

Contractor’s Representative in all business transactions (initial one) \_\_\_\_ conducted in the State of Texas OR \_\_\_\_ related to this Contract; and

The Governing Entity warrants that the above resolution (a) was entered into without dissent or reservation by the Governing Entity, (b) has not been rescinded or amended, and (c) is now in full force and effect; and

**PART 1 - IN AUTHENTICATION OF THE ADOPTION OF THIS RESOLUTION, I  
SUBSCRIBE MY NAME ON THIS \_\_\_\_\_ DAY OF \_\_\_\_\_, 20 \_\_\_\_.**

\_\_\_\_\_  
(Authorized Signature for Governing Entity)

\_\_\_\_\_  
(Print or Type Name and Title of Authorized Signatory)

**SWORN AND SUBSCRIBED** before me on \_\_\_\_\_  
Date

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

My Commission Expires: \_\_\_\_\_  
Expiration Date

\_\_\_\_\_  
Print or Type Name of Notary Public

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## CONTRACTOR'S ACT OF ASSURANCE RESOLUTION

I hereby certify that it was RESOLVED by a quorum of the directors of the \_\_\_\_\_ (Name of Corporation), meeting on the \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_, that:

Authorized Representative(s):

be, and hereby is/are authorized to act on behalf of \_\_\_\_\_ (Name of Corporation), as its representative in all business transactions conducted in the State of Texas, and;

That all above resolution was unanimously ratified by the Board of Directors at said meeting and that the resolution has not been rescinded or amended and is now in full forces and effect; and;

In authentication of the adoption of this resolution, I subscribe my name and affix the seal of the Corporation this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_.

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

[SEAL]

## VENDOR COMPLIANCE WITH RECIPROCITY ON NON- RESIDENT BIDDERS

Texas Government Code Section 2252.002 provides that in order for nonresident bidders to be awarded a governmental contract, the bidder must bid projects for construction, improvements, supplies, or services in Texas at an amount lower than the lowest Texas resident bidder by the same amount that a Texas resident bidder would be required to underbid the nonresident bidder in order to obtain a comparable contract in the nonresident bidder's state. A nonresident bidder is a person, including a contractor, whose principal place of business or corporate office is outside of the state of Texas. This requirement does not apply to a contract involving Federal funds. The appropriate blanks in Section A must be filled out by all nonresident bidders in order for your bid to meet specifications. The failure of a nonresident bidder to do so will automatically disqualify that bidder. Resident bidders must check the blank in Section B.

A. Non-resident vendors in \_\_\_\_\_ (give state), our principal place of business, are required to be \_\_\_\_\_ percent lower than resident bidders by state law. A copy of the statute is attached.

Non-resident vendors in \_\_\_\_\_ (give state), our principal place of business, are not required to underbid resident bidders.

B. Our principal place of business or corporate office is in the state of Texas: \_\_\_\_\_.

BIDDER:

\_\_\_\_\_  
Company

\_\_\_\_\_  
City

\_\_\_\_\_  
State

\_\_\_\_\_  
Zip

\_\_\_\_\_  
By (print name)

\_\_\_\_\_  
Signature

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

**THIS FORM MUST BE RETURNED WITH THE BID**

**SECTION 00 52 00**

STANDARD FORM OF AGREEMENT  
BETWEEN OWNER AND CONTRACTOR

THIS AGREEMENT is dated as of \_\_\_\_\_ by and between **the San Jacinto River Authority** (hereinafter called “**OWNER**”) and \_\_\_\_\_ (hereinafter called “**CONTRACTOR**”).

OWNER and CONTRACTOR, in consideration of the covenants hereinafter set forth, agree as follows:

**Article 1. WORK.**

CONTRACTOR shall complete all Work as specified or indicated in the Contract Documents. The Work is generally described as follows:

Construction of **Siphon 7 Improvements – Phase 1**

**Article 2. PRINCIPAL ARCHITECT/ENGINEER AND OWNER’S REPRESENTATIVE.**

The project has been designed by Texas Water Engineering, PLLC., 19901 Southwest Freeway Sugarland, Texas 77479, who is hereinafter called “PRINCIPAL ARCHITECT/ENGINEER” and who assumes all duties and responsibilities and has the rights and authority assigned to PRINCIPAL ARCHITECT/ENGINEER in the Contract Documents in connection with completion of the Work in accordance with the Contract Documents. OWNER’S Representative shall be Texas Water Engineering, PLLC.

**Article 3. CONTRACT TIMES.**

The Work will be Substantially Completed within 210 **calendar days** after the date when the Contract Time Requirements commence to run as provided in Article 2.3 of the General Conditions, and CONTRACTOR shall achieve Final Completion within 30 **calendar days** of the date required for Substantial Completion.

OWNER and CONTRACTOR recognize that **time is of the essence** of this Agreement and that OWNER will suffer financial loss if the Work is not completed within the times specified in the above paragraph, plus any extensions thereof allowed in accordance with Article 12 of the General Conditions. They also recognize the delays, expense and difficulties involved in proving the actual loss suffered by OWNER if the Work is not completed on time. Accordingly, instead of requiring any such proof, OWNER and CONTRACTOR agree that as liquidated damages for delay (but not as a penalty) and, as a reasonable estimate of such damages, CONTRACTOR shall pay OWNER Two Thousand Five Hundred Dollars (\$2,500.00) for each and every day of delay in CONTRACTOR achieving Substantial Completion of the Work and readiness for final payment beyond the times specified in the above paragraph. OWNER shall have the option of deducting the amount of any liquidated damages from any monies that may be owed to CONTRACTOR or to recover such amount from the CONTRACTOR or its sureties, at CONTRACTOR’S expense.

**Article 4. CONTRACT AMOUNT.**

OWNER shall pay CONTRACTOR for completion of the Work, in accordance with the Contract Documents, an amount in current funds equal to the sum of the amounts determined to be due and owing pursuant to the Proposal and any subsequent Change Orders and Change Directives thereto.

**Article 5. PAYMENT PROCEDURES.**

CONTRACTOR shall submit Applications for Payment in accordance with Article 14 of the General Conditions. Applications for Payment will be processed by OWNER'S Representative or PRINCIPAL ARCHITECT/ENGINEER as determined by the OWNER and as provided in the General Conditions and Supplemental Conditions, if any.

OWNER shall make progress payments on account of the Contract Amount on the basis of CONTRACTOR'S Applications for Payment as recommended by OWNER'S Representative or PRINCIPAL ARCHITECT/ENGINEER and in conformance with the procedures described in the General Conditions. All such payments will be measured by the schedule of values established in Article 2.4.2.07 of the General Conditions (and on the number of units of each Unit Price item completed, if unit price contract). Upon final completion and acceptance of the Work in accordance with Article 14.11 of the General Conditions, OWNER shall pay the remainder of the Contract Amount as recommended by OWNER'S Representative as provided in said Article 14.11.

The 10 percent retainage withheld pursuant to Article 14.01.5 of the General Conditions shall be deposited in an interest-bearing account, and the interest earned on such retainage shall be paid to CONTRACTOR on completion of the contract.

**Article 6. CONTRACTOR'S REPRESENTATIONS.**

In order to induce OWNER to enter into this Agreement CONTRACTOR makes the following representations:

CONTRACTOR has examined and carefully studied the Contract Documents (including the Addenda listed in Article 7) and the other related data identified in the Proposal Documents.

CONTRACTOR has visited the site and become familiar with and is satisfied as to the general, local, and site conditions that may affect cost, progress, performance, or furnishing of the Work.

CONTRACTOR is familiar with and is satisfied as to all federal, state, and local Legal Requirements that may affect cost, progress, performance, and furnishing of the Work.

CONTRACTOR has carefully studied all reports of explorations and tests of subsurface conditions at or contiguous to the Site and all drawings of physical conditions in or relating to existing surface or subsurface structures at or contiguous to the Site. CONTRACTOR acknowledges that such reports and drawings are not Contract Documents, are not warranted or represented in any manner by Owner to accurately show the conditions at the Site, and may not be complete for CONTRACTOR'S purposes. CONTRACTOR acknowledges that OWNER and PRINCIPAL ARCHITECT/ENGINEER do not assume and expressly disclaim any responsibility for the accuracy or completeness of the



information and data shown or indicated in the Contract Documents with respect to subsurface conditions or Underground Facilities at or contiguous to the Site or CONTRACTOR'S interpretation of such information and data. CONTRACTOR has obtained and carefully studied (or assumes responsibility for having done so) all such additional supplementary research, examinations, investigations, explorations, tests, studies, and data concerning conditions (surface, subsurface, and Underground Facilities) at or contiguous to the Site or otherwise which may affect cost, progress, performance, or furnishing of the Work or which relate to any aspect of the means, methods, techniques, sequences, and procedures of construction to be employed by CONTRACTOR and safety precautions and programs incident thereto. CONTRACTOR does not consider that any additional examinations, investigations, explorations, tests, studies, or data are necessary for the performance and furnishing of the Work at the Contract Amount, within the Contract Time Requirements and in accordance with the other terms and conditions of the Contract Documents.

CONTRACTOR is aware of the general nature of work to be performed by OWNER and others at the Site that relates to the Work as indicated in the Contract Documents.

CONTRACTOR has correlated the information known to CONTRACTOR, information and observations obtained from visits to the Site, reports, and Drawings identified in the Contract Documents and all additional examinations, investigations, explorations, tests, studies, and data with the Contract Documents.

CONTRACTOR has given PRINCIPAL ARCHITECT/ENGINEER through the OWNER or OWNER'S Representative written notice of all conflicts, errors, ambiguities, or discrepancies that CONTRACTOR has discovered in the Contract Documents and the written resolution thereof by PRINCIPAL ARCHITECT/ENGINEER is acceptable to CONTRACTOR, and the Contract Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performance and furnishing of the Work.

Pursuant to Section 2270.002 of the Texas Government Code, contemporaneous with CONTRACTOR's execution of this Agreement, CONTRACTOR shall execute the Verification Company Does Not Boycott Israel, attached hereto and incorporated herein.

**Article 7. CONTRACT DOCUMENTS.**

The Contract Documents are comprised of the following:

1. This Agreement.
2. Verification Company Does Not Boycott Israel
2. Exhibits to this Agreement:

Document	Title	Date	Page(s)

3. Performance, Payment, Maintenance, and Surface Correction Bonds.
4. General Conditions of the Contract.
5. Supplemental Conditions, if any.

6. Specifications 01 11 13 through 33 11 16, prepared by Texas Water Engineering, PLLC. and sealed on June 4, 2018.
7. Drawings.
8. Addenda:

Addendum No.	Addendum Date	Signature Acknowledging Receipt

9. CONTRACTOR'S Proposal Form pursuant to Competitive Sealed Proposal No. 18-0036.
10. Prevailing Wage Rates.
11. The following which may be delivered or issued after the Effective Date of the Agreement and are not attached thereto: All written Change Orders or Change Directives pursuant to Article 3.3 of the General Conditions.

There are no Contract Documents other than those listed in this Article. The Contract Documents may only be amended, modified, or supplemented as provided in Article 3.3 of the General Conditions.

**Article 8. INDEMNITY PROVISIONS.**

**THE GENERAL, SPECIAL, AND SUPPLEMENTAL CONDITIONS, IF ANY, INCORPORATED INTO THIS AGREEMENT CONTAIN PROVISIONS THAT MAY RELIEVE ONE PARTY FOR RESPONSIBILITY IT WOULD OTHERWISE HAVE UNDER THE LAW FOR DAMAGES OR OTHER LIABILITY ARISING OUT OF THE WORK.**

**EACH OF THE PARTIES HERETO SPECIFICALLY AGREES THAT IT HAS A DUTY TO READ THIS AGREEMENT, THE GENERAL, SPECIAL, AND SUPPLEMENTAL CONDITIONS, IF ANY, AND ALL OTHER CONTRACT DOCUMENTS AND AGREES THAT IT IS CHARGED WITH NOTICE AND KNOWLEDGE OF THE TERMS OF THIS AGREEMENT AND ALL CONTRACT DOCUMENTS; THAT IT HAS IN FACT READ THIS AGREEMENT AND ALL CONTRACT DOCUMENTS AND IS FULLY INFORMED AND HAS FULL NOTICE AND KNOWLEDGE OF THE TERMS, CONDITIONS AND EFFECTS OF THIS AGREEMENT; THAT IT HAS HAD THE OPPORTUNITY TO BE REPRESENTED BY INDEPENDENT LEGAL COUNSEL OF ITS CHOICE PRECEDING ITS EXECUTION OF THIS AGREEMENT AND HAS RECEIVED OR VOLUNTARILY CHOSEN NOT TO RECEIVE THE ADVICE OF ITS ATTORNEY IN ENTERING INTO THIS AGREEMENT; AND THAT IT RECOGNIZES THAT CERTAIN TERMS OF THIS AGREEMENT AND THE CONTRACT DOCUMENTS RESULT IN ONE PARTY ASSUMING THE LIABILITY INHERENT IN SOME ASPECTS OF THE TRANSACTION AND RELIEVING THE OTHER PARTY OF ITS RESPONSIBILITY FOR SUCH LIABILITY. EACH PARTY HERETO AGREES AND COVENANTS THAT IT WILL NOT CONTEST THE VALIDITY OR ENFORCEMENT OF ANY EXCULPATORY PROVISION OF THIS AGREEMENT ON THE BASIS THAT THE PARTY HAD NO NOTICE OR**

**KNOWLEDGE OF SUCH PROVISION OR THAT THE PROVISION IS NOT  
"CONSPICUOUS".**

**Article 9. MISCELLANEOUS.**

Terms used in this Agreement which are defined in Article 1 of the General Conditions will have the meanings indicated in the General Conditions.

CONTRACTOR certifies that it has not engaged in corrupt, fraudulent, collusive, or coercive practices in competing for or in executing the Contract. For the purposes of this Article 9:

1. "corrupt practice" means the offering, giving, receiving, or soliciting of anything of value likely to influence the action of a public official in the proposal process or in the Contract execution;
2. "fraudulent practice" means an intentional misrepresentation of facts made (a) to influence the proposal process or the execution of the Contract to the detriment of OWNER, (b) to establish Proposal or Contract prices at artificial noncompetitive levels, or (c) to deprive OWNER of the benefits of free and open competition;
3. "collusive practice" means a scheme or arrangement between two or more Proposers, with or without the knowledge of OWNER, a purpose of which is to establish Proposal prices at artificial, non-competitive levels; and
4. "coercive practice" means harming or threatening to harm, directly or indirectly, persons or their property to influence their participation in the proposal process or affect the execution of the Contract.

No assignment by a party hereto of any rights or interests in the Contract will be binding on another party hereto without the written consent of the party sought to be bound; and, specifically but without limitation, moneys that may become due and moneys that are due may not be assigned without such consent (except to the extent that the effect of this restriction may be limited by law), and unless specifically stated to the contrary in any written consent to an assignment no assignment will release or discharge the assignor from any duty or responsibility under the Contract.

OWNER and CONTRACTOR each binds itself, its officers, directors, shareholders, partners, members, successors, assigns, and legal representatives to the other party hereto, its officers, directors, shareholders, partners, members, successors, assigns and legal representatives in respect to all covenants, agreements, and obligations contained in the Contract Documents.

Any provision or part thereof of the Contract Documents held to be void or unenforceable under any Law or Regulation shall be deemed stricken, and all remaining provisions or parts thereof shall continue to be valid and binding upon OWNER and CONTRACTOR, who agree that the Contract Documents shall be reformed to replace such stricken provision or part thereof with a valid and enforceable provision that comes as close as possible to expressing the intention of the stricken provision or part thereof.

This Agreement may be executed in counterparts, each of which shall be deemed an original, but all of which together shall be deemed to be one and the same agreement. A signed copy of this Agreement delivered by facsimile, email, or other means of electronic transmission shall be deemed to have the same legal effect as delivery of an original signed copy of this Agreement. Duplicate copies of duly executed and delivered counterparts of this Agreement shall be deemed to have the same full force and effect as originals and may be relied upon as such. Notwithstanding the foregoing, OWNER and CONTRACTOR agree that this Agreement may be executed using electronic signatures at the option and in the discretion of OWNER, and, in such event, the provisions of the Uniform Electronic Transaction Act, Chapter 332, Texas Business and Commerce Code, as amended, and any applicable policies and procedures of OWNER regarding electronic signatures shall apply.

IN WITNESS WHEREOF, OWNER and CONTRACTOR have signed this Agreement.

This Agreement will be effective on \_\_\_\_\_, (which is the effective date of the Agreement).

**OWNER: San Jacinto River Authority**

By: \_\_\_\_\_

Attest: \_\_\_\_\_

Address for giving notices:

**CONTRACTOR:**

By: \_\_\_\_\_

(CORPORATE SEAL)

Attest: \_\_\_\_\_

Address for giving notices:

License No. \_\_\_\_\_

Agent for service of process: \_\_\_\_\_

**END OF SECTION**

**VERIFICATION COMPANY DOES NOT BOYCOTT ISRAEL**

BEFORE ME, the undersigned authority, on this day personally appeared \_\_\_\_\_ [name], \_\_\_\_\_ [title] of \_\_\_\_\_ [Contractor], and, upon oath, after first being duly sworn, deposed and stated:

“My name is \_\_\_\_\_ and I am the \_\_\_\_\_ [title] of \_\_\_\_\_ [Contractor], hereinafter referred to in this verification as ‘Contractor’. The facts set forth herein are within my personal knowledge and are true and correct, and I am competent and authorized to make this verification on behalf of Contractor.

Contractor does not Boycott Israel; and

Contractor will not Boycott Israel during the term of this Agreement; and

‘Boycott Israel’ as used herein means refusing to deal with, terminating business activities with, or otherwise taking any action that is intended to penalize, inflict economic harm on, or limit commercial relations specifically with Israel, or with a person or entity doing business in Israel or in an Israeli-controlled territory, but does not include an action made for ordinary business purposes.”

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

By: \_\_\_\_\_  
[Signature of Affiant]

Printed Name: \_\_\_\_\_

Title: \_\_\_\_\_

SUBSCRIBED AND SWORN TO before me on this \_\_\_\_ day of \_\_\_\_\_, 201\_\_, by \_\_\_\_\_ [title] of \_\_\_\_\_ [Contractor], known to me or proved through photo identification.

\_\_\_\_\_  
Notary Public in and for the State of Texas  
My commission expires: \_\_\_\_\_

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**SECTION 00 60 20**

**MONTHLY SUBCONTRACTOR PAYMENT REPORTING FORM**

Legal Project Name: \_\_\_\_\_

SJRA Project No.: \_\_\_\_\_

Contractor's Company Name: \_\_\_\_\_

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

**CERTIFICATION**

BEFORE ME, the undersigned authority, on this day personally appeared \_\_\_\_\_,  
\_\_\_\_\_ [title] of \_\_\_\_\_ [Contractor], and, upon oath, after first being duly  
sworn, deposed and stated:

“My name is \_\_\_\_\_ and I am the \_\_\_\_\_ [title] of  
\_\_\_\_\_ [Contractor], hereinafter referred to in this affidavit as “Contractor”. The facts  
set forth herein are within my personal knowledge and are true and correct, and I am competent and  
authorized to make this affidavit on behalf of Contractor.

Contractor has paid each and all of its Subcontractors, laborers, suppliers, vendors and  
materialmen, if any, in full, for all work, labor, materials, equipment and/or services provided to Contractor  
for incorporation in or use or work on the Project, through the period ending \_\_\_\_\_ [end  
date of last paid pay period] (the “Pay Period”), except to the extent of any contractual retainage withheld  
by Contractor, or other amounts withheld by Contractor for defective work or otherwise in accordance with  
its contract with any Subcontractor, laborer, supplier, vendor or materialman and identified in the Payment  
Notifications described below.

Contractor acknowledges that SJRA is relying on Contractor's statements and representations  
herein in making payment for Work performed on the Project. Contractor agrees to indemnify SJRA from  
any and all loss, cost or expense, including but not limited to attorneys' fees incurred, resulting from any  
false or incorrect information contained in this affidavit.”

EXCEPTION: Contractor sent Payment Notifications to the following Subcontractors, laborers, suppliers,  
vendors or materialmen explaining why Contractor withheld payment, copies of which are attached:

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

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

City, State, and Zip Code: \_\_\_\_\_ City, State, and Zip Code: \_\_\_\_\_

Amount of Payment Withheld: \_\_\_\_\_ Amount of Payment Withheld: \_\_\_\_\_

Date Payment First Withheld: \_\_\_\_\_ Date Payment First Withheld: \_\_\_\_\_

Description of Good Faith Reason: \_\_\_\_\_ Description of Good Faith Reason: \_\_\_\_\_

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

\_\_\_\_\_  
(Signature of Contractor's Representative)

\_\_\_\_\_  
(Print or Type Name of Contractor's Representative)

**SWORN TO AND SUBSCRIBED** before me on:

\_\_\_\_\_  
Date

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

My Commission Expires: \_\_\_\_\_  
Expiration Date

\_\_\_\_\_  
Print or Type name of Notary Public



**SECTION 00 61 13.13**  
**PERFORMANCE BOND**

STATE OF TEXAS

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

KNOW ALL MEN BY THESE PRESENTS: That \_\_\_\_\_ (Contractor) of the City of \_\_\_\_\_, County of \_\_\_\_\_, and State of Texas, as Principal, and \_\_\_\_\_ authorized under the Laws of the State of Texas to act as surety on bonds for principals, as Surety, are held and firmly bound unto San Jacinto River Authority (Owner), in the penal sum of \_\_\_\_\_ Dollars (\$ \_\_\_\_\_) for the payment whereof, the said Principal and Surety bind themselves, and their heirs, administrators, executors, successors and assigns, jointly and severally, by these presents:

WHEREAS, the Principal has entered into a certain written contract with the Owner, dated the \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_, for construction of: \_\_\_\_\_ (the "Contract"), which Contract is hereby referred to and made a part hereof as fully and to the same extent as if copied at length herein.

NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION IS SUCH, that if the said Principal shall faithfully perform said Contract and shall in all respects duly and faithfully observe and perform all and singular the covenants, conditions and agreements in and by said Contract agreed and covenanted by the Principal to be observed and performed, within the time provided therein and any extensions thereof that may be granted by the Owner, and during the life of any guarantees or warranties contained in or required under said Contract, and shall also well and truly perform all the undertakings, covenants, terms, conditions and agreements of any and all modifications of said Contract that may hereafter be made, then this obligation shall be void; otherwise to remain in full force and effect;

PROVIDED, HOWEVER, that this bond is executed pursuant to the provisions of Chapter 2253 of the Texas Government Code as amended and all liabilities on this bond shall be determined in accordance with the provisions of said statute to the same extent as if it were copied at length herein.

Surety, for value received, stipulates and agrees that no change, extension of time, alteration or addition to the terms of the Contract, or to work performed thereunder, or the plans, specifications, or drawings, accompanying the same, shall in anyway affect its obligation on this bond, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the Contract, or the work to be performed thereunder.

IN WITNESS WHEREOF, the said Principal and Surety have signed and sealed this instrument on the \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_.

\_\_\_\_\_  
Principal

\_\_\_\_\_  
Surety

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

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

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

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

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

PHYSICAL ADDRESS:  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

MAILING ADDRESS FOR NOTICE OF CLAIMS:  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

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

LOCAL RECORDING AGENT  
PERSONAL IDENTIFICATION  
NUMBER:  
\_\_\_\_\_

The name and address of the Resident Agent of Surety is:  
\_\_\_\_\_  
\_\_\_\_\_

**END OF SECTION**

**SECTION 00 61 13.16**  
**STATUTORY PAYMENT BOND**

STATE OF TEXAS

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

KNOW ALL MEN BY THESE PRESENTS: That \_\_\_\_\_ (Contractor) of the City of \_\_\_\_\_, County of \_\_\_\_\_, and State of Texas, as Principal, and \_\_\_\_\_ authorized under the Laws of the State of Texas to act as surety on bonds for principals, as Surety, are held and firmly bound unto San Jacinto River Authority (Owner), in the penal sum of \_\_\_\_\_ Dollars (\$ \_\_\_\_\_) for the payment whereof, the said Principal and Surety bind themselves, and their heirs, administrators, executors, successors and assigns, jointly and severally, by these presents:

WHEREAS, the Principal has entered into a certain written contract with the Owner, dated the \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_, for construction of: \_\_\_\_\_ (the "Contract").

which Contract is hereby referred to and make a part hereof as fully and to the same extent as if copied at length herein.

NOW, THEREFORE, THE CONDITIONS OF THIS OBLIGATION IS SUCH, that if the said Principal shall pay all claimants supplying labor and material to him or a Sub-Contractor in the prosecution of the work provided for in said Contract, then, this obligation shall be void; otherwise to remain in full force and effect;

PROVIDED, HOWEVER, That this bond is executed pursuant to the provisions of Chapter 2253 of the Texas Government Code as amended and all liabilities on this bond shall be determined in accordance with the provisions of said statute to the same extent as if it were copied at length herein.

Surety, for value received, stipulates and agrees that no change, extension of time, alteration or addition to the terms of the Contract, or to work performed thereunder, or the plans, specifications, or drawings, accompanying the same, shall in anyway affect its obligation on this bond, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the Contract, or the work to be performed thereunder.

IN WITNESS WHEREOF, the said Principal and Surety have signed and sealed this instrument on the \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_.

\_\_\_\_\_  
Principal

\_\_\_\_\_  
Surety

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

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

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

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

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

PHYSICAL ADDRESS:\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

MAILING ADDRESS FOR NOTICE OF CLAIM:

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

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

LOCAL RECORDING AGENT  
PERSONAL IDENTIFICATION  
NUMBER:

\_\_\_\_\_

The name and address of the Resident Agent of Surety is:

\_\_\_\_\_

\_\_\_\_\_

**END OF SECTION**

**SECTION 00 61 19**

**ONE-YEAR MAINTENANCE BOND**

**THAT WE,** \_\_\_\_\_,  
\_\_\_\_\_, as Principal, hereinafter called Contractor, and the other  
subscriber hereto, \_\_\_\_\_,  
as Surety, do hereby acknowledge ourselves to be held and firmly bound to the San  
Jacinto River Authority (“SJRA”) in the sum of \$ \_\_\_\_\_,  
\_\_\_\_\_ , for the payment of which sum to be made to the  
SJRA and its successors, Contractor and Surety do bind themselves, their successors,  
jointly and severally.

**THE CONDITIONS OF THIS OBLIGATION ARE SUCH THAT:**

**WHEREAS,** the Contractor has on or about this day executed a Contract in  
writing with the SJRA for \_\_\_\_\_,  
all of such work to be done as set out in full in said Contract Documents therein referred  
to and adopted by the SJRA, all of which are made a part of this instrument as fully and  
completely as if set out in full herein.

**NOW THEREFORE,** if the said Contractor shall comply with the provisions of  
Paragraph 13.7.1 of the General Conditions, and correct work not in accordance with  
the Contract documents discovered within the established one-year period, then this  
obligation shall become null and void, and shall be of no further force and effect;  
otherwise, the same is to remain in full force and effect.

Notices required or permitted hereunder shall be in writing and shall be deemed  
delivered when given in accordance with the definition of Written Notice in the General  
Conditions of the Contract.

**IN WITNESS THEREOF,** the said Contractor and Surety have signed and sealed  
this instrument on the respective dates written below their signatures and Surety has  
attached its current Power of Attorney.

ATTEST, SEAL: (if a corporation)  
WITNESS: (if not a corporation)

\_\_\_\_\_  
Name of Contractor

By: \_\_\_\_\_  
Name:  
Title:

By: \_\_\_\_\_  
Name:  
Title:  
Date:

ATTEST/SURETY WITNESS:

\_\_\_\_\_  
Full Name of Surety

(SEAL)

\_\_\_\_\_  
Address of Surety for Notice  
\_\_\_\_\_

\_\_\_\_\_  
Telephone Number of Surety  
\_\_\_\_\_

By: \_\_\_\_\_

Name:

Title:

Date:

By: \_\_\_\_\_

Name:

Title: Attorney-in-Fact

Date:

**END OF SECTION**

**SECTION 00 61 20**

**ONE-YEAR SURFACE CORRECTION BOND**

**THAT WE,** \_\_\_\_\_,  
\_\_\_\_\_, as Principal, hereinafter called Contractor, and the other  
subscriber hereto, \_\_\_\_\_,  
as Surety, do hereby acknowledge ourselves to be held and firmly bound to the San  
Jacinto River Authority (“SJRA”) in the sum of \$\_\_\_\_\_ such sum being equal to four  
percent of the Original Contract Price, for the payment of which sum to be made to the  
SJRA and its successors, Contractor and Surety do bind themselves, their successors,  
jointly and severally.

**THE CONDITIONS OF THIS OBLIGATION ARE SUCH THAT:**

**WHEREAS,** the Contractor has entered into a Contract in writing with the SJRA  
dated of even date herewith, for \_\_\_\_\_,  
all of such work to be done in accordance with the Contract documents therein referred  
to, and adopted by the SJRA.

**NOW THEREFORE,** if the Contractor shall comply with the provisions of  
Paragraph 13.7.1 of the General Conditions, and repair, replace, restore, and correct  
surface work associated with backfill operations of subsurface work not in accordance  
with the Contract documents discovered within one year from the date that the One-  
year Maintenance Bond has expired, then this obligation shall become null and void,  
and shall be of no further force and effect; otherwise, the same is to remain in full force  
and effect.

Notices required or permitted hereunder shall be in writing and shall be deemed  
delivered when actually received or, if earlier, on the third day following deposit in a  
United States Postal Service post office or receptacle, with proper postage affixed  
(certified mail, return receipt requested), addressed to the respective other party at the  
address prescribed in the Contract documents, or at such other address as the  
receiving party may hereafter prescribe by written notice to the sending party.

**IN WITNESS THEREOF**, the said Principal and Surety have signed and sealed this instrument on the respective dates written below their signatures.

ATTEST, SEAL: (if a corporation)

WITNESS: (if not a corporation)

By: \_\_\_\_\_

Name:

Title:

\_\_\_\_\_  
Name of Contractor

By: \_\_\_\_\_

Name:

Title:

Date:

ATTEST/SURETY WITNESS:

(SEAL)

\_\_\_\_\_  
Full Name of Surety

\_\_\_\_\_  
Address of Surety for Notice

\_\_\_\_\_  
Telephone Number of Surety

By: \_\_\_\_\_

Name:

Title:

Date:

By: \_\_\_\_\_

Name:

Title: Attorney-in-Fact

Date:

**END OF SECTION**



**SECTION 00 62 04**

HISTORY OF OSHA ACTIONS AND LIST OF ON-THE-JOB INJURIES

Prior to award of the Contract, Successful Offeror will be required to file the following with the San Jacinto River Authority:

1. A history of all OSHA actions, advisories, etc., Contractor has received on all jobs worked in any capacity, prime or subcontractor. The history shall be for the two-year period preceding the Bid Date of the Project.
2. A list of all on-the-job injuries, accidents, and fatalities suffered by any present or former employees of Contractor during the same two-year period.
3. If less than the two-year period, give the date Contractor started doing business.
4. Provide the company Experience Modification Rate (EMR) for the three-year period preceding the Proposal Submission Date of the Project.

An officer of the company must certify in a notarized statement that the information submitted is true and correct.

**END OF SECTION**

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**SECTION 00 62 07**

**CERTIFICATION REGARDING DEBARMENT,  
SUSPENSION, AND OTHER RESPONSIBILITY MATTERS**

Contractor certifies to the best of its knowledge and belief that it and its principals:

1. Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by any Federal, State, or local department or agency;
2. Have not within a three-year period preceding this proposal been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State, or local) transaction or contract under a public transaction: violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;
3. Are not presently indicted for or otherwise criminally or civilly charged by a government entity (Federal, State, or local) with commission of any of the offenses enumerated in paragraph 2 of this certification; and
4. Have not within a three-year period preceding this application/proposal had one or more public transactions (Federal, State, or local) terminated for cause or default.

I understand that a false statement on this certification may be grounds for rejection of this proposal or termination of the award.

Company:

\_\_\_\_\_  
Typed Name & Title of Authorized Representative

\_\_\_\_\_  
Signature of Authorized Representative

\_\_\_\_\_  
Date

I am unable to certify the above statements. My explanation is attached.

**END OF SECTION**

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**SECTION 00 62 10**

**NAME AND QUALIFICATIONS OF PROPOSED SUPERINTENDENT (FOR FILING)**

Prior to award of the Contract, Offeror selected will be required to file the following with the San Jacinto River Authority:

1. The name and qualifications of the Superintendent being proposed to supervise the Project.

This information must be submitted to the SJRA within the time period stated in within 10 days of written notification of contract award. An officer of the company must certify in a statement that the information submitted is true and correct.

**END OF SECTION**

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**SECTION 00 62 16**  
**AFFIDAVIT OF INSURANCE**

**BEFORE ME**, the undersigned authority, on this day personally appeared

\_\_\_\_\_  
Affiant

who being by me duly sworn on his oath stated that he/she is \_\_\_\_\_  
Title

of \_\_\_\_\_  
Contractor's Company Name

the Contractor named and referred to within the Contract Documents; that he/she is fully competent and authorized to give this affidavit on behalf of Contractor, and that the attached original insurance certificate truly and accurately reflects the insurance coverage that is now in effect and will be in effect during the periods required by the Contract.

\_\_\_\_\_  
Affiant's Signature

SWORN AND SUBSCRIBED before me on \_\_\_\_\_  
Date

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

\_\_\_\_\_  
Print or type Notary Public name

My Commission Expires: \_\_\_\_\_  
Expiration Date

**END OF SECTION**

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# San Jacinto River Authority

## Certificate of Substantial Completion

ADMINISTRATIVE OFFICE  
 P.O. Box 329 · Conroe, Texas 77305  
 (T) 936.588.3111 · (F) 936.588.3043

### SECTION 00 65 16 CERTIFICATE OF SUBSTANTIAL COMPLETION

		Date of Substantial Completion:	
Project Name:		Project Number:	
Project Location:		Contract Number:	
Contractor:		Notice To Proceed Date:	
Principal Architect/Eng.:		Contracted Amount:	
Construction Manager:		Amount at Completion:	
Inspector:		Time to Complete:	
Punch List Correction Period:		Date of Inspection:	
	Days		

**Description of Substantially Complete Work:**

Issuance and execution of this Certificate of Substantial Completion by the San Jacinto River Authority (SJRA), shall denote that the described Work for the referenced Project has been inspected for compliance to the Project's Contract Documents and the described Work was found to be Substantially Complete. Therefore, the Date of Substantial Completion is established as indicated above.

Items having no impact on the intended and proper implementation, operation, or utilization of the described Work which have been determined as requiring correction or incomplete, are documented on the attached Substantial Completion Punch List. All such items shall be completed within the above stated Punch List Correction Period.

Punch List omissions of Contract Work does not relieve the Contractor of its responsibility to complete the Project Work in accordance with the Contract Documents.

Contract required warranties and guarantee periods shall commence on the Date of Substantial Completion.

Final insurance(s) shall remain in effect until the Project's Date of Final Completion of the Work is established.

<b>Construction Manager:</b>	_____	_____	Date: _____
	Print	Signature	
<b>Company:</b>	_____		
<b>Principal Architect/Eng.</b>	_____	_____	Date: _____
	Print	Signature	
<b>Company:</b>	_____		
<b>Contractor:</b>	_____	_____	Date: _____
	Print	Signature	
<b>Company:</b>	_____		
<b>SJRA Representative:</b>	_____	_____	Date: _____
	Print	Signature	
<b>SJRA General Manager:</b>	_____	_____	Date: _____
	Print	Signature	



# San Jacinto River Authority

## Certificate of Substantial Completion

ADMINISTRATIVE OFFICE  
 P.O. Box 329 · Conroe, Texas 77305  
 (T) 936.588.3111 · (F) 936.588.3043

### SUBSTANTIAL COMPLETION INSPECTION PUNCH LIST

		PREPARATION DATE:	
PROJECT NAME:		PROJECT NUMBER:	
PROJECT LOCATION:		PREPARED BY:	
CONTRACTOR:		INSPECTION DATE:	
WORK PORTION:			

#### INSPECTION ATTENDEES:

NAME	COMPANY	E-MAIL	TELEPHONE

SJRA FIELD REPRESENTATIVE:			DATE:	
----------------------------	--	--	-------	--

	PRINTED	SIGNATURE	
CONTRACTOR ( <i>ACKNOWLEDGE RECEIPT</i> ):			DATE:
	PRINTED	SIGNATURE	

### SUBSTANTIAL COMPLETION INSPECTION PUNCH LIST

DESCRIPTION:	DATE COMPLETE:	SIGNED BY:





# San Jacinto River Authority

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## Certificate of Substantial Completion

ADMINISTRATIVE OFFICE  
P.O. Box 329 · Conroe, Texas 77305  
(T) 936.588.3111 · (F) 936.588.3043

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# San Jacinto River Authority

ADMINISTRATIVE OFFICE  
 P.O. Box 329 · Conroe, Texas 77305  
 (T) 936.588.3111 · (F) 936.588.3043

## CERTIFICATE OF PARTIAL SUBSTANTIAL COMPLETION

### SECTION 00 65 16.23 CERTIFICATE OF PARTIAL SUBSTANTIAL COMPLETION

		Date of Partial Substantial	
Project Name:		Project Number:	
Project Location:		Contract Number:	
Contractor:		Notice To Proceed Date:	
Principal Architect/Eng.:		Contracted Amount:	
Construction Manager:		Amount at Completion:	
Inspector:		Time to Complete:	
Punch List Correction Period:	_____ Days	Date of Inspection:	

**Description of Substantially Complete Work:**

Issuance and execution of this Certificate of Partial Substantial Completion by the San Jacinto River Authority (SJRA), shall denote that the described Work for the referenced Project has been inspected for compliance to the Project's Contract Documents and the described Work was found to be Substantially Complete. Therefore, the Date of Partial Substantial Completion is established as indicated above.

Items having no impact on the intended and proper implementation, operation, or utilization of the described Work which have been determined as requiring correction or incomplete, are documented on the attached Partial Substantial Completion Punch List. All such items shall be completed within the above stated Punch List Correction Period.

Punch List omissions of Contract Work does not relieve the Contractor of its responsibility to complete the Project Work in accordance with the Contract Documents.

Contract required warranties and guarantee periods shall commence on the Date of Partial Substantial Completion.

Final insurance(s) shall remain in effect until the Project's Date of Final Completion of the Work is established.

<b>Construction Manager:</b>	_____	_____	<b>Date:</b> _____
	Print	Signature	
<b>Company:</b>	_____		
<b>Principal Architect/Eng.:</b>	_____	_____	<b>Date:</b> _____
	Print	Signature	
<b>Company:</b>	_____		
<b>Contractor:</b>	_____	_____	<b>Date:</b> _____
	Print	Signature	
<b>Company:</b>	_____		
<b>SJRA Representative:</b>	_____	_____	<b>Date:</b> _____
	Print	Signature	
<b>SJRA General Manager:</b>	_____	_____	<b>Date:</b> _____
	Print	Signature	







# San Jacinto River Authority

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ADMINISTRATIVE OFFICE  
P.O. Box 329 · Conroe, Texas 77305  
(T) 936.588.3111 · (F) 936.588.3043

## CERTIFICATE OF PARTIAL SUBSTANTIAL COMPLETION

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**SECTION 00 65 19**

**CONTRACTOR'S CERTIFICATION OF FINAL COMPLETION**

CERTIFICATE OF FINAL COMPLETION OF: [Legal Project Name]

Project No.: [ ]

Contract Dated: [Contract Date]

BEFORE ME, the undersigned authority, a Notary Public in and for the State of Texas, on this day personally appeared \_\_\_\_\_ who, being by me duly sworn, on his oath says that he or she represents \_\_\_\_\_, the Contractor who has performed a contract with the San Jacinto River Authority ("SJRA") for the construction of the Work described above, and is duly authorized to make this affidavit; that he or she has personally examined the Work described above as required by the Contract documents; that said Work and all items thereof have been completed and all known defects made good; that all surplus material, refuse, dirt and rubbish have been cleaned up and removed or disposed of as directed by the SJRA; that all parts of Work are in a neat, tidy, finished condition and ready in all respects for acceptance by the SJRA; that all gravel or shell roadway surfaces removed during the course of the Work have been replaced in accordance with the Specifications, that rates of pay for all labor employed on said Work have not been below the minimum set out in "Labor Classification and Minimum Wage Scale" in the Contract documents and that within the knowledge of affiant all just bills for labor and material and for the rental or use of any equipment or apparatus, used in, on, or in connection with the Work have been paid in full by the Contractor.

\_\_\_\_\_  
Affiant's Signature

SWORN AND SUBSCRIBED before me on  
**PART 1 -**

\_\_\_\_\_  
**DATE**

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

\_\_\_\_\_  
Print or type name

My Commission Expires: \_\_\_\_\_  
Expiration Date

THIS IS TO CERTIFY that I have thoroughly inspected the Work performed by the above named Contractor on the above described Contract and find all things in accordance with the Contract documents governing this Work.

\_\_\_\_\_  
Inspector

\_\_\_\_\_  
*[Project Manager or Construction Manager]*

Approved:

\_\_\_\_\_  
*[Title of Approval Authority], [Contracting Department]*

**END OF SECTION**

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# San Jacinto River Authority

ADMINISTRATIVE OFFICE  
 P.O. Box 329 · Conroe, Texas 77305  
 (T) 936.588.3111 · (F) 936.588.3043

## CERTIFICATE OF FINAL COMPLETION

### SECTION 00 65 19.23 CERTIFICATE OF FINAL COMPLETION

#### CERTIFICATE OF FINAL COMPLETION

	Date of Final Completion:	
Project Name:	Project Number:	
Project Location:	Contract Number:	
Contractor:	Notice To Proceed Date:	
Principal:	Contracted Amount:	
Construction Manager:	Amount at Completion:	
Inspector:	Time to Complete:	Days
Punch List Correction Period:	Date of Inspection:	

**Description of Finally Complete Work:**

**DATE OF FINAL COMPLETION** - The Work performed under the Contract was inspected on above indicated Date of Final Completion and found to be complete. The date of final completion of the Work is hereby established as indicated above.

**PUNCH LIST** - Contractor certified in Document 00 65 19 – Contractor’s Certification of Final Completion that all Punch List items were completed or corrected. Failure to identify incomplete work items or requirements of the Contract prior to issuance of this Certificate does not alter the responsibility of Contractor to comply with all provisions of the Contract.

**ACCEPTANCE OF THE WORK** - Based on inspection and to the best of our knowledge, information and belief, the Work has been completed in accordance with the terms and conditions of the Contract and we recommend acceptance of the Work by the San Jacinto River Authority or their delegated authority.

<b>Construction Manager:</b>	_____	_____	Date: _____
	Print	Signature	
<b>Company:</b>			
<b>Principal Architect/Engineer:</b>	_____	_____	Date: _____
	Print	Signature	
<b>Company:</b>			
<b>Contractor:</b>	_____	_____	Date: _____
	Print	Signature	
<b>Company:</b>			
<b>SJRA Project Manager:</b>	_____	_____	Date: _____
	Print	Signature	
<b>SJRA General Manager:</b>	_____	_____	Date: _____
	Print	Signature	



**San Jacinto River Authority**

ADMINISTRATIVE OFFICE  
P.O. Box 329 · Conroe, Texas 77305  
(T) 936.588.3111 · (F) 936.588.3043

**CERTIFICATE OF  
FINAL COMPLETION**

**FINAL COMPLETION INSPECTION PUNCH LIST**

PREPARATION DATE:			
PROJECT NAME:		PROJECT NUMBER:	
PROJECT LOCATION:		PREPARED BY:	
CONTRACTOR:		INSPECTION DATE:	
WORK PORTION:			

**INSPECTION ATTENDEES:**

NAME	COMPANY	E-MAIL	TELEPHONE

<b>SJRA FIELD REPRESENTATIVE:</b>			<b>DATE:</b>	
-----------------------------------	--	--	--------------	--

PRINTED

SIGNATURE

<b>CONTRACTOR (ACKNOWLEDGE RECEIPT):</b>			<b>DATE:</b>	
--	--	--	--------------	--

PRINTED

SIGNATURE

**FINAL COMPLETION INSPECTION PUNCH LIST**

DESCRIPTION:	DATE COMPLETE:	SIGNED BY:



# San Jacinto River Authority

ADMINISTRATIVE OFFICE  
P.O. Box 329 · Conroe, Texas 77305  
(T) 936.588.3111 · (F) 936.588.3043

## CERTIFICATE OF FINAL COMPLETION

PROJECT NAME:		PROJECT NUMBER:	
PROJECT LOCATION:		PREPARED BY:	
CONTRACTOR:		INSPECTION DATE:	
WORK PORTION:			
FINAL COMPLETION INSPECTION PUNCH LIST (CONTINUED)			
DESCRIPTION:		DATE COMPLETE:	SIGNED BY:

- End of Punch List -  
**END OF SECTION**



## San Jacinto River Authority

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ADMINISTRATIVE OFFICE  
P.O. Box 329 · Conroe, Texas 77305  
(T) 936.588.3111 · (F) 936.588.3043

## CERTIFICATE OF FINAL COMPLETION

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**SECTION 00 65 21**

**CONDITIONAL WAIVER AND RELEASE UPON PROGRESS PAYMENT**

Legal Project Name: \_\_\_\_\_

SJRA Project No.: \_\_\_\_\_

Contractor's Company Name ("Contractor"): \_\_\_\_\_

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

On receipt by Contractor of a check from the San Jacinto River Authority ("SJRA") in the sum of \$\_\_\_\_\_ payable to Contractor, and when the check has been properly endorsed and has been paid by the bank on which it is drawn, this document becomes effective to waive and release any and all rights, claims and causes of action which Contractor may have against SJRA, including but not limited to any and all claims for costs, expenses and damages incurred by Contractor, arising out of or related to all labor, materials, equipment and/or services furnished for incorporation in or use or work on the Project, through the period ending \_\_\_\_\_ [end date of current pay period] (the "Pay Period"), except to the extent of any contractual retainage withheld from Contractor, and except for the following pending claims, if any:

<u>Description of Claim</u>	<u>Amount (\$)</u>
-----------------------------	--------------------

Contractor warrants that Contractor has already paid or will use the funds received from this progress payment to promptly pay in full all amounts due the Contractor's laborers, Subcontractors, materialmen, vendors and suppliers for all work, materials, equipment, and/or services provided for or to the above referenced Project through the Pay Period.

Date \_\_\_\_\_

\_\_\_\_\_ (Contractor name)

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

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

This instrument was executed and acknowledged before me on this \_\_\_ day of \_\_\_\_\_, 20\_\_, by \_\_\_\_\_, known to me as the person whose name is subscribed above, as \_\_\_\_\_ [title] of \_\_\_\_\_ [company], on behalf of and as the authorized act of said entity.

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

My Commission Expires: \_\_\_\_\_

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**SECTION 00 65 27**

**CONDITIONAL WAIVER AND RELEASE UPON FINAL PAYMENT**

Legal Project Name: \_\_\_\_\_

SJRA Project No.: \_\_\_\_\_

Contractor's Company Name ("Contractor"): \_\_\_\_\_

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

On receipt by Contractor of a check from the San Jacinto River Authority ("SJRA") in the sum of \$\_\_\_\_\_ payable to Contractor, and when the check has been properly endorsed and has been paid by the bank on which it is drawn, this document becomes effective to waive and release any and all rights, claims and causes of action which Contractor may have against SJRA, including but not limited to any and all claims for costs, expenses and damages incurred by Contractor, arising out of or related to all labor, materials, equipment and/or services furnished for incorporation in or use or work on the Project, except for the following pending claims, if any:

<u>Description of Claim</u>	<u>Amount (\$)</u>
-----------------------------	--------------------

Contractor warrants that Contractor has already paid or will use the funds received from this payment to promptly pay in full all amounts due the Contractor's laborers, Subcontractors, materialmen, vendors and suppliers for all work, materials, equipment, and/or services provided for or to the above referenced Project.

Date \_\_\_\_\_

\_\_\_\_\_ (Contractor name)

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

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

This instrument was executed and acknowledged before me on this \_\_\_ day of \_\_\_\_\_, 20\_\_\_, by \_\_\_\_\_, known to me as the person whose name is subscribed above, as \_\_\_\_\_ [title] of \_\_\_\_\_ [company], on behalf of and as the authorized act of said entity.

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

My Commission Expires: \_\_\_\_\_

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**Section 00 72 00  
GENERAL CONDITIONS OF THE CONTRACT**

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**ARTICLE 1 – DEFINITIONS**

UNLESS OTHERWISE STATED IN THE CONTRACT DOCUMENTS, WORDS WHICH HAVE WELL-KNOWN TECHNICAL OR CONSTRUCTION INDUSTRY MEANINGS ARE USED IN THE CONTRACT DOCUMENTS IN ACCORDANCE WITH SUCH RECOGNIZED MEANINGS.

Whenever used in these General Conditions or in the other Contract Documents the following terms have the meanings indicated which are applicable to both the singular and plural thereof:

- 1.001 Addendum:** Written instruments issued by the Contract Awarding Authority which clarify, correct or change the bidding requirements or the Contract Documents prior to the Due Date. "Addenda" is the plural form of Addendum.
- 1.002 Agreement:** Document signed by the Parties and binding the Parties, containing the name of Contractor, title and location of the Project, original Contract Time Requirements, Original Contract Amount, enumeration of documents included in the Contract and other provisions.
- 1.003 Allowance:** A not-to-exceed amount which is established between the Owner and the Contractor as part of the Contractor's Bid/Proposal when the precise scope of a particular line item has not been defined to a level which is adequate for the Contractor to provide definitive line item pricing for that particular scope of Work. The use of any Allowances by the Contractor in any Bid/Proposal will be subject to the Owner's sole approval. Additional Allowances or adjustments can be added to any Bid/Proposal upon the agreement of the Owner and Contractor.
- 1.004 Alternative Dispute Resolution:** The process by which a disputed Claim may be settled if the Owner and the Contractor cannot reach an agreement between themselves, as an alternative to litigation.
- 1.005 Application for Payment:** Is the Contractor's monthly pay application, the form of which must be acceptable to the Owner.
- 1.006 Bid/Proposal:** A complete, properly signed response to an Invitation for Bid/Proposal that, if accepted, would bind the Bidder/Offeror to perform the resultant Contract.
- 1.007 Bidder/Offeror:** A person, firm, or entity that submits a Bid/Proposal in response to an Invitation for Bids/Proposals. Any Bidder/Offeror may be represented by an agent after submitting evidence reasonably satisfactory to Owner demonstrating the agent's authority to bind the Bidder/Offeror. The agent cannot certify as to his own agency status.
- 1.008 Bid/Proposal Documents:** The Advertisement or Invitation for Bids/Proposals, Instructions to Bidders/Offerors, the Bid/Proposal Form, the Contract Documents and Addenda.
- 1.009 Bonds:** Performance Bond, Payment Bond, Maintenance Bond, and other Surety instruments executed by Surety. When in singular form the term refers to an individual instrument.
- 1.010 Calendar Day:** Any day of the week; no days being excepted. Work on Saturdays, Sundays, and/or Legal Holidays shall be as approved by and coordinated with Owner.
- 1.011 Change Directive:** A written directive to Contractor, signed by Owner, ordering a change in the Work that is within the general scope of the Contract and consisting of additions, deletions, or other revisions and stating a proposed basis for adjustment, if any, in the Contract Amount or Contract Time Requirements, or both. A Change Directive may be used in the absence of total agreement on the terms of a Change Order. A Change Directive can change the Contract Amount or Contract Time Requirements, and the parties may reasonably expect that the

- change directed or documented by a Change Directive will be incorporated in a subsequently issued Change Order.
- 1.012 Change Orders:** Written agreements entered into between Contractor and Owner authorizing an addition, deletion, or revision to the Contract, issued on or after the Execution Date of the Contract.
- 1.013 CMT Consultant:** Owner’s consultant responsible for the testing of construction materials engineering, and the verification testing services necessary for acceptance of the Work by the Owner as required by Section 2267.058(a) of the Texas Government Code.
- 1.014 Claim:** A written demand or written assertion by the Owner or the Contractor seeking, as a matter of right, an adjustment or interpretation of Contract terms, payment of money, extension of time or other relief with respect to the terms of the Contract. The Party making the Claim has the responsibility to substantiate the Claim.
- 1.015 Commissioning:** This is the process of verification, preliminary testing, starting up and functional operations testing of all equipment and systems which are part of the Project. The term “commissioning” shall specifically include the drafting, review and verification of all test plans and test reports for all equipment and systems which are part of the Project.
- 1.016 Construction Documents:** Means the Plans or Drawings and the Specifications and such other documents incorporated into the Contract Documents that set out the Contractor's scope of work to be performed under the Contract and/or the technical requirements for the design and construction of the Work.
- 1.017 Contractor:** Means the individual, firm, corporation, or other business entity identified as such in the Agreement, including its successors and its authorized representatives, with whom Owner has entered into the Contract for performance of the Work. The Contractor may also be referred to as the “Bidder” or “Offeror” in the Contract Documents, both of which will be understood to mean the “Contractor” as identified in the Agreement.
- 1.018 Construction Phase:** Means the implementation and execution of the Work required by the Contract Documents, commencing with the Notice to Proceed for the Work.
- 1.019 Contract:** The binding legal agreement between the Owner and the Contractor including all documents that have been incorporated into the agreement between Owner and Contractor for performance of the Work, as evidenced by the Contract Documents, and into which these General Conditions of the Contract (General Conditions) have been incorporated.
- 1.020 Contract Amount:** The monetary amount stated in the Agreement as it may be adjusted by Change Order or Change Directive, payable by Owner to Contractor for completion of the Work in accordance with the Contract Documents.
- 1.021 Contract Awarding Authority:** The SJRA Board of Directors. When authorized by the SJRA Board of Directors, the SJRA General Manager may enter into Contracts on behalf of the SJRA.
- 1.022 Contract Documents:** Those items so designated in the Agreement. Approved Shop Drawings, other Contractor submittals, and the reports and drawings of physical subsurface, geotechnical or environmental conditions are not Contract Documents.
- 1.023 Contract Time Requirements:** Means those requirements for the timely performance of the Work as set forth in the Agreement, including Milestones and the required dates for Mechanical Completion, Substantial Completion and Final Completion.
- 1.024 Cost of the Work:** Has the meaning set forth in Article 11.5.

- 1.025 Critical Path:** The longest series of tasks that runs consecutively from the beginning to the end of the Work, as determined by duration and workflow sequence. This longest path determines how quickly the Work can be completed, given appropriate resources.
- 1.026 Day:** Means that twenty-four hour period measured from midnight to the next midnight. When any period is referred to in days, it will be computed to exclude the first and include the last day of such period.
- 1.027 Defective:** Means with respect to any Work, failing to conform in any respect to any one or more requirements of the Contract Documents.
- 1.028 Delay:** Means a delay, disruption, hindrance, interference, acceleration, recovery effort, or loss of productivity or efficiency, or any other impact whatsoever with respect to the Critical Path of the Work.
- 1.029 Discrepancies:** Means any error, omission, conflict, inconsistency, discrepancy, or lack of clarity in the Contract Documents discovered by the Contractor or that should reasonably have been discovered by the Contractor in fulfilling its obligations arising from the Contract and based upon its applicable standard of care as a Contractor and not as a design professional. The Discrepancy must be determinable by the Contractor through an evaluation of one or more drawings or specifications which are part of the Construction Documents, the above-grade Site conditions, geotechnical reports, surveys or other information provided to Contractor by Owner or any combination thereof.
- 1.030 Division 01:** Means the General Requirements (Division One) of the Specifications made a part of the Construction Documents, whether such Specifications are set out in a separate document or are part of the Project Manual.
- 1.031 Document Control:** This is the process of generating, transmitting, receiving, recording, filing and distributing documents and records generated by the Project Team Members and others during the execution of the Project. The process may utilize an electronic or paper format, or both.
- 1.032 Drawings:** Those portions of the Contract Documents which are graphic and pictorial representations of the scope, extent and character of the Work to be furnished and performed by Contractor and which have been approved by Owner. Drawings may include plans, elevations, sections, details, schedules and diagrams. Shop Drawings are not Drawings.
- 1.033 Due Date:** The date and time specified for receipt of Bids/Proposals or any other required submittal from the Contractor.
- 1.034 Equal:** The terms "equal" or "approved equal" shall have the same meaning.
- 1.035 Execution Date:** Date of last signature of the parties to the Agreement.
- 1.036 Field Order:** A written authorization by the Owner for a minor variation in the Work from the requirements of the Contract Documents which do not involve an adjustment in the Contract Amount or Contract Time Requirements and are compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents.
- 1.037 Final Completion:** The point in time when Owner determines that all Work has been completed and the Contract fully performed except for those obligations that survive final payment.
- 1.038 Force Account:** A basis of payment for the direct performance of Work with payment based on the Cost of the Work and consideration for overhead and profit, as set forth in Section 11.5.
- 1.039 Force Majeure:** For purposes of this Contract, events of "force majeure" shall consist of the following, to the extent that they are beyond the reasonable control of Contractor and also cause Delay to the Critical Path of the Project: acts of God, acts of war, terrorist acts, civil unrest, riots, labor disputes (excluding

disputes with laborers on the Project), unavoidable material shortages, fire or other casualty loss (not attributable to the acts or omissions of Contractor or any Subcontractor of any tier), newly announced or enacted governmental restrictions, or acts or inactions of governmental agencies other than the Owner and outside of the Owner’s responsibility and control.

**1.040 Hazardous Conditions:** Are any materials, wastes, substances, and chemicals deemed to be hazardous under applicable Legal Requirements or the handling, storage, remediation, or disposal of which are regulated by applicable Legal Requirements.

**1.041 Not used.**

**1.042 Legal Requirements:** Are all applicable federal, state, and local laws, codes, ordinances, rules, regulations, orders, and decrees of any governmental or quasi-governmental entity having jurisdiction over the Project or Site, the practices involved in the Project or Site or any Work.

**1.043 Legal Holidays:**

.1 The following are recognized by the Owner:

<u>Holiday Observed</u>	<u>Date</u>
New Year’s Day	January 1
Martin Luther King Day	Third Monday in January
Presidents’ Day	Third Monday in February
Memorial Day	Last Monday in May
Independence Day	July 4
Labor Day	First Monday in September
Veterans Day	November 11
Thanksgiving Day	Fourth Thursday in November
Friday after Thanksgiving	Friday after Thanksgiving
Christmas Eve	December 24
Christmas Day	December 25

.2 If a Legal Holiday falls on Saturday, it will be observed on the preceding Friday. If a Legal Holiday falls on Sunday, it will be observed on the following Monday.

**1.044 Major Subcontractor:** Means a Subcontractor of the Contractor whose Subcontract amount with the Contractor exceeds or is reasonably expected to exceed the sum of \$50,000.00.

**1.045 Manufacturer:** An individual or entity who produces goods, materials, or equipment for use or sale and has a direct contract with Contractor or Supplier or any Subcontractor or Sub-Subcontractor to furnish materials or equipment to be incorporated in the Work.

**1.046 Master Project Schedule:** Is the most recent version of the Contractor’s Project Schedule which has been formally accepted by the Owner.

**1.047 Mechanical Completion:** Means when the specified Work has been delivered, constructed, installed, and Contractor has successfully completed all required local functional testing, obtained Manufacturers’ certificates of proper installation, and completed operations readiness testing such that all improvements and equipment are ready for performance testing.

**1.048 Milestones:** Means a significant event specified in the Owner’s Project Schedule or the Contract Documents relating to an intermediate completion date or time prior to Substantial Completion of all the Work.

**1.049 Modification:** Means a written amendment to the Contract, including but not limited to (1) a Change Order, or (2) a Change Directive.

- 1.050 Notice to Proceed:** A Written Notice given by Owner to Contractor fixing the date on which the Contract Time Requirements will commence to run by establishing Date of Commencement of the Work covered by the Written Notice and on which Contractor shall start to perform Contractor's obligations under the Contract Documents for such Work.
- 1.051 Owner:** The San Jacinto River Authority (the "SJRA" or the "Owner"), a public entity, organized and existing under the laws of the State of Texas, acting through the SJRA Board of Directors, the SJRA General Manager or his/her designee, officers, agents or employees to administer design and construction of the Project.
- 1.052 Owner's Independent Contractor:** A contractor who has been employed separately by the Owner and is not a Subcontractor of the Contractor.
- 1.053 Owner's Project Schedule:** Means the dates indicated in the Instructions to Bidders/Offerors and all Contract Time Requirements.
- 1.054 Owner's Representative:** The designated representative or representatives of the Owner. Owner's Representative may be designated from the Owner's staff, the Principal Architect/Engineer, an Owner's Independent Contractor(s), or an Owner's consultant(s) employed for the purpose of representing the Owner on a given Project or Projects.
- 1.055 Partial Occupancy or Use:** Use by Owner of a substantially completed part of the Work for the purpose for which it is intended (or a related purpose) prior to Substantial Completion of all the Work, provided Owner and Contractor have, with respect to such part of the Work, accepted in writing the responsibilities assigned to each of them for payments, retainage if any, security, maintenance, utilities, corrective work, insurance and warranties.
- 1.056 Pre-construction Conference:** Is the required meeting between the Owner and the Contractor before Work can be initiated in the field. Contractor will have made all of the required submittals prior to the date of the Pre-construction Conference in accordance with Section 2.4.2.
- 1.057 Preliminary Project Schedule:** Is the initial Contractor's Schedule for the Work required under Section 2.4.2 and must conform to and be integrated with the Milestones contained in the Owner's Project Schedule for the Work and is subject to Owner's approval.
- 1.058 Principal Architect/Engineer (Engineer):** The Owner's design professional identified as such in the Contract. The terms "Principal Architect/Engineer" and "Engineer", as indicated with initial capital letters, mean the same entity, as defined in the Agreement. References to Principal Architect/Engineer in these General Conditions shall refer to the Owner's Principal Architect/Engineer (Engineer), except as otherwise expressly provided herein. Nothing contained in the Contract Documents shall create any contractual or agency relationship between the respective Principal Architect/Engineer and Contractor. References can be singular or plural and will apply to all of the Principal Architects or Engineers as may be applicable.
- 1.059 Project:** Total construction, of which the Work performed under Contract may be the whole or part, and which may include construction by the Owner or by Owner's Independent Contractors.
- 1.060 Project Manual:** That portion of the Contract Documents which may include the following: introductory information; bidding requirements, Contract forms, Agreement, General Conditions, Supplemental General Conditions; General Requirements; Specifications; Drawings; Project Safety Manual; and Addenda.
- 1.061 Project Schedule:** Is the Contractor's most recent schedule submitted to the Owner.



- 1.062 Project Team:** Means the Owner, the Owner's Representative, the Contractor, the Principal Architect/Engineer, any consultants of the Principal Architect/Engineer designated by the Owner, any Owner's Independent Contractors, and any Owner's consultants employed for the purpose of programming, design, and construction of the Project. The constitution of the Project Team may vary at different stages of the Work. The Project Team will be designated by Owner and may be modified from time to time by Owner.
- 1.063 Not used.**
- 1.064 Recovery Schedule:** Means a short duration schedule implemented to bring the Work back on schedule to achieve the Contract Time Requirements for the Project.
- 1.065 Rental Rate Blue Book:** Is the document published by EquipmentWatch which identifies the rental rates for equipment in the construction industry.
- 1.066 Resident Project Representative:** The authorized representative of the Owner's staff, the Principal Architect/Engineer, or an Owner's consultant who may be assigned to the Site or any part thereof. Not all Projects will utilize a Resident Project Representative.
- 1.067 Schedule of Values:** Is a schedule, prepared and maintained by the Contractor, allocating portions of the Contract Amount to various portions of the Work, including a tabulation of all of the costs of the various Subcontracts and materials which in the aggregate make up the Contract Amount. The Schedule of Values shall be subject to Owner's approval and, after such approval, be used as the basis for reviewing the Contractor's Applications For Payment.
- 1.068 Scope of Work:** Is the entire Work which is included within the Contract for this Project. This term can also be used to describe the subset of Work which is included within a particular Trade Subcontract.
- 1.069 Shop Drawings:** All drawings, diagrams, illustrations, schedules and other data or information which are specifically prepared or assembled for the Work by or for Contractor, subcontractor or supplier and submitted by Contractor as required by the Contract Documents.
- 1.070 Site:** Is the land or premises on which the Project is located.
- 1.071 Specifications:** Those portions of the Contract Documents furnished by Owner through its respective Principal Architects/Engineers consisting of written technical descriptions as applied to the Work, which set forth to Contractor, in detail, the requirements which must be met by all materials, equipment, construction, systems, standards, workmanship, and services as applied to the Work and certain administrative requirements and procedural matters.
- 1.072 Start-Up:** This is the subset of Commissioning at which time the Project equipment and / or systems are placed in full operation in preparation for the operational testing phase of the Project.
- 1.073 Stipulated Sum:** Single lump sum amount stated for the completion of the Work or a portion thereof required by this Contract.
- 1.074 Substantial Completion:** The stage in the progress of the Work when the Work, or designated portion thereof, is sufficiently complete in accordance with the Contract Documents so Owner can occupy or utilize the Work for its intended use, as evidenced by a Certificate of Substantial Completion approved by Owner, as further defined in Article 14.07.
- 1.075 Subcontractor (or Trade Subcontractor):** An individual, firm, corporation, or other business entity having a direct contract with the Contractor for the performance of a portion of the Work under the Contract. A Subcontractor includes a supplier of tools, equipment or materials as well as an individual or entity renting tools or equipment to the Contractor. For purposes of this

- Contract, unless designated otherwise, the term "Subcontractor" shall include all Sub-Subcontractors and Suppliers in contractual privity to the Subcontractor.
- 1.076 Sub-Subcontractor:** An individual, firm, corporation, or other business entity who has a direct or indirect contract with a Subcontractor of any tier to perform a portion of the Work, to furnish tools, equipment or materials, or to rent tools or equipment. For purposes of this Contract, unless designated otherwise, the term "Sub-Subcontractor" shall include all lower tier subcontractors and Suppliers in contractual privity to the Sub-Subcontractor.
- 1.077 Superintendent:** The representative of Contractor authorized in writing to receive and fulfill instructions from the Owner's Representative, and who shall supervise and direct construction of the Work.
- 1.078 Supplemental General Conditions:** The part of the Contract Documents which amends or supplements the General Conditions, but only to the extent provided therein. Not all Projects will utilize Supplemental General Conditions. All General Conditions which are not so amended or supplemented remain in full force and effect.
- 1.079 Supplier:** An individual or entity having a direct contract with Contractor or with any Subcontractor to furnish materials or equipment or products, or services to be incorporated in the Work by Contractor or any Subcontractor.
- 1.080 Surety:** Corporate entity that is bound by one or more Bonds, and is responsible for the completion of the Work, including during the correction period, and for payment of debts incurred by Contractor or Subcontractors for work, services, labor, materials or equipment provided in connection with the Work. Surety shall include any co-surety or reinsurer, as applicable.
- 1.081 Underground Improvements:** Is defined in Section 4.2.3 of these General Conditions.
- 1.082 Unit Price:** An amount stated in the Contract for an individual, measurable item of work, which, when multiplied by actual quantity incorporated into the Work, amounts to full compensation for completion of the item, including work incidental to it.
- 1.083 Unit Price Quantities:** Quantities indicated in the Contract that are approximations made by the Owner for contracting purposes.
- 1.084 Unit Price Work:** Is any Work which is to be executed based upon a Unit Price for that Work which has been agreed upon in advance between the Parties in accordance with Section 11.6 of these General Conditions.
- 1.085 Unusual Inclement Weather:** Is defined in Section 12.2 of these General Conditions.
- 1.086 Value Analysis:** Means the systematic application of recognized techniques by a multi-disciplined team to identify the function of a product or service, establish a worth for that function, generate alternatives through the use of creative thinking, and provide the needed functions to accomplish the original purpose of the Project, reliably, without sacrificing safety, necessary quality, or environmental attributes of the Project.
- 1.087 Work:** The entire completed construction, or the various separately identifiable parts thereof, required to be furnished under the Contract Documents, including all labor, products, equipment, material, supervision, insurance, temporary facilities and services provided by Contractor to fulfill Contractor's obligations. The Work may constitute the whole or a portion of the Project.
- 1.088 Working Day:** Any day of the week, not including Saturdays, Sundays, or Legal Holidays in which conditions under the Contractor's control will permit work for a continuous period of not less than seven (7) hours during Working Hours. Upon agreement with Owner, work on Saturdays, Sundays and/or Legal Holidays may be allowed and will be considered a Working Day.

- 1.089 Working Hours:** Those hours in which the Work shall be performed. Except as otherwise authorized in writing by Owner's, all Work shall be done between 7:00 a.m. and 6:00 p.m. However, emergency work may be done without prior permission as indicated in Section 6.11.07. Night Work may be revoked at any time by Owner if Contractor fails to maintain adequate equipment and supervision for the prosecution and control of the night Work.
- 1.090 Written Notice:** Written communication between Owner and Contractor. Written Notice shall be deemed to have been duly served if delivered in person to Owner's Representative or Contractor's duly authorized representative, or if delivered at or sent by registered or certified mail with proper postage affixed to the attention of Owner's Representative or Contractor's duly authorized representative at the last business address known to the party giving notice, or by facsimile to the facsimile number known to the party giving notice, provided any notice delivered by facsimile after 5:00PM shall be deemed delivered on the next business day.

**ARTICLE 2 - PRELIMINARY MATTERS**

- 2.1 Delivery of Contract, Bonds, Insurance, etc.:** After written notification to Contractor of anticipated award of Contract, and at least ten (10) days prior to the SJRA Board of Directors Meeting at which a contract award is anticipated, Contractor shall deliver to Owner original, hard copies of the signed Agreement, unsigned Bond forms, required evidence of insurance, including without limitation, all certificates of insurance and endorsements, signed disclosure of interested parties (Form 1295), signed Conflict of interest Questionnaire, and signed and notarized Verification Company Does Not Boycott Israel, as identified in the Bid/Proposal Documents. Within three (3) days of Contractor's receipt of the fully executed Agreement, the Contractor shall deliver the original, hard copy fully executed Bonds to Owner. The requirements of this Section 2.1 apply regardless of whether or not the Agreement is also executed using electronic signatures or transmitted electronically. Any violation of this Section 2.1 by Contractor shall render the Contract voidable by Owner.
- 2.2 Copies of Documents:** Owner shall furnish to Contractor up to ten (10) copies of the Contract Documents unless otherwise specified. Additional copies will be furnished, upon request, at a cost to be specified by the Owner.
- 2.3 Commencement of Contract Time Requirements; Notice to Proceed:** The applicable Contract Time Requirements will begin to run on the day indicated in the Notice to Proceed for the Work covered in such Notice.
- 2.4 Before Starting Construction:**
- 2.4.1** No Work shall be done at the Project Site prior to the Pre-construction Conference without Owner's written approval. Before undertaking each part of the Work, Contractor shall carefully study the Contract Documents to check and verify pertinent figures shown thereon and compare them accurately to all applicable field measurements and conditions and other information known to Contractor and other information made available to Contractor by Owner. Contractor shall promptly report in writing to Owner's Representative any conflict, error, ambiguity or Discrepancy which Contractor may discover and shall obtain a written interpretation or clarification from Owner's Representative before proceeding with any Work affected thereby. Contractor shall be liable to Owner for failure to report any conflict, error, ambiguity or

Discrepancy in the Contract Documents about which Contractor knew or reasonably should have known.

**2.4.2** Successful completion of the Work within the applicable Contract Time Requirements is of primary importance. **Time is of the essence to this Contract.** Therefore, the Contractor hereby agrees to submit to the Owner's Representative for review and approval, or acceptance, as appropriate, all information required by this section, including a Preliminary Project Schedule for the Work within thirty (30) days from date of the Owner's issuance of the Notice To Proceed with the Work or at the scheduled Pre-construction Conference, whichever is later. The Owner's Representative will schedule the Pre-construction Conference upon the timely submittal of the required documents, unless the allowable time for providing the required submittals is extended by written mutual agreement. Prior to the date scheduled for the Pre-construction Conference, the Contractor will submit the following to the Owner:

- .01** A proposed Preliminary Project Schedule (the "Preliminary Project Schedule") for the Work developed using the scheduling software authorized in Section 6.03 of the General Conditions, unless otherwise approved by Owner, to confirm that all Work will be completed within the respective Contract Time Requirements. The Preliminary Project Schedule must satisfy the requirements of Section 6.03 of these General Conditions and must be prepared in accordance with Division 01 - Section 01 32 16, Construction Progress Schedules. Such Preliminary Project Schedule shall also conform to the Owner's Project Schedule. This Preliminary Project Schedule must contain sufficient detail to indicate that the Contractor has properly identified required Work elements and tasks, has provided for a sufficient and proper workforce and integration of Subcontractors and Suppliers, has provided sufficient resources and has considered the proper sequencing of the Work required to result in a successful Project that can be completed within the Contract Time Requirements. The Project Schedule and Schedule of Values shall be developed together to permit the Work progress to be accurately reflected in the Contractor's Applications for Payment.
- .02** An organizational chart showing the principals and management personnel who will be involved with the Work, including each one's responsibilities for the Work;
- .03** A complete listing of the Contractor's key employees proposed for the Work. List each one by name and job title, and show length of employment with Contractor.
- .04** Emergency contact telephone numbers for the Project Manager and the project Superintendent.
- .05** A discussion and confirmation of the Contractor's commitment to health, safety and environment by providing a copy of its Health, Safety and Environmental Policies, employee's safety handbook and the safety records for the past three years of Contractor's proposed project manager and Superintendent;
- .06** A preliminary schedule of Shop Drawings and sample submittals;
- .07** A preliminary Schedule of Values for all of the Work, subdivided into component parts in sufficient detail to serve as the basis for progress payments during construction. At a minimum, the schedule of values

shall be broken out by trade and split between materials and labor as commented on and accepted by Owner. Such prices will include overhead and profit applicable to each item of Work;

- .08 A letter designating Contractor's Superintendent and project manager, and a confirmation of past project experience for the Contractor's Superintendent and project manager specifically applicable to the Work;
- .09 A letter designating the "Competent Person(s)" on general safety and excavation safety measures along with certifications or other documentation of the safety representative's qualifications;
- .10 If applicable, an excavation safety system plan;
- .11 If applicable, a plan illustrating proposed locations of temporary facilities;
- .12 A letter designating the Texas Registered Professional Land Surveyor for layout of the Work, if the Work requires the services of a licensed surveyor.

**2.4.3** Neither the rejection, acceptance, comment on nor the approval of any of the submittals required in Section 2.4.2, above, will constitute either the adoption, affirmation, or direction of the Contractor's means and methods of the performance of the Work which remain the sole responsibility of the Contractor. Owner shall not be responsible for, and will not have control or charge of, construction means, methods, techniques, sequences or procedures, or for safety precautions and programs in connection with the Work, and shall not be responsible for the Contractor's failure to carry out the Work in accordance with the Contract Documents. Owner shall not be responsible for or have control or charge over the acts or omissions of Contractor, Subcontractors or any of their agents or employees or any other persons performing any of the Work.

**2.5 Pre-construction Conference:** Prior to commencement of Work at the Site, Contractor must attend a Pre-construction Conference with Owner's Representative and others required by Owner, and participate in an inspection of the Project Site if required by Owner.

**2.6 Initially Acceptable Schedules:** Unless otherwise provided in the Contract Documents, Contractor shall obtain approval of Owner of the Preliminary Project Schedule submitted in accordance with Section 2.4.2.01 before the first progress payment will be made to Contractor. The Preliminary Project Schedule must provide for an orderly progression of the designated portion of the Work to completion within the Contract Time Requirements, including any specified Milestones, and shall permit the Work progress to be accurately reflected in the Contractor's Applications for Payment. Approval of the Preliminary Project Schedule by Owner will not impose on Owner responsibility or liability for the sequencing, scheduling or progress of the Work, nor shall it constitute interference with, nor shall it relieve Contractor from Contractor's full responsibility for the Work. Contractor's schedule of Shop Drawings and sample submissions shall provide adequate time, in Owner's opinion, for properly reviewing and processing the required submittals. Contractor's Schedule of Values must conform to the requirements set forth in the Contract. The process of approving Preliminary Project Schedule and updates to the Master Project Schedule shall not constitute a warranty by the Owner that any non-Contractor milestones or activities will occur as set out on the Preliminary Project Schedule or the Master Project Schedule, or approval of the logic set out in the Preliminary Project Schedule

or Master Project Schedule. Approval of the Preliminary Project Schedule, the Master Project Schedule or any updates thereto does not constitute a warranty by the Owner to furnish any Owner-furnished information or services any earlier than Owner would otherwise be obligated to furnish that information or services under the Contract Documents. Failure of the Work to proceed in the sequence scheduled by Contractor shall not serve as any basis for a Claim for additional compensation or adjustment of the Contract Time Requirements.

**ARTICLE 3 - CONTRACT DOCUMENTS: INTENT, AMENDING, REUSE**

**3.1 Intent:** The intent of the Contract Documents is to include all information necessary for the proper execution and timely completion of the Work by Contractor. The Contractor will execute the Work described in and reasonably inferable from the Contract Documents as necessary to produce the results intended by the Contract Documents.

**3.1.1** The Contract Documents are complementary in nature, and what is shown in one location on the Drawings or Specifications shall be construed to apply to all other similar locations of the Drawings and Specifications. In the event of any internal inconsistency in either the Drawings or Specifications, or with each other, the Owner shall resolve such inconsistency and Contractor shall perform in accordance with the Owner’s determination. In the determination of the Contract Amount, the Contractor has provided for such further development consistent with the Contract Documents and reasonably inferable therefrom. It is the intent and understanding of Contractor that the Contract Amount includes the construction of completed and tested Work by the Contractor, including all devices, fasteners, materials or other work not shown in the Drawings and Specifications but which are reasonably inferable therefrom and any and all incidental accessories necessary to make the Work complete and operable in all respects (even if not specified in the description of the Work, but necessary for proper installation and operation of the Work under the Drawings and Specifications), all of which shall be included in the Contract Amount.

**3.1.2** The expression “reasonably inferable” and similar terms in the Contract Documents shall be interpreted to mean reasonably inferable by a contractor familiar with the Project and exercising the care, skill and diligence of the Contractor required by the Contract Documents. Such further development does not include such things as changes in scope, systems, kinds and quality of materials, finishes or equipment, all of which, if required, shall be incorporated by Change Order or Change Directive. The Contract Documents shall be interpreted with the understanding that a common sense approach will be utilized as necessary so that the Contract Documents produce the intended results for the benefit of the Owner as follows:

- .1** The Contract Documents are intended to be complimentary and interpreted in harmony so as to avoid conflict. Words and phrases will be interpreted in a manner consistent with construction and design industry standards. What is required by any Contract Document shall be required by all of them;
- .2** In the event of any inconsistency, conflict or ambiguity between or among the Contract Documents that cannot be harmonized so as to avoid conflict, the Contract Documents shall take precedence in the

following order: Modifications, documents amending, modifying or supplementing the Contract Documents pursuant to Article 3.3 of the General Conditions, the Agreement, Exhibits to the Agreement, the Supplemental Conditions (if any), the General Conditions, Instructions to Bidders/Offerors, Notice to Proceed, Addenda, Specifications, Drawings, Contractor's Bid/Proposal, Documentation submitted by Contractor prior to Notice of Award and attached to the Agreement, Performance, Payment and Maintenance Bonds; and

- .3 The definitions of terms herein shall apply equally to the singular and plural forms of the terms defined. Whenever the context may require, any pronoun shall include the corresponding masculine, feminine and neuter forms. The words "include", "includes" and "including" shall be deemed to be followed by the phrase "without limitation". Unless the context requires otherwise (a) any definition of or reference to any agreement, instrument or other document herein shall be construed as referring to such agreement, instrument or other document as from time to time amended, supplemented or otherwise modified (subject to any restrictions on such amendments, supplements or modifications set forth herein), (b) any reference herein to any Party shall be construed to include such Party's successors and assigns (subject to the restrictions contained herein), and (c) the words "herein", "hereof" and "hereunder", and words of similar import, shall be construed to refer to the entirety of the Contract Documents and not to any particular provision, unless the context clearly dictates otherwise. No provision of this Agreement shall be interpreted or construed against any Party because such Party or its legal representative drafted such provision.

### **3.1.3 Standards, Specifications, Codes, Laws, and Regulations**

- .1 Reference to standards, specifications, manuals, or codes of any technical society, organization, or association, or to Legal Requirements, whether such reference be specific or by implication, shall mean the standard, specification, manual, code, or Legal Requirements in effect at the time of opening of Bids/Proposals (or on the Effective Date of the Agreement if there were no Bids/Proposals) and as amended, modified, codified or reenacted, in whole or in part, and in effect from time to time, except as may be otherwise specifically stated in the Contract Documents.
- .2 No provision of any such standard, specification, manual or code, or any instruction of a Supplier shall be effective to change the duties or responsibilities of Owner, Contractor, or Engineer, or any of their subcontractors, consultants, agents, or employees from those set forth in the Contract Documents. No such provision or instruction shall be effective to assign to Owner, or the Principal Architect/Engineer, or any of their related entities 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.

**3.2 Reporting and Resolving Discrepancies:** If, during the performance of the Work, Contractor discovers any Discrepancy within the Contract Documents or

between the Contract Documents and any provisions of any Legal Requirements or of any such standard, specification, manual or code or instructions of any Supplier, Contractor shall report it to Owner's Representative in writing at once, and Contractor shall not proceed with the Work affected thereby until a clarification, an amendment or supplement to the Contract Documents has been issued by one of the methods indicated in Section 3.3.1 or Section 3.3.2 below. Contractor shall be liable to Owner for failure to report any such Discrepancy that Contractor knew about or should reasonably have discovered in fulfilling its obligations arising from the Contract.

**3.3 Clarifying, Amending and Supplementing Contract Documents:**

**3.3.1** The Contract Documents may be amended to provide for additions, deletions and revisions in the Work or to modify the terms and conditions thereof in one or more of the following ways:

- .1 Change Order.
- .2 Change Directive.

**3.3.2** In addition, the requirements of the Contract Documents may be supplemented, and minor variations and deviations in the Work that do not affect the Contract Amount or Contract Time Requirements may be authorized, in one or more of the following ways:

- .1 Field Order.
- .2 Shop Drawing or sample approved in accordance with the Contract Documents.
- .3 Written interpretation or clarification issued in accordance with the Contract Documents.

**3.4 Reuse of Documents Prohibited:** Contractor and any Subcontractor or Supplier or other person or organization performing or furnishing any of the Work under a direct or indirect contract with Owner: (i) shall not have or acquire any title to or ownership rights in any of the Drawings, Specifications or other documents (or copies of any thereof) prepared by or bearing the seal of Principal Architect/Engineer or Principal Architect/Engineer's consultant, and (ii) shall not reuse any of such Drawings, Specifications, other documents or copies on extensions of the Project or any other project without written consent of Owner and Principal Architect/Engineer. Contractor may retain one (1) set of such documents for its records.

**3.5** Not Used.

**3.6 Electronic Data:** Owner utilizes Microsoft SharePoint or similar document management software (the "Program") for its projects. Contractor will be provided access to the Program solely for purposes of Contractor's performance of its obligations under the Contract, at no cost to Contractor. The Program may be used to handle management, distribution and submission of all Project documents (including without limitation drawings, specifications, submittals, RFIs, schedules, etc.). Contractor must access the Program for all such Project documents, unless otherwise directed in writing by Owner. Contractor is responsible for all of the content contained in the Program related to the Project, including but not limited to all periodic updates, revisions and additions to the Project documents contained therein. All Project documents contained in the Program shall be deemed delivered to Contractor. Contractor is responsible for ensuring and maintaining compatibility of



Contractor's computer systems with the Program. Contractor shall take all necessary precautions to prevent any unauthorized access to the Program and the Project documents contained therein, and to prevent any virus or malware infiltration of the Program. **CONTRACTOR SHALL COMPLY WITH ALL MICROSOFT OR OTHER SIMILAR DOCUMENT MANAGEMENT SOFTWARE VENDOR TERMS AND CONDITIONS APPLICABLE TO CONTRACTOR'S USE OF THE PROGRAM, AND SHALL DEFEND, INDEMNIFY AND HOLD HARMLESS OWNER FROM AND AGAINST ANY AND ALL CLAIMS, DAMAGES, LIABILITY, LOSS, COST AND EXPENSE, INCLUDING BUT NOT LIMITED TO ATTORNEYS' FEES, INCURRED AS A RESULT OF ANY CONTRACTOR BREACH OF SUCH TERMS AND CONDITIONS (COLLECTIVELY "CLAIMS" AS USED IN THIS SECTION 3.6), EVEN IF SUCH CLAIMS ARE CAUSED IN PART BY, BUT NOT TO THE EXTENT CAUSED BY, THE NEGLIGENCE OR FAULT, THE BREACH OR VIOLATION OF A STATUTE, ORDINANCE, GOVERNMENTAL REGULATION, STANDARD, OR RULE, OR THE BREACH OF CONTRACT OF OWNER, ITS AGENT OR EMPLOYEE, OR ANY THIRD PARTY UNDER THE CONTROL OR SUPERVISION OF OWNER, OTHER THAN CONTRACTOR OR ITS AGENT, EMPLOYEE OR SUBCONTRACTOR OF ANY TIER.** Any use, interpretation, conclusion or information obtained or derived from such Program information and documents will be at the user's sole risk. If there is a conflict or inconsistency between the Program information or documents and any hard copies furnished to Contractor, Contractor shall promptly notify Owner and Principal Architect/Engineer in writing, and shall not rely upon such Program information or documents or the hard copies furnished to Contractor until such conflict or inconsistency is resolved in writing by Owner or Principal Architect/Engineer. When distributing documents in electronic media format, Owner makes no representations as to compatibility, usability, or readability of documents resulting from the use of software application packages, operating systems, or computer hardware differing from those which are used by Owner or the data's creator.

**ARTICLE 4 - AVAILABILITY OF LANDS; SUBSURFACE AND PHYSICAL CONDITIONS; REFERENCE POINTS**

**4.1 Availability of Lands:** The Owner will provide access to all land and interests in land required for the Work and will notify Contractor of any known restrictions in such access. Contractor may make a Claim if, after having received seventy-two hours' prior written notice, the Owner fails to provide timely access to the Work. Contractor is solely responsible for and must obtain any additional temporary construction facilities, stockpiling or storage sites not otherwise provided by the Owner.

**4.1.1** In the event that Owner has agreed to provide any special licenses or easement(s) relating to the Work and in the event that Delays in the Work that are the responsibility of the Contractor cause the Work to be Delayed to the point that the ending date of such a license or easement has been exceeded, the Contractor shall reimburse the Owner for any additional costs and/or expenses incurred by Owner (including but not limited to reasonable attorneys' fees) in endeavoring to extend or renew the duration of any such license or easement in order to facilitate the completion of the Work.

**4.2 Subsurface and Physical Conditions:**

- 4.2.1** Contractor specifically represents that it has carefully examined the plans, the geotechnical report, if any, and the Site of the proposed Work and is thoroughly familiar with all of the conditions surrounding construction of the Project, having had the opportunity to conduct any and all additional inquiry, tests and investigation that he/she deems necessary and proper, to satisfy itself as to conditions, including but not limited to subsurface conditions, at the Site of the Work, and to inform itself by its independent research, tests and investigations of the difficulties to be encountered and to judge for itself the accessibility of the Work and all attending circumstances affecting the cost of doing the Work or time required for its completion. Contractor acknowledges the receipt of the geotechnical report, if any, and agrees that the report is not a guarantee of specific Site conditions which may vary between boring locations and over time, and is not a Contract Document. Contractor may not rely upon or make any Claim against Owner with respect to any Contractor interpretation of or conclusion drawn from any data, interpretations, opinions or information contained in such reports or shown or indicated in such drawings. Contractor shall make no claims against the Owner and shall bear all risk of losses, if any, resulting on account of the amount and character of the Work, or because the conditions under which the Work must be done vary or differ from conditions or information contained in the Contract Documents, or are different from what were estimated or anticipated by it.
- 4.2.2** Except as provided in Section 4.2.5 below, Contractor must notify Owner in writing as soon as reasonably possible, but no later than three (3) calendar days, if unforeseen conditions are encountered at the Site which are (i) subsurface or otherwise concealed physical conditions that differ materially from those indicated in the Contract Documents or other information provided by Owner to Contractor or (ii) unknown physical conditions of an unusual nature, that differ materially from those normally encountered in the type of Work being performed under this Contract. Contractor may not disturb the conditions until Owner conducts an investigation of such conditions. Upon receipt of notice from the Contractor, the Owner's Representative will promptly investigate such conditions with the Principal Architect/Engineer.
- 4.2.3** Notwithstanding any other provision of this Contract, Contractor is solely responsible for the location and protection of any and all underground utilities, pipelines, facilities and improvements, whether public or private, and whether utility\_distribution, supply or collection systems, or lines connecting customers to utility distribution, supply or collection systems, and including but not limited to all electric, telecommunication, gas, water, storm sewer and sanitary sewer lines, and all pipes, conduits, cables, wires, manholes, vaults, tanks, and tunnels (collectively "Underground Improvements"). Contractor shall notify "One Call" and shall retain a private underground locator service, and shall exercise due care to locate, mark, uncover and otherwise protect all Underground Improvements in the construction zone and any of Contractor's Work or storage areas. Contractor's responsibility for the location and protection of Underground Improvements is primary and non-delegable. **Contractor shall defend and indemnify Owner from and against any losses, Claims, expenses, costs or penalties (including fines that may be levied against Owner) that may result from damage to any Underground Improvements in the Work area.** Owner reserves the right to repair any damage Contractor causes to such Underground Improvements

at Contractor's expense or to offset the cost of such repairs against funds then or thereafter due Contractor pursuant to the Contract. If any Underground Improvements are damaged by Contractor, Contractor shall give verbal notice to the Owner's Representative within one (1) hour and written notice within twenty-four (24) hours after such damage occurs.

**4.2.4** Contractor shall take reasonable precaution to avoid disturbing primitive records and antiquities of archaeological, paleontological or historical significance. No objects of this nature shall be disturbed without written permission of Owner and Archeology Division, Texas Historical Commission. When such objects are uncovered unexpectedly, Contractor shall stop all Work in close proximity and immediately notify the Owner's Representative and Archeology Division, Texas Historical Commission of their presence. Contractor shall reference Texas Water Development Board Emergency Conditions for cultural resources in the event of accidental discoveries. Contractor shall not disturb them until written permission and permit to do so is granted by the governing authorities and Owner. All primitive rights to antiquities uncovered on Owner's property shall remain property of State of Texas, Archeology Division, Texas Historical Commission in accordance with the Texas Natural Resources Code. If it is determined by Owner, in consultation with Archeology Division, Texas Historical Commission, that exploration or excavation of primitive records or antiquities on Project Site is necessary to avoid loss, Contractor shall cooperate in salvage work attendant to preservation. If the Work stoppage or salvage work causes an increase in Contractor's cost of, or time required for, performance of the Work, the Contract Amount and/or Contract Time Requirements will be equitably adjusted.

**4.2.5 Environmental Conditions:** Contractor shall immediately stop all Work and must notify Owner in writing as soon as reasonably possible, but no later than one (1) calendar day after any significant environmental conditions are encountered at the Site which are or may be subject to any Legal Requirements. Contractor shall reference Texas Water Development Board Emergency Conditions for threatened and endangered species in the event of accidental discoveries. Contractor shall not disturb the conditions until Owner conducts an investigation. Owner's Representative and Principal Architect/Engineer will promptly investigate such conditions. If it is determined that such conditions are subject to Legal Requirements, did not result from any Hazardous Conditions brought to the Site by Contractor or any Subcontractor, and cause an increase or decrease in the Contractor's cost of or time required for performance of any part of the Work, Owner's Representative will recommend an equitable adjustment in the Contract Amount or Contract Time Requirements, or both. If it is determined that such conditions are not subject to Legal Requirements or resulted from any Hazardous Conditions brought to the Site by Contractor or any Subcontractor, Owner's Representative will notify Contractor in writing of such findings and the Contract Amount and Contract Time Requirements will not be adjusted. Contractor may dispute such a determination in accordance with Article 16.

**4.3 Reference Points:** Unless otherwise specified, primary control lines and bench marks suitable for use in layout will be furnished by Owner. Lay out of the Work shall be performed in accordance with the requirements of Division 01. Controls, bench marks and property boundary markers shall be carefully preserved by

Contractor by use of flags, staffs or other visible devices and in case of destruction or removal by Contractor, any Subcontractor or their employees, such controls and bench marks shall be replaced by a Texas Registered Professional Land Surveyor at Contractor's expense. Any SJRA survey monuments damaged by Contractor will be reestablished by Owner at Contractor's expense.

**4.4 Hazardous Conditions:**

**4.4.1** Contractor shall not be responsible for any Hazardous Conditions uncovered or revealed at the Site which were not shown, indicated or identified in the Contract Documents to be within the scope of the Work, and which were not brought onto the Site by the Contractor or the Subcontractors. Contractor shall immediately notify Owner's Representative of any such suspected Hazardous Conditions encountered at the Site before or during performance of the Work, and shall stop Work immediately in the affected area, and take all necessary precautions to avoid disturbance of the Hazardous Conditions.

**4.4.2** Contractor shall be responsible for any Hazardous Conditions brought to the Site by Contractor, Subcontractor, Suppliers or anyone else for whom Contractor is responsible.

**4.4.3** No asbestos-containing materials or lead-based paint shall be incorporated into the Work or brought on the Project Site without prior written approval of Owner. The Contractor shall not knowingly use, specify, request or approve for use any asbestos containing materials or lead-based paint without the Owner's written approval. When a specific product is specified, the Contractor shall endeavor to verify that the product does not include asbestos containing material or lead-based paint.

**4.4.4** Refer to Section 1.040 Hazardous Conditions definitions and to Division 01 for procedures related thereto.

- .1** Not used.
- .2** Upon receiving notice of the presence of suspected Hazardous Conditions, Owner shall take the necessary measures required to ensure that the Hazardous Conditions are remediated or rendered harmless. Such necessary measures shall include Owner retaining qualified independent consultants to (i) ascertain whether Hazardous Conditions have actually been encountered, and, if they have been encountered, (ii) prescribe the remedial measures that Owner must take either to remove the Hazardous Conditions or render the Hazardous Conditions harmless.
- .3** Contractor shall be obligated to resume Work at the affected area of the Project only after Owner or its qualified independent consultant provides written certification that (i) the Hazardous Conditions have been removed or rendered harmless and (ii) all necessary approvals have been obtained from all government and quasi-government entities having jurisdiction over the Project or Site. The Contractor shall be responsible for continuing the Work in the unaffected portion of the Project and Site.
- .4** Contractor will be entitled, in accordance with these General Conditions, to an adjustment in its Contract Amount and/or Contract Time Requirements to the extent Contractor's cost of performance is

actually increased and/or the Critical Path of the Work has been delayed by the presence of Hazardous Conditions discovered at the Site.

- .5 Notwithstanding anything in the Contract Documents to the contrary, Owner, its officers, directors, agents and employees, and the Owner's Representative, the Principal Architect/Engineer, the Principal Architect/Engineer's Consultants and Subconsultants and their respective officers, directors, partners, employees and agents are not responsible for Hazardous Conditions introduced to the Site by Contractor, Subcontractors or anyone for whose acts they may be liable. Contractor shall be responsible for use, storage and remediation of any Hazardous Conditions brought to the Site by Contractor, Subcontractors, Suppliers or anyone else for whom Contractor is responsible. **Contractor shall defend, indemnify and hold harmless Owner and Owner's officers, directors, employees and agents and the Owner's Representative, the Principal Architect/Engineer, the Principal Architect/Engineer's Consultants and Subconsultants and their respective officers, directors, partners, employees and agents from and against any and all claims, losses, damages, liabilities and expenses, including attorneys' fees and court costs, arising out of or resulting from Hazardous Conditions introduced to the Site by Contractor, Subcontractors or anyone for whose acts they may be liable. Notwithstanding the foregoing, if Subchapter C of Chapter 151 of the Texas Insurance Code applies to the Contract, the obligation to defend, indemnify and hold harmless set forth in this Section 4.4.4.5 shall not apply to the extent prohibited by Subchapter C of Chapter 151 of the Texas Insurance Code.**

## **ARTICLE 5 - BONDS AND INSURANCE**

**5.1 Surety and Insurance Companies:** All Bonds and insurance required by the Contract Documents shall be obtained from solvent surety or insurance companies that are duly admitted and licensed by the State of Texas and authorized to issue bonds or insurance policies for the limits and coverages required by the Contract Documents. Bonds shall be in a form acceptable to Owner and shall be issued by a surety which complies with the requirements of Chapter 3503 of the Texas Insurance Code. The Surety must obtain reinsurance for any portion of the risk that exceeds 10% of the Surety's capital and surplus. For bonds exceeding \$100,000, the Surety must also hold a certificate of authority from the U.S. Secretary of the Treasury or have obtained reinsurance from a reinsurer that is authorized as a reinsurer in Texas and holds a certificate of authority from the U.S. Secretary of the Treasury and has an A.M. Best rating of A-, X or better.

**5.2 Workers' Compensation Insurance Coverage:**

### **5.2.1 Definitions:**

- .1 Certificate of coverage ("certificate") - A copy of a certificate of insurance, a certificate of authority to self-insure issued by the

- division, or a coverage agreement (DWC Form-81, DWC Form-82, DWC Form-83, or DWC Form-84), showing statutory workers' compensation insurance coverage for the person's or entity's employees providing services on the Project, for the duration of the Project.
- .2 Duration of the Project - includes the time from the beginning of the Work on the Project until the Contractor's/person's Work on the Project has been completed and accepted by Owner.
  - .3 Persons providing services on the Project includes all persons or entities performing all or part of the services the Contractor has undertaken to perform on the Project, regardless of whether that person contracted directly with the Contractor and regardless of whether that person has employees. This includes, without limitation, independent contractors, Subcontractors, leasing companies, motor carriers, owner-operators, employees of any such entity, or employees of any entity which furnishes persons to provide services on the Project.
  - .4 Services include, without limitation, providing, hauling, or delivering equipment or materials, or providing labor, transportation, or other service related to a project. "Services" does not include activities unrelated to the Project, such as food/beverage vendors, office supply deliveries, and delivery of portable toilets.
- 5.2.2** Contractor shall provide coverage, based on proper reporting of classification codes and payroll amounts and filing of any coverage agreements, which meets the statutory requirements of Texas Labor Code, Section 401.011(44) for all employees of the Contractor providing services on the Project, for the duration of the Project.
- 5.2.3** Contractor must provide a certificate of coverage to Owner prior to being awarded the Contract.
- 5.2.4** If the coverage period shown on the Contractor's current certificate of coverage ends during the Duration of the Project, the Contractor must, prior to the end of the coverage period, file a new certificate of coverage with Owner showing that coverage has been extended.
- 5.2.5** Contractor shall obtain from each person providing services on the Project, and provide to Owner:
- .1 A certificate of coverage, prior to that person beginning Work on the Project, so Owner will have on file certificates of coverage showing coverage for all persons providing services on the Project; and
  - .2 No later than seven (7) days after receipt by Contractor, a new certificate of coverage showing extension of coverage, if the coverage period shown on the current certificate of coverage ends during the Duration of the Project.
- 5.2.6** Contractor shall retain all required certificates of coverage for the Duration of the Project and for one (1) year thereafter.
- 5.2.7** Contractor shall notify Owner in writing by certified mail or personal delivery, within ten (10) days after Contractor knew or should have known,

of any change that materially affects the provision of coverage of any person providing services on the Project.

- 5.2.8** Contractor shall post on each Project Site a notice, in the text, form and manner prescribed by the Texas Department of Insurance, Division of Workers' Compensation, informing all persons providing services on the Project that they are required to be covered, and stating how a person may verify coverage and report lack of coverage.
- 5.2.9** Contractor shall contractually require each person with whom it contracts to provide services on the Project, to:
- .1** Provide coverage, based on proper reporting of classification codes and payroll amounts and filing of any coverage agreements, which meets the statutory requirements of Texas Labor Code, Section 401.011(44) for all of its employees providing services on the Project, for the Duration of the Project;
  - .2** Provide to Contractor, prior to that person beginning Work on the Project, a certificate of coverage showing that coverage is being provided for all employees of the person providing services on the Project, for the Duration of the Project;
  - .3** Provide Contractor, prior to the end of the coverage period, a new certificate of coverage showing extension of coverage, if the coverage period shown on the current certificate of coverage ends during the Duration of the Project;
  - .4** Obtain from each other person with whom it contracts, and provide to Contractor: a) a certificate of coverage, prior to the other person beginning Work on the Project; and b) a new certificate of coverage showing extension of coverage, prior to the end of the coverage period, if the coverage period shown on the current certificate of coverage ends during the Duration of the Project;
  - .5** Retain all required certificates of coverage on file for the Duration of the Project and for one (1) year thereafter;
  - .6** Notify Owner in writing by certified mail or personal delivery, within ten (10) days after the person knew or should have known, of any change that materially affects the provision of coverage of any person providing services on the Project; and
  - .7** Contractually require each person with whom it contracts, to perform as required by these Section 5.2.9.1 through Section 5.2.9.7, with the certificates of coverage to be provided to the person for whom they are providing services.
- 5.2.10** By signing this Contract or providing or causing to be provided a certificate of coverage, Contractor is representing to Owner that all employees of the Contractor who will provide services on the Project will be covered by workers' compensation coverage for the Duration of the Project, that the coverage will be based on proper reporting of classification codes and payroll amounts, and that all coverage agreements will be filed with the appropriate insurance carrier or, in the case of a self-insured, with the division. Providing false or misleading information may subject Contractor to administrative penalties, criminal penalties, civil penalties or other civil actions.

**5.2.11** Contractor's failure to comply with any of these provisions is a breach of the Contract by Contractor which entitles Owner to declare the Contract void if Contractor does not remedy the breach within ten (10) days after receipt of notice of breach from Owner.

**5.3 Additional Insurance Requirements:**

**5.3.1 Contractor And Subcontractor Provided Insurance:** Contractor and Subcontractors shall obtain and maintain insurance coverages described in Sections 5.3.1.01 through 5.3.1.08 and, to the extent applicable, Sections 5.3.1.09 through 5.3.1.11 through the end of the warranty period (with the exception of Builders' Risk, which is required to remain in effect at least until final payment) or such longer periods of time as may be set forth herein; except that Subcontractors' limits of coverage for Commercial General Liability shall be no less than \$1,000,000 per occurrence and \$2,000,000 in the aggregate, Subcontractors shall not be required to maintain separate Builder's Risk Insurance, Subcontractors shall not be required to maintain Environmental Impairment Liability or Pollution Liability Insurance unless their Scope of Work involves Hazardous Conditions in which event such Subcontractors shall maintain such insurance with limits of coverage not less than \$1,000,000 per occurrence and \$2,000,000 in the aggregate, Subcontractors shall not be required to maintain Professional Liability coverage unless their Scope of Work includes professional services in which event such Subcontractors shall maintain such insurance with limits of coverage not less than \$1,000,000 per occurrence and in the aggregate, and Subcontractors' limits of coverage for Umbrella Liability shall be no less than \$3,000,000. All insurance secured by Contractor, Subcontractors and Sub-Subcontractors pursuant to Owner's requirements under this provision shall be in accordance with Article 5 of the General Conditions and Section 5.3.1.01 as follows.

**5.3.1.01 General Requirements.**

- .01** Contractor shall carry insurance in the types and amounts indicated below for the Duration of the Project or such longer periods of time set forth below, and shall include coverage for items owned by Owner in the care, custody and control of Contractor prior to and during construction and the warranty period.
- .02** Contractor shall forward Certificates of Insurance evidencing the coverage and limits of insurance required herein to Owner with copies to each additional insured and loss payee listed in the Supplemental Conditions (if any), before the Contract is executed. Contractor shall also provide copies of policy endorsements and excerpts from policies to evidence the required coverages. Contractor shall not commence Work until the required insurance is obtained and until such insurance has been reviewed and approved by Owner. Approval of insurance by Owner shall not relieve or decrease the liability of Contractor hereunder and shall not be construed to be a limitation of liability on the part of Contractor. Contractor must also forward new Certificates of Insurance to Owner whenever a previously identified policy period has expired as verification of continuing coverage.
- .03** Contractor's insurance coverage is to be written by companies licensed to do business in the State of Texas at the time the policies are issued and shall be written by companies with A.M. Best ratings of A-, X or



better, except for pollution liability or environmental impairment liability insurance which shall be written by companies with A.M. Best ratings of A- or better.

- .04** All endorsements naming the Owner as an additional insured, waivers of subrogation in favor of Owner, and notices of cancellation endorsements as well as the Certificates of Insurance shall specify Owner's name and address as: the San Jacinto River Authority, 1577 Dam Site Road, Conroe, Texas 77304.
- .05** The "other" insurance clause shall not apply to the Owner where the Owner is an additional insured shown on any policy. Insurance policies required by the Contract shall be primary and non-contributing with respect to any other insurance coverage maintained by or available to the Owner and/or other additional insureds. The policies shall be endorsed to provide severability of interests.
- .06** If underlying insurance policies are not written with coverage limits for at least the amounts specified below, Contractor shall carry Umbrella or Excess Liability Insurance for any differences in amounts specified. If Excess Liability Insurance is provided, it shall follow the form of the primary coverage and have the same inception and termination dates as the primary coverage.
- .07** Owner shall be entitled, upon request and without expense, to receive certified copies of policies and endorsements thereto and may make any reasonable requests for deletion or revision or modification of particular policy terms, conditions, limitations, or exclusions except where policy provisions are established by law or regulations binding upon either of the parties hereto or the underwriter on any such policies. Failure of Contractor to provide certified copies, as requested, is a material breach of the Contract.
- .08** Owner reserves the right to review the insurance requirements set forth during the effective period of this Contract and to make reasonable adjustments to insurance coverage, limits, and exclusions when deemed necessary and prudent by Owner based upon changes in statutory law, court decisions, the claims history of the industry or financial condition of the insurance company as well as Contractor.
- .09** All insurance policies required to be maintained will contain a provision or endorsement stating that the coverage afforded will not be cancelled until at least 30 days' prior written notice has been provided to the Contractor and to the Owner. Contractor shall not cause any insurance to be canceled nor permit any insurance to lapse during the term of the Contract or as required in the Contract.
- .10** Contractor shall be responsible for premiums, deductibles and self-insured retentions, if any, stated in policies. The amounts of all deductibles or self-insured retentions shall be disclosed on the Certificates of Insurance. Any deductible or self-insured retention in excess of \$25,000 is subject to the written approval of Owner.
- .11** Contractor shall provide Owner thirty (30) days written notice of erosion of the aggregate limits below occurrence limits for all applicable coverages required by the Contract.
- .12** If Owner-owned property is being transported or stored off-site by Contractor, then the appropriate property policy will be endorsed for transit and storage in an amount sufficient to protect Owner's property.

- .13 The insurance coverages required under this contract are required minimums and are not intended to limit the responsibility or liability of Contractor. The inclusion of required minimum insurance limits in this Contract shall not be construed as limiting the Owner's or other additional insured's rights under any policy with higher limits. The minimum insurance limits set forth in this Contract shall be deemed to be amended to any higher limits actually contained in Contractor's insurance policies.
- .14 The Contractor hereby waives its rights of recovery from the Owner, its officers, directors, agents and employees, and the Owner's Representative, the Principal Architect/Engineer, the Principal Architect/Engineer's Consultants and Subconsultants and their respective officers, directors, partners, employees and agents with regard to all causes of property and/or liability loss covered by insurance required by this Contract, and shall cause a waiver of subrogation endorsement to be provided in favor of the Owner, its officers, directors, agents and employees, and the Owner's Representative, the Principal Architect/Engineer, the Principal Architect/Engineer's Consultants and Subconsultants and their respective officers, directors, partners, employees and agents on all insurance coverage carried by the Contractor, whether required herein or not.
- .15 Failure to obtain and maintain the required insurance shall constitute a material breach of, and default under, this Contract. If Contractor shall fail to remedy such breach, Contractor will be liable for any and all costs, liabilities, damages and penalties resulting to Owner from such breach, unless a written waiver of the specific insurance requirement(s) is provided to Contractor by Owner. In the event of any failure by Contractor to comply with the provisions of this Contract, Owner may, without in any way compromising or waiving any right or remedy at law or in equity, on notice to Contractor, purchase such insurance, at Contractor's expense, provided that Owner shall have no obligation to do so and if Owner shall do so, Contractor shall not be relieved of or excused from the obligation to obtain and maintain such insurance amounts and coverages.
- .16 Additional insured status shall be provided in favor of the Owner, its officers, directors, agents and employees, and the Owner's Representative, the Principal Architect/Engineer, the Principal Architect/Engineer's Consultants and Subconsultants and their respective officers, directors, partners, employees and agents on all insurance policies other than Workers' Compensation, Professional Liability and Builder's Risk, on ISO forms CG 20 10 10 01 and CG 20 37 10 01 or their combined equivalent. It is the intent of the parties to this Contract that this Additional Insured status shall include coverage for completed operations and for the additional insureds' concurrent and sole negligence. Notwithstanding the foregoing, if Subchapter C of Chapter 151 of the Texas Insurance Code applies to the Contract, this additional insured obligation shall not require or provide coverage the scope of which is prohibited under Subchapter C of Chapter 151 of the Texas Insurance Code.
- .17 Contractor's obligations under this Contract to defend, indemnify and/or hold harmless Owner or other parties shall not be limited in any way by any insurance required of Contractor by this Contract or otherwise provided or maintained by

Contractor. Any insurance obligations of Contractor under this Contract are independent from Contractor's obligations under this Contract to defend, indemnify and/or hold harmless Owner or other parties.

**5.3.1.02 Business Automobile Liability Insurance:** Provide coverage for all owned, non-owned and hired vehicles. The policy shall provide coverage in the following types and amounts:

- .1 A minimum combined single limit of \$1,000,000 per occurrence for bodily injury and property damage.
- .2 A minimum combined single limit of \$1,000,000 minimum per occurrence for bodily injury and property damage.
- .3 The policy shall contain the following endorsements in favor of Owner:
  - .a Waiver of Subrogation endorsement; and
  - .b 30 day Notice of Cancellation endorsement; and
  - .c Additional Insured endorsement.

**5.3.1.03 Workers' Compensation And Employers' Liability Insurance:** Coverage shall meet or exceed statutory limits and all other benefits outlined in the Texas Workers' Compensation Act (Section 401). The minimum policy limits for Employers' Liability Insurance coverage shall be \$500,000 bodily injury per accident, \$500,000 bodily injury by disease policy limit and \$500,000 bodily injury by disease each employee.

- .1 Contractor's policy shall cover all States in which Work is performed and apply to the State of Texas and shall include these endorsements in favor of Owner:
  - .a Waiver of Subrogation; and
  - .b 30 day Notice of Cancellation.

**5.3.1.04 Commercial General Liability Insurance:** Provide coverages with minimum limits as follows: combined bodily injury and property damage limit of \$2,000,000 minimum per occurrence and \$5,000,000 aggregate. The Contractor's policy shall include coverage for:

- .1 Blanket contractual liability coverage for liability assumed under the Contract and all contracts relative to this Project; and
- .2 Completed Operations/Products Liability for at least three years after Substantial Completion; and
- .3 Explosion, Collapse and Underground (X, C & U) coverage; and
- .4 Independent Contractors coverage; and
- .5 Aggregate limits of insurance per project; and
- .6 Additional insureds as required in 5.3.1.01.16; and
- .7 30 day notice of cancellation in favor of Owner; and
- .8 Waiver of Transfer of Recovery Against Others in favor of all required additional insureds; and
- .9 Primary and non-contributing endorsement.

**5.3.1.05 Builder's Risk Insurance:** Contractor shall maintain Builder's Risk Insurance or Installation Insurance on an all-risk physical loss form in the Contract Amount plus the value of subsequent Contract Modifications and cost of materials supplied or installed by others, comprising total value for the entire Work at the site on a replacement cost basis without optional

deductibles. Coverage shall include, without limitation, insurance against the perils of fire (with extended coverage) and physical loss or damage including, without duplication of coverage, theft, vandalism, explosion, tornado, malicious mischief, collapse, earthquake, flood, surface water, windstorm, falsework, testing and startup, temporary buildings and debris removal including demolition occasioned by enforcement of any applicable legal requirements and shall cover reasonable compensation for Principal Architect/Engineer's and Contractor's services and expenses required as a result of any insured loss. Coverage shall continue until final payment for the Work is made by the Owner. Coverage shall allow for partial occupancy/use by the Owner. Owner shall be an additional named insured on the policy. Policy must include expenses incurred in the repair or replacement of any insured property, including but not limited to fees and charges of the Principal Architect/Engineer and any other engineers and architects and their respective subconsultants. If off-site storage is permitted by the Owner, coverage shall include materials in transit and storage in an amount sufficient to protect property being transported or stored. Any losses covered by the Builder's Risk or Installation Insurance shall be adjusted by the Owner.

**5.3.1.06 Environmental Impairment Liability or Pollution Liability Insurance:**

Contractor shall comply with the following insurance requirements in addition to those specified above:

- .1 Provide an Environmental Impairment Liability policy with minimum limits of \$2,000,000 each occurrence and \$5,000,000 aggregate. Coverage shall contain a "per project" aggregate, 30 day notice of cancellation to Owner and waiver of subrogation in favor of Owner. Coverage to include non-owned disposal sites. Coverage shall include clean-up costs, bodily injury, property damage and defense costs.
- .2 Policy shall contain proper endorsement wording to comply with Federal or TCEQ requirements. Policy will also cover vessels and marine operations. Contractor shall submit complete copies of the policy providing pollution liability coverage to Owner.

**5.3.1.07 Professional Liability Insurance:** For Work which requires professional engineering or architectural or professional survey services to meet the requirements of the Contract, including but not limited to excavation safety systems, traffic control plans, and construction surveying, the Contractor or Subcontractors, responsible for performing the professional services shall provide Professional Liability Insurance with a minimum limit of \$1,000,000 each occurrence and \$3,000,000 aggregate to pay on behalf of the assured all sums which the assured shall become legally obligated to pay as damages by reason of any negligent act, error, or omission committed in connection with professional services provided for or in connection with the Work of this Contract.

**5.3.1.08 Umbrella Liability:** Umbrella Liability with a limit of \$5,000,000, with the Owner as an additional insured and with waiver of subrogation and 30 day notice of cancellation. The Umbrella Liability policy shall follow form, be excess over and be no less broad than all coverages described above (with the exception of Workers' Compensation, Professional

Liability and Pollution Liability), shall include a drop-down provision and contain a per job aggregate. This policy shall have the same inception and expiration dates as the Commercial General Liability insurance required above. Contractor shall maintain such insurance in identical coverage, form and amount, including required endorsements, for at least three (3) years following Date of Substantial Completion of the Work to be performed under the Contract.

**5.3.1.09 Protection and Indemnity:** Protection and Indemnity coverage for any over water operations, vessels, barges, divers. This policy shall have limits of \$1,000,000 each occurrence, \$2,000,000 aggregate and policy endorsed to provide

**5.3.1.10 Excess P&I:** Excess P&I in the amount of \$20,000,000 each occurrence with additional insured, waiver of subrogation and 30 day notice of cancellation to the Owner.

**5.3.1.11 Marine:** Contractor and/or any Subcontractors shall have appropriate workers compensation insurance to provide coverage for USL&H and Jones Act exposures.

### **5.3.2 Waiver of Rights**

**5.3.2.1** All policies purchased in accordance with Section 5.3.1.05 shall contain provisions to the effect that in the event of payment of any loss or damage the insurers will have no rights of recovery against any of the insureds or additional named insureds thereunder. Owner and Contractor waive all rights of recovery for damages against each other and their respective officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them, the Principal Architect/Engineer, the Principal Architect/Engineers Consultants and Subconsultants and Owner's Representative and any named insured or additional named insured or loss payee to the extent (a) of losses and damages caused by, arising out of or resulting from any of the perils or causes of loss covered by such policies and any other property insurance applicable to the Work and (b) that such losses and damages are actually paid by such policies or other property insurance applicable to the Work. None of the above waivers shall extend to the rights that any party making such waiver may have to the proceeds of insurance held by Owner as adjuster or recipient thereof or otherwise payable under any such policy.

### **5.3.3 Receipt and Application of Insurance Proceeds**

**5.3.3.1** Any insured loss under the policies of insurance required by Section 5.3.1.05 will be adjusted with Owner and made payable to Owner for the named insureds, additional named insureds, and loss payees, as their interests may appear, subject to the requirements of any applicable mortgage clause and of Section 5.3.3.2. Owner shall deposit any money so received and shall distribute it in accordance with such agreement as the parties in interest may reach. If no other special agreement is reached, the damaged Work shall be repaired or replaced, the moneys so received applied on account thereof, and the Work and the cost thereof, to the extent of loss payments received, covered by an appropriate Change Order.

**5.3.3.2** Owner shall have power to adjust and settle any loss with the builder's risk or other property insurers.

**5.3.4 Partial Utilization, Acknowledgment of Property Insurer:**

**5.3.4.1** If Owner desires to occupy or use a portion or portions of the Work prior to Substantial Completion of all the Work as provided in Section 14.08, no such use or occupancy shall commence before the insurers providing the property insurance pursuant to Section 5.3.1.05 have acknowledged notice thereof and in writing effected any changes in coverage necessitated thereby. The insurers providing the property insurance shall consent by endorsement on the policy or policies, and the property insurance shall not be canceled or permitted to lapse on account of any such partial use or occupancy.

**5.4 Bonds:**

**5.4.1 General:**

- .1** Contractor shall furnish performance, payment, and one-year maintenance Bonds, each in an amount at least equal to the Contract Amount as security for the faithful performance and payment of all of Contractor's obligations under the Contract Documents, as well as a second year maintenance Bond, in an amount equal to ten percent (10%) of the Contract Amount. The one-year maintenance Bond shall remain in effect until completion of the correction period specified in Section 13.7.1. The second year maintenance Bond shall remain in effect until 2-years from the date of Substantial Completion. Contractor shall also furnish such other Bonds as are required by the Contract Documents.
- .2** Bonds shall be executed on forms furnished by Owner, as included in the Specifications. All Bonds signed by an agent must be accompanied by a certified copy of such agent's authority to act. The evidence of authority shall show that it is effective on the date the agent or attorney-in-fact signed each Bond.
- .3** 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 is placed into receivership, Contractor shall within ten (10) days thereafter substitute other Bonds and Surety, each of which must be acceptable to Owner.
- .4** The Performance Bond and Payment Bond shall be issued in an amount of one hundred percent (100%) of the Contract Amount as security for the faithful performance and/or payment of all Contractor's obligations under the Contract Documents. All Bonds, including but not limited to the Performance Bond and Payment Bond shall be issued by a solvent corporate surety company authorized to do business in the State of Texas, and shall meet any other requirements established by law or by Owner pursuant to applicable law. Any surety duly authorized to do business in Texas may write Performance and Payment Bonds on a project without reinsurance to the limit of ten percent (10%) of its capital and surplus. Such a surety must reinsure any obligations over the ten percent (10%) limit.

**5.4.2 Performance Bond:**

- .1 Contractor shall furnish Owner with a Performance Bond in the form set out in the Contract Documents.
- .2 The Performance Bond shall include the one (1) year warranty correction period obligation from the date of Substantial Completion of the Work.

**5.4.3 Payment Bond:**

- .1 Contractor shall furnish Owner with a Payment Bond in the form set out in the Contract Documents.

**5.4.4 One-Year Maintenance Bond:**

- .1 Contractor shall furnish Owner with a One-Year Maintenance Bond in the form set out in the Contract Documents.

**5.4.5 Second-Year Maintenance Bond:**

- .1 Contractor shall furnish Owner with a Second-Year Maintenance Bond in the form set out in the Contract Documents.
- .2 The Second-Year Maintenance Bond shall be in an amount equal to ten percent (10%) of the Contract Amount, and shall remain in effect until 2-years from the date of Substantial Completion.

**ARTICLE 6 - CONTRACTOR'S RESPONSIBILITIES**

**6.01 Supervision and Superintendence:**

**6.01.1** 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. Contractor shall be responsible to see that the completed Work strictly complies with the Contract Documents.

**6.01.2** Contractor shall have an English-speaking, competent Superintendent on the Work at all times that Work is in progress. The Superintendent will be Contractor's representative on the Site and shall have the authority to act on the behalf of Contractor. All communications given to the Superintendent shall be as binding as if given to Contractor. Contractor's Superintendent and Project Manager shall provide cellular telephone numbers and emergency and home telephone number(s) at which one or the other may be reached if necessary when Work is not in progress. Telephone or cellular phone number(s) shall be to a live person having responsible authority for the Work and not an answering machine or answering service. The Superintendent must be an employee of the Contractor, unless such requirement is waived in advance in writing by the Owner. If the Contractor proposes a management structure with a Project Manager supervising, directing, and managing construction of the Work in addition to or in substitution of a Superintendent, the requirements of these

Construction Documents with respect to the Superintendent shall likewise apply to any such Project Manager:

- .1 Contractor shall present the resume of the proposed Superintendent to the Owner's Representative showing evidence of experience and successful superintendence and direction of Work of a similar scale and complexity. If, in the opinion of the Owner, the proposed Superintendent does not have sufficient experience in line with the Work, he/she will not be allowed to be the designated Superintendent for the Work.
- .2 The Superintendent shall not be replaced without prior Written Notice to Owner's Representative. If Contractor deems it necessary to replace the Superintendent, Contractor shall provide the necessary information for approval, as stated above, on the proposed new Superintendent.
- .3 A qualified substitute Superintendent may be designated in the event that the designated Superintendent is temporarily away from the Work, but not to exceed a time limit acceptable to the Owner's Representative.
- .4 Contractor shall replace the Superintendent upon Owner's request in the event the Superintendent is unable to perform to Owner's satisfaction.

**6.02 Labor, Materials and Equipment:**

**6.02.1** Contractor shall maintain a work force adequate to accomplish the Work within the Contract Time Requirements. Contractor agrees to employ only orderly and competent workers, skillful in performance of the type of Work required under this Contract. Contractor, Subcontractors, Sub-Subcontractors, and their employees may not use or possess any alcoholic or other intoxicating beverages, illegal drugs or controlled substances while on the job or on Owner's property, nor may such workers be intoxicated, or under the influence of alcohol or drugs, on the job. Subject to the applicable provisions of Texas law, Contractor, Subcontractors, Sub-Subcontractors, and their employees may not use or possess any firearms or other weapons while on the job or on Owner's property. If Owner or Owner's Representative notifies Contractor that any worker or representative of Contractor is incompetent, disorderly, abusive, or disobedient, has knowingly or repeatedly violated safety regulations, has possessed any firearms in contravention of the applicable provisions of Texas law or this Contract, or has possessed or was under the influence of alcohol or drugs on the job, Contractor shall immediately remove such worker or representative, including any officer or owner of Contractor, from performing Contract Work, and may not employ such worker or representative again on Contract Work without Owner's prior written consent. Contractor shall at all times maintain good discipline and order on or off the Site in all matters pertaining to the Project. Contractor shall pay workers no less than the applicable wage rates established for the Contract, and maintain weekly payroll reports as evidence thereof, in accordance with the requirements of Chapter 2258 of the Texas Government Code.

**6.02.2** Except as otherwise stated in the Contract Documents, all Work at the Site shall be performed during regular Working Days and regular Working Hours.



Contractor will not permit the performance of Work on a Saturday, Sunday, or any legal holiday without the Owner's prior written consent given after the Contractor has provided 48-hour advanced written notice to the Owner's Representative.

**6.02.3** Unless otherwise specified in Division 01, Contractor shall provide and pay for all 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 furnishing, performance, testing, start-up and completion of the Work, provided the Owner's CMT Consultant shall provide certain inspection services, the Owner shall provide testing of construction materials engineering and the verification testing services necessary for acceptance of the Work by Owner, as required by Section 2267.058(a) of the Texas Government Code.

**6.02.4** All materials and equipment shall be of good quality and new (including new products made of recycled materials, pursuant to Section 361.426 of the Texas Health & Safety Code), except as otherwise provided in the Contract Documents. If required by Owner's Representative, Contractor shall furnish satisfactory evidence (reports of required tests, Manufacturer's certificates of compliance with material requirements, mill reports, etc.) as to the kind and quality of materials and equipment. All materials and equipment shall be applied, installed, connected, erected, used, cleaned and conditioned in accordance with instructions of the applicable Manufacturer or Supplier, except as otherwise provided in the Contract Documents.

**6.02.5 Substitutes and "Approved Equal" Items:**

.1 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 Manufacturer or Supplier, the specification or description is intended to establish the type, function and quality required. Unless the specification or description contains words reading that no like, equivalent or "approved equal" item or no substitution is permitted, other items of material or equipment of other Manufacturers or Suppliers may be submitted by Contractor, at Contractor's sole risk, including potential impacts and disruptions to the Critical Path of the Project Schedule, to Principal Architect/Engineer for their review and approval through Owner's Representative under the following circumstances:

(a) "Approved Equal": If in Principal Architect/Engineer's and Owner's sole discretion an item of material or equipment proposed by Contractor is functionally equal and of equivalent type and quality to that named, and sufficiently similar so that no change in related Work, time of performance or Contract Amount will be required, it may be approved by Principal Architect/Engineer and Owner through the submittal process as an "approved equal" item. Contractor shall provide Principal Architect/Engineer and Owner with all necessary documentation required for Principal Architect/Engineer and Owner to make their evaluation, and shall identify the item of material or

equipment proposed by Contractor as a variation in accordance with Section 6.20.5.

- (b) Substitute Items: Contractor may submit an item of material or equipment which does not qualify as an "approved equal" item under Subsection 6.02.5.1(a), or may resubmit an item of material or equipment proposed by Contractor and rejected by Principal Architect/Engineer or Owner as an "approved equal" item under Subsection 6.02.5.1(a), as a proposed substitute item. All of Contractor's requests for substitutions must be clearly identified as a "**Request For Substitution**" on the face of the document. Contractor shall submit sufficient information as provided in Division 01 to allow Principal Architect/Engineer and Owner to evaluate the item of material or equipment proposed as a substitute for the item named.
- .2 Substitute Construction Methods and Procedures: If a specific means, method, technique, sequence or procedure of construction is shown or indicated in and expressly required by the Contract Documents, Contractor may, at Contractor's sole risk, including potential impacts and disruptions to the Critical Path of the Project Schedule, with prior approval of Principal Architect/Engineer, furnish or utilize a substitute means, method, technique, sequence, or procedure of construction. All such proposed substitutions must be clearly identified as being a "**Substitution**" in all of the Contractor's submittals. Contractor shall submit sufficient information to Owner's Representative to allow Principal Architect/Engineer's, in Principal Architect/Engineer's sole discretion, evaluation of the proposed substitute as an equivalent to that method or procedure expressly called for by the Contract Documents. The procedure for review by Principal Architect/Engineer will be same as that provided for substitute items in Division 01.
- .3 Principal Architect/Engineer's Evaluation: Principal Architect/Engineer will be allowed a reasonable time within which to evaluate each proposal or submittal made pursuant to Subsections 6.02.5.1(a), 6.02.5.1(b), and 6.02.5.2. Principal Architect/Engineer and Owner will be the judge of acceptability. No "approved equal" or substitute shall be ordered, installed, or utilized until Principal Architect/Engineer's and Owner's review is complete, and any "approved equal" is approved through the submittal process, or any approved substitute is evidenced by either a Change Order, or a Change Directive. Owner may require Contractor to furnish at Contractor's expense a special performance guarantee or other surety Bond with respect to any approved substitute. Owner shall not be responsible for any Delay due to review time for any "approved equal" or substitute.
- .4 Contractor's Expense: All data and documentation to be provided by Contractor in support of any proposed "approved equal" or substitute item will be at Contractor's expense.
- .5 The approval of the Principal Architect/Engineer and/or Owner will not relieve the Contractor from primary responsibility and liability for the suitability and performance of any proposed substitute item, method or procedure and will not relieve Contractor from its primary responsibility and liability for curing Defective Work and performing warranty work, which the Contractor shall cure and perform,

regardless of any claim the Contractor may choose to advance against the Owner, the Principal Architect/Engineer or Manufacturer.

- .6 Notwithstanding the foregoing, it is agreed and understood that the Contract Amount shall not be adjusted as a result of the Contractor's use of the cost of any possible substitute or "approved equal" items in calculating its Bid/Proposal price.

**6.02.6** Contractor agrees to assign and hereby assigns to Owner any rights it may have to bring antitrust suits against its Manufacturers or Suppliers for overcharges on materials incorporated in the Project growing out of illegal price fixing agreements. Contractor further agrees to cooperate with Owner should Owner wish to prosecute suits against Manufacturers or Suppliers for illegal price fixing.

**6.03 Project Schedule Requirements:** Unless otherwise provided in Division 01, Contractor shall adhere to the Owner's Project Schedule as provided by the Owner, which shall be further developed by the Contractor to become first the Contractor's Preliminary Project Schedule and then, upon acceptance by the Owner, become the Master Project Schedule, as it may be adjusted from time to time as provided below:

**6.03.1 Preliminary Project Schedule:** Within thirty (30) days from the issuance of a Notice To Proceed by the Owner, the Contractor shall submit to the Owner's Representative a Preliminary Project Schedule to be used as the Contractor's baseline schedule for the Project. This Preliminary Project Schedule shall be initially based on and shall include and be consistent with all of the Milestones contained in Division 01, Work Covered By Contract Documents Specification, and shall be presented in a form reasonably acceptable to the Owner. The Preliminary Project Schedule shall be a Critical Path Method (CPM) schedule depicting all significant activities which will occur on the Project; the durations for all major items of Work to be performed; the start and finish dates of such activities; the Contract Time Requirements as set out in the Contract Documents; and the precedence logic of such activities. The Contractor's Preliminary Project Schedule shall include, at a minimum:

- .1 Duration and milestone dates for all equipment, materials delivery, and operations efforts that may affect the timely completion of the Project.
- .2 Duration and milestone dates for each anticipated construction activity.
- .3 Pre-purchase of materials and equipment with a "long lead" time.
- .4 Permitting and regulatory milestones.
- .5 Dates associated with the activities leading to delivery milestones from others including for offsite roadways and utilities.

**6.03.2** The Contractor shall coordinate the Preliminary Project Schedule with the Contractor's Submittal Schedules for Shop Drawings and Samples as required by Division 01 of the Project Manual. The Contractor's Submittal Schedule must provide an adequate duration for reviewing and processing the required Submittals acceptable to Owner and the Principal Architect/Engineer.

**6.03.3** The Contractor shall provide Owner with an electronic version (by disk or CD) of the Preliminary Project Schedule and of each subsequent Master

Project Schedule, including all subsequent electronic schedule revisions and updates, created without password protection, in latest version of Microsoft Project (.MPT, .MPX or .MPD suffix) or a format approved by Owner. Failure to furnish Owner, Owner's Representative, and Principal Architect/Engineer with a revised Project Schedule in one of the above formats within ten (10) days of receipt of a written request shall constitute a breach of the Contract by Contractor, and shall be considered to be adequate cause for termination of the Contractor by Owner.

**6.03.4 Master Project Schedule:** Once the Contractor's Preliminary Project Schedule has been accepted by Owner, it shall become the Master Project Schedule (Baseline Schedule) for the Project. The Contractor shall update the Master Project Schedule monthly or more often by the submission of a revised Master Project Schedule or when circumstances develop which make it beneficial to the Project, or as may be required by Owner. Once the most recently revised Master Project Schedule has been accepted by Owner, the Master Project Schedule shall be considered to have been updated. The updated Master Project Schedule shall then be distributed by the Contractor to Owner's staff, the Principal Architect/Engineer, each consultant, and other appropriate parties. The Master Project Schedule shall be reviewed at the monthly team meeting at a summary level, including for a three month look-ahead and anticipated Project completion.

**6.03.5 Changes to the Master Project Schedule:** A copy of the accepted Master Schedule shall be maintained unaltered. The Contractor shall thereafter submit to Owner's Representative an updated Project Schedule each month with its Application for Payment, to reflect actual progress that has been made and to forecast future progress of the Work. The monthly Project Schedule update shall be based upon the accepted Master Project Schedule. Contractor shall submit to Owner's Representative for review and acceptance by Owner any proposed changes or adjustments in its monthly Project Schedule that modify either the Master Project Schedule or the previous month's approved Project Schedule. Any such proposed adjustments must be substantiated with a written narrative containing an explanation of any changes to the underlying logic of the subject schedule. Contractor's proposed changes to the schedule must show how the Contractor will consistently advance the progress of the Work in accordance with the Critical Path of the Work and the Contract Time Requirements, including all required contractual Milestones. Such adjustments will conform generally to the Master or monthly Project Schedule then in effect and additionally will comply with any provisions of Division 01 applicable thereto.

**6.03.6** Proposed adjustments indicated by the Project Schedule that will change the Contract Time Requirements, including Milestones, shall be submitted in accordance with the requirements of Article 12. Any such proposed adjustments must be substantiated with documentation of any changes to the underlying logic of the Master Project Schedule. Such adjustments may only be made by a Change Order or Change Directive in accordance with Article 12.

**6.03.7** Contractor shall keep a current schedule of submittals that coordinates with the Master Project Schedule, and shall submit the initial schedule of

submittals to Owner's Representative for acceptance along with the Preliminary Project Schedule.

**6.04 Concerning Subcontractors, Suppliers and Others:**

**6.04.1 Assignment:** Contractor shall retain direct control of and give direct attention to the fulfillment of this Contract. Contractor shall not assign, transfer, or convey this Contract or any portion thereof, or any right, title or interest in, to or under same, or any causes of action or claims for damages arising under this Contract or any breach thereof, without the prior written consent of Owner. In addition, without Owner's written consent, the Contractor will not subcontract the performance of the entire Work or the supervision and direction of the Work.

**6.04.2 Award of Subcontracts for Portions of the Work:** Contractor shall not employ any Subcontractor, Supplier or other person or organization, whether initially or as a substitute, against whom Owner may have reasonable objection. Owner will communicate such objections by Written Notice. If Owner requires a change without good cause of any Subcontractor, person or organization previously accepted by Owner, the Contract Amount shall be increased or decreased by the difference in the cost caused by any such change, and an appropriate Change Order shall be issued. Contractor shall not substitute any Subcontractor, person or organization that has been accepted by Owner, unless the substitute has been accepted in writing by Owner. No acceptance by Owner of any Subcontractor, Supplier or other person or organization shall constitute a waiver of any right of Owner to reject Defective Work. Contractor shall comply with the applicable requirements set forth in the Bid/Proposal Documents and Contract Documents with respect to Subcontractors and the subcontracting process.

**6.04.3** Contractor shall enter into written agreements with all Subcontractors and Suppliers which specifically bind the Subcontractors, Manufacturers and Suppliers to the applicable terms and conditions of the Contract Documents for the benefit of Owner and Principal Architect/Engineer. The Owner reserves the right to specify that certain requirements shall be adhered to by all Subcontractors, Manufacturers and Suppliers as indicated in other portions of the Contract Documents and these requirements shall be made a part of the agreements between Contractor and Subcontractors, Manufacturers and Suppliers.

**6.04.4** Contractor shall be fully responsible to Owner for all acts and omissions of the Subcontractors, Manufacturers, or Suppliers and other persons and organizations performing or furnishing any of the Work under a direct or indirect contract with Contractor just as Contractor is responsible for Contractor's own acts and omissions. Nothing in the Contract Documents shall create for the benefit of any such Subcontractor, Manufacturer, or Supplier or other person or organization any contractual relationship between Owner and any such Subcontractor, Supplier, Manufacturer or other person or organization, nor shall it create any obligation on the part of Owner or Principal Architect/Engineer to pay or to see to the payment of any moneys due any such Subcontractor, Manufacturer, or Supplier or other

person or organization except as may otherwise be required by laws and regulations.

- 6.04.5** Contractor shall be solely responsible for efficiently scheduling and coordinating the Work of Subcontractors, Manufacturers, Suppliers and other persons and organizations performing or furnishing any of the Work under a direct or indirect contract with Contractor in order to avoid any Delays or inefficiencies in the prosecution of the Work. Contractor shall require all Subcontractors, Manufacturers, Suppliers and such other persons and organizations performing or furnishing any of the Work to communicate with Owner's Representative through Contractor.
- 6.04.6** The divisions and sections of the Specifications and the identifications of any Drawings shall not control Contractor in dividing or delineating the Work to be performed by any specific trade.
- 6.04.7** Contractor shall pay each Subcontractor, Manufacturer and Supplier their appropriate share of payments made to Contractor not later than ten (10) Calendar Days from Contractor's receipt of payment from Owner.
- 6.04.8** To the extent allowed by Texas law, the Owner shall be deemed to be a third party beneficiary to each subcontract and may, if Owner elects, following a termination of the Contractor, require that the Subcontractor(s) perform all or a portion of unperformed duties and obligations under its subcontract(s) for the benefit of the Owner, rather than the Contractor; however, if the Owner requires any such performance by a Subcontractor for the Owner's direct benefit, then the Owner shall be bound and obligated to pay such Subcontractor the reasonable value for all Work performed by such Subcontractor to the date of the termination of the Contractor, less previous payments to Contractor for such Subcontractor's work, and for all Work performed by Subcontractor thereafter. In the event that the Owner elects to invoke its right under this section, Owner will provide written notice of such election to the terminated Contractor and the affected Subcontractor(s).

**6.05 Patent Fees and Royalties:**

- 6.05.1** Contractor shall be responsible at all times for compliance with applicable patents or copyrights encompassing, in whole or in part, any design, device, material, or process utilized, directly or indirectly, in the performance of the Work or the formulation or presentation of its Bid/Proposal.
- 6.05.2** Contractor shall pay all royalties and license fees and shall provide, prior to commencement of Work hereunder and at all times during the performance of same, for lawful use of any design, device, material or process covered by letters patent or copyright, suitable legal agreement with the patentee, copyright holder, or their duly authorized representative, whether or not a particular design, device, material, or process is specified by Owner.
- 6.05.3** Contractor shall defend Owner in all suits or claims for infringement of any patent or copyright and shall indemnify and save Owner harmless from any loss or liability, direct or indirect, arising with respect to Contractor's process in the formulation of its Bid/Proposal or the performance of the

Work or otherwise arising in connection therewith, with the exception that the Contractor will not be responsible to defend or indemnify the Owner for such loss or liability when a particular design, process or product of a particular Manufacturer or Manufacturers is required by the Contract Documents, or where the copyright violations are contained in Drawings, Specifications or other documents prepared by the Owner or Principal Architect/Engineer, unless Contractor knew or reasonably should have known of the patent or copyright violation and failed to notify Owner of same. Owner reserves the right to provide its own defense to any suit or claim of infringement of any patent or copyright in which event Contractor shall, to the extent provided in this Subsection, indemnify and save harmless Owner from all costs and expenses of such defense as well as satisfaction of all judgments entered against Owner.

**6.05.4** Owner shall have the right to stop the Work and/or terminate this Contract at any time in the event Owner discovers that Contractor's work methodology includes the use of any infringing design, device, material or process.

**6.06 Permits, Fees:** Contractor shall obtain and pay for all construction permits, licenses and fees required for prosecution of the Work. However, Owner or Owner's Representative will obtain and pay for the following permits, licenses and/or fees:

- .1 Site Development Permit; and
- .2 Initial Corp of Engineer Permits (404, Letter of Permission only, if applicable).

**6.07 Laws and Regulations:**

**6.07.1** Contractor shall give all notices and comply with all Legal Requirements applicable to furnishing and performing the Work, including arranging for and obtaining any required inspections, tests, approvals or certifications from any governmental entity or public body having jurisdiction over the Work or any part thereof. Except where otherwise expressly required by applicable laws and regulations, neither Owner, Owner's Representative, nor Principal Architect/Engineer shall be responsible for monitoring Contractor's compliance with any Legal Requirements.

**6.07.2** Maintaining clean water, air and earth or improving thereon shall be regarded as of prime importance. Contractor shall plan and execute its operations in compliance with all applicable Legal Requirements concerning control and abatement of water pollution and prevention and control of air pollution.

**6.07.3** If Contractor performs any Work knowing or having reason to know that it is contrary to applicable Legal Requirements, Contractor shall bear all claims, costs, losses and damages arising therefrom; however, it shall not be Contractor's primary responsibility to make certain that the Specifications and Drawings are in accordance with all Legal Requirements, but this does not relieve Contractor of the Contractor's obligations under the terms of the Contract.

- 6.07.4** This Work is subject to the Texas Pollution Discharge Elimination System (TPDES) permitting requirements for the installation and maintenance of temporary and permanent erosion and sediment controls and storm water pollution prevention measures throughout the construction period.

Contractor's responsibilities are as follows.

- .01** Contractor must prepare a Storm Water Pollution Prevention Plan (SWPPP), or make modifications if SWPPP is already completed and as required, prior to filing the NOI form.
- .02** Contractor must file a Notice of Intent (NOI) form with the TCEQ at least two (2) days prior to start of construction activity and pay for the permit. The required NOI form is available from the Internet at <https://www.tceq.texas.gov/assets/public/permitting/waterquality/forms/20022.pdf>. The form shall be mailed or submitted online to the TCEQ. If submitting online, the web address is <https://www3.tceq.texas.gov/steers/>. If Contractor has not already registered to use the TCEQ online application submittal service, it will take up to ten (10) working days to receive a user name and password. Contractor shall take this timeframe into consideration if applying online. A Time Extension shall not be granted for this timeframe. The mailing address is:

Texas Commission on Environmental Quality  
Stormwater Processing Center (MC-228)  
P.O. Box 13087  
Austin, TX 78711-3087

For overnight mail: Stormwater Processing Center (MC-228)  
12100 Park 35 Circle  
Austin, TX 78753

- .03** Contractor must mail a copy of the completed Notice of Intent (NOI) form to the local Municipal Separate Storm Sewer Systems (MS4) representative.
- .04** Contractor must obtain a signed certification statement from all Subcontractors responsible for implementing the erosion and sediment control measures. This statement shall indicate that the Subcontractor understands the permit requirements. The certified statement forms shall be attached to and become part of the SWPPP.
- .05** Contractor must post a notice near the main entrance of the Work with the following information.
  - .1** The TPDES permit number for the Work or a copy of the NOI if a permit number has not yet been assigned,
  - .2** The name and telephone number of a local contact person,
  - .3** A brief description of the Work, and
  - .4** The location of the SWPPP if the Site is inactive or does not have an on-site location to store the plan.
  - .5** If posting this information near a main entrance is infeasible due to safety concerns, the notice must be posted in a local public building. If the Work is linear (pipeline, highway, etc.), the notice must be placed in a publicly accessible location near



where construction is actively underway and moved as necessary. For linear Work, multiple postings of the information may be required by Owner (e.g. postings at both ends of the Work).

- .06 Contractor must maintain all erosion and sediment control measures and other protective measures identified in the SWPPP in effective operating condition.
  - .07 Contractor must retain weekly inspection reports and be available for audit by the Owner, the TCEQ or the EPA.
  - .08 Contractor must perform inspections every seven (7) calendar days and after every ½ inch rainfall event, noting the following observations on an inspection form provided by Owner:
    - .1 Locations of discharges of sediment or other pollutants from the Site.
    - .2 Locations of storm water / erosion / sedimentation controls that are in need of maintenance.
    - .3 Locations of storm water / erosion / sedimentation controls that are not performing, failing to operate, or are inadequate.
    - .4 Locations where additional storm water / erosion / sedimentation controls are needed.
  - .09 Contractor must maintain at Work Site at all times a copy of the SWPPP (with all updates, as described below) and inspection reports.
  - .10 Contractor must update the SWPPP as necessary to comply with TPDES permitting requirements, which includes noting changes in erosion / sedimentation controls and other best management practices that are part of the SWPPP and which may be necessary due to the results of inspection reports.
  - .11 Contractor must file a Notice of Termination with the TCEQ within thirty (30) days of final stabilization on all portions of the Work Site. Form is available from Owner or on the Internet at:  
<https://www.tceq.texas.gov/assets/public/permitting/waterquality/forms/10443.docx>.  
The notice shall be mailed to:  
Texas Commission on Environmental Quality  
Storm Water & General Permits Team;
  - .12 Upon completion of the Work, the Contractor must provide copies of all TPDES records to Owner.
- 6.07.6** Contractor shall abide by all Legal Requirements including, but not limited to, the Endangered Species Act.
- 6.07.7** Contractor warrants and represents that: (i) Contractor does not have any contracts with and does not provide supplies or services to any organization designated as a foreign terrorist organization by the United States secretary of state as authorized by 8 U.S.C. Section 1189 (a “Foreign Terrorist Organization”); or (ii) the United States government has affirmatively declared Contractor to be excluded from its federal sanctions regime relating to Sudan, its federal sanctions regime relating to Iran, or any federal sanctions regime relating to a Foreign Terrorist Organization.

**6.08 Taxes:**

- 6.08.1** Contractor shall pay only those sales, consumer, use and other similar taxes required to be paid by Contractor in accordance with the laws and regulations of the State of Texas in the performance of this public works contract.
- 6.08.2** Owner is an exempt organization as defined by Chapter 11 of the Property Tax Code of Texas and is thereby exempt from payment of Sales Tax under Chapter 151, Limited Use Sales, Excise and Use Tax, Texas Tax Code, and Article 1066 (C), Local Sales and Use Tax Act, Revised Civil Statutes of Texas.
- 6.08.3** In addition, if the Project is construction of a water or wastewater system certified by the Texas Commission on Environmental Quality as a regional system, equipment, services and supplies used solely to construct the Project are exempted from taxes imposed by Chapter 151, Limited Sales, Excise and Use Tax, Texas Tax Code.

**6.09 Use of Premises:**

- 6.09.1** Contractor shall confine construction equipment, the storage of materials and equipment and the operations of workers to the Site and land and areas identified in and permitted by the Contract Documents and other land and areas permitted by laws and regulations, rights-of-way, permits and easements, and shall not unreasonably encumber the premises with construction equipment or other materials or equipment. Contractor assumes 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. Should any claim be made by any such owner or occupant because of or in connection with the performance of the Work, Contractor shall promptly settle with such other party by negotiation or otherwise resolve the claim by arbitration or other dispute resolution proceeding or at law. Any such settlement shall not include any admission of liability on the part of Owner and shall be subject to Owner's approval, which approval shall not be unreasonably withheld.
- 6.09.2** Contractor shall defend, indemnify and hold harmless the Owner, the Owner's Representative, the Principal Architect/Engineer, Principal Architect/Engineer's Consultants and anyone directly or indirectly employed by any of them from and against all claims, costs, losses and damages (including court costs and reasonable attorneys' fees) arising out of or resulting from any claim or action, legal or equitable, brought by any such owner or occupant against Owner, Owner's Representative, Principal Architect/Engineer or any other party indemnified hereunder arising out of the Work except to the extent such claims, costs, losses or damages are caused by negligence or fault, breach or violation of a statute, ordinance, governmental regulation, standard or rule or breach of contract of the Owner, the Owner's Representative, the Principal Architect/Engineer, Principal Architect/Engineer's Consultants or any third party under the control or supervision of them other than Contractor or its agent or employee or Subcontractors of any tier.
- 6.09.3** During the progress of the Work and on a daily basis, Contractor shall keep the premises free from any accumulations of waste materials, rubbish and

other debris resulting from the Work. Contractor shall provide such personnel, waste containers and or equipment necessary to maintain an orderly, clean and safe work site. Contractor shall keep all streets, access streets, driveways, and areas of public access, walkways, and other designated areas clean and open at all times. At the completion of the Work, Contractor shall remove all waste materials, rubbish and debris from and about the premises as well as all tools, appliances, construction equipment and machinery and surplus materials. Contractor shall have the Site clean and ready for occupancy by Owner at Substantial Completion of the Work. Contractor shall, at a minimum, restore to original condition all property not designated for alteration by the Contract Documents. If the Contractor fails to clean up or restore at the completion of the Work, Owner may do so and the cost thereof will be charged against the Contractor.

**6.09.4** Contractor shall not load or 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.

**6.10 Record Documents:** Contractor shall maintain in a safe place at the Site, or other location acceptable to Owner, one (1) record copy of all red line Record Drawings, Specifications, Addenda, Change Orders, Change Directives, Field Orders and written interpretations and clarifications in good order and annotated to show all changes made during construction. These record documents together with all final samples and all final Shop Drawings and submittals will be available to Owner, Owner Representative, and Principal Architect/Engineer for reference during performance of the Work. Upon Substantial Completion of the Work, these record documents, samples, Shop Drawings and submittals shall become the property of the Owner and shall be neatly labeled and organized per the Owner's direction and promptly delivered in containers acceptable to the Owner, to Owner's Representative. Record drawings must also include an electronic format that is either ".dwg" or ".dxf".

**6.11 Safety and Protection:**

**6.11.01** Contractor shall be responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the Work. Prior to commencement of the Work, Contractor shall submit a site security plan for approval by Owner. By reviewing the plan or making recommendations or comments, Owner will not assume liability nor will Contractor be relieved of liability for damage, injury or loss. 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 Work 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, but not limited to, trees, shrubs, lawns, walks, pavements, roadways, structures, utilities and Underground Improvements not designated for removal, relocation or replacement in the course of construction.

**6.11.02** The Contractor will provide a Safety Manager for this Project. The Safety Manager will be responsible for the safety of the entire Work and the prevention of accidents in connection with the Work. The Safety Manager shall be competent and qualified to perform his/her duties, including but not limited to having received all appropriate Occupational Safety and Health Act of 1970, as amended (“OSHA”) and other safety training, and experienced in managing safety programs on construction projects comparable in scope and complexity.

**6.11.03 Specific Duties of the Contractor’s Safety Manager:** This person will ensure compliance with all provisions of the Contract Documents, OSHA, other governmental agencies, industry safety requirements and standards. The Contractor Safety Manager will prepare and enforce a site-specific safety plan for the Work.

- .1** Additional duties of the Contractor’s Safety Manager shall include the following:
- (a)** Be responsible for safety over-sight of the entire Work.
  - (b)** Review and direct immediate action to correct all substandard safety conditions.
  - (c)** Be responsible for providing any necessary additional safety personnel with support in carrying out the duties and responsibilities of that position.
  - (d)** Conduct regular supervisory safety meetings, including the discussion of observed unsafe work practices or conditions, a review of accidents experienced and corrective actions, and encouragement of safety suggestions from employees.
  - (e)** Investigate all accidents and implement immediate corrective action.
  - (f)** Cooperate with the insurance carrier(s) and Owner’s safety personnel.
  - (g)** Provide timely reports in writing of any observed unsafe conditions or practices, or violations of job security regarding safety issues and take corrective actions.
  - (h)** Report all injuries and accidents in a timely manner to the Contractor and safety personnel in accordance with Contract Documents, federal, state and local laws and regulations.
  - (j)** Ensure that the necessary competent safety persons are on Site as required in the Contract.
  - (k)** Comply with insurance carriers requirements in all accident investigation and reporting procedures.
  - (m)** Coordinate safety activities with insurance carriers, and take necessary steps to promptly implement safety recommendations or directives issued thereby.
  - (n)** Be responsible for the availability and proper use of all necessary safety equipment including personal protective equipment and apparel for the employees.



- 6.11.05** Before commencing any excavation which will exceed a depth of five feet (5'), the Contractor shall prepare and employ detailed drawings and specifications regarding the safety systems to be utilized. Said plans and specifications shall include a certification from a registered Texas professional engineer indicating full compliance with the OSHA provisions cited above.
- 6.11.06 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 at the Site in accordance with applicable laws and regulations.
- 6.11.07 Emergencies:**
- .1** In emergencies affecting the safety or protection of persons or the Work at the Site or adjacent thereto, Contractor, without special instruction or authorization from Owner, Owner Representative, or Principal Architect/Engineer, is obligated to act reasonably to prevent threatened damage, injury or loss and to mitigate damage or loss to the Work. Contractor shall give Owner's Representative telephone notification as soon as reasonably practical and a prompt written notice if Contractor believes that any significant changes in the Work or variations from the Contract Documents have been caused thereby. If Owner determines that a change in the Contract Documents is required because of the action taken by Contractor in response to such an emergency, a Change Directive or Change Order will be issued to document the consequences of such action.
  - .2** Authorized agents of Contractor shall respond immediately to call-out at any time of any day or night when circumstances warrant the presence on Project Site of Contractor or his agent to protect the Work or adjacent property from damage, injury or loss, or to take such action or measures pertaining to the Work as may be necessary to provide for the safety of the public. Should Contractor and/or its agent fail to respond and take action to alleviate such an emergency situation, Owner may direct other forces to take action as necessary to remedy the emergency condition, and Owner will deduct any cost of such remedial action from the funds due Contractor under this Contract, or Contractor shall reimburse Owner for same on demand.
  - .3** In the event there is an accident involving injury to any individual or damage to any property on or near the Work, Contractor shall provide to Owner's Representative verbal notification within one (1) hour and written notification within twenty-four (24) hours of the event and shall be responsible for recording the location of the event and the circumstances surrounding the event through photographs, interviewing witnesses, obtaining medical reports, police accident reports and other documentation that describes the event. Copies of such documentation shall be provided to Owner's Representative, for Owner's and Principal Architect/Engineer's records, within forty-eight (48) hours of the event. Contractor shall cooperate with Owner on any Owner investigation of any such incident.

**6.12 Continuing the Work:** Contractor shall carry on the Work and adhere to the Project Schedule during all disputes or disagreements with Owner. No Work shall be delayed or postponed pending resolution of any disputes or disagreements, except as Owner and Contractor may otherwise agree in writing.

**6.13 Contractor's General Warranty and Guarantee:**

**6.13.1** Contractor warrants and guarantees to Owner that all Work will conform to the drawings and specifications, be performed in a good and workmanlike manner in accordance with the Contract Documents and will not be Defective and that the whole and entire Work will function and operate as expressed or required by the Contract Documents. This warranty will survive the termination or expiration of the Contract. 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 or Suppliers; or
- .2 normal wear and tear under normal usage.

**6.13.2** Nothing in this warranty is intended to limit any Manufacturer's warranty which provides Owner with greater warranty rights than set forth in this Section or the Contract Documents. Further, nothing in this warranty shall be limited by the Contractor's obligation to cure defects within any specific corrective or warranty period as required in the Contract Documents, including Section 13.7 below.

**6.13.3** Contractor's obligation to perform and complete the Work in a good and workmanlike manner 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 Owner's Representative, Owner's CMT Consultant, and/or Principal Architect/Engineer;
- .2 recommendation of any progress or final payment by Owner's Representative;
- .3 the issuance of a certificate of Substantial Completion or any payment by Owner to Contractor under the Contract Documents;
- .4 use or occupancy of the Work or any part thereof by Owner;
- .5 any acceptance by Owner or any failure to do so;
- .6 any review of a Shop Drawing or sample submittal;
- .7 any inspection, test or approval by others;
- .8 any correction of Defective Work by Owner; or
- .9 progress payments or final payment by Owner.

**6.13.4** Except as otherwise agreed in writing by the Parties, partial occupancy or use of some or all of the Work or any part thereof shall not commence the corrective period under Section 13.7 below.

**6.13.5** Independent from Contractor's warranty and corrective work obligations, Contractor shall be responsible for maintenance of the Work prior to Owner's occupancy or use of same, such that the Work shall be capable of being started-up and operated as designed without any additional

maintenance, or any repair or replacement of, or additional work or services on, the equipment, materials or systems.

**6.13.6** Not used.

**6.14 INDEMNIFICATION BY CONTRACTOR:**

**6.14.1** Contractor shall defend, indemnify and hold harmless (collectively, "Indemnify") Owner, the Owner's Representative, the Principal Architect/Engineer, Principal Architect/Engineer's Consultants and Subconsultants and their respective officers, directors, partners, employees, agents and other Consultants (the "INDEMNIFIED PARTIES") from and against all claims, costs, losses, demands, injuries, liabilities, damages, causes of action and expenses (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 resulting from the Work, provided that any such claim, cost, loss, demand, injury, liability, damage or cause of action:

- .1 Is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself), including the loss of use resulting therefrom, and
- .2 Is caused in whole or in part by any negligent act or omission of Contractor, any Subcontractor, any Supplier, any person or organization directly or indirectly employed by any of them to perform or furnish any of the Work or anyone for whose acts any of them may be liable, even if caused in part by any negligence or omission of one or more of the INDEMNIFIED PARTIES; save and except that Contractor's obligation to Indemnify shall not apply to the extent such claims, costs, losses, demands, injuries, liabilities, damages, causes of action or expenses are caused by negligence or fault, breach or violation of a statute, ordinance, governmental regulation, standard or rule or breach of contract of an Indemnified Party or any third party under the control or supervision of an Indemnified Party other than Contractor or its agent or employee or Subcontractors of any tier.

**6.14.2** Notwithstanding Subsection 6.14.1, **CONTRACTOR AGREES TO AND SHALL DEFEND, INDEMNIFY AND HOLD HARMLESS (COLLECTIVELY "INDEMNIFY") OWNER, THE OWNER'S REPRESENTATIVE, THE PRINCIPAL ARCHITECT/ENGINEER, PRINCIPAL ARCHITECT/ENGINEER'S CONSULTANTS AND SUBCONSULTANTS AND THEIR RESPECTIVE OFFICERS, DIRECTORS, PARTNERS, MEMBERS, EMPLOYEES, AGENTS AND OTHER CONSULTANTS (COLLECTIVELY THE "INDEMNIFIED PARTIES" OR INDIVIDUALLY AN "INDEMNIFIED PARTY") FROM AND AGAINST ANY AND ALL CLAIMS, COSTS, LOSSES, DEMANDS, INJURIES, LIABILITIES, DAMAGES, AND CAUSES OF ACTION, INCLUDING BUT NOT LIMITED TO ALL EXPENSES OF LITIGATION, COURT COSTS AND ATTORNEYS' FEES (COLLECTIVELY, IN THIS SUBSECTION 6.14.2, "EMPLOYEE CLAIMS"), FOR BODILY INJURY OR DEATH OF ANY EMPLOYEE OF CONTRACTOR, ITS AGENTS, OR ITS SUBCONTRACTORS OF ANY TIER**



**(COLLECTIVELY “EMPLOYEE” FOR THE PURPOSE OF THIS SECTION 6.14.2), ACTUALLY OR ALLEGEDLY OCCASIONED BY, CONTRIBUTED TO OR ARISING OUT OF, IN WHOLE OR IN PART, THE WORK OR THIS CONTRACT, INCLUDING BUT NOT LIMITED TO CLAIMS DUE TO NEGLIGENCE, GROSS NEGLIGENCE, BREACH OF WARRANTY, BREACH OF CONTRACT, VIOLATION OF ANY STATUTE, RULE OR REGULATION OR OTHER ACT OR OMISSION BY CONTRACTOR, ITS EMPLOYEES, AGENTS OR ANY SUBCONTRACTOR OF CONTRACTOR OF ANY TIER, OR THEIR RESPECTIVE AGENTS OR EMPLOYEES, OR ANY OTHER PARTY FOR WHOSE ACTS CONTRACTOR IS LIABLE. CONTRACTOR’S OBLIGATION TO INDEMNIFY SHALL APPLY EVEN IF SUCH EMPLOYEE CLAIMS ARE ACTUALLY OR ALLEGEDLY CAUSED IN WHOLE OR IN PART BY THE ACTS, OMISSIONS, OR NEGLIGENCE OF AN INDEMNIFIED PARTY, EVEN IF SUCH NEGLIGENCE OR OTHER ACTS OR OMISSIONS ARE ACTIVE OR PASSIVE, DIRECT OR INDIRECT, SOLE OR CONCURRENT. THIS INDEMNITY AGREEMENT IS INTENDED TO INDEMNIFY THE INDEMNIFIED PARTIES FROM THE CONSEQUENCES OF THEIR OWN NEGLIGENCE, AS PROVIDED ABOVE.**

- 6.14.3** The indemnification obligation under Section 6.14.1 and 6.14.2 shall not be limited in any way by any insurance required by or provided in connection with this Contract or otherwise, or by any limitation on the amount or type of damages, or compensation or benefits payable by or for Contractor or any such Subcontractor, Supplier or other person or organization under workers' compensation acts, disability benefit acts or other employee benefit acts.
- 6.14.4** Notwithstanding anything in Section 6.14.1 or 6.14.2 to the contrary, the obligations of Contractor under Section 6.14.1 and 6.14.2 shall not extend to the liability of a registered architect, a licensed engineer, or an agent, servant or employee of a registered architect or a licensed engineer, for damage that is caused by or results from defects in plans, designs or specifications prepared, approved or used by the architect or engineer, or negligence of the architect or engineer in the rendition or conduct of professional duties called for or arising out of the construction contract and the plans, designs or specifications that are a part of the construction contract; and arises from personal injury or death, property injury, or any other expense that arises from personal injury, death, or property injury.
- 6.14.5** In the event Contractor fails to follow Owner's directives concerning use of the Site, scheduling or course of construction, or engages in other conduct which results in damage to property based on inverse condemnation or otherwise, then and in that event, Contractor shall indemnify Owner against all costs and claims resulting therefrom except to the extent such costs or claims are caused by negligence or fault, breach or violation of a statute, ordinance, governmental regulation, standard or rule or breach of contract of Owner or any third party under the control or supervision of Owner other than Contractor or its agent or employee or Subcontractors of any tier.
- 6.14.6** Subject to the limitation as set out in Section 6.14.4, in the event Contractor's negligence or breach of contract results in Delay in the progress of the Work or the performance of services being done by others

on the Site or otherwise with regard to the Project (including Owner's separate contractors, design professionals, and consultants) so as to result in loss for which Owner becomes liable to such others, then Contractor shall indemnify Owner from and reimburse Owner for such loss, except to the extent such loss is caused by negligence or fault, breach or violation of a statute, ordinance, governmental regulation, standard or rule or breach of contract of Owner or any third party under the control or supervision of Owner other than Contractor or its agent or employee or Subcontractors of any tier.

**6.15 Not used.**

**6.16 Not used.**

**6.17 Notice of Claim:** Should Contractor suffer injury or damage to person or property because of any error, omission or act of Owner or of any of Owner's employees or agents or others for whose acts Owner is liable, a Claim must be made to Owner within five (5) calendar days of the event giving rise to such injury or damage. The provisions of this Section 6.17 shall not be construed as a substitute for or a waiver of the provisions of any applicable statute of limitations or statute of repose.

**6.18 Liquidated Damages or Economic Disincentives:** Contractor and its Surety shall be liable for liquidated damages or economic disincentives as provided in the Contract for the failure of the Contractor to timely complete the Work within the Contract Time Requirements.

**6.19 Commissioning:** The Contractor will be responsible to provide all of the required commissioning of the mechanical, electrical, instrumentation, and proprietary equipment and systems for the Project. This is the process of verification, preliminary testing, starting up and functional operations testing of all such equipment and systems which are part of the Project. The term "commissioning" shall specifically include the drafting, review and verification of all test plans and test reports for all equipment and systems which are part of the Project. The verification, testing, start-up and commissioning of the mechanical, electrical, instrumentation, and proprietary equipment and systems for the Project can be performed by the Contractor's personnel or it can be part of a subcontract work package with the Contractor managing and supervising that Scope of Work.

**6.19.1** At least ninety (90) days prior to the planned dates for the initiation of the preliminary testing of any mechanical, electrical, instrumentation, and proprietary equipment and systems for the Project, or within a time-frame agreed upon at the Pre-Construction Meeting, the Contractor shall prepare and submit an overall Project Testing and Commissioning Program for Owner, Owner's Representative, and Principal Architect/Engineers' review and approval.

**6.19.2 Project Testing and Commissioning Program:** The Project Testing and Commissioning Program shall cover all aspects of the Project and shall contain as a minimum, all of the following information:

**.1 Equipment Test Plans:** An individual Equipment Test Plan configured for each piece of mechanical, electrical, instrumentation, and

proprietary equipment and items on the entire Project that identifies how each piece of such equipment or item is to be verified, tested and commissioned including what functional elements must be demonstrated and precisely how those functional elements will be demonstrated to be operational to the Owner, Owner's Representative, and the Principal Architects/Engineers.

**6.20 Shop Drawings & Submittals:** The Contractor shall be required to provide submittals, samples and Shop Drawings to the Owner's Representative for transmittal to the Principal Architect/Engineer for approval in accordance with the Schedule of Submittals and section 01 33 00 of Division 01 Submittals.

**6.20.1** Each submittal shall be identified in a format and in quantities as may be required by the Owner and section 01 33 00 of Division 01 Submittals. Contractor shall utilize Owner's standard forms unless otherwise approved in writing by the Owner.

**6.20.2** Where a Shop Drawing or sample is required by the Contract Documents or the Schedule of Submittals, any related Work performed prior to Principal Architect/Engineer's review and approval of the pertinent submittal will be at the sole risk and expense of Contractor.

**6.20.3** Before submitting each Shop Drawing or sample, Contractor shall have:

- .1** reviewed and coordinated each Shop Drawing or sample with other Shop Drawings and samples and with the requirements of the Work and the Contract Documents;
- .2** determined and verified all field measurements, quantities, dimensions, specified performance and design criteria, installation requirements, materials, catalog numbers, and similar information with respect thereto;
- .3** determined and verified the suitability of all materials offered with respect to the indicated application, fabrication, shipping, handling, storage, assembly, and installation pertaining to the performance of the Work; and
- .4** determined and verified all information relative to Contractor's responsibilities for means, methods, techniques, sequences, and procedures of construction, and safety precautions and programs incident thereto.

**6.20.4** Each submittal shall bear a stamp or specific written certification that Contractor has satisfied Contractor's obligations under the Contract Documents with respect to Contractor's preparation, review and approval of that submittal.

**6.20.5** With each submittal, Contractor shall give Principal Architect / Engineer specific written notice of any variations that the Shop Drawing or sample may have from the requirements of the Contract Documents. This notice shall be both a written communication separate from the Shop Drawings or sample submittal; and, in addition, by a specific notation made on each Shop Drawing or sample submitted to Principal Architect / Engineer for review and approval of each such variation.

- 6.20.6** Principal Architect/Engineer will provide timely review of Shop Drawings and Samples in accordance with the Schedule of Submittals acceptable to Principal Architect/Engineer. Engineer's review and approval will be only to evaluate whether the items covered by the submittals appear that they 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.
- 6.20.7** Principal Architect/Engineer's review and approval 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 approval of a separate item as such will not indicate approval of the assembly in which the item functions.
- 6.20.8** Principal Architect/Engineer's review and approval 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 6.20.5 and Principal Architect/Engineer has given written approval of each such variation by specific written notation thereof incorporated in or accompanying the Shop Drawing or sample. Principal Architect / Engineer's review and approval shall not relieve Contractor from responsibility for complying with the requirements of Section 6.20.3.
- 6.20.9** Contractor shall make corrections required by Principal Architect / Engineer and shall return the required number of corrected copies of Shop Drawings and submit, as required, new samples for review and approval. Contractor shall direct specific attention in writing to revisions other than the corrections called for by Principal Architect/Engineer on previous submittals.
- 6.21 Operation & Maintenance Manuals:** The Contractor shall be required to provide Operations & Maintenance Manuals for all mechanical, electrical, instrumentation, and proprietary equipment and items being installed as part of the Work. The Contractor must compile all specified instructions, maintenance manuals and operating data as defined under this section and in the Specifications. The compilation and assembly of the Operations & Maintenance Manuals for the Work can be performed by the Contractor's personnel or it can be part of a subcontract work package with the Contractor managing and supervising that Scope of Work. The Contractor shall strictly adhere to all of the requirements for the assembly, formatting and printing of the O&M Manuals as more thoroughly defined in the Contract Documents.
- 6.22 Training of Owner's Personnel:** The Contractor shall be required to provide training of the Owner's designated personnel for all mechanical, electrical, instrumentation, and proprietary equipment and items being installed on the Project. The Contractor must provide this training as defined under this section, Division 01 and the Specifications. The training of the Owner's designated personnel for all mechanical, electrical, instrumentation, and proprietary equipment and items being installed on the Project can be performed by the Contractor's personnel or it can be part of a subcontract work package with the Contractor managing and supervising that Scope of Work.

**ARTICLE 7 - OTHER WORK**

- 7.1** Owner may perform other work related to the Project at the Site by Owner's own forces, or let other contracts for the other work, or have other work performed by utility owners. Contractor and Owner agree to and shall use best efforts to cooperate and coordinate the Work with others performing work and other work related to the Project in order to avoid conflicts and Delays in the Work.
- 7.2** Contractor shall afford Owner's Independent Contractors and each utility owner (and Owner, if Owner is performing the additional work with Owner's employees) proper and safe access to the Site and a reasonable opportunity for the introduction and storage of materials and equipment and the execution of such other work and shall properly connect and coordinate the Work with theirs. Unless otherwise provided in the Contract Documents, Contractor shall do all cutting, fitting and patching of the Work that may be required to make its several parts come together properly and integrate with such other work. Contractor shall not endanger any work of others by cutting, excavating or otherwise altering their work and will only cut or alter their work with the advance written consent of Owner's Representative and the other contractors whose work will be affected. Unless expressly so consented to by such parties, Contractor shall promptly remedy damage caused by Contractor to completed or partially completed construction or to property of the Owner or separate contractors.
- 7.3** If the proper execution or results of any part of Contractor's Work depends upon work performed by others, Contractor shall inspect such other work and promptly report to Owner's Representative 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 report will constitute an acceptance of such other work as fit and proper for integration with Contractor's Work except for latent defects and deficiencies in such other work.
- 7.4** Owner shall provide for coordination of the activities of the Owner's own forces and of Owner's Independent Contractors with the Work of Contractor, who shall cooperate with them. Contractor shall participate with Owner's Independent Contractors and Owner's Representative in reviewing their construction schedules when directed to do so. On the basis of such review, Contractor shall make any revisions to the Project Schedule agreed upon as necessary after a joint review. The agreed upon construction sequences shall then constitute the Project Schedules to be used by Contractor, separate contractors and Owner until subsequently revised.
- 7.5** Contractor shall coordinate the activities of all Subcontractors. If Owner performs other work on the Project or at the Site with Owner's Independent Contractors, Contractor agrees to reasonably cooperate and coordinate its activities with those of such separate contractors so that the Project can be completed in an orderly and coordinated manner without unreasonable disruption.

**ARTICLE 8 - OWNER'S RESPONSIBILITIES**

- 8.1** Prior to the start of construction, Owner will designate in writing a person or entity to act as Owner's Representative during construction. The Owner shall retain the right

to communicate directly with the Contractor. However, except as otherwise provided in these General Conditions, the Owner shall issue communications to Contractor through the Owner's Representative. Owner's Representative will be responsible for providing Owner-supplied information and approvals. Owner's Representative will also endeavor to provide Contractor with prompt notice if it observes a failure on the part of the Contractor to fulfill its contractual obligations, including any errors, omissions or defects in the performance of the Work; however, failure of the Owner's Representative to provide Contractor with such notice shall not relieve Contractor of any of its responsibilities under the Contract Documents.

- 8.2** Owner and Owner's Representative will not supervise, direct, control or have authority over or be responsible for Contractor's means, methods, techniques, sequences or procedures of construction or the safety precautions and programs incident thereto. Owner and Owner's Representative are not responsible for any failure of Contractor to comply with Legal Requirements applicable to furnishing or performing the Work. Owner and Owner's Representative are not responsible for Contractor's failure to perform or furnish the Work in accordance with the Contract Documents. Failure or omission of Owner or Owner's Representative to discover, or object to or condemn any Defective Work or material shall not relieve Contractor from the obligation to properly and fully perform the Contract.
- 8.3** Owner and Owner's Representative are not responsible for the acts or omissions of Contractor, or of any Subcontractor, any Manufacturer or Supplier, or of any other person or organization performing or furnishing any of the Work. Contractor acknowledges and agrees that Owner's or Owner's Representative's direction to perform Work in accordance with the approved Master Project Schedule is not a demand for acceleration or a dictation of Contractor's means or methods.
- 8.4** Information or services under the Owner's control shall be furnished by the Owner with reasonable promptness. The Owner or Owner's Representative shall have a reasonable amount of time to investigate Site conditions, review submittals, analyze requests for changes, and to make other decisions in the orderly administration of the Contract. Contractor must notify the Owner and/or Owner's Representative in writing, if the time for the investigation, review, analysis of any submittals, required for changes or otherwise required for Owner's decision, impacts in any way the Critical Path of the approved Master Project Schedule.

**8.5 Furnishing of Services and Information**

**8.5.1** Owner may provide, at its own cost and expense, for Contractor's information and use, any of the following, all of which are not binding on Owner, are not Contract Documents, are not warranted or represented in any manner to accurately show the conditions at the Site of the Work, and shall not be the basis for any Claim for damages, additional compensation or extension of time should the actual conditions in the course of the Work vary or differ from conditions or information contained in or inferable from them:

- .1** Surveys describing the property, boundaries, topography and reference points for use during construction, including existing service and utility lines;

- .2 Geotechnical studies describing subsurface conditions, and other surveys describing other latent or concealed physical conditions at the Site;
- .3 Temporary and permanent easements, zoning and other requirements and encumbrances affecting land use, or necessary to permit the proper design and construction of the Project and enable Contractor to perform the Work;
- .4 A legal description of the Site;
- .5 As-built and record drawings of any existing structures at the Site; and
- .6 Environmental studies, reports and impact statements describing the environmental conditions, including Hazardous Conditions, known by the Owner to be in existence at the Site.

**ARTICLE 9 – PRINCIPAL ARCHITECT/ENGINEER'S STATUS DURING CONSTRUCTION**

**9.1 Principal Architect/Engineer's Authority and Responsibilities:**

- 9.1.1 The duties and responsibilities and the limitations of authority of Principal Architect/Engineer during construction, as set forth in the Contract Documents, may be assigned or assumed by the Owner, but shall not be extended without written consent of Owner and/or Principal Architect/Engineer. The assignment of any authority, duties or responsibilities to Principal Architect/Engineer under the Contract Documents, or under any agreement between Owner and Principal Architect/Engineer, or any undertaking, exercise or performance thereof by Principal Architect/Engineer, is intended to be for the sole and exclusive benefit of Owner and not for the benefit of Contractor, Subcontractor, Supplier, or any other person or organization, or for any surety or employee or agent of any of them.
- 9.1.2 Principal Architect/Engineer will not supervise, direct, control or have authority over or be responsible for Contractor's means, methods, techniques, sequences or procedures of construction, or the safety precautions and programs incident thereto. Principal Architect/Engineer is not responsible for any failure of Contractor to comply with Legal Requirements applicable to the furnishing or performing the Work. Principal Architect/Engineer is not responsible for Contractor's failure to perform or furnish the Work in accordance with the Contract Documents. Failure or omission of Principal Architect/Engineer to discover, or object to or condemn any Defective Work or material shall not relieve Contractor from the obligation to properly and fully perform the Contract.
- 9.1.3 Principal Architect/Engineer is not responsible for the acts or omissions of Contractor, or of any Subcontractor, any Manufacturer or Supplier, or of any other person or organization performing or furnishing any of the Work.
- 9.1.4 If Owner and Principal Architect/Engineer agree, Principal Architect/Engineer will review the final Application for Payment and accompanying documentation and all maintenance and operating instructions, schedules, guarantees, Bonds and certificates of inspection, tests and approvals and other documentation required to be delivered by Article 14, but only to determine generally that their content appears to

comply with the requirements of, and in the case of certificates of inspections, tests and approvals that the results certified indicate compliance with, the Contract Documents.

- 9.1.5** The limitations upon authority and responsibility set forth in this Section 9.1 shall also apply to Principal Architect/Engineer's Consultants, Resident Project Representative and assistants.
- 9.2 Visits to Site:** If Owner and Principal Architect/Engineer agree, Principal Architect/Engineer will make visits to the Site at intervals appropriate to the various stages of construction as requested by the Owner or the Owner's Representative and as Principal Architect/Engineer deems necessary in order to observe as an experienced and qualified design professional 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, Principal Architect/Engineer will endeavor for the benefit of Owner to determine, in general, if the Work is proceeding in accordance with the Contract Documents. Principal Architect/Engineer will not be required to make exhaustive or continuous on-site inspections to check the quality or quantity of the Work. Principal Architect/Engineer's efforts will be directed toward providing for Owner a greater degree of confidence that the completed Work will conform generally to the Contract Documents. On the basis of such visits and on-site observations, Principal Architect/Engineer will keep Owner and Owner's Representative informed of the progress of the Work and will endeavor to guard Owner against Defective Work. Principal Architect/Engineer's visits and on-site observations are subject to all the limitations on Principal Architect/Engineer's authority and responsibility set forth in Section 9.1 above.
- 9.3 Resident Project Representative:** If Owner and Principal Architect/Engineer agree, Principal Architect/Engineer may furnish a Resident Project Representative to assist Principal Architect/Engineer in providing more continuous observation of the Work. Owner may designate another representative or agent to represent Owner at the Site who is not a Principal Architect/Engineer, Principal Architect/Engineer's consultant, agent or employee.
- 9.4 Clarifications and Interpretations:** Principal Architect/Engineer may determine that written clarifications or interpretations of the requirements of the Contract Documents (in the form of drawings or otherwise) are necessary. Such written clarifications or interpretations will be consistent with the intent of and reasonably inferable from the Contract Documents, will be issued by the Principal Architect/Engineer after consultation with the Owner, and the Contractor will comply with same. If Contractor believes that a written clarification or interpretation alters the Scope of Work and justifies an adjustment in the Contract Amount or the Contract Time Requirements, Contractor may make a Claim as provided in Article 11 or 12.
- 9.5 Rejecting Defective Work:** Principal Architect/Engineer will recommend that Owner disapprove or reject Work which Principal Architect/Engineer believes fails to conform to a requirement of the Contract Documents or believes will not produce a completed Project that conforms to the Contract Documents, or will prejudice the integrity of the design concept of the completed Project as a functioning whole as indicated by the Contract Documents.



- 9.6** The Principal Architect/Engineer shall not have the authority to issue changes in the field without the express written approval of the Owner.
- 9.7 Shop Drawings:** Refer to Division 01 for Principal Architect/Engineer's authority concerning Shop Drawings.

**ARTICLE 10 - CHANGES IN THE WORK**

**10.1 Changes:**

- 10.1.1** Without invalidating the Contract and without providing notice to any Surety, Owner may, at any time or from time to time, order additions, deletions or revisions in the Work. Such changes in the Work will be authorized by Change Order, Change Directive or Field Order. In the event that the Owner and the Contractor are unable to negotiate the terms of a Change Order for the performance of additional Work, the Owner may, at its election, perform such additional Work with its own forces or an Independent Contractor and such work will be considered "Other Work" in accordance with Article 7 or issue a Change Directive.
- 10.1.2** Changes in the Work shall be performed under applicable provisions of the Contract Documents, and Contractor shall proceed promptly, unless otherwise provided in the Change Order, Change Directive or Field Order. Contractor's proposals for changes in the Contract Amount and/or Contract Time Requirements shall be submitted within ten (10) Calendar Days as requested by the Owner, including estimated impacts to the approved Master Project Schedule if any. Owner will review each proposal and promptly respond to Contractor. After initial review of Contractor's proposal by Owner, Contractor shall provide any supporting data requested by Owner, including but not limited to any Subcontractor or Supplier proposal, within seven (7) Calendar Days, unless Owner grants an extension.
- 10.1.3** Contractor shall not be entitled to an increase in the Contract Amount or an extension of the Contract Time Requirements with respect to any Work performed that is not required by the Contract Documents as amended, modified and supplemented as provided in Sections 3.3.1 and 3.3.2, except in the case of an emergency as provided in Section 6.11.15 or in the case of uncovering Work as provided in Section 13.4.
- 10.1.4** Except in the case of an emergency as provided in Section 6.11.15, a Change Order or Change Directive is required before Contractor commences any activities associated with a change in the Work which, in Contractor's opinion, will result in a change in the Contract Amount and/or Contract Time Requirements. Any Work performed prior to Contractor's receipt of a Change Order or Change Directive, will be at Contractor's sole risk and expense, including potential cost impacts and any Delay to the Critical Path of the Master Project Schedule.
- 10.1.5** Not used.
- 10.1.6** Contractor shall provide to the Owner's Representative's all Contractor documentation/records deemed necessary by Owner or Owner's Representative to evaluate the Contractor's Claim including, but not limited

to certified payroll, receipts, bills of lading, invoices, schedules, contractor daily reports, and equipment logs. Other documents, if any, shall be provided pursuant to the Contract Documents.

**10.2 Change Orders:**

**10.2.1** Owner and Contractor shall execute appropriate written Change Orders covering:

- .1 a change in the Work, subject to limitations in Article 10 and elsewhere in the Contract;
- .2 the amount of the adjustment in the Contract Amount, if any; and
- .3 the extent of the adjustment in the Contract Time Requirements, if any.

**10.2.2** An executed Change Order shall constitute a settlement of and represent the complete, equitable, and final amount of adjustment in the Contract Amount and/or Contract Time Requirements owed to Contractor or Owner as a result of the occurrence or event causing the change in the Work encompassed by the Change Order.

**10.3 Change Directives:**

**10.3.1** Owner may, by written Change Directive, order changes in the Work within the general scope of the Contract consisting of additions, deletions or other revisions, the Contract Amount and Contract Time Requirements being adjusted as the Owner may deem necessary. A Change Directive may be used in the absence of complete and prompt agreement on the terms of a Change Order, or as otherwise may be deemed to be necessary by the Owner. Where practicable, any items or elements of changed Work that may be agreed upon, prior to the performance of Work under this Article, will be included in a separate Change Order.

**10.3.2** If the Change Directive provides for an adjustment to the Contract Amount, the adjustment shall be based on one of the methods provided in Article 11.4.1.

**10.3.3** A Change Directive signed by Contractor indicates the agreement of Contractor with the proposed basis of adjustment in the Contract Amount and Contract Time Requirements as described within that Change Directive. Such agreement shall be effective immediately and shall be recorded later by preparation and execution of an appropriate Change Order.

**10.3.4** The Contractor is not obligated to execute a Change Directive, but that Change Directive still constitutes valid direction to the Contractor from the Owner. The refusal by the Contractor to accept the terms incorporated within a Change Directive does not invalidate the content of the Change Directive or undermine in any manner the Owner's right to provide the directive contained within that Change Directive. Upon receipt of a Change Directive, Contractor shall promptly proceed with the change in the Work involved, provided, prior to the commencement of any Work under this section, the Contractor must submit its proposed Work plan, anticipated schedule, and a list of its work force and equipment proposed to be used in

such Work for Owner's approval. Upon such approval, Contractor must promptly commence and make continuous progress in the Change Directive Work. The Owner reserves the right to withhold payment for low production or lack of progress.

- 10.3.5** The Owner will allow the Contractor to bill for all portions of a Change Directive for which the Work has been successfully completed, if and to the extent the Change Directive provides for an adjustment to the Contract Amount.

**10.4 Field Order:**

- 10.4.1** Owner may authorize minor variations in the Work from the requirements of the Contract Documents which do not involve an adjustment in the Contract Amount or the Contract Time Requirements and are compatible with the design concept of the completed Project as a functioning whole as intended by the Contract Documents. These minor variations shall be accomplished by written Field Order and shall be binding on Owner and on Contractor who shall perform the Work involved promptly. Contractor shall promptly acknowledge in writing the receipt of a Field Order.

- 10.4.2** If Contractor believes that a Field Order justifies an adjustment in the Contract Amount and/or Contract Time Requirements, Contractor shall make a prompt written request to Owner for a Change Order or Change Directive. Any request by Contractor for an adjustment in Contract Amount and/or Contract Time Requirements must be made in writing prior to the Contractor or the Contractor's Subcontractors beginning the Work covered by the Field Order.

**10.5 Limitation on Damages for Delay:**

- 10.5.1** Contractor shall receive no compensation or damages for Delays except when, and only to the extent that, Contractor demonstrates to the reasonable satisfaction of Owner that direct and unavoidable extra cost to Contractor is caused by: (a) Change Orders or Change Directives (not attributable to Contractor's failure to comply with the Contract Documents or other fault or negligence) that Delay the Work; or (b) specific orders given by Owner to stop or suspend Work (not attributable to Contractor's failure to comply with the Contract Documents or other fault or negligence) that Delay the Work; or (c) failure of Owner to:

.1 provide permits or material, which is to be furnished by Owner, or

.2 provide access to the Work,

and only to the extent that such circumstances continue after the Contractor furnishes Owner with written notice of such failure, such circumstances are not attributable to Contractor's failure to comply with the Contract Documents or other fault or negligence, and such failure causes Delay;

(a "Compensable Delay").

- 10.5.2** When extra compensation or damages are claimed for a Compensable Delay, Written Notice and support shall be delivered to the Owner as Provided in Section 12.1.1, and a written statement thereof shall be

presented by Contractor to Owner's Representative for Owner's Representative and Owner's review and consideration. Contractor's application for extra compensation or damages shall, however, be subject to review and approval by the Owner. In no event other than a Compensable Delay shall the Contractor be entitled to any compensation or recovery of any damages in connection with any Delays, including without limitation: consequential damages, lost opportunity costs, lost profits, unabsorbed home office overhead or other similar damages, and Contractor hereby expressly waives and releases any and all rights to claim or recover any such compensation or damages. The Owner's exercise of any of its rights or remedies under the Contract Documents (including without limitation ordering changes in the Work, or directing suspension, rescheduling, or correction of the Work), regardless of the extent or frequency of the Owner's exercise of such rights or remedies, shall not be construed as active interference in the Contractor's performance of the Work.

**10.5.3** In the event of a Compensable Delay, Contractor's sole and exclusive remedy (other than as provided in Section 10.5.4) shall be recovery of Contractor's General Conditions Costs for the period of time during any Working Day that Contractor is prevented from performing Work on the Critical Path, and Contractor hereby expressly waives and releases any and all rights to claim or recover any other compensation or damages arising out of or related to a Compensable Delay. "General Conditions Costs" consist only of actual and direct costs necessarily incurred by the Contractor and which Contractor was unable to mitigate despite the exercise of reasonable diligence, for standby costs of facilities, machinery, and equipment on Site ("Standby Equipment Costs"), and "Jobsite Overhead" as defined below, calculated as follows:

- .1 Standby Equipment Costs will not be claimable, due or paid for periods when the facilities, machinery or equipment would have otherwise been idle. Claims for Standby Equipment Costs time are limited to no more than eight (8) hours per twenty-four (24) hour day, forty (40) hours per week, and one hundred seventy-six (176) hours per month. Standby Equipment Costs will be payable at 50 percent (50%) of the applicable Blue Book Rental Rates and calculated by dividing the monthly rate by one hundred seventy-six (176), multiplying the result by the number of standby hours, and multiplying that number by the regional adjustment factor and the rate adjustment factor contained in the Blue Book. Operating costs will not be claimable or payable.
- .2 Jobsite Overhead will be claimable and payable based on actual costs that the Contractor will be required to document. "Jobsite Overhead" is defined as the wages or salaries of the Contractor's on-Site administrative and supervisory personnel (when unable to perform other services for Contractor), and reasonable office expenses incurred at the Site office, and will not include any element of home office labor, employees or overhead expenses.

**10.5.4** Except as otherwise provided in this Section 10.5, an extension of the Contract Time Requirements, to the extent permitted under Article 12, shall be the sole remedy of the Contractor for any claimed Delays, or loss, costs, expenses or damages incurred as a result of same.

**10.5.5** This Section 10.5 is intended as a limitation on damages available to Contractor and as a defense in favor of Owner against damages not compensable in accordance with its terms, in both cases pursuant to Section 271.155 of Subchapter I of Chapter 271 of the Texas Local Government Code. Contractor and Owner agree that such limitation and defense shall apply even if Owner is found to have breached the Contract.

**ARTICLE 11 - CHANGE OF CONTRACT AMOUNT**

**11.1** The Contract Amount is stated in the Contract and, including authorized adjustments, is the total amount payable by Owner to Contractor for performance of the Work in accordance with the Contract Documents.

**11.2** Contractor agrees and acknowledges that, unless otherwise permitted by law, the original Contract Amount may not be increased by more than twenty-five percent (25%).

**11.3** The Contract Amount shall only be changed by a Change Order or Change Directive. Any Claim by Contractor for an adjustment in the Contract Amount shall be made by Written Notice delivered to Owner promptly (but in no event later than fifteen (15) calendar days) after the start of the occurrence or event giving rise to the Claim and stating the general nature of the Claim. Notice of the amount of the Claim with supporting data shall be delivered within thirty (30) calendar days after Written Notice of Claim is delivered by Contractor, and shall represent that the adjustment claimed covers all known amounts to which Contractor is entitled as a result of said occurrence or event. If Owner and Contractor cannot otherwise agree, all Claims by Contractor for adjustment in the Contract Amount shall be determined as set out in Article 16.

**11.4 Determination of Value of Change Order or Change Directive Work:**

**11.4.1** The value of any Work covered by a Change Order or Change Directive for an adjustment in the Contract Amount will be determined by one of the following methods:

- .1 by application of unit prices contained in the Contract Documents or subsequently agreed upon to the quantities of the items involved.
- .2 by a mutually agreed lump sum properly itemized and supported by sufficient substantiating data to permit evaluation.
- .3 by a cost which has been determined in a manner agreed upon by the Parties and mutually acceptable fixed or percentage fee; or
- .4 as provided in Subsection 11.5.

**11.4.2** No cost will be included in the Change Order or Change Directive for the Contractor's time spent preparing the Change Order or responding to the Change Directive, nor will costs be included for the time to negotiate the Change Order or Change Directive costs for machinery, tools, or equipment as described in Subsection 11.5.3.

**11.4.3** Before using the method described in Section 11.4.1.4, Owner and Contractor agree to attempt to negotiate a Change Order or Change Directive using the methods identified in Sections 11.4.1.1 through

11.4.1.3, as appropriate, to determine the adjustment in the Contract Amount.

**11.5 Determination of Value of Change Order or Change Directive Work When No Agreement:** If none of the methods defined in Sections 11.4.1.1, 11.4.1.2 or 11.4.1.3 can be agreed upon before a change in the Work is commenced which will result in an adjustment in the Contract Amount, then the change in the Work will be performed by Change Directive, and the appropriate adjustment determined using the Force Account method set forth below in Subsections 11.5.1 through 11.5.6. The "Cost of the Work" consists only of those items specified in Subsections 11.5.1 through 11.5.5, below.

**11.5.1** For all personnel, Contractor or Subcontractors will be entitled to reimbursement for wages or salaries and employee benefit costs for extra Work performed using the employees' actual wages or salaries and a forty percent (40%) burden rate. No charge for additional superintendence will be permitted unless considered necessary and ordered by Owner;

**11.5.2** Contractor will be entitled to the actual cost, including freight charges, of the materials used and installed on such Work. In case material invoices indicate a discount may be taken, the actual cost will be the invoice price minus the discount;

**11.5.3** For machinery, trucks, power tools, or other similar equipment (the "equipment") agreed to be necessary by Owner and Contractor, Contractor will be entitled to reimbursement for actual rental costs;

**11.5.4** Contractor will be entitled to the actual cost of Contractor's premiums for Bond(s) and insurance on the extra Work, based on invoices from Surety and insurance carriers. Contractor shall provide Owner's Representative or Owner with invoices from Surety and insurance carriers indicating such cost when requested by Owner's Representative or Owner;

**11.5.5** Contractor will be entitled to reimbursement for actual, direct additional General Conditions Costs, but without duplication of any costs otherwise recoverable under this Subsection 11.5, reasonably and necessarily incurred by Contractor in the performance of the extra Work and which can be reasonably demonstrated to the Owner to be necessary to implement the changed Work; and

**11.5.6** Contractor will be entitled to allowances for overhead and profit as stated below.

**.1** The maximum allowance for overhead and profit on increases due to Change Orders and Change Directives:

	Overhead	Profit
To Contractor for change in the Work performed by Subcontractors:	10 percent	0 percent
To first tier Subcontractors for change in the Work performed by its Subcontractors:	10 percent	0 percent

To Contractor and Subcontractor for change in the Work performed by their respective firms: 10 percent 5 percent

- .2 For changes in the Work performed by Contractor and Subcontractors, allowance for overhead and profit will be applied to an amount equal to cost of all additions less cost of all deletions to the Work. Allowance for overhead to Contractor and first tier Subcontractors on changes performed by Sub-Subcontractors are applied to an amount equal to the sum of all increases to the Work by applicable Sub-Subcontractors, less any decreases in such Sub-subcontractors' Work.

**11.5.7** If Owner deletes Work or makes a change which results in a net decrease in the Contract Amount, the Owner is entitled to a credit calculated in accordance with Subsections 11.4.1.1 through 11.4.1.4.

**11.5.8** The compensation, as herein provided for, shall be received by Contractor and any affected Subcontractor as payment in full for Work done by Change Directive and will include use of small tools, and total overhead expense and profit. Contractor shall maintain in accordance with generally accepted accounting principles a documented, itemized accounting, evidencing the expenses and savings, including overhead and profit, associated with such changes, both for expenses and savings, in the performance of the Work resulting from the change. Contractor shall submit to Owner's Representative records of Work done by Change Directive at the end of each day, which records will be made upon forms provided for this purpose by Owner, and Contractor shall request that Contractor and Owner's Representative compare records of Work done by Change Directive at the end of each day. Any record of such comparison shall be signed by both Owner's Representative and Contractor, with one copy being retained by Owner and one by Contractor. Refusal by Contractor to sign these records within two (2) working days of presentation does not invalidate the accuracy of the record.

## **11.6 Unit Price Work:**

**11.6.1** The following Sections 11.6.1 through 11.6.7 apply only to those elements of the Work which are identified in the Contract Documents as being "Unit Price Work".

**11.6.2** Where the Contract Documents provide that all or part of the Work is to be Unit Price Work, initially the Contract Amount will be deemed to include for all Unit Price Work an amount equal to the sum of the established unit price for each separately identified item of Unit Price Work times the estimated quantity of each item as set forth in the Bid/Proposal. The estimated quantities of items of Unit Price Work are not guaranteed and are solely for the purpose of comparison of Bids/Proposals and determining an initial Contract Amount. Determinations of the actual quantities and classifications of Unit Price Work performed by Contractor will be made by Owner's Representative. Owner's Representative will review with Contractor the determinations on such matters before rendering a written decision thereon (by recommendation of payment on an Application for Payment or otherwise).

- 11.6.3** When "plan quantity" is indicated for a Bid/Proposal item, Contractor shall be paid the amount specified in the Contract Documents without any measurements.
- 11.6.4** Contractor agrees each Unit Price includes amounts for all overhead and profit associated with performing the units of Work for which the Unit Prices applies.
- 11.6.5** A Major Item is any individual Bid/Proposal item in the Bid/Proposal that has a total cost equal to or greater than five percent (5%) of the original Contract Amount or \$50,000, whichever is greater, computed on the basis of Bid/Proposal quantities and Contract Unit Prices.
- 11.6.6** Owner or Contractor may make a Claim for an adjustment in the Contract Amount in accordance with Article 11 if:
- .1** the actual quantity of any Major Item should become as much as twenty five percent (25%) more than or twenty five percent (25%) less than that in the Bid/Proposal; or
  - .2** Contractor presents documentation contesting accuracy of a "plan quantity" and Owner verifies actual quantity and determines the "plan quantity" is in error by five percent (5%) or more;
- 11.6.7** Provided, however, in the event a Major Item is reduced by twenty-five percent (25%) or more relative to the quantity amount in the Bid/Proposal, no additional Article 11.5.6 profit or overhead will be added, if, due to other additions in the Work, the net value of the Contract Amount is not reduced.

## **ARTICLE 12 - CHANGE OF CONTRACT TIMES**

### **12.1 Requisites for Changes in Contract Time Requirements:**

- 12.1.1** The Contract Time Requirements (including Milestones) may only be changed by Change Order duly executed by both Contractor and Owner or by Change Directive. Any Claim for an adjustment of the Contract Time Requirements (including Milestones) or adjustment of the Contract Amount due to any Compensable Delay as provided in Section 10.5 shall be made by Written Notice delivered by the party making the Claim to the other party promptly (but in no event later than five (5) calendar days after the start of the occurrence or event giving rise to the Delay) and stating the general nature of the Delay. Notice of the extent of the Delay and any requested adjustment of the Contract Amount due to any Compensable Delay as provided in Section 10.5, with supporting data, shall be delivered within thirty (30) calendar days after Written Notice of Claim is delivered by claimant, and shall represent that the adjustment claimed is the entire adjustment to which claimant is entitled as a result of said occurrence or event. If Owner and Contractor cannot otherwise agree, all Claims for adjustment in the Contract Time Requirements (including Milestones) and/or adjustment of the Contract Amount due to any Compensable Delay as provided in Section 10.5 shall be determined in accordance with and



subject to the requirements of Article 16. Notwithstanding anything in the Contract Documents to the contrary, no Claim for an adjustment in the Contract Time Requirements (including Milestones) and/or adjustment of the Contract Amount due to any Compensable Delay as provided in Section 10.5 will be valid if not submitted in accordance with the requirements of this Article.

**12.1.2** When Contractor is at fault and Owner stops the Work so that corrections in the Work can be made by Contractor, no extensions of time will be allowed.

**12.1.3** In the event of a Delay attributable to Force Majeure, an extension of the Contract Time Requirements (including Milestones) in an amount equal to the time lost due to such Delay shall be Contractor's sole and exclusive remedy for such Delay. "Force Majeure" is circumstances beyond the control of both Owner and Contractor, and not attributable to the fault or negligence of Contractor, any Subcontractor or any other party for whose acts Contractor is liable, and includes an Act of God, war, riot, terrorism, civil commotion, sovereign conduct, industry-wide delays or disruptions in manufacture or delivery of materials or equipment required for the Work, and Unusual Inclement Weather and the direct effects thereof such as standing water or loss of Site power. In such an event, Contractor shall take all commercially reasonable action to mitigate the Delay, and Owner and Contractor will meet no later than three (3) business days after cessation of the event to establish a proposed new Project Schedule for the Project. Any claimed Force Majeure Delay attributable to industry-wide delays or disruptions in manufacture or delivery of materials or equipment required for the Work shall be supported by the following documentation:

- (a) By copies of purchase orders for Delayed item(s) indicating date ordered by Contractor/Subcontractor and date of purchase order receipt by Supplier;
- (b) If item(s) require Shop Drawings or other submittal information in accordance with the Contract Documents, by providing records of dates Contractor forwarded submittal(s) to Owner's Representative, dates Owner or Principal Architect/Engineer returned submittal(s) to Contractor, and dates submittal(s) were forwarded to Manufacturer or Supplier;
- (c) By copies of document(s) from Manufacturer or Supplier, on Manufacturer's or Supplier's letterhead, indicating date(s) item(s) would be ready for shipment and/or actual shipment date(s);
- (d) By copies of correspondence between Contractor / Subcontractor and Manufacturer or Supplier indicating Contractor / Subcontractor's efforts to expedite item(s); and
- (e) If item(s) are being purchased by a Subcontractor, by providing correspondence, meeting notes, etc., that reflect Contractor's efforts with the Subcontractor to expedite delivery of the item(s).

**12.1.4** The Contractor will only be entitled to an extension of time for Delays that can be demonstrated by the Contractor through critical path analysis as causing Delay, and only for any Delay caused by Force Majeure, Changes ordered in the Work by the Owner through Change Order or Change Directive which justify additional time, or other Delays as described in Section 10.5. No extension of time shall relieve Contractor or Surety on its performance Bond from all of

Contractor's obligations hereunder which shall remain in full force and effect.

**12.2 Weather Delays:**

**12.2.1** Contractor may be granted an extension of time because of "Unusual Inclement Weather", as defined below. However, the Contractor will not be granted an extension of time for "Normal Rain Days", as defined below.

**12.2.2** "Unusual Inclement Weather" is defined as a rain event, or extreme temperatures, high winds, hail or lightning, which occurs at the Site and is of sufficient magnitude to prevent Contractor from performing units of Work critical to maintaining the Master Project Schedule on a day when Work is scheduled to be performed and is otherwise capable of being performed, and which is beyond the Normal Rain Days as defined in Section 12.2.3 below.

**12.2.3** Baseline Rain Day Determination. "Normal Rain Days" are based on U.S. Weather Bureau Records available for the most immediate area of the Site of the Work, and are included in Owner's Project Schedule, are not a justification for an extension of time, and are broken down by the number of calendar days in each month as follows:

January	7 days	July	6 days
February	6 days	August	7 days
March	7 days	September	6 days
April	7 days	October	7 days
May	8 days	November	6 days
June	8 days	December	6 days

**12.2.4 Not used.**

**12.2.5** Rainfall will be measured with the Owner's Representative's approval at the Site using an approved rain gauge or with the Owner's Representative's approval at the nearest operational public weather data collection facility to the Site.

**ARTICLE 13 - TESTS AND INSPECTIONS; CORRECTION, REMOVAL OR ACCEPTANCE OF DEFECTIVE WORK**

**13.1 Notice of Defects:** All Defective Work may be rejected, corrected or accepted as provided in Article 13. Contractor must give Owner, Owner's Representative, and Principal Architect/Engineer prompt notice of any Defective Work of which Contractor has actual knowledge. Prompt notice of all Defective Work of which Owner, Owner's Representative, Owner's CMT Consultant, or Principal Architect/Engineer has actual knowledge may be given to Contractor. Payment may be withheld by the Owner for identified Defective Work until such time as the Owner, Owner's Representative, or

Principal Architect/Engineer has determined the Defective Work has been corrected such that it complies with all applicable Contract requirements.

**13.2 Access to Work:** Owner, Owner's Representative, Owner's CMT Consultant, Principal Architect/Engineer, Principal Architect/Engineer's Consultants, other representatives and personnel of Owner, independent testing laboratories and governmental agencies having jurisdiction will have access to the Work at reasonable times for observing, inspecting and testing. Contractor shall provide them proper and safe conditions for such access, and advise them of Contractor's site safety procedures and programs so that they may comply therewith as applicable.

**13.3 Tests and Inspections:**

**13.3.1** Contractor shall give at least twenty-four (24) hours advance notice of readiness of the Work for all required inspections, tests or approvals, and shall coordinate and cooperate with inspection and testing personnel to facilitate the required inspections or tests.

**13.3.2** Owner shall employ and pay for services of an independent testing laboratory to perform all inspections, tests or approvals required by the Contract Documents except:

- .1 for inspections, tests or approvals covered by Section 13.3.3 and 13.3.4 below;
- .2 for costs incurred with tests or inspections conducted pursuant to Section 13.4.3 below shall be paid as provided in Section 13.4.3;
- .3 for reinspecting or retesting Defective Work; and
- .4 as otherwise specifically provided in the Contract Documents.

All testing laboratories shall meet the requirements of ASTM E-329.

**13.3.3** If Legal Requirements require any Work (or part thereof) specifically to be inspected, tested or approved by an employee or other representative of any governmental entity or public body, Contractor shall assume full responsibility for arranging and obtaining such inspections, tests or approvals, pay all costs in connection therewith and furnish Owner's Representative the required certificates of inspection or approval.

**13.3.4** Contractor shall also be responsible for arranging and obtaining and shall pay all costs in connection with any inspections, tests or approvals required for Owner's, Owner's CMT Consultant's, Owner's Representative's, and Principal Architect/Engineer's review of materials or equipment to be incorporated in the Work, or of materials, mix designs or equipment submitted for review prior to Contractor's purchase thereof for incorporation in the Work.

**13.4 Uncovering Work:**

**13.4.1** If any Work that is to be inspected, tested or approved is covered by Contractor without prior written concurrence of Owner's Representative, or if any Work is covered contrary to the written request of Owner's Representative, Contractor must, if requested by Owner's Representative,

uncover and recover the Work at Contractor's expense, except as provided in Section 13.4.2.

- 13.4.2** Uncovering Work as provided in Section 13.4.1 shall be at Contractor's expense unless Contractor has given Owner's Representative timely notice of Contractor's intention to cover the same and Owner's Representative has not acted within five (5) working days of receipt of such notice.
- 13.4.3** If Owner's Representative considers it necessary or advisable that permissibly covered Work be observed, inspected or tested, Contractor shall uncover, expose or otherwise make available for observation, inspection or testing that portion of the Work in question, furnishing all necessary labor, material and equipment. If it is found that such Work is Defective, Contractor shall pay or otherwise bear all claims, costs, losses and damages arising out of or resulting from such uncovering, exposure, observation, inspection and testing and satisfactory replacement or reconstruction (including but not limited to all costs of repair or replacement of work of others). If, however, such Work is not found to be Defective, Contractor shall, subject to Section 13.4.1, be allowed an increase in the Contract Amount or an extension of the Contract Time Requirements (including Milestones), or both, directly attributable to such uncovering, exposure, observation, inspection, testing, replacement and reconstruction.

**13.5 Owner May Stop the Work:**

- 13.5.1** If the Work is Defective, or Contractor fails to supply sufficient skilled workers or suitable materials or equipment, or fails to furnish or perform the Work in such a way that the completed Work will conform to the Contract Documents, Owner may order Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, this right of Owner to stop the Work shall not give rise to any duty or obligation on the part of Owner to exercise this right for the benefit of Contractor or any Surety or other party.
- 13.5.2** If Contractor fails to correct Defective Work or submit a plan that is satisfactory to Owner for taking corrective action, Owner may order Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated, or Owner may take any other action permitted by this Contract. A notice to stop the Work, based on defects, shall not stop Calendar or Working Days charged against the Contract Time Requirements.

- 13.6 Correction or Removal of Defective Work:** If required by Owner, Contractor shall promptly, as directed, either correct all Defective Work, whether or not fabricated, installed or completed, or, if the Work has been rejected by Owner or Owner's Representative, remove it from the Site and replace it with Work that is not defective. Contractor shall correct or remove and replace Defective Work, or submit a plan of action detailing how the deficiency will be corrected, within the time frame identified in the notice of Defective Work. Contractor shall pay all claims, costs, losses and damages arising out of or resulting from such correction or removal (including but not limited to all costs of repair or replacement of Work of others, and all costs of reinspecting and/or retesting such Defective Work).

**13.7 Corrective period:**

**13.7.1** If within one (1) year after the date of Substantial Completion or such longer period of time as may be prescribed by Legal Requirements or by the terms of any applicable special guarantee or express warranty required by the Contract Documents or by any specific provision of the Contract Documents (including but not limited to Section 14.11.2), any Work, including Work performed after the Substantial Completion date, is found to be Defective, Contractor shall promptly, without cost to Owner and in accordance with Owner's written instructions:

- (a) correct such Defective Work, or, if it has been rejected by Owner, remove it from the Site and replace it with Work that is not Defective, and
- (b) satisfactorily correct or remove and replace any damage to other Work or the work of others, or damage to other property, whether personal or real property, resulting from the correction, removal or replacement of such Defective Work.

Such one (1) year or longer period will renew and recommence for Work requiring correction upon the completion of correction of such Work.

**13.7.2** If Contractor does not promptly comply with the terms of Owner's corrective action instructions, or in an emergency where Delay would result in unreasonable risk of loss or damage, Owner may have the Defective Work corrected or the rejected Work removed and replaced, and all claims, costs, losses and damages arising out of or resulting from such removal and replacement (including but not limited to all costs of repair or replacement of work of others) will be paid or otherwise borne by Contractor.

**13.7.3** In special circumstances where a particular item of equipment is placed in continuous service before Substantial Completion of all the Work, the corrective period for that item will still start to run from the date of Substantial Completion of the Work.

**13.7.4** If correction of Defective Work will affect the function or use of the facility, Contractor shall not proceed with correction of Defective Work without prior coordination with and approval of Owner.

**13.7.5** The obligations of the Contractor to perform warranty and corrective work will survive the acceptance of the Work and any termination of the Contract.

**13.7.6** Owner will utilize the "Warranty Item Form" a copy of which is attached hereto for the purpose of providing written notice of defects discovered during the corrective period. Contractor will acknowledge receipt of the notice by dating, signing, completing and returning the form to Owner when the defect is corrected, including such information on or attached to the form to describe the nature of the repairs or corrections that were made. If the defect cannot be corrected within seven (7) Calendar Days of receipt of notice, Contractor shall promptly provide a written explanation to Owner (or Owner's Representative) describing the repairs or other correction needed and the time required to complete the repairs or other correction.

- 13.7.7** Establishment of the required period for correction of Work as described in Subsection 13.7.1 above relates only to the specific obligation of the Contractor to correct defects in Work discovered during the corrective period, and has no relationship to the time within which any obligation to comply with the Contract Documents may be sought to be enforced, nor to the time within which proceedings may be commenced to establish the Contractor's liability with respect to any failure by Contractor to have complied with its obligations under the Contract Documents.
- 13.7.8** All Manufacturer and extended Manufacturer warranties shall be assigned to Owner as a condition of Final Completion.
- 13.8 Acceptance of Defective Work:** If, instead of requiring correction or removal and replacement of Defective Work, Owner decides to accept it, Owner may do so. Contractor shall pay or otherwise bear all claims, costs, losses and damages attributable to Owner's evaluation of and determination to accept such Defective Work. If any such acceptance occurs prior to recommendation of final payment, a Change Order will be issued incorporating the necessary revisions in the Contract Documents and compensating Owner for the diminished value of the Defective Work. If the acceptance occurs after such recommendation, an appropriate amount will be paid by Contractor to Owner after a calculation by Owner of the diminution in value of the Defective Work.
- 13.9 Owner May Correct Defective Work:** If Contractor fails within a reasonable time after Written Notice of Owner to correct Defective Work, or to remove and replace rejected Work, 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, Owner may, after seven (7) calendar days' Written Notice to Contractor, correct any such deficiency. If, in the sole discretion of the Owner, significant progress has not been made by Contractor during this seven (7) calendar day period to correct the deficiency, the Owner may exercise any actions necessary to remedy the deficiency. In exercising the rights and remedies under this paragraph, Owner may proceed expeditiously. In connection with such corrective or remedial action, Owner 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 stored at the Site or for which Owner has paid Contractor but which are stored elsewhere. Contractor shall allow Owner, its agents and employees, Owner's other contractors, Principal Architect/Engineer and Principal Architect/Engineer's consultants access to the Site or any such offsite storage facility to enable Owner to exercise the rights and remedies under this paragraph. All claims, costs, losses and damages incurred or sustained by Owner in exercising such rights and remedies will be paid or otherwise borne by Contractor and a Change Order will be issued incorporating the necessary revisions in the Contract Documents with respect to the Work. Such claims, costs, losses and damages will include but not be limited to all costs of repair or replacement of work of others destroyed or damaged by correction, removal or replacement of Contractor's Defective Work. Contractor shall not be allowed an extension of the Contract Time Requirements (including Milestones), or entitled to make any claim for damages resulting from any Delay in the performance of the Work attributable to the exercise by Owner of Owner's rights and remedies hereunder.

**ARTICLE 14 - PAYMENTS TO CONTRACTOR AND COMPLETION**

**14.01 Application for Progress Payment:**

- 14.01.1** No more often than once a month, Contractor shall submit to Owner or if directed by Owner, to Owner's Representative, for review an Application for Payment, in a form acceptable to Owner, filled out and signed by Contractor covering the Work completed as of the last day of the month for which an Application for Payment is being made. Application for Payment shall be accompanied by such supporting documentation as is required by the Contract Documents. The Application for Payment shall constitute Contractor's representation that the Work has been performed in accordance with the Contract Documents, has progressed to the point represented in the Application for Payment, and that title to all Work has passed or will pass to Owner free and clear of all claims, encumbrances, and security interests upon the incorporation of the Work into the Project, or upon Contractor's receipt of payment, whichever occurs earlier.
- 14.01.2** Such applications shall not include requests for payment on account of changes in the Work which have been properly authorized by Change Directives, if the Change Directive does not provide for an adjustment to the Contract Amount, or if the changes in the Work are not yet included in Change Orders.
- 14.01.3** Such applications shall not include requests for payment of amounts the Contractor does not intend to pay to a Subcontractor or Manufacturer or Supplier because of a dispute or other reason.
- 14.01.4** If payment is requested on the basis of materials or equipment not incorporated in the Work but delivered and suitably stored at the Site or at another location agreed to in writing, the Application for Payment shall be accompanied by such bills of sale, data and other information satisfactory to Owner and Owner's Representative substantiating Owner's title to such materials or equipment or otherwise protecting Owner's interests therein. Payment on account of such materials or equipment will not include any amount for Contractor's overhead or profit or relieve Contractor of its obligation to protect and install such materials or equipment in accordance with the requirements of the Contract and to correct or restore damaged or Defective Work and shall in no event exceed eighty five percent (85%) of the line item valuation for such materials or equipment in the Schedule of Values. If materials or equipment are stored at another location, at the direction of the Owner they shall be stored in a bonded and insured facility, accessible to Owner's Representative and Principal Architect/Engineer, CMT Consultant, and Owner, and shall be clearly marked as property of Owner. Contractor shall insure such materials and equipment while so stored and in transit to the Site. Title to materials delivered to the Site of the Work or a staging area will pass to Owner upon payment by Owner without the necessity for further documentation. Risk of loss for all such materials and equipment will not pass to Owner until final payment.
- 14.01.5** In making progress payments, ten percent (10%) of the approved amount shall be retained until final completion and acceptance of the Contract Work. However, if the Owner at any time after fifty percent (50%) of the

work has been completed finds that satisfactory progress is being made, Owner may authorize any of the remaining progress payments to be made in full. Also, if the Contractor has achieved Substantial Completion of the Work and the Owner finds the amount retained to be in excess of the amount adequate for the protection of the Owner, Owner, at its sole discretion, may release to the Contractor all or a portion of such excess amount. The Owner is not obligated to pay interest on amounts retained except as provided in the Agreement. The interest rate to be paid on such retainage shall be the rate of interest paid by the Owner's depository bank on interest bearing accounts of similar amounts during the period of time interest accrues as provided herein.

**14.01.6 Applications for Payment shall include the following documentation:**

- .1 an updated Project Schedule and narrative;
- .2 an Affidavit of all bills paid to Subcontractors and Suppliers in the Monthly Subcontractor Payment Reporting Form included in the Specifications;
- .3 conditional waivers and releases from Contractor upon progress and final payments, in the forms included in the Specifications; and
- .4 a Contractor's Monthly Report;

**14.02 Contractor's Warranty of Title:** Contractor warrants and guarantees that title to all Work, materials and equipment covered by any Application for Payment, whether incorporated in the Project or not, will pass to Owner free and clear of all claims no later than the time of payment to Contractor.

**14.03 Review of Applications for Progress Payment:**

**14.03.1** Contractor shall submit its Application for Payment to the Owner's Representative not later than three (3) days after the first day of each month. The Owner's Representative will, within seven (7) calendar days after receipt of each Application for Payment, either indicate a recommendation for payment and forward the Application for Payment for processing by Owner, or return the Application for Payment to Contractor indicating Owner's Representative's reasons for refusing to recommend payment. In the latter case, Contractor shall make the necessary corrections and resubmit the Application for Payment.

**14.03.2** Owner's Representative's recommendation of any payment requested in an Application for Payment will constitute a representation by Owner's Representative, based upon Owner's Representative's on-site observations of the executed Work and on Owner's Representative's review of the Application for Payment and the accompanying schedules and other information, that to the best of Owner's Representative's knowledge, information and belief:

- .1 the Work has progressed to the point indicated; and
- .2 the quality of the Work is generally in accordance with the Contract Documents (subject to an evaluation of the Work as a functioning whole prior to or upon Substantial Completion, to the results of any subsequent tests called for in the Contract Documents, to a final determination of quantities and classifications for unit price Work, and to any other qualifications stated in the recommendation).



**14.03.3** By recommending any such payment, Owner's Representative will not be deemed to have represented that:

- .1 exhaustive or continuous on-site inspections have been made to check the quality or the quantity of the Work;
- .2 examination has been made to ascertain how or for what purpose Contractor has used money previously paid on account of the Contract Amount;
- .3 Contractor's construction means, methods, techniques, sequences or procedures have been reviewed; or
- .4 that there may not be other matters or issues between the parties that might entitle Contractor to be paid additionally by Owner or entitle Owner to withhold payment from Contractor.

**14.04 Decisions to Withhold Payment:**

**14.04.1** Owner may withhold or nullify the whole or part of any payment to such extent as may be necessary on account of:

- .01 Defective Work not remedied;
- .02 third party Claims filed or reasonable evidence indicating probable filing of such Claims;
- .03 failure of Contractor to timely or properly make payments to Subcontractors or for labor, materials or equipment;
- .04 reasonable evidence that the Work cannot be completed for the unpaid balance of the Contract Amount;
- .05 damage to Owner or another contractor for which Contractor is responsible;
- .06 reasonable evidence that the Work will not be completed within the Contract Time Requirements, and that the unpaid balance would not be adequate to cover actual or liquidated damages or economic disincentives for the anticipated Delay;
- .07 failure of Contractor to submit a Schedule of Values in accordance with the Contract Documents;
- .08 failure of Contractor to submit a submittal schedule in accordance with the Contract Documents;
- .09 failure of Contractor to submit and update the construction Project Schedule in accordance with the Contract Documents;
- .10 failure of Contractor to maintain a record of changes on drawings and documents;
- .11 failure of Contractor to maintain weekly payroll reports and, as applicable, provide copies of reports in a timely manner upon request of Owner;
- .12 Contractor's neglect or unsatisfactory prosecution of the Work, including failure to clean up;
- .13 property damage claims that are the responsibility of the Contractor; or
- .14 failure of Contractor to comply with any provision of the Contract Documents.

**14.04.2** When the above reasons for withholding payment are remedied or no longer exist, Contractor shall resubmit a statement for withheld amounts. Payment will be made within forty-five (45) calendar days of receipt by

the Owner of an approved Application for Payment, subject to Article 14.05 and Government Code, Section 2251.025(b).

**14.05 Delayed Payments:** Owner shall endeavor to, but shall not be obligated to, make payment to Contractor within thirty (30) calendar days of receipt of an Application for Payment in acceptable form, including all supporting documents and information required. However, Contractor agrees that should Owner fail to make payment to Contractor of the sum due on any such Application for Payment within forty-five (45) calendar days after the day on which Owner received the Application for Payment, then Owner will pay to Contractor, in addition to the sum due on such Application for Payment, interest thereon at the rate specified in Government Code, Section 2251.025(b) from date due until fully paid, which shall fully liquidate and shall be Contractor's sole and exclusive remedy for any injury to or damages incurred by Contractor arising out of such delay in payment.

**14.06 Arrears:** No money shall be paid by Owner upon any claim, debt, demand or account whatsoever, to any person, firm or corporation who is in arrears to the Owner for taxes; and the Owner shall be entitled to counterclaim and automatically offset against any such debt, claim, demand or account in the amount of taxes so in arrears and no assignment or transfer of such debt, claim, demand or account after said taxes are due, shall affect the right of Owner to so offset said taxes, and associated penalties and interest if applicable, against the same.

**14.07 Substantial Completion:**

**14.07.1** When the Contractor considers that the Work, or a portion thereof which the Owner agrees to accept separately, is substantially complete, the Contractor shall notify Owner's Representative and request a determination as to whether the Work or designated portion thereof is substantially complete. If Owner, Owner's Representative or the Principal Architect/Engineer does not consider the Work substantially complete, Owner's Representative will notify Contractor giving reasons for that position. After performing any required Work, Contractor shall then submit another request for Owner's Representative to determine Substantial Completion. If Owner considers the Work substantially complete, Owner's Representative will prepare and deliver a certificate of Substantial Completion which shall establish the date of Substantial Completion, shall include a punch list of items to be completed or corrected before final payment, shall establish the time within which Contractor shall complete or correct the punch list items, and shall establish responsibilities of the Owner and Contractor for security, maintenance, heat, utilities, damage to the Work, warranties, corrective periods, and insurance.

Failure to include an item on the punch list does not alter the responsibility of Contractor to complete all Work in accordance with the Contract Documents. If a Certificate of Occupancy or Certificate of Compliance is required by governmental entities or public authorities having jurisdiction over the Work, said certificate shall be issued before the Work or any portion thereof is considered to have achieved Substantial Completion. The certificate of Substantial Completion shall be signed by Owner and Contractor to evidence acceptance of the responsibilities assigned to them in such certificate.

- .1 For water and wastewater lines construction, Substantial Completion means, in addition to the definition at Section 1.072, that the Work, including all testing and disinfection, have been completed and accepted and the line(s) placed into service. A certificate of Substantial Completion may not be issued. Work that remains after Substantial Completion could include the final pavement of roadways, adjustment of structures to final grade and re-vegetation. Owner's Representative will issue a notice specifying what portion of the Work is partially completed for the purpose of payment and what Work remains to be done on the portion being accepted as having achieved Substantial Completion.
  - .2 For water and wastewater lines construction that includes roadway construction and/or reconstruction, a certificate of partial Project Substantial Completion may be given for the Work described and deemed substantially complete per Article 14.07.1.1, exclusive of any Project roadway construction and/or reconstruction. Having received a certificate of partial Substantial Completion on the water and wastewater lines construction, a certificate of Substantial Completion of the entire or balance of the Project may be given when the roadway construction and/or reconstruction is found to be substantially complete as per Article 14.07.1.3. The requirements of Article 14.08 Partial Utilization, shall also apply.
  - .3 For roadway construction and/or reconstruction, Substantial Completion means, in addition to the definition at Section 1.072, that the Work, including the final surface course, all permanent traffic control devices (pavement markings, signs, etc.), punch list items, and final cleanup has been completed, accepted, and placed into service, and, any street lighting conduit that has been installed, lowered or relocated must be inspected for usability by, and must have received written approval from, the Owner as well as having been completed, accepted, and placed into service. A certificate of Substantial Completion may not be issued. Work that remains after Substantial Completion could include final clean up. The Owner's Representative will issue a notice specifying what portion of the Work is partially completed for the purpose of payment and what Work remains to be done on the portion being accepted as having achieved Substantial Completion.
  - .4 Substantial Completion shall also comprise the completion of Work associated with the Project so that the utilities, systems, equipment, and/or facilities are operating properly and functioning per their intended use, as designed. Work that can be completed between Substantial Completion and Final Completion includes finish work such as cleanup, finish painting, landscape repairs, and final documentation. However, Contractor shall provide all Owner required equipment and system operation and maintenance training and Manufacturer certifications, and shall submit all spare parts and final O&M Data in order for Substantial Completion to be deemed achieved.
- 14.07.2** Owner shall have the right to exclude Contractor from the Work after the date of Substantial Completion, but Owner will allow Contractor

reasonable access to complete or correct items on the punch list and perform and complete warranty or corrective work.

- 14.07.3** Unless otherwise provided in the Contract Documents, for all periods prior to the issuance of a Certificate of Substantial Completion for the Project or for any designated area within the Project, the Contractor shall be responsible for the cost of all temporary and permanent utility charges necessary to maintain the progress and quality of the construction Work which is under the Contractor's control.
- 14.07.4** Unless otherwise provided in the Contract Documents, for all periods prior to the issuance of a Certificate of Substantial Completion for the Project or for any designated area within the Project, the Contractor shall be responsible for the cost of all temporary structural support systems necessary for the safe execution of the Work. Such systems shall be the sole responsibility of the Contractor.
- 14.08 Partial Utilization:** Use by Owner, at Owner's option, of any substantially completed part of the Work which: (i) has specifically been identified in the Contract Documents, or (ii) Owner and Contractor agree constitutes a separately functioning and usable part of the Work that can be used by Owner for its intended purpose without significant interference with Contractor's performance of the remainder of the Work, may be accomplished prior to Substantial Completion of all the Work in accordance with the following:
- 14.08.1** Owner at any time may request Contractor to permit Owner to use any such part of the Work which Owner believes to be ready for its intended use and substantially complete. If Contractor agrees that such part of the Work is substantially complete, Contractor shall certify to Owner's Representative that such part of the Work is substantially complete and request Owner's Representative to issue a notice specifying what portion of the Work is substantially complete for the purpose of payment and what Work remains to be done on the portion being accepted. Contractor at any time may notify Owner's Representative that Contractor considers any such part of the Work ready for its intended use and substantially complete and request Owner's Representative to issue a notice specifying what portion of the Work is substantially complete for the purpose of payment and what Work remains to be done on the portion being accepted. The provisions of Sections 14.7.1 and 14.7.2 will apply with respect to notice specifying what portion of the Work is substantially complete for the purpose of payment and what Work remains to be done on the portion being accepted.
- 14.08.2** Such partial utilization must be authorized to the extent required by any governmental entities or public authorities having jurisdiction over the Work.
- 14.08.3** Warranty and corrective period requirements for such partial utilization shall be in accordance with Section 13.7.3 above.
- 14.09 Final Inspection:** Upon Written Notice from Contractor that the entire Work or an agreed portion thereof is complete, Owner will make a final inspection with Contractor and provide Written Notice 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. Owner's Representative, Principal Architect/Engineer, CMT Consultant and other third party consultants and any other governmental entity or public authority with jurisdiction over the Project may assist Owner in the inspection and testing of the Work and Contractor agrees to and shall cooperate with any such consultants or authorities with respect to any such inspections and tests.

**14.10 Final Application for Payment:** Contractor may make application for final payment following the procedure for progress payments after Contractor has completed all such corrections to the satisfaction of Owner (and Owner's Representative) and delivered the following documents:

**14.10.01** Affidavit by Contractor certifying the payment of all debts and claims;

**14.10.02** Architect's/Engineer's Certificate of Completion;

**14.10.03** Three (3) complete final operating and maintenance manuals, each containing maintenance and operating instructions, schedules, guarantees, and other documentation required by the Contract Documents;

**14.10.04** Record documents (as provided in Section 6.10);

**14.10.05** Complete releases or waivers (satisfactory to Owner) of all claims arising out of or filed in connection with the Work;

**14.10.06** Certificate evidencing that insurance required by the Contract, if any, will remain in force after final payment and through the warranty and corrective periods and any longer period of time required by the Contract;

**14.10.07** Non-Use of Asbestos Affidavit (After Construction) and lead based paints;

**14.10.08** TPDES records in accordance with Section 6.07.4;

**14.10.09** Consent of Surety, if any, to final payment; and

**14.10.10** Any other documentation required by the Contract Documents.

**14.11 Final Payment and Acceptance:**

**14.11.1** If, on the basis of observation of the Work during construction, final inspection, and review of the final Application for Payment and accompanying documentation as required by the Contract Documents, Owner's Representative and Owner are satisfied that the Work has been completed and Contractor's other obligations under the Contract Documents have been fulfilled and there are no outstanding claims, Owner's Representative will recommend the final Application for Payment and thereby notify the Owner, who, if it accepts such recommendation, will pay to Contractor the balance due Contractor under the terms of the Contract. If the sole remaining unfinished item

to complete the Work is the reestablishment of vegetation, Owner has the right to require Contractor to execute and deliver to Owner a re-vegetation letter with a reasonable fiscal amount posted via an irrevocable, callable on demand letter of credit issued by a financial institution acceptable to Owner and at no cost to Owner to ensure completion of this item, as a condition of final payment. This Work must be accomplished within one hundred twenty (120) Calendar Days of the date of Final Completion of the Work. When the permanent erosion control has been established, Owner will initiate an inspection for final acceptance of the erosion controls. If the re-vegetation is not completed within the one hundred twenty (120) Calendar Days, Owner, at its option, may draw upon and complete the Work using the proceeds of the posted re-vegetation letter of credit.

**14.11.2** Owner will issue a certificate of Final Completion to Contractor which establishes the Final Completion date. If the sole remaining unfinished item to complete the Work is the reestablishment of vegetation, and Contractor has executed the above-described re-vegetation letter of credit to ensure completion of this item, the Owner will issue a certificate of conditional acceptance to Contractor which establishes the Final Completion date.

**14.11.3** Final payment is considered to have taken place when Contractor or any of its representatives negotiates Owner's final payment check, whether labeled final or not, for cash or deposits the check in any financial institution for its monetary return.

**14.12 Waiver of Claims by Contractor:** The making and acceptance of final payment will constitute A waiver of all claims by Contractor against Owner other than those previously made in writing and still unsettled at the time of the final payment.

**14.13 Contractor's Payment Obligations** Contractor will pay the Subcontractors, in accordance with its contractual obligations to such parties, all the amounts Contractor has received from Owner on account of their work. Contractor will impose similar requirements on the Subcontractors to pay those parties with whom they have contracted. Contractor will defend and indemnify Owner from and against any claims for payment by any such parties.

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

**15.1 Owner May Suspend Work Without Cause:** At any time and without cause, Owner may suspend the Work or any portion thereof for a period of not more than one hundred twenty (120) calendar days by Written Notice to Contractor, or such longer period of time as agreed to in writing by Owner and Contractor. Contractor shall promptly resume the Work upon Owner's written direction to proceed. Contractor shall be allowed an adjustment in the Contract Amount or an extension of the Contract Time Requirements, or both, directly attributable to any such suspension if Contractor makes an approved Claim therefor as provided in Articles 10.5 and 12.1.

**15.2 Owner May Terminate Without Cause:** Upon seven (7) calendar days' Written Notice to Contractor, Owner may, without cause and without prejudice to any right

or remedy of Owner, elect to terminate the Contract. In such case, Contractor shall be paid (without duplication of any items):

- 15.2.1** for completed and acceptable Work executed in accordance with the Contract Documents prior to the effective date of termination;
- 15.2.2** for reasonable demobilization costs;
- 15.2.3** for reasonably anticipated profits on completed and accepted Work not previously paid and not included in separate pay items calculated to date of termination but not for anticipated profit on unperformed Work or unabsorbed overhead, or lost opportunity; and
- 15.2.4** for all costs reasonably incurred in settlement of terminated contracts with Subcontractors, Manufacturers, Suppliers and others, including for reasonably anticipated profits on completed and accepted Work not previously paid and not included in separate pay items calculated to date of termination but not for anticipated profit on unperformed Work or unabsorbed overhead, or lost opportunity. Contractor agrees to negotiate in good faith with Subcontractors, Manufacturers, Suppliers and others to mitigate its and Owner's costs.

**15.3 Owner May Terminate With Cause:**

- 15.3.1** Upon the occurrence of any one or more of the following events (each, a "default"):
  - .1** if Contractor persistently fails to perform the Work in accordance with the Contract Documents;
  - .2** if Contractor disregards Legal Requirements;
  - .3** if Contractor disregards the authority of Owner or Owner's Representative;
  - .4** if Contractor makes fraudulent statements;
  - .5** if Contractor fails to maintain a work force adequate to accomplish the Work within the Contract Time Requirements;
  - .6** if Contractor fails to make adequate progress and endangers successful completion of the Contract; or
  - .7** if Contractor otherwise breaches any provision of the Contract Documents;

Owner may, after giving Contractor (and the performance bond Surety, if any) seven (7) calendar days Written Notice, terminate in whole or in part the Contract or the Contractor's right to perform Work. Owner, at its option, may proceed with negotiation with Surety for completion of the Work. Alternatively, Owner may exclude Contractor from the Site and take possession of the Work (without liability to Contractor for trespass or conversion), incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere, and finish the Work as Owner may deem expedient. In such case Contractor shall not be entitled to receive any further payment until the Work is finished. If the unpaid balance of the Contract Amount exceeds all claims, costs, losses and damages sustained by Owner arising out of or resulting from the Contractor's default and Owner's completion of the Work,

including attorneys' fees and other expenses and additional Owner's Architect/Engineer fees and other expenses in connection with such completion, Owner shall pay Contractor only for the value of unpaid, conforming Work performed by Contractor prior to such termination up to but not more than such excess. If such claims, costs, losses and damages exceed such unpaid balance, Contractor or Surety shall pay the difference to Owner upon demand. In the event that a termination for cause is found to be wrongful, the termination shall be deemed converted to a termination without cause as set forth in Section 15.2 and Contractor's remedy for wrongful termination shall be exclusively limited to the recovery of the payments permitted for termination without cause as set forth in Section 15.2.

**15.3.2** Where Contractor's services have been so terminated by Owner, the termination will not affect any rights or remedies of Owner against Contractor and Surety then existing or which may thereafter accrue. Any retention or payment of moneys due Contractor by Owner will not release Contractor from liability.

**15.4 Contractor May Stop Work or Terminate:** If through no act or fault of Contractor, the Work is suspended for a period of more than one hundred and twenty (120) calendar days by Owner or under an order of court or other governmental entity or public authority, or such longer period of time as agreed to in writing by Owner and Contractor, or (except during disputes) Owner's Representative fails to forward to Owner for processing any properly prepared and submitted Application for Payment within seven (7) calendar days after it is submitted, or (except during disputes) Owner fails for forty-five (45) calendar days after it is submitted to pay Contractor any sum finally determined by Owner to be due, then Contractor may, upon forty-five (45) calendar days' Written Notice to Owner, and provided Owner does not remedy such suspension or failure within that time, terminate the Contract and recover from Owner payment on the same terms as provided in Section 15.2. The provisions of this Section 15.4 are not intended to preclude Contractor from making a Claim under Articles 11 and 12 for an increase in Contract Amount or Contract Time Requirements or otherwise for expenses or damage directly attributable to Contractor's stopping Work pursuant to this Section.

**15.5 Discretionary Notice to Cure:** In its sole discretion, Owner may, but is not required to, provide a Notice to Cure to Contractor and its Surety to cure an event of default described in Section 15.3.1 above and/or an anticipatory breach of contract and, if required by Owner, the Contractor and Surety shall attend a meeting with Owner, regarding the Notice to Cure, the event of default, and/or the anticipatory breach of contract. If issued, the Notice to Cure will set forth the time limit by which the cure is to be completed or commenced and diligently prosecuted. Upon receipt of any Notice to Cure, Contractor shall prepare a report describing its program and measures to accomplish the cure of the event of default and/or anticipatory breach of contract within the time required by the Notice to Cure. The Contractor's report must be delivered to Owner at least three (3) days prior to any requested meeting with the Owner and Surety.

**15.6 Bankruptcy:** If Contractor declares bankruptcy or is adjudged bankrupt or makes an assignment for the benefit of creditors or if a receiver is appointed for the benefit of creditors or if a receiver is appointed by reason of Contractor's insolvency, Contractor may be unable to perform this Contract in accordance with the Contract



requirements. In such an event, Owner may demand Contractor or its successor in interest provide Owner with adequate assurance of Contractor's ability to perform in accordance with the terms and conditions of the Contract. If Contractor fails to provide adequate assurance of performance to Owner's reasonable satisfaction within ten (10) days of such a request, Owner may terminate the Contract or the Contractor's right to perform Work for cause or without cause, pursuant to Sections 15.2 or 15.3 above. If Contractor fails to provide timely adequate assurance of its performance and actual performance, Owner may prosecute the Work with its own forces or with other contractors on a time and material or other appropriate basis and the cost of which will be charged against the Contract balance or otherwise borne by Contractor.

**15.7 Duty to Mitigate:** In the event of any termination or suspension under this Contract, the Contractor agrees to and shall take all reasonable actions to mitigate its damages and any and all claims for damages which may be asserted against the Owner.

**15.8 Responsibility during Demobilization:** While demobilizing, the Contractor will take all necessary and reasonable actions to preserve and protect the Work, the Site and other property of the Owner or others at the Site.

## **ARTICLE 16 - DISPUTE RESOLUTION**

### **16.1 Filing of Claims:**

**16.1.1** All Claims by Contractor shall be made by Written Notice delivered to Owner within fifteen (15) calendar days after the start of the occurrence or event giving rise to the Claim and stating the general nature of the Claim. Notice of the amount of the Claim with supporting data shall be delivered in writing within thirty (30) calendar days after Written Notice of Claim is delivered by Contractor and shall represent that the adjustment claimed covers all known monetary amounts and/or extensions of time to which Contractor is entitled.

**16.1.2** Within thirty (30) calendar days of receipt of notice of the amounts and/or time extensions sought by the Claim with supporting data, Owner's Representative and Contractor shall meet to discuss the Claim, after which a written offer of settlement or written notification of no settlement offer may be made to Contractor. If Contractor is not satisfied with any proposal presented, Contractor shall have thirty (30) calendar days in which to: (i) submit additional supporting data requested by the other party along with a written request to re-evaluate the Claim; (ii) modify the initial Claim; or (iii) request Alternative Dispute Resolution.

### **16.2 Alternative Dispute Resolution:**

**16.2.1** If a dispute exists concerning a Claim, the parties agree to use the following procedure prior to pursuing any other available remedies except that nothing herein shall preclude the Owner from seeking injunctive or other extraordinary relief in a court of competent jurisdiction prior to the completion of the following procedure. Owner reserves the right to include the Owner's Representative, Principal Architect/Engineer and/or the CMT Consultant as a party. Similarly, Contractor agrees to participate at its own

cost in similar dispute resolution procedures for any dispute between Owner and any such other parties, and Contractor agrees to require its Subcontractors to participate in the following procedures in any dispute between Owner and Contractor, upon Owner's written request, if in Owner's sole discretion the participation of Contractor and/or any Subcontractor is necessary to the resolution of any such dispute.

**16.2.2 Negotiating with Previously Uninvolved Personnel:** Either party may make a written request for a meeting to be held between representatives of each party within fourteen (14) Calendar Days of the request or such later period that the parties may agree to. Each party shall endeavor to include, at a minimum, one (1) previously uninvolved senior level decision maker (an owner, officer, or employee of each organization) with the authority to negotiate and settle the dispute on behalf of their organization. If a previously involved senior level decision maker is unavailable due to the size of the Contractor's organization or any other reason, the Contractor shall nonetheless provide an appropriate senior level decision maker for the meeting. The purpose of this and any subsequent meetings will be good faith negotiations and resolution of the matters constituting the dispute. Negotiations shall be concluded within thirty (30) Calendar Days of the first meeting, unless mutually agreed otherwise. This step may be waived by a written agreement signed by both parties, in which event the parties may proceed directly to mediation as described below.

**16.2.3 Mediation:**

- .1 If the procedure described in 16.2.2 proves unsuccessful or is waived pursuant to its terms, the parties shall initiate the mediation process. Owner and Contractor agree to select within thirty (30) calendar days a mediator trained in mediation skills, and experienced in the mediation of construction disputes, to assist with resolution of the dispute. Owner and Contractor agree to act in good faith in the selection of the mediator and to give all due consideration to qualified individuals nominated to act as mediator. Should the parties fail to agree on a mediator within thirty (30) calendar days of initiation of the mediation process, the parties agree to ask the American Arbitration Association to select a qualified individual, which selection shall be binding on the parties. If the dispute is technical in nature, the mediator appointed by the American Arbitration Association shall be qualified by at least ten (10) years' experience in construction, engineering, and/or public works projects. If a party refuses to participate in the selection of a mediator or refuses to attend a scheduled mediation, the other party may pursue other remedies available to it.
- .2 Mediation is a forum in which an impartial person, the mediator, facilitates communication between parties to promote reconciliation, settlement, or understanding among them. The parties hereby agree that mediation, at a minimum, shall provide for (i) conducting an on-site investigation, if appropriate, by the mediator for fact gathering purposes, (ii) a meeting of all parties for the exchange of points of view and (iii) separate meetings between the mediator and each party to the dispute for the formulation of resolution alternatives. The parties agree to participate in mediation in good faith for up to thirty

(30) calendar days after the date of the first mediation session, unless mutually agreed otherwise. Should the parties fail to reach a resolution of the dispute through mediation, then the parties may pursue other remedies available to them.

**ARTICLE 17 – MISCELLANEOUS**

- 17.1 Computation of Times:** When any period of time is measured in the Contract Documents in 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 legal holiday, such day will be omitted from the computation.
- 17.2 Venue; Choice of Law:** Venue for any suit at law or in equity involving the Contract or the parties' relationship created by it shall lie exclusively in Montgomery County, Texas. The Contract and any disputes arising out of it shall be construed in accordance with and governed by the laws of the State of Texas, without regard to its conflict of laws principles. Any claims or causes of action arising under or in conjunction with this Contract shall be brought in a court of competent jurisdiction in Montgomery County, Texas. In the event of litigation relating to this Contract or the performance or nonperformance of Work hereunder, the Contractor and the Owner voluntarily and irrevocably consent to the jurisdiction of the applicable courts in Montgomery County, Texas, and hereby waive any argument that such a forum is inconvenient.
- 17.3 Extent of Contract:** This Contract represents the entire and integrated agreement between the Owner and Contractor with respect to the subject matter hereof and supersedes all prior and contemporaneous negotiations, representations or agreements, whether written or oral, and each party disclaims any reliance upon any such prior or contemporaneous negotiation, representation or agreement.
- 17.4 Remedies Cumulative:** Except as limited by this Contract, remedies provided for herein are cumulative, and in addition to and not in lieu of those provided by law or available in equity.
- 17.5 Severability:** If any word, phrase, clause, sentence or provision of the Contract, or the application of same to any person or set of circumstances is for any reason held to be unconstitutional, void, invalid or unenforceable, then such word, phrase, clause, sentence or provision shall be deemed severed herefrom and the remainder of this Contract shall remain in full force and effect.
- 17.6 Independent Contractor:** The Contract shall not be construed as creating an employer/employee relationship, a partnership, or a joint venture. Contractor is an independent contractor and Contractor's work and services shall be those of an independent contractor. Without limiting the generality of the foregoing, Contractor agrees and understands that the Contract does not grant any rights or privileges to any employee of Contractor, its Subcontractors or Suppliers which are established for employees of Owner.
- 17.7 Prohibition of Gratuities:** Owner may, by Written Notice to Contractor, terminate the Contract without liability if Owner determines that gratuities were offered or given by Contractor or any agent or representative of Contractor to any officer or employee of Owner with a view toward securing the Contract or securing

favorable treatment with respect to the awarding or amending or the making of any determinations with respect to the performing of such Contract. In the event the Contract is terminated by Owner pursuant to this provision, Owner shall be entitled, in addition to any other rights and remedies, to recover or withhold the amount of the cost incurred by Contractor in providing such gratuities, to the extent Contractor attempted to charge Owner for same or included any such costs in the Contract Amount.

**17.8 Prohibition Against Personal Interest in Contracts:** No officer, employee, independent consultant, or elected official of Owner who is involved in the development, evaluation, or decision-making process of the performance of any solicitation shall have a financial interest, direct or indirect, in the Contract resulting from that solicitation. Any violation of this provision shall render the Contract voidable by Owner.

**17.9 Owner’s Right to Audit:**

**17.9.1** “Records” means all records generated by or on behalf of Contractor and each Subcontractor and Supplier of Contractor, whether paper, electronic, or other media, which are in any way related to performance of or compliance with this Contract, including, without limitation:

- .01 accounting records;
- .02 written policies and procedures, contractor daily diaries, and pay reports;
- .03 subcontract files (including proposals of successful and unsuccessful bidders, bid recaps, etc.);
- .04 original estimates and estimating work sheets;
- .05 correspondence;
- .06 Change Order files (including documentation covering negotiated settlements);
- .07 back charge logs and supporting documentation;
- .08 general ledger entries detailing cash and trade discounts earned, insurance rebates and dividends;
- .09 subcontracts, purchase orders or other agreements between Contractor and any Subcontractor or Manufacturer, or Supplier;
- .10 records necessary to evaluate Contract compliance, Change Order pricing, and any Claim submitted by Contractor or any of its payees;
- .11 SWP3 Documentation;
- .12 job cost reports; and
- .13 any other Contractor record that may substantiate any charge or claim related to this Contract.

**17.9.2** Contractor shall allow Owner’s agent or its authorized representative to inspect, audit, and/or reproduce, or all three, all Records generated by or on behalf of Contractor and each Subcontractor and Manufacturer or Supplier, upon Owner’s written request. Further, Contractor shall allow Owner’s agent or authorized representative to interview any of Contractor’s employees, all Subcontractors and all Manufacturers and Suppliers, and any of their respective employees.

**17.9.3** Contractor shall retain all its Records, and require all its Subcontractors and Manufacturers and Suppliers to retain their respective Records, during the

performance of this Contract and for three (3) years after final payment or any termination, until all audit and litigation matters that Owner has brought to the attention of Contractor are resolved, or as otherwise required by law, whichever is longer. Owner's right to inspect, audit or reproduce Records, or interview employees of Contractor or its respective Subcontractors or Manufacturers and Suppliers exists during the performance of this Contract, and for three (3) years after final payment or any termination, until all audit and litigation matters that Owner has brought to Contractor's attention are resolved, or as otherwise required by law, whichever is longer, and at no cost to Owner.

- 17.9.4** Contractor must provide sufficient and accessible facilities during its normal business hours for Owner to inspect, audit or reproduce Records, or all three, and to interview any person about the Records.
- 17.9.5** Contractor shall insert these requirements in each written contract between Contractor and any Subcontractor, Manufacturer or Supplier and require each Subcontractor, Manufacturer and Supplier to comply with these provisions.
- 17.10 Survival of Obligations:** All representations, indemnifications, warranties and guarantees made in, required by or provided pursuant to the Contract Documents, as well as all continuing obligations indicated in the Contract Documents, will survive final payment, completion and acceptance of the Work and termination or completion of the Contract.
- 17.11 No Waiver:** The waiver of any provision of this Contract will not be deemed to be a waiver of any other provision of this Contract. No provision of this Contract will be deemed waived whatsoever unless expressly provided in writing, nor will a waiver of any default be deemed a waiver of any subsequent defaults of the same type. The failure at any time to enforce this Contract, whether the default is known or not, shall not constitute a waiver of or estoppel against the right to do so.
- 17.12 Condition Precedent to Right to Sue:** Notwithstanding anything in the Contract Documents to the contrary, the Contractor must have provided at least 90 days prior written notice of a claim for damages as a condition precedent to the right to sue on the Contract.
- 17.13 WAIVER OF THE RIGHT TO JURY TRIAL. OWNER AND CONTRACTOR HEREBY, KNOWINGLY, IRREVOCABLY AND INTENTIONALLY WAIVE ANY RIGHTS EITHER PARTY MAY HAVE TO A TRIAL BY JURY IN RESPECT TO ANY CLAIM, CAUSE OF ACTION, PROCEEDING OR COUNTER CLAIM BASED UPON THE CONTRACT DOCUMENTS, OR ARISING OUT OF, UNDER OR IN CONNECTION WITH THE CONSTRUCTION OF THE WORK OR ANY COURSE OF CONDUCT, COURSE OF DEALING, STATEMENTS (WHETHER VERBAL OR WRITTEN) OR ACTIONS OF ANY PARTY. HOWEVER, THIS WAIVER OF JURY TRIAL SHALL NOT APPLY TO LITIGATION WHICH MAY BE INITIATED BY ANY THIRD PARTIES.**
- 17.14 Attorneys' Fees and Costs.** If Contractor brings any suit against Owner and Contractor does not prevail in such suit, Contractor shall be liable for all attorneys' fees and costs incurred by Owner as a result of such suit.

“Prevail” as used in this Section 17.14 means the Contractor recovers a judgment against Owner for at least eighty percent (80%) of all relief sought by Contractor in Claims against Owner in the Written Notice(s) as provided in Section 16.1.1 above, and the judgment is greater than any relief offered to Contractor by Owner in any written settlement offer.

**END OF GENERAL CONDITIONS TERMS**

<b>WARRANTY ITEM NO. _____</b> <b>(PROJECT NAME)</b>
<b>The General Conditions of the Contract require that Defects be corrected within seven (7) days after written notice is received.</b>

**TO:** \_\_\_\_\_  
*name/ address / telephone / fax / email*

**ATTENTION OF:** \_\_\_\_\_

**FROM:** \_\_\_\_\_  
*project manager name / address / telephone / fax / email*

**PROJECT:** \_\_\_\_\_  
*name / location / CIP ID number*

**END DATE OF WARRANTY OR CORRECTIVE PERIOD:** \_\_\_\_\_  
\_\_\_\_\_

**SUBJECT:** \_\_\_\_\_

- If checked, the defect requires immediate attention. The Contractor has been called.
- If checked, the Owner has been asked to consult with the Contractor on the defect.

**PLEASE CORRECT THE FOLLOWING ITEM(S):**

<b>DATE OF REQUEST</b> _____	<b>SIGNATURE</b> _____ Project Manager
<input type="checkbox"/> _____	Phone No. _____
<input type="checkbox"/> _____	Phone No. _____
<input type="checkbox"/> _____	Phone No. _____

<b>RESPONSE FROM Contractor:</b> DATE CORRECTION WAS MADE: _____
--

The Contractor must endeavor to correct the defect within seven (7) calendar days after written notice is received. If the defect cannot be corrected by that time, Contractor shall provide a written explanation to the Owner describing the repairs or other correction needed and the time required to complete the repairs or corrections.

**Description of corrections made:**

**DATE OF REPLY:** \_\_\_\_\_ **SIGNATURE:** \_\_\_\_\_  
**PRINTED NAME:** \_\_\_\_\_

When the repair/correction is complete, the contractor should return a copy to each of the following:

- \_\_\_\_\_ Phone No. \_\_\_\_\_
- \_\_\_\_\_ Phone No. \_\_\_\_\_
- \_\_\_\_\_ Phone No. \_\_\_\_\_

**END OF SECTION**





**SECTION 00 73 43**  
**WAGE SCALE FOR CONSTRUCTION**

- 1.1 Contractor and its Subcontractors must pay the general prevailing wage rates for building construction for each craft or type of worker or mechanic employed in the execution of any building construction or repair under the Contract in accordance with Chapter 2258 of the Texas Government Code. The San Jacinto River Authority (“SJRA”) has determined the prevailing wage rate in the locality in which the work is being performed, which is set forth in Exhibit "A".
- 1.2 In bidding, Contractor warrants and represents that it has carefully examined the classifications for each craft or type of worker needed to execute the Contract and determined that such classifications in Exhibit "A" include all necessary categories to perform the work under the Contract.
- 1.3 If Contractor believes that an additional classification for a particular craft or type of worker is necessary to perform work under the Contract, it must submit with its bid a request to the San Jacinto River Authority to use an additional labor classification not listed in Exhibit "A" and specify the proposed new classification. The SJRA shall determine whether a proposed classification is already covered in Exhibit "A", and, if it is, specify which classification is appropriate. The SJRA’s decision is conclusive. If the SJRA decides that a new classification is necessary, it will determine the appropriate prevailing wage rate for any resurveyed, amended, new, or additional craft or type of worker not covered by Exhibit "A". Such determination must be decided in accordance with procedures established by the SJRA, and in compliance with Chapter 2258 of the Texas Government Code.
- 1.4 Contractor must not use any labor classification not covered by Exhibit "A" until such classification is established and approved for use by the SJRA.  
  
A Contractor or Subcontractor who violates Chapter 2258 of the Texas Government Code must pay to the SJRA \$60 per each worker employed for each calendar day or part of the day that the worker is paid less than the wage rates set forth in Exhibit "A".
- 1.5 The SJRA may withhold money required to be withheld under Chapter 2258 of the Texas Government Code from the final payment to Contractor or earlier payments if the SJRA makes a determination that there is good cause to believe that Contractor has not complied with these provisions and Chapter 2258 of the Government Code, in which

case the SJRA may withhold the money at any time subsequent to the finding by the SJRA.

- 1.6 Contractor and Subcontractors must keep records as required by Chapter 2258 of the Government Code, and specifying:
- (1) the name and classification of each worker employed under the Contract; and
  - (2) the actual per diem wages paid to each worker, and the applicable hourly rate.
- The records must be open at all reasonable hours for inspection by the officers and agents of the SJRA.
- 1.7 The prevailing wage rate does not prohibit the payment of more than the rates stated.
- 1.8 The hourly cost of salary for non-exempt workers for labor in excess of 40 hours per worker per week, shall be calculated at 1.5 times the worker's base pay, plus 1.0 times fringe benefits, for the applicable craft and level.

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**EXHIBIT “A”**

LABOR CLASSIFICATIONS AND PREVAILING WAGE RATES  
 FOR  
 CONSTRUCTION  
 2018

**Heavy Construction Projects- Flood Control Only**

County Name: Montgomery County and Harris County

Wages based on DOL General Decision: TX180067 01/05/2018 TX67

CLASSIFICATION	RATE	FRINGES
Asphalt Distributer	\$9.47	
Asphalt Paving Machine	\$10.05	
Asphalt Raker	\$8.28	
Asphalt Shoveler	\$7.45	
Batching Plant Weigher	\$11.11	
Broom or Sweeper Operator	\$8.01	
Bulldozer	\$9.91	
Carpenter	\$10.35	
Concrete Curbing Mach.	\$8.80	
Concrete Finisher-Paving	\$9.87	
Concrete Finisher-Structures	\$9.86	
Concrete Finishing Machine	\$11.79	
Concrete Joint Sealer	\$10.50	
Concrete Paving Float	\$9.30	
Concrete Paving Saw	\$10.01	
Concrete Paving Spreader	\$9.32	
Concrete Rubber	\$9.00	
Crane, Clamshell, Backhoe, Derrick, Dragline, Shovel	\$11.35	
Crusher or Screening Plant Operator	\$11.00	
Electrician	\$16.15	
Flagger	\$7.25	
Form Builder (Structures)	\$9.96	
Form Liner – Paving & Curb	\$9.03	
Form Setter (Paving/Curb)	\$8.86	
Form Setter – Structures	\$9.05	
Foundation Drill Operator, Crawler Mounted	\$12.59	
Foundation Drill Operator, Truck Mounted	\$12.73	
Front End Loader	\$9.29	
Labor Common	\$7.45	
Labor – Utility	\$8.53	
Lineperson	\$7.50	
Manhole Builder (Brick)	\$8.49	
Mechanic	\$11.38	

<b>Milling Machine Operator</b>	\$10.43	
<b>Mixer</b>	\$7.94	
<b>Motor Grader:</b>		
Fine Grade	\$11.11	
Other	\$10.67	
<b>Oiler</b>	\$9.56	
<b>Painter - Structures</b>	\$14.00	
<b>Pavement Marking Machine</b>	\$7.45	
<b>Piledriver</b>	\$10.96	
<b>Pipe Layer</b>	\$8.49	
<b>Reinforcing Steel Setter Paving</b>	\$12.50	
<b>Reinforcing Steel Setter Structures</b>	\$12.47	
<b>Roller, Pneumatic, Self Propelled</b>	\$7.96	
<b>Roller, Steel Wheel Other Flatwheel or Tamping</b>	\$7.61	
<b>Roller, Steel Wheel Plant Mix Pavements</b>	\$9.25	
<b>Scraper</b>	\$8.69	
<b>Servicer</b>	\$9.51	
<b>Sign Erector</b>	\$10.06	
<b>Sign Installer</b>	\$7.45	
<b>Slipform Machine Operator</b>	\$9.20	
<b>Spreader Box Operator</b>	\$9.08	
<b>Steelworker Structural</b>	\$10.35	
<b>Tractor – Crawler Type</b>	\$10.12	
<b>Tractor – Pneumatic</b>	\$8.99	
<b>Traveling Mixer</b>	\$9.35	
<b>Trenching Machine, Heavy</b>	\$13.56	
<b>Trenching Machine, Light</b>	\$10.50	
<b>Truck Driver Lowboy Float</b>	\$11.29	
<b>Truck Driver Single Axle Heavy</b>	\$8.76	
<b>Truck Driver Single Axle, Light</b>	\$8.15	
<b>Truck Driver Tandem Axle Semi-Trailer</b>	\$8.00	
<b>Wagon Drill, Boring Machine</b>	\$10.15	
<b>Welder</b>	\$10.43	
<b>Work Zone Barricade</b>	\$7.45	
<b>Welders</b> – Receive rate prescribed for craft performing operation to which welding is incidental.		

**END OF SECTION**



**Texas Water Development Board  
Supplemental Contract Conditions and  
Instructions**

(TWDB-0552)

**For Construction Services for  
Projects Funded through State Programs**

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**Forms and Guidance:**

The Texas Water Development Board (TWDB) forms and guidance documents noted in this instruction document may be accessed through the TWDB's Financial Assistance web site at:

<http://www.twdb.texas.gov/financial/instructions/index.asp>

Search by either the document number or name.



# I. INSTRUCTIONS TO APPLICANT

## 1. Applicability

These Supplemental Conditions contain provisions that are worded to comply with certain statutes and regulations which specifically relate to projects receiving state funds only. These supplemental conditions apply to projects funded by the following financial assistance programs:

- (a) the Texas Water Development Fund (DFund),
- (b) State Participation (SP),
- (c) Rural Water Assistance Fund (RWAFF),
- (d) Economically Distressed Areas Program (EDAP), and
- (e) State Water Implementation Fund for Texas (SWIFT).

Provisions that are applicable to the project's funding source or dollar value of the contract are so noted within these provisions.

## 2. Use of Conditions

The language and conditions listed under *Section II: Instructions to Bidders* are to be included in the instructions to bidders for construction services. The provisions listed under *Section III: Supplemental Contract Conditions* shall be included in their entirety with the other general and special conditions that are typically included in the construction contract documents by the design engineer.

## 3. Modifications to Provisions

These provisions shall be included as a stand-alone section in the contract documents. The Applicant and the consulting engineer (Engineer) should carefully study these provisions before incorporating them into the construction contract documents. In particular, Water Districts and other types of districts should be aware of statutes relating to their creation and operation which may affect the application of these conditions. The TWDB Project Engineer/Reviewer should be consulted if the Applicant thinks there is a need to modify parts of these provisions.

Supplemental Condition #13 (Archeological Discoveries and Cultural Resources) and #14 (Endangered Species) may be superseded or modified by project specific conditions established during the environmental review process.

These documents may confer certain duties and responsibilities on the Engineer that are beyond, or short of, what the Applicant intends to delegate. The Applicant should ensure that the contractual agreement with the Engineer provides for the appropriate services. Otherwise the Applicant should revise the wording in these special conditions to agree with actually delegated functions.

#### **4. Good Business Practices**

There are other contract provisions that the Applicant (Owner) and Engineer should include as a matter of good business practices. It is recommended that provisions addressing the following matters be included in the construction contract.

- (a) Specifying the time frame for accomplishing the construction of the project, and the consequences of not completing on time, including liquidation damages.
- (b) Specifying the type, dollar value, and documentation of insurance the contractor is to carry. At a minimum the contractor should carry worker's compensation, liability and builder's risk insurance.
- (c) Identifying the responsibility of the contractor – Responsibility and Warranty of Work.
- (d) Price reduction for defective pricing of negotiated costs.
- (e) Differing site conditions - notice and claims regarding site conditions differing from indicated conditions.
- (f) Covenants against contingent fees - prohibit contingent fees for securing business.
- (g) Gratuities - prohibitions against offering and accepting gratuities.
- (h) Audit and access to records.
- (i) Suspension of work - conditions under which the Owner may suspend work.
- (j) Termination - conditions under which the Owner may terminate the contract.
- (k) Remedies - procedures for resolving disputes.

#### **5. Other Requirements**

There may be other local government requirements and applicable Federal and State statutes and regulations that are not accommodated by these conditions. It is the Applicant's responsibility to ensure that the project and all contract provisions are consistent with the relevant statutes and regulations.

#### **6. Advertisements for Bids**

State procurement statutes require advertising a contract for bids for at least two (2) consecutive weeks. By not following this requirement, the project may need to be re-advertised. The official advertisement for bids that is published in newspapers shall include certain information such as, but not limited to, the following:

- (a) A clear description of what is being procured.
- (b) How to obtain plans and specifications (P&S) and necessary forms and information.
- (c) The date and time by which bids are to be submitted (deadline).
- (d) The address where bids are to be provided.
- (e) This contract is contingent upon release of funds from the Texas Water Development Board (TWDB).
- (f) This contract is subject to the U.S. Iron and Steel and Manufactured Goods requirements of Texas Water Code §17.183 (does not apply to State Participation or SWIFT projects).
- (g) Acknowledgement of any special requirements such as mandatory pre-bid conference.
- (h) Right to reject any and all bids.
- (i) General bond requirements.

## 7. Bid Proposal

The Bid Proposal form should account for the following:

- (a) If lump sum bid, include a list of the materials used and associated costs.
- (b) Distinguish eligible and ineligible items.
- (c) Accommodate trench safety requirements with separate per unit pay item for trench excavation safety protection, Health and Safety Code Chapter 756, Subchapter C.
- (d) Include space for the Contractor to acknowledge receipt of each Addendum issued during the bidding process.

## 8. Bidding Process

The Plans and Specifications (P&S) should include an explanation of how the bids will be processed. The explanation should include the following components:

- (a) Whether a pre-bid conference will be held, whether it is optional or mandatory, where and when it will be held.
- (b) Specify the criteria and process for determining responsiveness and responsibility of the bidder.
- (c) Specify the method of determining the successful bidder and award (e.g., award to the lowest responsive, responsible bidder, accounting for any multiple parts to bids) and accounting for non-resident bidder reciprocity requirements.
- (d) Allow for withdrawal of a bid due to a material mistake.
- (e) Identify the time frame that the bids may be held by the Applicant before awarding a contract (e.g., typically for 60 or 90 days).
- (f) Acknowledge right of the Applicant to reject any and all bids.

## 9. Release of Funds

- (a) Submittal of Bid Documents to TWDB Project Engineer/Reviewer to allow contingent award of contract:
  - (1) Advertisement and affidavit of advertisement.
  - (2) Bid tabulation.
  - (3) All addenda submitted and approved for the contract.
  - (4) Bid proposal of apparent low bidder (or chosen bidder, with explanation) with bid bond.
  - (5) Site certificate (ED-101).
  - (6) Consulting engineer's recommendation to award letter.
  - (7) A description of any bidding irregularities.
  - (8) Construction inspection proposal.
  - (9) Vendor Compliance with Reciprocity of Non-Resident Bidders Form (TWDB-0459).

(b) Following contingent award of the contract, TWDB Project Engineer/Reviewer should receive a bound copy of the executed contract documents (including specifications). This document should include:

- (1) Executed agreement.
- (2) Contractor's act of assurance (ED-103).
- (3) Contractor's act of assurance resolution (ED-104).
- (4) Payment and Performance bond (must be executed on or after the date of execution of the contract).
- (5) Contractor's Certificate of Insurance.
- (6) Sufficiency of funds letter (if the project is not 100% funded with TWDB funds).

After reviewing and approving the executed bid documents, the TWDB will issue an authorization for the Applicant to issue a notice to proceed. At this time, TWDB staff can begin releasing construction funds, in accordance with program specific requirements.

For any questions or proposed modifications to these conditions, please contact your TWDB Project Engineer/Reviewer.

## II. INSTRUCTIONS TO BIDDERS

The language and conditions listed in this section shall be included in the “Instructions to Bidders” section of the construction contract document.

### 1. Contingent Award of Contract

This contract is contingent upon release of funds from the Texas Water Development Board. Any contract or contracts awarded under this Invitation for Bids is/are expected to be funded in part by a loan or grant from the Texas Water Development Board. Neither the state of Texas, nor any of its departments, agencies, or employees are or will be a party to this Invitation for Bids or any resulting contract.

### 2. U.S. Iron and Steel and Manufactured Goods (Does not apply to State Participation or SWIFT Projects)

Any contract(s) awarded under this Invitation for Bids is/are subject to the U.S. Iron and Steel and Manufactured Goods requirements (Texas Water Code §17.183). Refer to Guidance TWDB-1105 – “Requirements for U.S. Iron and Steel and Manufactured Goods”.

### 3. Bid Guarantee

Each bidder shall furnish a bid guarantee equivalent to five percent of the bid price (Water Code §17.183). If a bid bond is provided, the Contractor shall utilize a surety company which is authorized to do business in Texas in accordance with Surety Bonds and Related Instruments, Chapter 3503 of the Insurance Code.

### 4. Award of Contract to Nonresident Bidder

A governmental entity may not award a governmental contract to a nonresident bidder unless the nonresident underbids the lowest bid submitted by a responsible resident bidder by an amount that is not less than the amount by which a resident bidder would be required to underbid the nonresident bidder to obtain a comparable contract in the state in which the nonresident's principal place of business is located. A non-resident bidder is a Contractor whose corporate offices or principal place of business is outside of the state of Texas (Source: Texas Government Code, Chapter 2252, Subchapter A, Nonresident Bidders, §2252.002).

The bidder will complete form TWDB-0459, Vendor Compliance with Reciprocity on Non-Resident Bidders, **which must be submitted with the bid.**

### **III. SUPPLEMENTAL CONTRACT CONDITIONS**

#### **1. Supersession**

The Owner and the Contractor agree that the TWDB Supplemental Conditions apply to the work eligible for Texas Water Development Board assistance to be performed under this contract and these clauses supersede any conflicting provisions of this contract.

#### **2. Privity of Contract**

Funding for this project is expected to be provided in part by a loan or grant from the Texas Water Development Board. Neither the state of Texas, nor any of its departments, agencies or employees is, or will be, a party to this contract or any lower tier contract. This contract is subject to applicable provisions in 31 TAC Chapter 363 in effect on the date of the assistance award for this project.

#### **3. Definitions**

- (a) The term "Owner" means the local entity contracting for the construction services.
- (b) The term "TWDB" means the Executive Administrator of the Texas Water Development Board, or other person who may be at the time acting in the capacity or authorized to perform the functions of such Executive Administrator, or the authorized representative thereof.
- (c) The term "Engineer" means the Owner's authorized consulting engineer for the project.

#### **4. Laws to be Observed**

In the execution of the contract, the Contractor must comply with all applicable local, state and federal laws, including but not limited to laws concerned with labor, safety, minimum wages, and the environment. The Contractor shall be familiar with and at all times shall observe and comply with all federal, state, and local laws, ordinances and regulations which in any manner affect the conduct of the work, and shall indemnify and save harmless the Owner, Texas Water Development Board, and their representatives against any claim arising from violation of any such law, ordinance or regulation by the Contractor, their Subcontractor or their employees.

#### **5. Review by Owner and TWDB**

- (a) The Owner, authorized representatives and agents of the Owner, and the TWDB shall, at all times have access to and be permitted to observe and review all work, materials, equipment, payrolls, personnel records, employment conditions, material invoices, and other relevant data and records pertaining to this contract, provided, however that all instructions and approval with respect to the work will be given to the Contractor only by the Owner through authorized representatives or agents.
- (b) Any such inspection or review by the TWDB shall not subject the state of Texas, or its representatives, to any action for damages.

## **6. Performance and Payment Bonds**

Each Contractor awarded a construction contract must furnish performance and payment bonds:

- (a) the performance bond shall include without limitation guarantees that work done under the contract will be completed and performed according to approved plans and specifications and in accordance with sound construction principles and practices;
- (b) the performance and payment bonds shall be in a penal sum of not less than 100 percent of the contract price and remain in effect for one year beyond the date of approval by the Engineer of the political subdivision; and
- (c) the Contractor shall utilize a surety company that is authorized to do business in Texas in accordance with Surety Bonds and Related Instruments, Chapter 3503 of the Insurance Code.

## **7. Payments Schedule and Cost Breakdown**

- (a) The Contractor shall submit for approval immediately after execution of the Agreement, a carefully prepared Progress Schedule, showing the proposed dates of starting and completing each of the various sections of the work, the anticipated monthly payments to become due to the Contractor, and the accumulated percent of progress each month.
- (b) The following paragraph applies only to contracts awarded on a lump sum contract price:

**COST BREAKDOWN** - The Contractor shall submit to the Owner a detailed breakdown of the estimated cost of all work to be accomplished under the contract, so arranged and itemized as to meet the approval of the Owner or funding agencies. This breakdown shall be submitted promptly after execution of the agreement and before any payment is made to the Contractor for the work performed under the contract. After approval by the Owner the unit prices established in the breakdown shall be used in estimating the amount of partial payments to be made to the Contractor.

## **8. Workers' Compensation Insurance Coverage (as applicable, consistent with Texas Labor Code § 406.096)**

- (a) The Contractor shall certify in writing that they provide workers' compensation insurance coverage for each employee of the Contractor employed on the public project.
- (b) Each Subcontractor on the public project shall provide such a certificate relating to coverage of the Subcontractor's employees to the general Contractor, who shall provide the Subcontractor's certificate to the governmental entity.
- (c) A Contractor who has a contract that requires workers' compensation insurance coverage may provide the coverage through a group plan or other method satisfactory to the governing body of the governmental entity.
- (d) The employment of a maintenance employee by an employer who is not engaging in

building or construction as the employer's primary business does not constitute engaging in building or construction.

(e) In this section:

- (1) "Building or construction" includes:
  - i. erecting or preparing to erect a structure, including a building, bridge, roadway, public utility facility, or related appurtenance;
  - ii. remodeling, extending, repairing, or demolishing a structure; or
  - iii. otherwise improving real property or an appurtenance to real property through similar activities.
- (2) "Governmental entity" means this state or a political subdivision of this state. The term includes a municipality.

## **9. U.S. Iron and Steel and Manufactured Goods (Does not apply to State Participation or SWIFT Projects)**

In the execution of the contract, the Contractor shall be familiar with and at all times shall observe and comply with all applicable federal, state, and local laws, ordinances and regulations concerned with the use of iron and steel and manufactured goods made in the United States which in any manner affect the conduct of the work, and shall indemnify and save harmless the Texas Water Development Board against any claim arising from violation of any such law, ordinance or regulation by the Contractor or by their Subcontractor or their employees

Consistent with Texas Water Code Section 17.183, iron and steel products and manufactured goods used in the project shall be produced in the United States, unless:

- (a) such products or goods are not:
  - (1) available in sufficient quantities;
  - (2) readily available; or
  - (3) of a satisfactory quality; or
- (b) the use of such products or goods will increase the total cost of the project by more than 20 percent.

## **10. Prevailing Wage Rates**

This contract is subject to Government Code Chapter 2258 concerning payment of Prevailing Wage Rates. The Owner will determine what the general prevailing rates are in accordance with the statute. The applicable provisions include, but are not limited to the following:

### **§2258.021. Right to be Paid Prevailing Wage Rates**

- (a) A worker employed on a public work by or on behalf of the state or a political subdivision of the state shall be paid:
  - (1) not less than the general prevailing rate of per diem wages for work of a similar character in the locality in which the work is performed; and
  - (2) not less than the general prevailing rate of per diem wages for legal holiday and overtime work.
- (b) Subsection (a) does not apply to maintenance work.



- (c) A worker is employed on a public work for the purposes of this section if the worker is employed by a Contractor or Subcontractor in the execution of a contract for the public work with the state, a political subdivision of the state, or any officer or public body of the state or a political subdivision of the state.

**§2258.023. Prevailing Wage Rates to be Paid by Contractor and Subcontractor; Penalty**

- (a) The Contractor who is awarded a contract by a public body or a Subcontractor of the Contractor shall pay not less than the rates determined under Section 2258.022 to a worker employed by it in the execution of the contract.
- (b) A Contractor or Subcontractor who violates this section shall pay to the state or a political subdivision of the state on whose behalf the contract is made, \$60 for each worker employed for each calendar day or part of the day that the worker is paid less than the wage rates stipulated in the contract. A public body awarding a contract shall specify this penalty in the contract.
- (c) A Contractor or Subcontractor does not violate this section if a public body awarding a contract does not determine the prevailing wage rates and specify the rates in the contract as provided by Section 2258.022.
- (d) The public body shall use any money collected under this section to offset the costs incurred in the administration of this chapter.
- (e) A municipality is entitled to collect a penalty under this section only if the municipality has a population of more than 10,000.

**§2258. 024. Records**

- (a) A Contractor and Subcontractor shall keep a record showing:
  - (1) the name and occupation of each worker employed by the Contractor or Subcontractor in the construction of the public work; and
  - (2) the actual per diem wages paid to each worker.
- (b) The record shall be open at all reasonable hours to inspection by the officers and agents of the public body.

**§2258. 025. Payment Greater Than Prevailing Rate Not Prohibited**

This chapter does not prohibit the payment to a worker employed on a public work an amount greater than the general prevailing rate of per diem wages.

**11. Employment of Local Labor (only applicable to projects funded by EDAP)**

The Contractor shall, to the maximum feasible extent, employ local labor for construction of the project. The Contractor and every Subcontractor undertaking to do work on the project which is, or reasonably may be done as on-site work, shall employ qualified persons who regularly reside within the political subdivision boundary of the Owner and the economically distressed area where the project is located (Texas Water Code, Section 17.183).

## 12. Payments

### (a) Progress Payments:

- (1) The Contractor shall prepare their requisition for progress payment as of the last day of the month and submit it, with the required number of copies, to the Engineer for review. Except as provided in paragraph (3) of this subsection, the amount of the payment due the Contractor shall be determined by adding to the total value of work completed to date, the value of materials properly stored on the site and deducting: (1) five percent (5%) minimum of the total amount, as a retainage and (2) the amount of all previous payments. The total value of work completed to date shall be based on the actual or estimated quantities of work completed and on the unit prices contained in the agreement (or cost breakdown approved pursuant to section 7b relating to lump sum bids) and adjusted by approved change orders. The value of materials properly stored on the site shall be based upon the estimated quantities of such materials and the invoice prices. Copies of all invoices shall be available for inspection by the Engineer.
- (2) The Contractor shall be responsible for the care and protection of all materials and work upon which payments have been made until final acceptance of such work and materials by the Owner. Such payments shall not constitute a waiver of the right of the Owner to require the fulfillment of all terms of the Contract and the delivery of all improvements embraced in this contract complete and satisfactory to the Owner in all details.
- (3) This clause applies to contracts when the Owner is a District or Authority. The retainage shall be ten percent of the amount otherwise due until at least fifty percent of the work has been completed. After the project is fifty percent completed, and if the District or Authority's Board finds that satisfactory progress is being made, then the District may authorize any of the remaining progress payments to be made in full. The District is not obligated to pay interest earned on the first 50% of work completed (Texas Water Code Sec. 49.276(d)).
- (4) The five percent (5%) retainage of the progress payments due to the Contractor may not be reduced until the building of the project is substantially complete and a reduction in the retainage has been authorized by the TWDB.

(b) Withholding Payments. The Owner may withhold from any payment otherwise due the Contractor so much as may be necessary to protect the Owner and if so elects may also withhold any amounts due from the Contractor to any Subcontractors or material dealers, for work performed or material furnished by them. The foregoing provisions shall be construed solely for the benefit of the Owner and will not require the Owner to determine or adjust any claims or disputes between the Contractor and their Subcontractors or Material dealers, or to withhold any monies for their protection unless the Owner elects to do so. The failure or refusal of the Owner to withhold any monies from the Contractor shall in no way impair the obligations of any surety or sureties under any bond or bonds furnished under this contract.

(c) Payments Subject to Submission of Certificates. Each payment to the Contractor by the

Owner shall be made subject to submission by the Contractor of all written certifications required of the Contractor, their Subcontractors and other general and special conditions elsewhere in this contract.

(d) Final Payment.

- (1) Upon satisfactory completion of the work performed under this contract, as a condition before final payment under this contract or as a termination settlement under this contract the Contractor shall execute and deliver to the Owner a release of all claims against the Owner arising under, or by virtue of, this contract, except claims which are specifically exempted by the Contractor to be set forth therein. Unless otherwise provided in this contract, by state law or otherwise expressly agreed to by the parties to this contract, final payment under this contract or settlement upon termination of this contract shall not constitute a waiver of the Owner' s claims against the Contractor or their sureties under this contract or applicable performance and payment bonds.
- (2) After final inspection and acceptance by the Owner of all work under the Contract, the Contractor shall prepare their requisition for final payment which shall be based upon the carefully measured or computed quantity of each item of work at the applicable unit prices stipulated in the Agreement or cost breakdown (if lump sum), as adjusted by approved change orders. The total amount of the final payment due to the Contractor under this contract shall be the amount computed as described above less all previous payments.
- (3) The retainage and its interest earnings, if any, shall not be paid to the Contractor until the TWDB has authorized a reduction in, or release of, retainage on the contract work.
- (4) Withholding of any amount due to the Owner, under general and/or special conditions regarding "Liquidated Damages" shall be deducted from the final payment due the Contractor.

### **13. Archaeological Discoveries and Cultural Resources**

No activity which may affect properties listed or properties eligible for listing in the National Register of Historic Places or eligible for designation as a State Archeological Landmark is authorized until the Owner has complied with the provisions of the National Historic Preservation Act and the Antiquities Code of Texas. The Owner has previously coordinated with the appropriate agencies and impacts to known cultural or archeological deposits have been avoided or mitigated. However, the Contractor may encounter unanticipated cultural or archeological deposits during construction.

If archeological sites or historic structures which may qualify for designation as a State Archeological Landmark according to the criteria in 13 TAC Chapter 26, or that may be eligible for listing on the National Register of Historic Places in accordance with 36 CFR Part 800, are discovered after construction operations are begun, the Contractor shall immediately cease operations in that particular area and notify the Owner, the TWDB, and the Texas Historical Commission, 1511 N. Colorado St. , P. O. Box 12276, Capitol Station, Austin, Texas 78711-2276. The Contractor shall take reasonable steps to protect

and preserve the discoveries until they have been inspected by the Owner's representative and the TWDB. The Owner will promptly coordinate with the State Historic Preservation Officer and any other appropriate agencies to obtain any necessary approvals or permits to enable the work to continue. The Contractor shall not resume work in the area of the discovery until authorized to do so by the Owner.

#### **14. Endangered Species**

No activity is authorized that is likely to jeopardize the continued existence of a threatened or endangered species as listed or proposed for listing under the Federal Endangered Species Act (ESA), and/or the State of Texas Parks and Wildlife Code on Endangered Species, or to destroy or adversely modify the habitat of such species.

If a threatened or endangered species is encountered during construction, the Contractor shall immediately cease work in the area of the encounter and notify the Owner, who will immediately implement actions in accordance with the ESA and applicable State statutes. These actions shall include reporting the encounter to the TWDB, the U.S. Fish and Wildlife Service, and the Texas Parks and Wildlife Department, obtaining any necessary approvals or permits to enable the work to continue, or implement other mitigation actions. The Contractor shall not resume construction in the area of the encounter until authorized to do so by the Owner.

#### **15. Hazardous Materials**

Materials utilized in the project shall be free of any hazardous materials, except as may be specifically provided for in the specifications.

If the Contractor encounters existing material on sites owned or controlled by the Owner or in material sources that are suspected by visual observation or smell to contain hazardous materials, the Contractor shall immediately notify the Engineer and the Owner. The Owner will be responsible for the testing and removal or disposal of hazardous materials on sites owned or controlled by the Owner. The Owner may suspend the work, wholly or in part during the testing, removal or disposal of hazardous materials on sites owned or controlled by the Owner.

#### **16. Changes**

\*Provisions identified with an asterisk below are consistent with Local Government Code 271.060. Counties and Municipalities may modify the identified provisions, when applicable, to conform to Local Government Code 262.031 (Counties) or 252.048 (Municipalities).

- (a) The Owner may at any time, without notice to any surety, by written order designated or indicated to be a change order, make changes in the work within the general scope of the contract, including but not limited to changes:
  - (1) In the specifications (including drawings and designs);
  - (2) In the time, method or manner of performance of the work;
  - (3) To decrease or increase the quantity of work to be performed or materials, equipment or supplies to be furnished;

- (b) \*The total price of a contract may not be increased by a change order unless provision has been made for the payment of the added cost by the appropriation of current funds or bond funds for that purpose, by the authorization of the issuance of certificates, or by a combination of those procedures.
- (c) \*A contract with an original contract price of \$1 million or more may not be increased by more than 25 percent. If a change order for a contract, with an original contract price of less than \$1 million, increases the contract amount to \$1 million or more, subsequent change orders may not increase the revised contract amount by more than 25 percent.
- (d) \*A governing body may grant authority to an official or employee responsible for purchasing or for administering a contract to approve a change order that involves an increase or decrease of \$50,000 or less.
- (e) Changes that involve an increase in price will be supported by documentation of the cost components. For projects funded through the EDAP program, or with grant proceeds, TWDB staff may request this information to be provided in a format equivalent to the Cost and Pricing Information form (No. WRD-277).
- (f) Any change orders involving a change in the project requiring a relocation of project components, sizing, or process may require additional environmental approval. A map and description of the proposed changes should be sent to the TWDB Environmental Reviewer for coordination and approval as soon as possible to avoid any delay.

## **17. Operation and Maintenance Manuals and Training**

- (a) The Contractor shall obtain installation, operation, and maintenance manuals from manufacturers and suppliers for equipment furnished under the contract. The Contractor shall submit three copies of each complete manual to the Engineer within 90 days after approval of shop drawings, product data, and samples, and not later than the date of shipment of each item of equipment to the project site or storage location.
- (b) The Owner shall require the Engineer to promptly review each manual submitted, noting necessary corrections and revisions. If the Engineer rejects the manual, the Contractor shall correct and resubmit the manual until it is acceptable to the Engineer as being in conformance with the design concept of the project and for compliance with information given in the contract documents. Owner may assess Contractor a charge for reviews of same items in excess of three (3) times. Such procedure shall not be considered cause for delay.
- (c) Acceptance of manuals by Engineer does not relieve Contractor of any requirements of terms of Contract.
- (d) The Contractor shall provide the services of trained, qualified technicians to check final equipment installation, to assist as required in placing same in operation, and to instruct operating personnel in the proper manner of performing routine operation and maintenance of the equipment.

- (e) Operations and maintenance manuals specified hereinafter are in addition to any operation, maintenance, or installation instructions required by the Contractor to install, test, and start-up the equipment.
- (f) Each manual is to be bound in a folder and labeled to identify the contents and project to which it applies. The manual shall contain the following applicable items:
  - (1) A listing of the manufacturer's identification, including order number, model, serial number, and location of parts and service centers.
  - (2) A list of recommended stock of parts, including part number and quantity.
  - (3) Complete replacement parts list.
  - (4) Performance data and rating tables.
  - (5) Specific instructions for installation, operation, adjustment, and maintenance.
  - (6) Exploded view drawings for major equipment items.
  - (7) Lubrication requirements.
  - (8) Complete equipment wiring diagrams and control schematics with terminal identification.

### **18. As-built Dimensions and Drawings**

- (a) Contractor shall make appropriate daily measurements of facilities constructed and keep accurate records of location (horizontal and vertical) of all facilities.
- (b) Upon completion of each facility, the Contractor shall furnish the Owner with one set of direct prints, marked with red pencil, to show as-built dimensions and locations of all work constructed. As a minimum, the final drawings shall include the following:
  - (1) Horizontal and vertical locations of work.
  - (2) Changes in equipment and dimensions due to substitutions.
  - (3) "Nameplate" data on all installed equipment.
  - (4) Deletions, additions, and changes to scope of work.
  - (5) Any other changes made.

### **19. Close-Out Procedures**

To close-out the contract and release final retainage, the following steps must be completed:

- (a) TWDB Staff must conduct a construction contract final inspection (CCFI).
- (b) The following submittals must be received, reviewed, and accepted by TWDB:
  - (1) The final change order, adjustment of quantities, or a statement that all change orders have previously been submitted and there will be no more change orders;
  - (2) The final pay request from the Contractor;
  - (3) An affidavit by the Contractor that all bills have been paid;
  - (4) Certification by the consulting Engineer that the work has been completed and was constructed in accordance with the approved plans and specifications and sound engineering principles and construction practices;
  - (5) Acceptance of the project by the Owner in the form of a written resolution or other formal action;

- (6) Notification of the beginning date of the warranty period for the contract; and
- (7) Confirmation that the Owner has received as-built drawings from the Contractor.

(c) TWDB will issue a Certificate of Approval allowing the release of retainage.

#### **IV. FORMS AND GUIDANCE LIST**

The following documents, mentioned throughout this guidance are available on the TWDB website at: <http://www.twdb.texas.gov/financial/instructions/index.asp>

##### **Forms:**

The following forms must be included in the bid documents:

- TWDB-0459, Vendor Compliance with Reciprocity of Non-Resident Bidders.
- Site Certificate (ED-101)
- Contractor's Act of Assurance (ED-103)
- Contractor's Act of Assurance Resolution (ED-104)

##### **Guidance Document:**

- Requirements for U.S. Iron and Steel and Manufactured Goods (TWDB-1105)



# U.S. Iron and Steel and Manufactured Goods Requirements

**OFFICE:** Water Supply & Infrastructure  
**NUMBER:** TWDB-1105  
**EFFECTIVE DATE:** July 11, 2016  
**REVIEW DATE:** July 11, 2018

<b>INTRODUCTION:</b>	<p>Effective September 1, 2013, Texas Water Code §17.183, requires that a political subdivision include a provision in its construction contracts that iron and steel products and manufactured goods used be produced in the United States when receiving financial assistance from the Texas Water Development Board (TWDB) through any of the following accounts or funds:</p> <ul style="list-style-type: none"><li>• the Texas Water Development Fund II Water Financial Assistance Account;</li><li>• the Economically Distressed Areas Program Account;</li><li>• the Water Infrastructure Fund; or</li><li>• the Rural Water Assistance Fund.</li></ul> <p>This provision requires that iron and steel products and manufactured goods used in the construction contract be produced in the United States, unless:</p> <ul style="list-style-type: none"><li>• the products or goods are not available in sufficient quantities, are not readily available, or are not of a satisfactory quality; or</li><li>• the use of the products or goods will increase the total cost of the project by more than 20 percent.</li></ul>
<b>DEFINITIONS:</b>	<p><b><u>Component</u></b> means any article, material, or supply, whether a manufactured good or raw material, that is directly incorporated into a manufactured good.</p> <p><b><u>Manufactured good</u></b> means an item produced as the result of a manufacturing process.</p> <p><b><u>Manufacturing process</u></b> means the application of a process to alter the form or function of materials or elements of a product in a manner that adds value and transforms the materials or elements so that a new end product is produced that is functionally different from the product that would result from simple assembly of the materials or elements.</p> <p><b><u>Produced in the United States</u></b> means:</p> <ul style="list-style-type: none"><li>• in the case of iron and steel products, products for which all manufacturing processes, from initial melting through application of coatings, take place in the United States, except metallurgical processes that involved the refinement of steel additives; and</li><li>• in the case of a manufactured good, a good for which:<ul style="list-style-type: none"><li>– all of the manufacturing process that produced the manufactured good takes place in the United States; and</li><li>– more than 60 percent of the components of the manufactured good, by cost, originate in the United States.</li></ul></li></ul> <p>If a component originates in the United States, the entire cost of that component contributes to the determination of the percentage of the components of the manufactured good that originate in the United States.</p>



<b>CRITERIA:</b>	This provision applies to funding of applications received after September 1, 2013 for projects which have not previously received TWDB construction funding.
<b>PROCEDURE:</b>	<p>The following procedure shall be utilized for implementation of U.S. Iron and Steel and Manufactured Goods as required by Texas Water Code §17.183</p> <ol style="list-style-type: none"> <li>1. The commitment resolution shall include a condition that the Applicant will abide by all applicable construction contract requirements related to the use of iron and steel products and manufactured goods produced in the United States, as required by Texas Water Code § 17.183.</li> <li>2. The TWDB supplemental conditions to the contract shall include the use of iron and steel products and manufactured goods produced in the United States as follows:  <i>In the execution of the Contract, the Contractor must comply with all applicable Local, State and Federal laws, including but not limited to laws concerned with labor, safety, minimum wages, the environment, and use of iron and steel and manufactured goods made in the United States. The Contractor shall make himself familiar with and at all times shall observe and comply with all Federal, State, and Local laws, ordinances and regulations which in any manner affect the conduct of the work, and shall indemnify and save harmless the Texas Water Development Board against any claim arising from violation of any such law, ordinance or regulation by himself or by his subcontractor or his employees.</i> </li> <li>3. Applicants shall include a reference to the U.S. Iron and Steel and Manufactured Goods provisions on the General Notes Plan Sheet(s).</li> <li>4. The TWDB will not approve a construction contract funded through the above-listed programs without the required language included in the contract documents and notation on the Plans. In addition, it is the responsibility of each Applicant to enforce the provisions of its construction contracts to ensure compliance with this requirement.</li> <li>5. The TWDB will rely upon the Applicant's certification without directing the Applicant on how to achieve the requirements.</li> <li>6. Should the TWDB in the course of its routine business have cause to suspect that the Applicant may not be in compliance with its contractual provisions, the TWDB will communicate with the Applicant. The TWDB will rely upon the Applicant to address any issue as appropriate.</li> <li>7. TWDB will communicate with the Applicant should any issues arise that may affect eligibility for reimbursement of expenses or certification of the project upon completion.</li> <li>8. The TWDB will require the Applicant to provide a certification, after the completion of the construction contract and prior to the issuance of a Certificate of Approval by the TWDB that states the project was completed in compliance with the U.S. Iron and Steel and Manufactured Goods provisions.</li> <li>9. This requirement shall be applied in a manner consistent with this State's obligations under any international agreement.</li> </ol>

## **EXCERPTS FROM TEXAS WATER CODE**

(Previously WRD-021)

The following excerpts from the Texas Water Code are hereby made a part of this contract. In the event there are any conflicts between these requirements and requirements of the specifications, these excerpts will govern.

### **CONSTRUCTION CONTRACT REQUIREMENTS**

Pursuant to § 17.183 of the Texas Water Code, the governing body of each political subdivision receiving financial assistance from the board shall require in all contracts for the construction of a project:

- (1) that each bidder furnish a bid guarantee equivalent to five percent of the bid price;
- (2) that each contractor awarded a construction contract furnish performance and payment bonds:
  - (A) the performance bond shall include without limitation guarantees that work done under the contract will be completed and performed according to approved plans and specifications and in accordance with sound construction principles and practices; and
  - (B) the performance and payment bonds shall be in a penal sum of not less than 100 percent of the contract price and remain in effect for one year beyond the date of approval by the engineer of the political subdivision; and
- (3) that payment be made in partial payments as the work progresses;
- (4) that each partial payment shall not exceed 95 percent of the amount due at the time of the payment as shown by the engineer of the project, but, if the project is substantially complete, a partial release of the five percent retainage may be made by the political subdivision with approval of the executive administrator;
- (5) that payment of the retainage remaining due upon completion of the contract shall be made only after:
  - (A) approval by the engineer for the political subdivision as required under the bond proceedings;
  - (B) approval by the governing body of the political subdivision by a resolution or other formal action; and
  - (C) certification by the development fund manager in accordance with the rules of the board that the work to be done under the contract has been completed and performed in a satisfactory manner and in accordance with sound engineering principles and practices;
- (6) that no valid approval may be granted unless the work done under the contract has been completed and performed in a satisfactory manner according to approved plans and specifications; and
- (7) that, if a political subdivision receiving financial assistance under Subchapter K of this chapter, labor from inside the political subdivision be used to the extent possible.

### **FILING CONSTRUCTION CONTRACT**

The political subdivision shall file with the Board a certified copy of each construction contract it enters into for the construction of all or part of a project. Each contract shall contain or have attached to it the specifications, plans, and details of all work included in the contract.  
Amended by Acts 1987, 70th Leg., ch. 1103, Sec. 1, eff. Sept. 1, 1987.

## Excerpts from Texas Water Code

Page 2 of 2

### INSPECTION OF PROJECTS

1. the Board may inspect the construction of a project at any time to assure that:
  - a. the contractor is substantially complying with the approved engineering plans of the project; and
  - b. the contractor is constructing the project in accordance with sound engineering principles.
2. inspection of a project by the Board does not subject the State to any civil liability.

### ALTERATION OF PLANS

After the Executive Administrator approves the engineering plans, a political subdivision may not make any substantial or material alteration in the plans unless the Executive Administrator authorizes the alteration in accordance with the rules of the Board. For a waste water treatment plant or other facility required to have commission approval of the plans and specifications, the commission must give its approval before a substantial or material alteration is made in those plans.

Amended by Acts 1987, 70th Leg., ch. 1103, Sec. 1, eff. Sept. 1, 1987.

### CERTIFICATE OF APPROVAL

The Executive Administrator may consider the following as grounds for refusal to give a Certificate of Approval for any construction contract:

1. failure to construct the project according to approved plans;
2. failure to construct the works in accordance with solid engineering principles; or
3. failure to comply with any terms of the contract.

Amended by Acts 1987, 70th Leg., ch. 1103, Sec. 1, eff. Sept. 1, 1987.

The Texas Water Code is available online at: <http://www.statutes.legis.state.tx.us/?link=WA>.  
Chapter WATER CODE, CHAPTER 17. PUBLIC FUNDING, Sec. §17.183.

**DIVISION 01**

GENERAL REQUIREMENTS

## **SECTION 01 11 13**

### **WORK COVERED BY CONTRACT DOCUMENTS**

#### **PART 1 - GENERAL**

##### **1.1 SUMMARY**

###### **A. Section Includes**

1. Definitions.
2. Work Covered by Contract Documents.
3. Cash Allowances.
4. Owner-Furnished Products.
5. Document Management Software
6. Work Sequence.
7. Work Guidelines.
8. Coordination of Work.
9. Contractors Use of Premises.
10. Contract Clarification.
11. Alternate Construction Methods.
12. Utility Lines.
13. Warranty.

###### **B. Related Specification Sections include but are not necessarily limited to:**

1. Division 00 – Proposing Requirements, Contract Forms, and Conditions of the Contract.
2. Division 01 – General Requirements.

##### **1.2 MEASUREMENT AND PAYMENT**

- A. No separate payment will be made for this item. Include the cost in associated items for this project.

##### **1.3 SUBMITTALS (NOT USED)**

##### **1.4 DEFINITIONS**

- A. Large Diameter Lines: Water lines 24-inch in diameter and larger. References to large diameter water lines apply to siphon pipes and appurtenances 24-inches in diameter and larger associated with Project.
- B. Mobilization Area: For Work at facilities, an area, defined on the Contract Drawings, for Contractor staging and storage of construction equipment, tools, products, and spare parts.

## **1.5 WORK COVERED BY CONTRACT DOCUMENTS**

Siphon 7 Improvements – Phase 1 Project, hereafter called “Project” is located at the intersection of the San Jacinto River Authority’s Main Canal and FM 2100 in Crosby, Texas. The Project will accommodate the future widening of FM 2100. Generally, the Project includes:

- Demolition of existing siphon intake and discharge structures and angled pipe segments of a 60-inch diameter reinforced concrete pipe.
- Installation of a temporary cofferdam around the work areas to maintain full canal flow capacity of 60 MGD.
- Rehabilitation of existing 60-inch diameter reinforced concrete pipe for use as a temporary bypass pipe that will remain in service until the completion of the road widening of FM 2100 (by others).
- Installation of new 60-inch diameter steel temporary bypass pipe that will remain in service until the completion of the road widening of FM 2100 (by others).
- Siphon area associated canal levee earth work, riprap and geotextile placement, and hydro-mulching of all disturbed areas.

CSP No. 18-0036 includes four (4) separate Proposal Options. Offerors may choose to provide a Proposal for one or more of the Proposal Options. For each Option that Offeror elects to provide a proposal for, Offeror shall include a separate specific Care of Water plan in accordance with Specification Section 01 57 23.02 – Control of Ground and Surface Water. Each Proposal Option will be independently evaluated and scored to determine overall Highest Ranked CSP No. 18-0036 Offeror and preferred Proposal Option based on the criteria set forth in Specification Section 00 21 13.02 – Instructions to Offerors.

The Proposal Options include the following:

Proposal Option No. 1 (as shown on sheets C-2 through C-5 of drawings): Install 48-inch (minimum inner diameter) HDPE pipe to slipline and extend existing 60-inch RCP bypass pipe. Install new 60-inch steel pipe along southern side of SJRA’s easement.

Proposal Option No. 2 (as shown on sheet C-6 of drawings): Extend existing 60-inch RCP bypass pipe and install a geopolymer mortar liner inside existing 60-inch RCP bypass pipe and extensions. Install new 60-inch steel pipe along southern side of SJRA’s easement.

Proposal Option No. 3 (as shown on sheet C-6 of drawings): Install 48-inch (minimum inner diameter) HDPE pipe to slipline and extend existing 60-inch RCP bypass pipe. Install new 60-inch steel pipe along northern side of SJRA’s easement.

Proposal Option No. 4 (as shown on sheet C-6 of drawings): Extend existing 60-inch RCP bypass pipe and install geopolymer mortar liner inside existing 60-inch RCP bypass pipe and extensions. Install new 60-inch steel pipe along northern side of SJRA’s easement.

**1.6 CASH ALLOWANCES (NOT USED)**

**1.7 OWNER-FURNISHED PRODUCTS (NOT USED)**

**1.8 DOCUMENT MANAGEMENT SOFTWARE**

- A. Contractor and the Owner's Representative shall be given the applicable number of Document Management System user names and passwords.
- B. Contractor shall use the Owner's internet based document management system to transmit its documents to the Owner's Representative, including but not limited to Requests for Information (RFIs), shop drawing submittals, applications for payment, and letters of correspondence. Refer to Specification Section 01 33 00 – Submittals. The document management software should be able to automatically notify all team members of a submittal upload regardless of the originator, i.e. contractor, Principal Architect/Engineer, Owner's Representative, or Owner. Notification of new uploads should go to all team members regardless if they are the Principal Architect/Engineer or not, i.e. sub-consultants for construction management & inspection, but are not tasked as the Principal Architect/Engineer.
- C. A minimum of one (1) and a maximum of three (3) accounts on the document management system will be provided by the Owner. Additional accounts may be requested by the Contractor.
- D. Each account will allow one (1) user to access the document management system. Training on the document management system will be provided by the Owner as requested by the Contractor at a mutually agreed upon date and location.

**1.9 WORK SEQUENCE**

- A. Construct Work in phases during the construction period. Coordinate construction schedule and operations with the Owner's Representative. Subcontractors shall coordinate its activities and operations with the Contractor.
- B. Construction of this project may require using multiple crews working concurrently in order to complete the project within the specified Contract Time. At no time will multiple crews be allowed to work in consecutive traffic control phases during construction.
- C. Data for all facilities and utilities shown were taken from available plans, record drawings, and/or utility maps made available from several sources. Actual field locations of facilities and utilities may vary from that shown on the Drawings. Contractor shall make a complete and independent verification of utility locations prior to submittal of subsequent shop drawings. Unless otherwise approved by the Owner's Representative, work shall not continue at locations where there is a conflict with existing utilities.

- D. Construction disturbing traffic shall be conducted during off-peak hours, 9:00 a.m. to 4:00 p.m. weekdays and/or weekends 7:00 p.m. Friday to 4:00 a.m. Monday, dependent upon provisions of Texas Department of Transportation. Exception to these times, if necessary, shall be sought during the permit application process. Continue work in areas using same construction schedule during following, consecutive days and/or weekends until work is completed.
- E. Flow in the canal must be maintained at all times (60 MGD).

### **1.10 WORK GUIDELINES**

- A. Maintain local driveway access to public schools, residential and commercial properties adjacent to work areas at all times. Provide temporary driveway access in accordance with Specification Sections 01 55 26 – Traffic Control and 01 14 19 – Use of Premises. Coordinate work and schedule with impacted business owners, schools, and residents in conjunction with the Owner's Representative, well in advance of commencing the Work in the area(s) of the impacted entities.
- B. Contractor shall adhere to each privately owned and operated utility company's construction guidelines when constructing the proposed Work adjacent-to or across each such entities wet or dry utility. Contractor to coordinate with such utilities for guidelines.
- C. Obtain right-of-entry agreement(s), insurance, crossing permit(s), and other documentation as required or deemed necessary by each utility or pipeline company or other such entity at no additional cost to the Owner.
- D. Contractor shall coordinate its Work schedule with those utility companies who require a representative of their company to be present (onsite) during the construction adjacent-to or across their wet or dry utility.
- E. Site restoration at all crossings shall be performed immediately upon completion of the Work. Restoration shall be performed in accordance with all applicable Specification Sections and utility company requirements.
- F. Hand dig within one (1) foot of underground service lines (public or private).
- G. Contractor shall bear the sole responsibility for damage to existing utilities resulting from its construction activities. The Contractor shall be responsible for the repair of damaged utilities, at no additional cost to the Owner.

### **1.11 COORDINATION OF WORK**

- A. Coordinate activity schedule and extend full cooperation to other Contractors who have responsibilities either concurrent with, proceeding, or following this project's duration along the work site. Ensure availability of access to selected portions of this project area to others and provide appropriate information for planning purposes to other Contractors. No compensation or time extension will be allowed as a result of conflicting construction activities.



- B. Comply with coordination requirements outlined in Specification Section 01 14 19 – Use of Premises.
- C. One-Call all three (3) One-Call centers in the state of Texas a minimum of seventy-two (72) hours prior to construction within twenty-five (25) feet of a utility/pipeline.  
Contact numbers for such centers are as follows:
  - 1. TESS (Texas) One Call (800) 344-8377
  - 2. Texas One-Call (800) 245-4545
  - 3. Texas (Lone Star) One Call (800) 669-8344
- D. Existing structures adjacent to the proposed alignment shall be closely monitored prior to, during, and for a length of time designated by Owner after construction is complete in all areas. Several conditions including, but not limited to, soil type, construction methods, weather conditions, surrounding construction, personnel experience, and supervision may impact the amount of ground movement within and surrounding the alignment. Contractor shall survey and adequately document the condition and elevation of existing structures adjacent to the proposed alignment. Monitoring program for proposed trenchless construction operations should be developed in accordance with trenchless construction Specification Sections.
- E. All work shall be performed to the lines, grades, elevations, and locations shown on the Drawings.
- F. Prevent overstress or damage of any structure and any part or member of it during construction. This applies to new and existing facilities, utilities, and structures affected by construction operations. Contractor shall monitor and record the effect of its construction operations on new and existing facilities, utilities and structures and provide engineered temporary supports and connections as required to assure the safety and stability of the same to prevent overstress of any part.
- G. Prior to commencing any Work involving state or local agencies, agency stipulated notifications shall be made by the Contractor. This may include, but is not limited to, the Texas Department of Transportation (TXDOT) Area Office that represents the Crosby, Texas area.
- H. Work shall include the restoration of existing drainage swale systems within TXDOT rights-of-way. TXDOT Area Office should represent the Crosby, Texas area rights-of-way within the Work area or as directed by the Owner's Representative. Contractor shall restore ground cover to areas damaged during construction by hydro-mulching per Specification Section 32 92 13 – Hydro-Mulching.
- I. Contractor Work performed within all rights-of-way shall be performed in accordance with the respective entities' standards. Contractor to coordinate with such entities to obtain required standards.

### **1.12 CONTRACTOR USE OF PREMISES**

- A. Comply with all requirements outlined in Specification Section 01 14 19 – Use of Premises.

### **1.13 CONTRACT CLARIFICATION**

- A. Should clarification of the Contract Documents be requested, request clarification before proceeding with Work by submitting a Request for Information (RFI). Such requests shall be preceded by a diligent investigation of the Contract Documents. Include evidence of such investigation(s) in all requests for clarification.

### **1.14 ALTERNATE CONSTRUCTION METHODS**

- A. Alternate construction means and methods will be permitted in accordance with applicable Contract Document details and specification at no additional cost to the Owner. Alternate construction means and methods shall provide a substantial benefit to the project and/or the Owner. Contractor accepts full responsibility for all additional costs of geotechnical investigations and other incidental items, including any re-design that may be necessary to permit the alternate construction means and methods.
- B. Contractor shall submit the below listed modifications for alternate construction methods to the Owner's Representative for Principal Architect/Engineer and Owner's consideration. Submittal shall be made prior to commencement of any construction activity utilizing an alternate construction method. Contractor execution of alternate construction methods prior to its receiving Principal Architect/Engineer and Owner's approval shall be at the sole risk of the Contractor for removal and replacement at no additional cost to the Owner. The following modifications must also be signed and sealed by a Licensed Professional Engineer registered in the State of Texas prior to submittal to Owner's Representative.
  - 1. Revisions to horizontal or vertical alignment;
  - 2. Proposed construction method and detailed plan of approach;
  - 3. Proposed traffic control plan;
  - 4. Proposed storm water pollution prevention plan, and;
  - 5. Revisions to material specifications.;
- C. If alignment revisions are requested, Contractor shall immediately inform the Owner Representative of any proposed changes and any potential impacts the revised alignment may have on that portion of the pipe segment and all adjacent pipe segments, existing or proposed.

### **1.15 UTILITY LINES**

- A. All utilities represented on the Drawings are shown as an approximate location and are based on the best information available during project design. Contractor shall field-verify the exact location of all utilities prior to commencing construction. The Contractor shall be responsible for any and all damage to these utilities, caused or resulting from their failure to locate, protect and/or maintain these utilities during construction.

### **1.16 WARRANTY**

- A. Comply with the warranty requirements stipulated in Contract Document General Conditions and the warranty requirements of the various specification sections of this project manual.

## **PART 2 - PRODUCTS**

### **2.1 TYPES OF PIPE FOR SMALL DIAMETER WATERLINES (NOT USED)**

### **2.2 TYPES OF PIPE FOR LARGE DIAMETER WATER LINE (BYPASS PIPE)**

- A. Drawings for large diameter waterlines on this project have been prepared on the basis of **Steel Pipe** except where other specific pipe material is identified. Unless specifically identified on Drawings, selection of the types of materials from those indicated as acceptable in the specifications is at the Contractor's option. Specifications and design criteria have been provided for acceptable alternate types of pipe. Include costs associated with changes in installation and construction, tie-ins, valves, vaults, manholes and other appurtenances to accommodate any selected alternate pipe in unit cost of water line construction. Contractor to submit any choice of specified alternate material to the Owner's

Representative as a miscellaneous submittal in accordance with Section 01 33 00 – Submittals.

- B. Only one type of pipe material may be used where material alternates are allowed. Contractor is responsible to ensure type of pipe selected and resulting methods and means complies with requirements and limitations set forth herein and on Drawings. When Contractor's selected pipe materials joins to pipes of different material and/or coatings to be constructed by others, Contractor shall request the Owner to identify the type of pipe in the adjoining contract. If that contract is scheduled to complete the adjoining section first, the Contractor must provide an approved connection with insulating kit and isolation test station at no additional cost to the Owner. Contractor to submit details of connections to each differing type materials its pipe will connect with including insulating details to the Owner's Representative as a miscellaneous submittal in accordance with Specification Section 01 33 00 – Submittals.
- C. Product manufacturers and subcontractor selection are within Contractor's control and will not warrant time extensions due to failure to produce required deliverables within Contract Time. Extension of Contract Time due to non-delivery of Contractor's choice of pipe material, which affects Contractor's schedule, will not be allowed. Submit pipe material and other critical submittals in a timely manner to allow sufficient review time by Owner's Representative and to maintain Construction Schedule.
- D. No separate payment for restrained or welded joints on large diameter water lines where required regardless of type of pipe.

**PART 3 - EXECUTION (NOT USED)**

**END OF SECTION**

**SECTION 01 14 19**

USE OF PREMISES

**PART 1 - GENERAL**

**1.1 SUMMARY**

A. Section Includes:

1. Administrative and procedural requirements for:
  - a. Contractor Responsibilities
  - b. Temporary Utilities
  - c. Limits of Construction
  - d. Storage Sheds and Buildings
  - e. Working Times
  - f. Site Access Times
  - g. Notification to Adjacent Occupants
  - h. Safety Requirements
  - i. First Aid Equipment
  - j. Fire Protection
  - k. Security Measures
  - l. Protection of Utilities, Pipelines, and Property
  - m. Surface Restoration
  - n. Traffic Control and Use of Public Rights of Way
  - o. Contractor's Roads and Parking
  - p. Coordination with Facility Owner's Operations
  - q. Contractor's Field Office
  - r. Principal Architect/Engineer's Field Office
  - s. Project Photographs
  - t. Special Considerations Related to Adjacent Properties and Facilities
  - u. Historical and Archaeological Sites

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

1. Division 00 – Proposing Requirements, Contract Forms, and General Conditions of the Contract.

2. Division 01 – General Requirements.
3. Specification Section 31 21 33 – Trenching, Backfilling, and Compacting for Utilities.

## **1.2 MEASUREMENT AND PAYMENT**

- A. No separate payment will be made for this item. Include the cost in associated items for this project.

## **1.3 SUBMITTALS**

- A. See Specification Section 01 33 00 – Submittals for the requirements for the mechanics and administration of the submittal process.
- B. Contractors Safety Program.
- C. All proposed notifications to adjacent occupants.
- D. Planning requests for temporary Owner's facility shutdowns.

## **1.4 CONTRACTOR RESPONSIBILITIES**

- A. Comply with applicable requirements specified in other sections of Project Specifications.
- B. Comply with procedures for access to the site and Contractor's use of rights-of-way.
- C. Maintain and operate temporary construction facilities and temporary systems to assure continuous service of Owner's and other adjacent existing facilities.
- D. Modify and extend temporary systems as Work progress requires.
- E. Completely remove materials and equipment when no longer required.
- F. Restore existing facilities used for temporary services to original or better condition, or as specified.
- G. Prior to installation of material, equipment and/or other work, verify with subcontractors, material or equipment manufacturers, and installers that the substrate or surface to which those materials will attach is acceptable for installation of those materials or equipment. (Substrate is defined as any building or construction surfaces to which materials or equipment are attached to, or required prior to installation i.e., floors, walls, ceilings, soils, utilities, site grading, and backfill etc.).
- H. Correct unacceptable substrate until acceptable for installation of equipment or materials.

## **1.5 TEMPORARY UTILITES**

- A. Obtaining Temporary Service:
  1. Make arrangements with utility service companies for temporary services,

unless provided by Owner.

2. Abide by rules and regulations of utility service companies and/or authorities/agencies/entities having jurisdiction.
3. Be responsible for utility service costs and permits until de-mobilization from site. Included services are fuel, power, light, heat, and any other utility services necessary for execution, completion, testing, and initial operation of Work.
4. Be responsible for providing approved metering devices, as necessary, for any temporary utilities.

**B. Water:**

1. Contractor to provide water required for performance of Work, specified tests of piping, equipment, devices, or other equipment, and for other uses as necessary. Contractor may request use of Owner's canal as a source of non-potable water.
2. Provide and maintain adequate supply of potable water for consumption by Contractor personnel and Owner's Representatives.
3. Provide necessary approved metering devices and backflow preventers.

**C. Electricity and Lighting:**

1. Provide electrical service required for Work, including testing of Work. Provide power for lighting, operation of equipment, and other use as necessary.
2. For projects on existing sites, electric power service to be provided includes temporary power service or generator(s) to maintain Owner's operations during scheduled shutdown(s). Coordinate all temporary shutdowns with Owner and Owner's Representative(s).
3. Minimum lighting level shall be ten (10) foot-candles for open areas; twenty (20) foot-candles for stairs and shops. Provide minimum of one (1) 300 watt lamp for each 200 square feet of work area.

**D. Heat and Ventilation:**

1. Provide temporary heat as necessary for protection or completion of Work.
2. Provide temporary heat and ventilation to assure safe working conditions. Maintain enclosed areas at minimum of 50°F.

**E. Sanitary Facilities:**

1. Provide and maintain sanitary facilities for persons on job site. Comply with regulations of State and local departments of health.
2. Enforce use of sanitary facilities by construction personnel at job site.

Enclose sanitary facilities. Pit-type toilets will not be permitted. No discharge will be allowed from these facilities. Collect and store sewage and waste so as not to cause nuisance or health problem. Haul sewage and waste off-site and properly dispose of in accordance with all applicable regulations.

3. Locate toilets near Work site, within 500 feet of working activities for line work projects and secluded from view as best as possible. Keep toilets clean and supplied throughout course of Work. Locate toilets a minimum of 100 feet from all water wells.

## **1.6 LIMITS OF CONSTRUCTION**

- A. Construction operations and storage areas are limited to Owner's property, permanent easements, temporary construction easements (TCE), and/or the Limits of Construction or Construction Limits as indicated on the Contract Drawings.
- B. Unauthorized use of areas, or trespassing on land outside of defined limits, is not permitted.
- C. Make arrangements, at no cost to the Owner, for Contractor's temporary use of any private properties which may be needed by Contractor for performance of Work. Contractor and Contractor's surety shall indemnify and hold harmless the Owner and Owner's Representatives against claims or demands arising from use of properties outside the Limits of Construction. Submit notarized copy of any separately negotiated agreement(s) between private property owner(s) and Contractor prior to use of area.
- D. Where Limits of Construction are shown on Contract Drawings to extend to a property or Right-of-Way line, keep equipment, materials, and stockpiles a minimum of 5 feet from boundary, or existing fence lines.
- E. Where utility alignment is within an esplanade and Limits of Construction are shown to extend to edge of the esplanade, keep equipment, materials, and stockpiles a minimum of 5 feet from back of curb.
- F. There are unique terms and conditions associated with the various public and private easements, rights-of-entry, encroachment and crossing documents (collectively, the easement documents) which may be site specific. Contractor shall familiarize itself with all easement Documents. Easement documents are available from the Owner on a case by case basis upon request.
- G. The Contractor, at its sole expense, shall be responsible for complying with all terms and conditions of all easement documents and the easement rights described therein for this project.
- H. Contractor shall safely, properly, and adequately assume and perform all of the duties, indemnities, responsibilities, and liabilities of the Owner under the



easement documents.

- I. Contractor, at its cost, shall provide all insurance required by the easement documents. All land included within the tracts covered by the easement documents and easements described herein shall be restored to its original condition prior to Substantial Completion of the construction (including, without limitation, repair or replacement of pavement, concrete, signs, fencing, trees, sidewalks, landscaping, shrubbery, and grass) unless otherwise specified in the Contract Documents.

### **1.7 STORAGE SHEDS AND BUILDINGS**

- A. Provide adequately ventilated, watertight storage facilities with floor above ground level for protection of materials and equipment susceptible to weather damage.
- B. Store materials in neat and orderly manner. Store materials and equipment to permit easy access for identification, inspection, and inventory.
- C. Storage of materials not susceptible to weather damage may be on blocks off ground.
- D. Storage of all fuels and chemicals shall be in designated areas by Contractor.
- E. Refer to Specification Section 01 65 50 – Product Delivery, Storage, and Handling for additional requirements.
- F. Fill and grade site for temporary structures to provide positive drainage away from Work area, but not to impact adjacent property owners.
- G. Avoid obstructing drainage ditches or inlets. When obstruction is unavoidable due to requirements of Work, provide grading and temporary drainage structures to maintain unimpeded drainage flow. Failure of the Contractor to maintain proper site drainage shall prohibit it from making a claim against the Owner for monetary or time damages due to drainage impacts.

### **1.8 WORKING TIMES**

- A. Construction shall be conducted during working hours as indicated in Specification Section 00 72 00 – General Conditions of the Contract, unless otherwise amended by a supplemental specification or agreement to the General Conditions of the Contract, and approved by Owner.

### **1.9 SITE ACCESS TIMES**

- A. Contractor to coordinate all site access, including deliveries, outside of working hours with Owner's Representative. Neither Owner nor Owner's Representatives shall sign for any Contractor deliveries. Refer to Specification Section 01 65 50 – Product Delivery, Storage, and Handling.
- B. Contractor shall coordinate with Owner to not interfere with Owner's facility

operations.

### **1.10 NOTIFICATION OF ADJACENT OCCUPANTS**

- A. Notify individual occupants in areas to be affected by Work of proposed construction activities and schedule using a standardized notification form letter and/or door hanger. Notification shall be made not less than 72 hours or more than 2 weeks prior to performance of work within 200 feet of homes or businesses. Coordinate all notifications with Owner's Representative.
- B. Include in notification the names and telephone numbers of two Contractor representatives for resident contact available on 24-hour call. Describe precautions that Contractor will take to protect private property and identify potential inconveniences and disruptions to resident's access and utilities.
- C. For Contractor's convenience, Owner's Representative will provide an example notice at the pre-construction meeting. In addition to other requirements of this specification regarding notification to adjacent occupants, Contractor's notice is generally to follow the form and content of the example notice.
- D. Submit proposed notification(s) to Owner for approval prior to distribution. Provide notice(s) in languages as appropriate (i.e., double sided notice. Notice on one side shall be written in English and flip side shall be written in Spanish).

### **1.11 SAFETY REQUIREMENTS**

- A. Beware of overhead power lines existing in area and in close proximity to project. When 10 feet of clearance between energized overhead power line and construction-related activity cannot be maintained, submit a request to the appropriate utility provider to de-energize or move conflicting overhead power line(s).
- B. Submit Contractor's Safety Program in accordance with Specification Section 01 33 00 – Submittals. Include Site Safety and Site Security in accordance with Specification Section 00 72 00 – General Conditions of the Contract. Include documented [response to trench safety system using information requirements](#) as specified in Specification Section 31 41 00 – Trench Safety System.
- C. Conduct operations in strict accordance with the Contractor's Safety Program, in accordance with applicable Federal, State, and local safety codes and statutes, and with good construction practice. Establish and maintain procedures for safety of all work, personnel, and equipment involved in Project.
- D. Observe and comply with Texas Occupational Safety Act (Art. 5182a, V.C.S.) and with all safety and health standards promulgated by Secretary of Labor under Section 107 of Contract Work Hours and Standards Act, published in 29 CFR Part 1926 and adopted by Secretary of Labor as occupational safety and health standards under Williams-Steiger Occupational Safety and Health Act of

1970, and to other legislation enacted for safety and health of Contractor employees. Safety and health standards apply to subcontractors and their employees as well as to Contractor and its employees.

- E. Observance of and compliance with regulations is solely and without qualification responsibility of Contractor without reliance or superintendence of or direction by the Owner or Owner's Representative. Immediately advise Owner's Representative of investigation or inspection by Federal Safety and Health Inspectors of Contractor or subcontractor's work or place of work on job site under this Contract, and after investigation or inspection, advise Owner's Representative of results. Submit one copy of accident reports to Owner's Representative within 10 days of occurrence.
- F. Protect areas occupied by workmen using best available devices for detection of lethal and combustible gases. Test devices frequently to assure functional capability. Constantly observe infiltration of liquids into Work area for visual or odor evidences of contamination, and immediately take appropriate steps to seal off entry of contaminated liquids into Work area.
- G. Implement safety measures, including but not limited to safety personnel, first-aid equipment, ventilating equipment, and other safety equipment, as specified or detailed on the Contract Drawings.
- H. Maintain required coordination with Police and Fire Departments during entire period covered by Contract.
- I. In safety plan, include project safety analysis. Itemize major tasks and potential safety hazards. Plan to eliminate hazards or protect workers and public from each hazard.

#### **1.12 FIRST AID EQUIPMENT**

- A. Provide first aid kit throughout construction period. List telephone numbers for hospitals, and ambulance services in each first aid kit.
- B. Have at least one person thoroughly trained in first aid and cardiopulmonary resuscitation (CPR) procedures present on site whenever Work is in progress. Contractor to conform to protocols and requirements for training and protection against "blood borne pathogens."

#### **1.13 FIRE PROTECTION**

- A. Conform to specified fire protection and prevention requirements established by Federal, State, or local governmental agencies and as provided in Contractor's Safety Program.

#### **1.14 SECURITY MEASURES**

- A. Protect all Work materials, equipment, and property from loss, theft, damage, and vandalism. Perform duty to protect property of the Owner used in

connection with performance of Work.

- B. If existing fencing or barriers are breached or removed for purposes of construction, provide and maintain temporary security fencing equal to existing.

### **1.15 PROTECTION OF UTILITIES, PIPELINES, AND PROPERTY**

- A. Utilize Utility Coordinating Committee One Call System (telephone number, (713) 223-4567), which must be called 48 hours in advance to locate utilities. Toll free telephone number is 1-800-669-8344, Texas (Lone Star) One Call System.
- B. Prevent damage to existing utilities during construction. Utilities shown on Drawings are at approximate locations. Pre-locate, by whatever means may be required (metal detection equipment, probes, excavation, survey), underground utilities before excavating in accordance with the Critical Locations investigation described in Specification Section 31 21 33 – Trenching, Backfilling and Compacting for Utilities. Perform investigative work and repairs required after investigation. Contractor is responsible for damages caused by failure to locate and preserve these underground utilities. Give owners of utilities a minimum of five (5) days' notice before commencing Work in area, for locating utilities during construction and for making adjustments or relocation of utilities when they conflict with proposed Work. Include cost for temporary relocation of utilities necessary to accommodate construction in unit costs for utility construction unless otherwise noted on Drawings. Bypassing of sanitary waste to storm drainage facilities is not allowed. Utility service laterals are not shown on Drawings. Contractor shall anticipate that service lines exist and repair them when damaged due to construction activity. No separate payment will be made for repair work. Include payment in unit prices for work in appropriate sections.
- C. Contractor shall adhere to each privately owned and operated utility company's construction guidelines when working adjacent-to or across each such entities wet or dry utility.
- D. Prior to abandonment of any utility indicated on the Drawings, make arrangements with Owner's Representative and utility owner to terminate service, remove meters, valves, appurtenances, transformers, and/or poles, as required.
- E. Utility Outages and Shutdowns: Provide a notification to the Owner's Representative and private utility companies (when applicable) a minimum of 48 hours, excluding weekends and holidays, in advance of required utility shutdown. Shutdown planning and coordination activities shall commence a minimum of 2-weeks prior to scheduled shutdown. Coordinate all work as required.
- F. Protect and prevent damage to existing crossing, parallel, and adjacent

pipelines during construction in accordance with Specification Section 01 11 13  
– Work Covered by Contract Documents.

- G. When excavating near product pipelines and prior to start of excavation, request that representative of pipeline company come to the construction site(s) to meet representatives of Contractor and Owner's Representative to discuss actual procedures that will be used. Request that pipeline company's representative probe and locate pipelines in at least three locations: one at each side of proposed excavation and one at centerline of proposed Work. Representative of the pipeline company and Owner's Representative must be present to observe activities of Contractor at all times when excavation is being conducted within 15 feet of existing pipelines.
- H. Protection of the Work, and Public and Private Property
1. Take precautions, provide programs, and take actions necessary to protect the Work, and public and private property from damage.
  2. Do not alter condition of properties adjacent to and along Limits of Construction.
  3. Do not use ways, means, methods, techniques, sequences, or procedures that result in damage to adjacent properties or improvements.
  4. Restore properties damaged by Contractor outside of designated Limits of Construction at no cost to Owner.
  5. Take action to prevent damage, injury, or loss, including, but not limited to, the following:
    - a. Store materials, supplies, and equipment in orderly, safe manner that will not interfere with progress of Work or work of others.
    - b. Provide suitable storage for materials subject to damage by exposure to weather, theft, breakage, or otherwise.
    - c. Place upon Work or any part thereof only safe loads.
    - d. Frequently clean up refuse, rubbish, scrap materials, and debris created by construction operations, keeping Project site safe and orderly.
    - e. Provide safe barricades and guard rails to protect pedestrian and vehicular traffic around openings, scaffolding, temporary stairs and ramps, excavations, elevated walkways, and other hazardous areas.
  6. Assume full responsibility for preservation of public and private property on or adjacent to the Limits of Construction. When direct or indirect damage is done by or on account of any act, omission, neglect, or misconduct in execution of Work by Contractor, restore to condition equal to or better than that existing before damage was done.

7. Perform daily clean up in affected construction areas in order to restore site to existing or better conditions. Areas should be free of debris, scrap material, dirt, mud, and other items identified by Owner's Representative. Do not leave buildings, roads, streets, or other construction areas unclean. If deemed necessary by the Owner's Representative, Contractor shall employ street sweeping/cleaning equipment to maintain area streets.
- I. Barricades and Warning Signals:
    1. Where Work is performed on or adjacent to any roadway, right-of-way, or public place, furnish and erect barricades, fences, lights, warning signs, and danger signals, and take other precautionary measures, for protection of persons or property and of the Work.
    2. Paint barricades to be visible at night. From sunset to sunrise, furnish and maintain at least one light at each barricade.
    3. Erect sufficient barricades to keep vehicles and pedestrians from entering the area under construction.
    4. Maintain barricades, signs, lights and provide watchmen until Project is accepted by the Owner or the site has been completely restored to its preconstruction condition.
    5. Whenever Work creates encroachment on public roadways, station flagmen to manage traffic flow in accordance with approved traffic control plan. Refer to Specification Section 01 55 26 – Traffic Control.
  - J. Protection of Existing Structures:
    1. Underground Structures:
      - a. Underground structures are defined to include, but not be limited to, sewer, water, gas, and other piping, manholes, boxes, chambers, electrical signal and communication conduits, tunnels, and other existing subsurface installations located within or adjacent to limits of Work.
      - b. Known underground structures including water, sewer, electric, and telecommunication services are shown on Contract Drawings. This information is not guaranteed to be correct or complete.
      - c. Explore ahead of trenching and excavation work and sufficiently uncover obstructing underground structures to determine their location, to prevent damage to them, and to prevent interruption of utility services. Restore underground structures to original conditions at no additional cost if damaged during construction.

- d. Locate and protect private lawn sprinkler systems which may exist within site. Repair or replace damaged systems to condition existing at start of Work, or better.
  - e. Necessary changes in location of Work may be made by the Owner to avoid unanticipated underground structures.
  - f. If permanent relocation of underground structures or other subsurface installations is required and not otherwise provided in Contract, the Owner will direct Contractor in writing to perform Work, which is paid for under provisions for changes as described in Specification Section 00 72 00 - General Conditions of the Contract.
2. **Surface Structures:** Surface structures are defined as existing buildings, structures and other constructed installations above ground surface. Included with structures are their foundations and any extensions below the surface. Surface structures include, but are not limited to buildings, tanks, walls, bridges, roads, dams, channels, open drainage, piping, poles, wires, posts, signs, markers, curbs, walks, guard cables, fencing, and other facilities visible above ground surface.
  3. **Existing Condition Survey:** Contractor shall survey and adequately document the condition and elevation of existing structures adjacent to the proposed alignment. Monitoring program for proposed trenchless construction operations shall be developed in accordance with trenchless construction Specification Sections.
  4. **Protection of Underground and Surface Structures:**
    - a. Support in place and protect from direct or indirect damage underground and surface structures located within or adjacent to limits of Work.
    - b. Prevent overstress or damage to any structure and any part or member of structures during construction. This applies to new and existing facilities, utilities, and structures affected by construction operations. Contractor shall monitor and record the effect of its construction operations on new and existing facilities, utilities, and structures, and shall provide engineered temporary supports and connections as required to assure the safety and stability of the structures and prevent overstress of any part. Employ a registered Professional Engineer licensed in the State of Texas to design temporary supports to assure safety and integrity of structures and facilities.
    - c. Install temporary supports carefully and as required by party owning or controlling structure. Before installing structure supports, satisfy Owner's Representative that methods and procedures have been approved by owner of structure.

- d. Avoid moving or changing property of public utilities or private corporations without prior written consent of responsible official of that service or public utility. Representatives of these utilities reserve the right to enter within limits of this Project for purpose of maintaining their properties, or of making changes or repairs to their property that may be considered necessary by performance of this Contract.
  - e. Notify owners and/or operators of utilities and pipelines adjacent to the Work of the nature of construction operations and dates when operations will be performed. When construction operations are required in immediate vicinity of existing structures, pipelines, or utilities, give minimum of 5 working days advance notice. Probe and flag location of underground utilities prior to commencement of excavation. Keep flags in place until construction operation reaches and uncovers utility.
  - f. Assume risks attending presence or proximity of underground and surface structures within or adjacent to Work including but not limited to damage and expense for direct or indirect damage caused by Contractor's Work to structure. Immediately repair damage.
- K. Protection of Installed Products:
- 1. Provide protection of installed products to prevent damage from subsequent operations. Remove protection facilities when no longer needed, prior to final completion of Work.
  - 2. Control traffic to prevent damage to equipment, materials, and surfaces.
  - 3. Provide coverings to protect equipment and materials from damage. Cover projections, wall corners, jambs, sills, and exposed sides of openings in areas used for traffic and passage of materials in subsequent work.

### **1.16 SURFACE RESTORATION**

- A. Restore site to the condition which existed before construction in accordance with Specification Section 01 74 23 – Restoration of Site, unless otherwise noted in Contract Documents.

### **1.17 TRAFFIC CONTROL AND USE OF PUBLIC RIGHTS OF WAY**

- A. Comply with traffic regulation in accordance with Specification Section 01 55 26 - Traffic Control, and approved traffic control plan(s).
- B. Provide barricades and signs in accordance with Section VI of the State of Texas Manual on Uniform Traffic Control Devices.
- C. Obtain necessary permits and Owner's approval when the nature of Work requires closing an entire street. Obtaining permits required for street closure are the Contractor's responsibility. Avoid unnecessary inconvenience to abutting property owners. Avoid closing more than two (2) consecutive



- intersections at one time, except by permission of Owner.
- D. Notify Owner's Representative at least 48 hours prior to closing a street or street crossing. It is the Contractor's responsibility to obtain all required permits for street closures in advance.
  - E. Maintain 10-foot-wide minimum access lane for emergency vehicles, including access to fire hydrants, at all times.
  - F. Remove surplus materials and debris and open each 500 lineal foot length of roadway for public use when work within that length is complete.
  - G. Contractor shall provide and install signs indicating entrances to businesses whose normal entry is impaired or detoured as a result of construction. Proposed signs shall be submitted to the Owner's Representative for approval prior to manufacture and installation.
  - H. Final acceptance of any portion of Work is not based on return of roadway to public use.
  - I. Avoid obstructing driveways or entrances to private property.
  - J. Provide temporary access or complete excavation and backfill in one continuous operation to minimize duration of obstruction when excavation is required across drives or entrances.
  - K. Contractor shall bear the sole responsibility for damage to existing traffic cables resulting from its construction activities. The Contractor shall be responsible for the repair of damaged traffic cables including the re-cabling of the entire intersection if required, at no additional cost to the Owner.
  - L. Construct and maintain temporary detours, ramps, and/or roads to provide for normal public traffic flow when use of public roads or streets is closed by necessities of Work. Contractor shall obtain all required roadway closure or detour permits in advance of commencing the proposed temporary detour, ramps, and/or roadway Work.
  - M. Provide mats or other means to prevent overloading or damage to existing roadways from tracked equipment, large tandem axle trucks or equipment that will damage existing roadway surface. Contractor shall repair or replace damaged roadway not scheduled for removal and/or replacement at no additional cost to the Owner. Repairs or replacement shall be in conformance with the roadway owner's requirements.
  - N. Provide daily sweeping of hard-surface roadways to remove soils tracked onto public roadways.

### **1.18 CONTRACTORS ROADS AND PARKING**

- A. Prevent interference with traffic on existing roads.

- B. Construct and maintain temporary access roads and parking areas.
- C. Designate temporary parking areas to accommodate Contractor's and Owner's Representative personnel. When site space is not adequate, provide additional off-site parking. Locate as approved by Owner's Representative.
- D. Minimize use by construction traffic of existing streets and driveways.
- E. Do not allow heavy vehicles or construction equipment in existing parking areas.
- F. Do not inhibit the ability of the Owner's personnel to access, operate, and maintain existing facilities during construction.

### **1.19 COORDINATION WITH FACILITY OWNER'S OPERATIONS**

- A. No shutdowns of SJRA's canal are permitted during the extent of this project.
- B. Perform the Work such that Owner's facilities remain in continuous satisfactory operation during the Project. Schedule and conduct the Work such that the Work does not:
  - 1. Impede Owner's production or processes,
  - 2. Create potential hazards to public health or wellbeing,
  - 3. Create potential hazards to operating equipment and personnel,
  - 4. Reduce the quality of Owner's facilities' product(s) or effluent, or
  - 5. Cause odors or other nuisances.
- C. If Contractor's operations cause an unscheduled interruption of Owner's operations, immediately re-establish satisfactory operation for Owner.
- D. Unscheduled shutdowns or interruptions of continued safe and satisfactory operation of Owner's facilities that result in fines or penalties by authorities having jurisdiction shall be paid solely by Contractor.

### **1.20 CONTRACTOR'S FIELD OFFICE**

- A. At Contractor's cost, and upon approval from Owner, Contractor may provide their own field office and temporary facilities, parking areas, equipment and material storage areas. Contractor shall be responsible for all permits, permissions, leases, utilities and maintenance of its facilities. Contractor shall maintain his temporary facilities in a clean, neat and orderly manner. Facilities for the Owner's Representative will be provided by the Owner. All Contract and progress meetings will be held at the Owner's facilities as identified at the pre-construction conference.
- B. Store materials in neat and orderly manner. Place materials and equipment to permit easy access for identification, inspection, and inventory.

### **1.21 PRINCIPAL ARCHITECT/ENGINEER'S FIELD OFFICE (NOT USED)**

**1.22 PROJECT PHOTOGRAPHS**

A. Refer to Specification Section 01 32 36.01 – Project Photographs

**1.23 SPECIAL CONSIDERATIONS RELATED TO ADJACENT PROPERTIES AND FACILITIES**

- A. Contractor shall be responsible for negotiations of any waivers or alternate arrangements required to enable transportation of materials to the site.
- B. Maintain conditions of access road to site such that access is not hindered as the result of construction related deterioration.
  - 1. Provide daily sweeping of hard-surface roadways to remove soils tracked onto roadway.

**1.24 HISTORICAL AND ARCHAEOLOGICAL SITES**

- A. If, during the course of construction, evidence of deposits of historical or archeological interest are found, the Contractor shall cease operations affecting the find and shall notify Owner.
  - 1. No further disturbance of the deposits shall ensue until the Contractor has been notified by Owner that Contractor may proceed.
  - 2. Owner will issue a notice to proceed after appropriate authorities have surveyed the find and made a determination to Owner.
  - 3. Compensation to the Contractor, if any, for lost time or changes in construction resulting from the find shall be determined in accordance with changed or extra work provisions of the Contract Documents.
- B. Refer to Specification Section 00 72 00 – General Conditions of the Contract including paragraph 4.2.4.

**1.25 WARRANTY (NOT USED)**

**PART 2 - PRODUCTS (NOT USED)**

**PART 3 - EXECUTION**

**3.1 MAINTENANCE**

- A. Maintain temporary facilities in a clean, neat, and orderly manner including maintenance of all-weather surface driveway and parking areas, buildings and furnishings, and equipment or materials furnished and supplied as part of any temporary field office or storage yard for duration of Contract.
- B. Provide regular janitorial services for any temporary field office for duration of Contract. Janitorial services consist of twice weekly sweeping and mopping of

floors and trash removal, weekly cleaning of restrooms, and weekly dusting of furniture and equipment.

- C. Provide soap and water, paper towels, toilet paper, cleansers, and other necessary consumables to properly maintain any temporary field office and all temporary toilet facilities.
- D. At this office, maintain complete field file of Shop Drawings, posted Drawings and Specifications, and other files of field operations including provisions for maintaining "As Built Drawings."
- E. Immediately repair damage, leaks, or defective service.
- F. Remove any field office provided under this contract from site upon acceptance of the entire work by the Owner.

**3.2 OWNER TRAINING (NOT USED)**

**END OF SECTION**

**SECTION 01 25 13**  
**PRODUCT SUBSTITUTIONS**

**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 one 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. Related Specification Sections include but are not necessarily limited to:

1. Division 00 – Bidding Requirements, Contract Forms, and Conditions of the Contract.
2. Division 01 – General Requirements.

C. Request for Substitution – General:

1. Base all bids on materials, equipment, and procedures 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 Owner's Representative.
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 Owner.

## **1.2 MEASUREMENT AND PAYMENT**

A. Payment will be made in accordance with the General Conditions.

## **1.3 SUBMITTALS (NOT USED)**

## **1.4 QUALITY ASSURANCE**

- A. In making request for substitution or in using an approved product, Contractor represents 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.

## **1.5 DEFINITIONS**

A. Product: Manufactured material or equipment.

## **1.6 PROCEDURE FOR REQUESTING SUBSTITUTION**

- A. Substitution shall be considered only:
1. After award of Contract.
  2. Under the conditions stated herein.
- B. Written request through Contractor only.
- C. Transmittal Mechanics:
1. Follow the transmittal mechanics prescribed for Shop Drawings in Specification Section 01 33 00 – Submittals.
    - a. Product substitution will be treated in a manner similar to "deviations," as described in Specification Section 01 33 00 – Submittals.
    - b. List the letter describing the deviation and justifications on the transmittal form in the space provided under the column with the heading DESCRIPTION.
      - 1) Include in the transmittal letter, either directly or as a clearly marked attachment, the items listed in the following paragraph below.
- D. Transmittal Contents:
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. Data relating to changes in construction schedule.
  6. Data relating to changes in cost.
  7. Samples:
    - a. At request of Owner's Representative.
    - b. Full size if requested by Owner's Representative.
    - c. Held until substantial completion.
    - d. Owner's Representative not responsible for loss or damage to samples.

### **1.7 APPROVAL OR REJECTION**

- A. Written approval or rejection of substitution given by the Owner's Representative, Principal Architect/Engineer, and the Owner.
- B. Owner's Representative reserves the right to require proposed product to comply with color and pattern of specified product if necessary to secure design intent.
- C. In the event the substitution is approved, the resulting cost and/or time reduction will be documented by Change Order in accordance with the General Conditions.
- D. Substitution will be rejected if:

1. Submittal is not through the Contractor with his stamp of approval.
  2. Request is not made in accordance with this Specification Section.
  3. In Owner's Representative opinion, acceptance will require substantial revision of the original design.
  4. In the Owner's Representative opinion, substitution will not perform adequately the function consistent with the design intent.
- E. Contractor shall reimburse Owner for the cost of the Owner's Representative evaluation whether or not substitution is approved.

**PART 2 - PRODUCTS (NOT USED)**

**PART 3 - EXECUTION (NOT USED)**

**END OF SECTION**



**SECTION 01 26 63**  
**CHANGE ORDERS**

**PART 1 - GENERAL**

**1.1 SUMMARY**

A. Section Includes:

Procedures for processing Change Orders, including:

1. Quality Assurance.
2. Responsible Individual.
3. Documentation of Change in Contract Price and Contract Time.
4. Change Procedures.
5. Proposals and Contract Modifications.
6. Work Change Directive.
7. Change Order.
8. Execution of Change Documentation.
9. Correlation of Contractor Submittals.

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

1. Division 00 – Introductory Information, Proposing Requirements, Contract Forms, and Conditions of the Contract.
2. Division 01 – General Requirements.

**1.2 MEASUREMENT AND PAYMENT**

A. No separate payment will be made for this item. Include the cost in associated items for this project.

**1.3 SUBMITTALS (NOT USED)**

**1.4 QUALITY ASSURANCE**

A. Reference Standards:

1. Equipment Rental Rates: equipmentwatch.com. Rental Rate is defined as full unadjusted base rental rate for appropriate item of construction equipment.

**1.5 RESPONSIBLE INDIVIDUAL**

A. Provide letter to the Owner's Representative indicating name, title, address and contact information of individual authorized to execute change documents and who is responsible for informing others in Contractor's employ and Subcontractors of changes to the Work. Information should be provided at the

Preconstruction Conference but, no later than 10 calendar days following the Preconstruction Conference.

**1.6 DOCUMENTATION OF CHANGE IN CONTRACT PRICE AND CONTRACT TIME**

- A. Maintain detailed records of changes in Work. Provide full information required for identification and evaluation of proposed changes, and substantiate costs of changes in Work.
- B. Document each proposal for change in cost or time with sufficient data to allow evaluation of proposal. Provide additional information upon request of the Owner or the Owner's Representative.
- C. Proposals shall include the following minimum information:
  - 1. Quantities of items in original Proposal with additions, reductions, deletions, and substitutions.
  - 2. Quantities and cost of items in original schedule of values with additions, reductions, deletions, and substitutions.
  - 3. Provide unit prices for items not included in original Proposal with supporting information when absent from original Proposal Work.
  - 4. Justification for changes in Contract Time.
  - 5. Additional data upon request.
- D. For changes in Work performed on a time-and-materials basis, provide the following additional information:
  - 1. Quantities and description of products and equipment.
  - 2. Taxes, insurance and bonds.
  - 3. Overhead and profit as noted in Document 00 72 00 - General Conditions, Article 11.5.
  - 4. Dates, times, and by whom work was performed.
  - 5. Time records and certified copies of applicable payrolls.
  - 6. Invoices, receipts for products, rented equipment, and subcontracts, similarly documented.
- E. For changes in Work performed on a time-and-materials basis, payment for rental equipment will be as follows:
  - 1. Actual invoice cost for duration required to complete extra work without markup for overhead and profit. When extra work comprises only a portion of rental invoice where equipment would otherwise be on site, compute hourly equipment rate by dividing the actual monthly invoice by 176. (One day equals 8 hours and 1 week equals 40 hours.)
  - 2. Do not exceed estimated operating costs given on equipmentwatch.com website for items of equipment. Overhead and profit will be allowed on operating cost.

- F. For changes in Work performed on a time-and-materials basis using Contractor-owned equipment, use equipmentwatch.com rates as follows:
1. Contractor-owned equipment will be paid at Rental Rate for duration of time required to complete extra work without markup for overhead and profit. Utilize lowest cost combination of hourly, daily, weekly, or monthly rates. Use 150 percent of Rental Rate for double shifts (one extra shift per day) and 200 percent of Rental Rate for more than two shifts per day. Standby rates shall be 50 percent of appropriate Rental Rate shown on equipmentwatch.com website. No other rate adjustments apply.
  2. Do not exceed estimated operating costs given on equipmentwatch.com. Overhead and profit will be allowed on operating cost. Operating costs will not be allowed for equipment on standby.

### **1.7 CHANGE PROCEDURES**

- A. Changes to Contract Price or Contract Time can only be made by issuance of Change Order. Issuance of Work Change Directive will be formalized into a Change Order. Changes will be in accordance with requirements of the General Conditions.
- B. The Owner's Representative will advise of minor changes in Work not involving an adjustment to Contract Price or Contract Time as authorized by the General Conditions by issuing supplemental instructions.
- C. Request clarification of Drawings, Specifications, Contract Documents, or other information by using Request for Information. Response by the Owner's Representative to Requests for Information does not authorize Contractor to perform tasks outside scope of Work. Changes must be authorized as described in this section.

### **1.8 PROPOSALS AND CONTRACT MODIFICATIONS**

- A. The Owner or the Owner's Representative may issue a Request for Proposal (RFP), which includes detailed description of proposed change with supplementary or revised Drawings and Specifications. The Owner or the Owner's Representative may also request a proposal in response to a Request for Information. Prepare and submit proposal within 7 days or as specified in the request.
- B. Submit request for Contractor changes to Owner's Representative describing proposed change and its full effect on Work, with a statement describing reason for change and effect on Contract Price and Contract Time including full documentation.
- C. The Owner may use the Principal Architect/Engineer to review Change Orders.

### **1.9 WORK CHANGE DIRECTIVE**

- A. The Owner may issue a signed Work Change Directive instructing Contractor to proceed with a change in Work. Work Change Directive will subsequently be incorporated in Change Order.

- B. Document will describe changes in Work and designate method of determining change in Contract Price or Contract Time.
- C. Proceed promptly to execute changes in Work in accordance with Work Change Directive.

### **1.10 CHANGE ORDER**

- A. Stipulated Price Change Order
  - 1. Stipulated Price Change Order will be based on accepted proposal.
- B. Unit Price Change Order
  - 1. Where Unit Prices for affected items of Work are included in Proposal, unit price Change Order will be based on unit prices, subject to the General Conditions.
  - 2. Where unit prices of Work are not pre-determined in Proposal, Work Change Directive or accepted proposal will specify unit prices to be used.
- C. Time-and-Material Change Order
  - 1. Provide itemized account and supporting data after completion of change, within time limits indicated for claims in the General Conditions.
  - 2. The Owner will determine change allowable in Contract Price and Contract Time as provided in the General Conditions.
  - 3. Maintain detailed records of work done on time-and-material basis as specified in paragraph 1.4, Documentation of Change in Contract Price and Contract Time.
  - 4. Provide full information required for evaluation of changes and substantiate costs for changes in Work.

### **1.11 EXECUTION OF CHANGE DOCUMENTATION**

- A. The Owner or the Owner's Representative will issue Change Orders, Work Change Directives, or accepted proposal for signatures of parties as described in the General Conditions.

### **1.12 CORRELATION OF CONTRACTOR SUBMITTALS**

- A. For Stipulated Price Contracts, promptly revise Schedule of Values and Application for Payment forms to record authorized Change Orders as separate line item.
- B. For Unit Price Contracts, next monthly estimate of Work after acceptance of a Change Order will be revised to include new items not previously included and appropriate unit rates.
- C. Promptly revise progress schedules to reflect change in Contract Time, and to adjust time for other items of work affected by change, and resubmit for review.
- D. Promptly enter changes to on-site and record copies of Drawings, Specifications, or Contract Documents.

**PART 2 - PRODUCTS (NOT USED)**

**PART 3 - EXECUTION (NOT USED)**

**END OF SECTION**

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**SECTION 01 29 73**  
**SCHEDULE OF VALUES**

**PART 1 - GENERAL**

**1.1 SUMMARY**

- A. Section Includes
  - 1. Measurement and Payment
  - 2. Definition
  - 3. Preparation
  - 4. Submittal
- B. Related Specification Sections include but are not necessarily limited to:
  - 1. Division 00 – Introductory Information, Proposing Requirements, Contract Forms, and Conditions of the Contract.
  - 2. Division 01 – General Requirements.

**1.2 MEASUREMENT AND PAYMENT**

- A. No separate payment will be made for this item. Include the cost in associated items for this project.

**1.3 SUBMITTALS**

- A. Submit Schedule of Values in accordance with requirements of Section 01 33 00 – Submittals. Submit at least 10 days prior to submitting first application for progress payment. Submit via SharePoint.
- B. Revise Schedule of Values and resubmit for items affected by contract modifications, Change Orders, and Work Change Directives. After changes are reviewed without exception by Authority's Principal Architect/Engineer, make submittal at least 10 days prior to submitting next application for progress payment.

**1.4 DEFINITIONS**

- A. Schedule of Values: Is a schedule, prepared and maintained by the Contractor, allocating portions of the Contract Amount to various portions of the Work, including a tabulation of all of the costs of the various Subcontracts and materials which in the aggregate make up the Cost of the Work. The Schedule of Values shall be subject to Owner's approval and, after such approval, be used as the basis for reviewing the Contractor's Application For Payment.
- B. Break down costs to list major products or operations for each line item which has an installed value of more than \$5000.

**1.5 PREPARATION**

- A. For stipulated price contracts, subdivide Schedule of Values into logical portions of Work, such as major work items or work in contiguous geographic areas.
- B. Schedule and Schedule of Values shall be developed together. At a minimum, the Schedule of Values shall be broken out by trade and split between materials and labor as approved by the Owner. Such Prices will include overhead and profit applicable to each item of work.
- C. For lump sum equipment items where submittal of operation/maintenance data and testing are required, include separate item for equipment operation and maintenance data submittal valued at 5 percent of lump sum amount for each equipment item and separate item for testing and adjusting valued at 5 percent of lump sum amount for each equipment item.
- D. Round off figures for each listed item to nearest \$100 except for value of one item, when necessary, to make total of items in Schedule of Values equal Contract Price for stipulated price contracts or lump sum amount in Schedule of Unit Price Work.
- E. Submit Schedule of Values in approved electronic spreadsheet, formatted to print on 11" x 17" paper, to the Owner's Document Management System.

**PART 2 - PRODUCTS (NOT USED)**

**PART 3 - EXECUTION (NOT USED)**

**END OF SECTION**



**SECTION 01 32 16**

**CONSTRUCTION PROGRESS SCHEDULE**

**PART 1 - GENERAL**

**1.1 SUMMARY**

- A. Section Includes:
  - 1. Specific requirements for the preparation, submittal, updating, status reporting and management of the construction Progress Schedule.
- B. Provide Construction Schedules for Work included in Contract in accordance with requirements in this Section. Create Construction Schedule using Critical Path Method (CPM) computer software capable of mathematical analysis of Precedence Diagramming Method (PDM) plans. Provide printed activity listings and bar charts in formats described in this Section.
- C. Combine activity listings and bar charts with narrative report to form Construction Schedule submittal for Owner and the Owner's Representatives.
- D. Related Specification Sections include, but are not necessarily limited to:
  - 1. Division 00 - Bidding Requirements, Contract Forms and Conditions of the Contract.
  - 2. Division 01 - General Requirements.

**1.2 MEASUREMENT AND PAYMENT**

- A. No separate payment will be made for this item. Include the cost of construction scheduling in overhead cost for this project.

**1.3 SCHEDULING STAFF**

- A. Employ or retain services of individual experienced in critical path scheduling for duration of Contract. Individual shall cooperate with Owner's Representative and shall update schedule (Progress Schedule) monthly as required by the Contract's General Conditions, to indicate current status of Work.

**1.4 QUALITY ASSURANCE**

- A. The person preparing and revising the construction Progress Schedule shall be experienced in the preparation of schedules of similar complexity.
- B. Within five (5) days from award of the Contract, Contractor shall submit to Owner's Representative the name of the person responsible for the preparation, maintenance, updating and revision of all schedules.
  - 1. Qualifications necessary:
    - a. At least five (5) years verifiable experience in the preparation and updating of complex construction schedules for projects of similar type, size and complexity.

b. Proficient in the use of Microsoft® Project® 2007.

## **1.5 DEFINITIONS**

A. The following definitions shall apply to this Specification Section:

1. **BASELINE SCHEDULE:** The initial as-bid, detailed, cost and resource loaded Progress Schedule prepared by the Contractor to define its plan for constructing the Project as required by the Contract Documents, and accepted by the Owner or Owner's Representative as meeting the requirements of the Contract Documents for specified constraints, sequences, milestones and completion dates.
2. **PROGRESS SCHEDULE:** The initially accepted Baseline Schedule, or subsequently approved Revised Baseline Schedules, updated each month to reflect actual start and finish dates of schedule activities and all time impact events whether caused by Contractor or Owner or factors beyond the control of either party.
3. **REVISED BASELINE SCHEDULE:** The initially accepted Baseline Schedule revised to reflect only approved changes.
4. **WORKING SCHEDULE:** A schedule developed from the Progress Schedule, utilizing scheduling software features not allowed for Baseline and Progress Schedules at the Contractor's sole discretion, to indicate the Contractor's plan for executing the Work, and providing for schedule recovery when approved time extensions are not sufficient to provide for timely completion due to Contractor inefficiencies beyond the control of the Owner or outside the risks accepted by the Owner.

## **1.6 SUBMITTALS**

A. Shop Drawings:

1. See Specification Section 01 33 00 – Submittals for requirements for the mechanics and administration of the submittal process.
2. Scheduler qualifications.
3. Baseline Schedule: Submitted within 30 days after Effective Date of Agreement.
4. Monthly Progress Schedules.
5. Revised Baseline Schedules.
6. Working Schedules.
7. Look-Ahead Schedules.

## **1.7 GENERAL REQUIREMENTS**

A. Contractor shall prepare and submit Baseline and Progress Schedules and updates and revisions to them as specified herein.

1. All scheduling to be performed in Microsoft® Project® 2007.

2. The Baseline and Progress Schedules shall be a calendar day-based and cost-loaded Critical Path Method (CPM) network diagram with supporting data.

B. Disallowed Scheduling Software Features:

1. The following specific features are not allowed to be applied in the Baseline and Progress Schedules:
  - a. Resource leveling.
  - b. Activity or event constraints, other than those specified by the Contract Documents.
  - c. Leads and lags:
    - 1) Create specific activities with specific durations in-lieu-of leads and lags.
    - 2) Durations shall have positive values.
  - d. Default progress data:
    - 1) Start and finish dates shall not be automatically updated.
    - 2) Update with actual start and finish dates documented from field reports.
    - 3) Work activities shall be updated by actual Work progression, not cash flow driven.
    - 4) Updating of activity percent complete and remaining duration shall be independent functions, not one parameter calculated from the other.
    - 5) Out-of-sequence progress shall be accounted for through retained logic, not a default option of progress override.
  - e. Multiple calendars.
2. Any float suppression techniques or other software features that corrupts the pure mathematical model calculating the critical path.
  - a. The following CPM schedule outputs will be rejected without further review:
    - 1) Schedules indicating the start of the critical path at a date point or activity beyond the date of Notice to Proceed, or schedules indicating a discontinuous critical path from Notice to Proceed to Contract completion.
    - 2) Schedules defining critical activities as those on a path or paths having some minimum value of float.
    - 3) Schedules with multiple critical paths.
    - 4) Schedules indicating a completion date beyond the contractual completion date.

3. Contractor, at Contractor's sole discretion, may employ the disallowed scheduling software features for Contractor's exclusive use in preparing a Working Schedule.
- C. Float Time:
1. Neither the Owner nor the Contractor owns the float; the project owns the float.
  2. As such, liability for delay of the project completion date rests with the party actually causing delay to the project completion date.
- D. By preparing and submitting the Baseline Schedule, the Contractor represents that it can and intends to execute the Work and portions thereof within the specified times and constraints and that its bid covers the costs associated with the execution of the Work in accordance with the Construction Schedule.
- E. Contractor shall provide an electronic copy on CD media for the Baseline Schedule and Progress Schedule and all monthly updates of both to accompany hard copies of the schedules and tabular reports.
1. Electronic submittal shall be in a format compatible with Microsoft® Project® 2007.
  2. Contractor shall provide with the schedules, a procedural outline of the system shut-downs and proposed tie-ins, and the Owner's O&M staff, which shall be subject to approval of the Owner.

## **1.8 SUBMITTAL PACKAGES**

- A. Baseline Schedule:
1. CPM time-scaled network diagram:
    - a. Three (3) prints of each sheet.
    - b. Minimum sheet size: 11 IN x 17 IN.
    - c. Provide electronic format (CD-ROM).
  2. Supporting data:
    - a. Three (3) sets of a list of project activities including the following:
      - 1) Holidays that will be observed during construction.
      - 2) Number of planned working days and shifts per week.
- B. Monthly updates that include the following:
1. Narrative Schedule Report.
  2. Revised Baseline Schedule as appropriate.
    - a. Update to reflect approved Change Orders occurring since the prior update.

- b. If no new approved Change Orders since prior update, provide a narrative report indicating such, and acknowledging the pertinence of the previously approved Baseline Schedule.
  3. Updated Progress Schedule.
  4. Explanation of changes in logic, duration of activities.
  5. The number of opaque reproductions which Contractor requires, plus three (3) copies which will be distributed by the Owner's Representative.
    - a. Do not submit fewer than three (3) copies.
  6. Provide electronic format (CD-ROM).
  7. Upload electronic version (pdf) to SharePoint.
- C. Look-Ahead Rolling Schedule:
  1. A four-week rolling schedule shall be provided by the Contractor at each progress meeting.
    - a. The schedule shall provide an accurate representation of the work performed the previous week and work planned for the current week and subsequent two (2) weeks.
  2. The schedule shall be provided in a tabular format with bars representing work duration.
    - a. The schedule shall refer to activity ID numbers on the Baseline and Progress Schedules.
    - b. Activities that are on the critical path and activities that are behind schedule shall be noted by color, highlight, or underscore.
  3. Derived from the Working Schedule, if applicable.
- D. Narrative Schedule Report:
  1. Schedule reports for Initial Baseline and Revised Baseline Schedules shall include the following minimum data for each activity:
    - a. Preceding and succeeding activities.
    - b. Activity description and number.
    - c. Durations of activities:
      - 1) Original durations.
      - 2) Remaining durations.
    - d. Earliest start date (by calendar date).
    - e. Earliest finish date (by calendar date).
    - f. Actual start date (by calendar date).
    - g. Actual finish date (by calendar date).
    - h. Latest start date (by calendar date).

- i. Latest finish date (by calendar date).
  - j. Float.
  - k. Percentage of activity completed.
  - l. Activity constraints specified by the Contract Documents.
  - m. Type of Tabulation (Initial or Updated).
  - n. Project Duration.
  - o. Project Contractual Completion Date.
  - p. The date of commencement of the Work as stated in the Notice to Proceed.
  - q. If an updated (revised) schedule, cite the new project completion date and project status and date of revision.
2. Shall be organized in the following sequence with all applicable documents included:
- a. Contractor's transmittal letter.
  - b. Work completed during the period.
  - c. Identification of unusual conditions or restrictions regarding labor, equipment or material.
  - d. Description of the current critical path.
  - e. Changes to the critical path and scheduled completion date since the last schedule submittal.
  - f. Description of problem areas.
  - g. Current and anticipated delays:
    - 1) Cause of delay.
    - 2) Impact of delay on other activities, milestones and completion dates.
    - 3) Corrective action and schedule adjustments to correct the delay.
  - h. Pending items and status thereof:
    - 1) Permits.
    - 2) Change orders.
    - 3) Time adjustments.
    - 4) Non-compliance notices.
  - i. Reasons for an early or late scheduled completion date in comparison to the contract completion date.

## **1.9 START-UP, DEMONSTRATION, TRAINING, AND FINAL COMPLETION (NOT USED)**

## **1.10 SCHEDULING CONFERENCE**

- A. Contractor shall schedule and Owner's Representative will conduct a scheduling conference with Contractor's project manager and construction scheduler.
1. Conference must take place within 10 business days after the Preconstruction Conference.
  2. Owner's Representative will review the requirements of this Specification Section and other specified scheduling and sequencing requirements with Contractor.
  3. Baseline Construction Schedule:
    - a. Provide five (5) copies of a Baseline Schedule in the form of an arrow or precedence diagram covering the following project phases and activities:
      - 1) Schedule of Submittals of Shop Drawings and schedule dates for fabrication and delivery of key and long lead time items.
      - 2) Contractor's submittal information shall show intended submittal dates and shall include, as a minimum, the maximum allowable review period.
      - 3) The information shall provide sufficient durations for reasonable administration of re-submittals, fabrication and transportation to produce realistic delivery dates for those procurement items.
  4. Owner's Representative shall review the schedule and provide comments.
  5. Provide approval of the schedule or request a meeting to review the schedule with Contractor within fourteen (14) days of receipt of the schedule.
  6. If requested, Contractor shall participate in a review and evaluation of the schedule with Owner's Representative.
  7. Any revisions necessary as a result of this review shall be resubmitted for review by Owner's Representative within seven (7) business days.
- B. Contractor shall submit a general time-scaled logic diagram displaying the major activities and sequence of planned operations.
1. Contractor shall be prepared to discuss the proposed work plan and schedule methodology that comply with the Contract requirements.
  2. If Contractor proposes deviations to specified construction staging of the project, then the general time-scaled logic diagram shall also display the deviations and resulting time impacts.
  3. Contractor shall be prepared to discuss the proposal.
- C. Contractor shall provide the Preliminary Schedule of Values for the work to be performed.
1. This document must match the total quantities and costs associated with the scheduled tasks.

- D. Owner's Representative will review the logic diagram, WBS coding structure, and activity identification system, and provide required Baseline Schedule changes to Contractor for implementation within seven (7) days following the Conference.
- E. Scheduling Conference are required on a weekly basis until agreement to the Baseline Schedule is reached.
  - 1. Contractor to provide copies of the revised schedule.
  - 2. Contractor to address specific comments from the previous meeting.
  - 3. Contractor to revise the narrative as required.

### **1.11 BASELINE SCHEDULE**

- A. Schedule shall include, but not be limited to, activities that show the following that are applicable to the project:
  - 1. Project characteristics, salient features, or interfaces, including those with outside entities that could affect time of completion.
  - 2. Project start date, scheduled completion date and other milestones.
  - 3. Work performed by Contractor, subcontractors and suppliers.
  - 4. Submittal development, delivery, review and approval, including those from Contractor, subcontractors and suppliers.
  - 5. Procurement, delivery, installation and testing of materials, plants and equipment.
  - 6. Testing and settlement periods.
  - 7. Utility notification and relocation.
  - 8. Erection and removal of falsework and shoring.
  - 9. Finish work and final cleanup.
  - 10. Project float as the predecessor activity to the scheduled completion date.
- B. Schedule shall have not less than 20 activities, unless otherwise authorized by the Owner's Representative.
  - 1. The number of activities shall be sufficient to assure adequate planning of the project, to permit monitoring and evaluation of progress, and to do an analysis of time impacts.
  - 2. Schedule activities shall include the following:
    - a. A clear and legible description.
    - b. Start and finish dates.
    - c. A duration of not less than one (1) working day, except for event activities, and not more than 30 working days, unless otherwise authorized by the Owner's Representative.



- d. At least one (1) predecessor and one (1) successor activity, except for project start and finish milestones.
  - e. Required constraints: Only contractually required constraints may be inserted into the Baseline Schedule.
  - f. Codes for responsibility, stage, work shifts, location and contract pay item numbers.
- C. Early Completion Time:
- 1. Contractor may show early completion time on any schedule provided that the requirements of the contract are met.
  - 2. Contractor may increase early completion time by improving production, reallocating resources to be more efficient, performing sequential activities concurrently or by completing activities earlier than planned.
  - 3. Show difference of early completion time as float days.
- D. Working durations shall be planned to incorporate the effects of normal weather impacts. See {General Conditions Article 12.2 for the “Baseline Rain Day Determination”}.

## **1.12 PROGRESS SCHEDULE**

- A. Develop Progress Schedule based on approved Baseline and Revised Baseline Schedules.
  - 1. All restrictions on use of constraints, leads and lags, resource leveling, etc., shall also apply to Progress Schedules.
- B. The Progress Schedule will be updated once per month for monitoring progress.
  - 1. Contractor may submit one (1) additional update per month for its own convenience.
- C. Indicate progress by making entries on the most recently accepted version of the network diagram and supporting data to show:
  - 1. Activities completed.
  - 2. Activities started.
  - 3. Remaining duration for each activity started but not yet completed.
  - 4. Percent complete based on value of work in place and value of equipment or material delivered and properly stored.
  - 5. Status of activity due to be completed by the next scheduled progress meeting.
- D. Computerized Progress Schedule and percent completion of Work shall be used to verify Contractor's payment requests.

1. Progress payments will not be processed by the Owner's Representative unless the updated Progress Schedule has been submitted concurrently with a pay request and found acceptable by the Owner's Representative.

### **1.13 REVISIONS TO PROGRESS SCHEDULE**

- A. Contractor shall submit data for a revised Progress Schedule within five (5) days of the occurrence of any of the following:
  1. When contractor-caused delay in completion of any activity or group of activities indicates an overrun of the Contract Time or Control Dates by 30 working days or 10 percent of the remaining duration, whichever is less.
  2. When delays in submittals, deliveries, or work stoppages are encountered making necessary the replanning or rescheduling of the Work.
  3. When the schedule does not represent the actual progress of the Work.
  4. When a change order significantly affects the contract completion date.
- B. The revised Progress Schedule shall be the basis of a Working Schedule showing:
  1. How Contractor intends to return to schedule.
  2. How Contractor intends to avoid falling behind schedule on future activities.
- C. Show changes on the network diagram and supporting data including:
  1. New activities and their duration.
  2. Modifications to existing activities.
- D. Provide written narrative report as needed to define:
  1. Problem areas, anticipated delays, and impact on the current schedule.
  2. Corrective action recommended, and its effect.
  3. Major changes in scope.
  4. Revised projections of progress and completion.
- E. Except as provided in the following subparagraphs 1 and 2, the cost of revisions to the Progress Schedule resulting from changes in the Work shall be included in the cost for the change in the Work, and shall be based on the complexity of the revision or Change Order, man-hours expended in analyzing the change, and the total cost of the change.
  1. The cost of revision to the Construction Schedule not resulting from authorized changes in the Work shall be the responsibility of the Contractor.
  2. The cost of revision to the Construction Schedule for the Contractor's convenience shall be the responsibility of the Contractor.
- F. The revised network diagram and supporting data for the Progress Schedule shall be submitted to the Owner's Representative upon completion of the revisions, but not later than the next progress meeting.

- G. Revisions to the Progress Schedule for the Contractor's convenience:
1. Must be approved by the Owner's Representative before Contractor changes the sequence of Work.

#### **1.14 TIME IMPACT ANALYSIS (TIA)**

- A. The accepted initial Baseline Schedule or subsequently accepted Revised Baseline Schedule shall be used for TIA.
- B. Contractor shall submit a written TIA to the Owner's Representative with each request for adjustment of Contract Time, or when Contractor or Owner's Representative consider that an approved or anticipated change may impact the critical path or contract progress.
1. The TIA must be attached to any change order prior to approval of any change to time or cost.
- C. The TIA shall illustrate the impacts of each change or delay on the current scheduled completion date or internal milestone, as appropriate.
1. The analysis shall use the Baseline or Revised Baseline Schedule (accepted Baseline Schedule) that has a data date closest to and prior to the event.
  2. If the Owner's Representative determines that the accepted Baseline Schedule used does not appropriately represent the conditions prior to the event, the accepted Baseline Schedule shall be updated to the day before the event being analyzed.
  3. The TIA shall include an impact schedule developed from incorporating the event into the accepted Baseline Schedule by adding or deleting activities, or by changing durations or logic of existing activities as appropriate to the nature of the change event.
  4. If the impact schedule shows that incorporating the event modifies the critical path and scheduled completion date of the accepted Baseline Schedule, the difference between scheduled completion dates of the two (2) schedules shall be equal to the adjustment of Contract Time.
- D. Contractor shall submit a TIA in duplicate within 15 working days of receiving a written request for a TIA from the Owner's Representative.
1. Contractor shall allow the Owner's Representative two (2) weeks after receipt to approve or reject the submitted TIA.
  2. All approved TIA schedule changes shall be shown on the next update schedule.
- E. In the event of a TIA rejection:
1. If a TIA submitted by the Contractor is rejected by the Owner's Representative, the Contractor shall meet with the Owner's Representative to discuss and resolve issues related to the TIA.

2. If agreement is not reached, the Contractor will be allowed 15 days from the meeting with the Owner's Representative to give notice.
3. Contractor shall only show actual as-built work, not unapproved changes related to the TIA, in subsequent update schedules.
4. If agreement is reached at a later date, approved TIA schedule changes shall be shown on the next update schedule.
5. Owner's Representative will withhold remaining payment on the schedule contract item if a TIA is requested by Owner's Representative and not submitted by Contractor within 15 working days.
6. The schedule item payment will resume on the next estimate after the requested TIA is submitted.
  - a. No other contract payment will be retained regarding TIA submittals.

### **1.15 NARRATIVE SCHEDULE REPORT**

- A. Narrative Schedule Report shall list Activities Started This Month; Activities Completed This Month; Activities Continued This Month; Activities Scheduled To Start or Complete Next Month; Problems Encountered This Month; Actions Taken to Solve These Problems.
- B. Narrative Schedule Report shall describe changes made to Construction Schedule Logic (i.e., changes in Predecessors and Lags); Activities Added to Schedule; Activities Deleted from Schedule; any other changes made to Schedule other than addition of Actual Start Dates and Actual Finish Dates and changes of Data Date and Remaining Durations for recalculation of mathematical analysis.

### **PART 2 - PRODUCTS (NOT USED)**

### **PART 3 - EXECUTION (NOT USED)**

**END OF SECTION**

**SECTION 01 32 36.01**  
**PROJECT PHOTOGRAPHS**

**PART 1 - GENERAL**

**1.1 SUMMARY**

A. Section Includes:

1. Technical and submittal requirements for project photographs, including:
  - a. Measurement and Payment
  - b. Project photographs for facility and pipeline projects. Facility projects may have one or more distinct sites. Pipeline projects may have more than one segment but are usually linear in nature, such as waterline or wastewater line projects.

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

1. Division 00 – Proposing Requirements, Contract Forms, and Conditions of the Contract.
2. Division 01 - General Requirements.

**1.2 MEASUREMENT AND PAYMENT**

- A. No separate payment will be made for this item. Include the cost in associated items for this project.

**1.3 DEFINITIONS:**

1. Pre-construction Photographs: Photographs taken, in sufficient numbers and detail, prior to beginning field activities, to show original construction site conditions.
2. Progress Photographs: Photographs, taken throughout the duration of construction at regular intervals from vantage points, approved by the Owner's Representative, that document progress of the Work.
3. Completed Project Photographs: Photographs, taken by a commercial photographer, which are suitable for framing and for use in brochures or on the Internet.

**1.4 SUBMITTALS:**

1. Refer to Specification Section 01 33 00 – Submittals.
2. Format and Media. Digital photography shall be used for Preconstruction and Progress Photographs. Digital or film photography may be used for Completed Project Photographs. Submit color prints of photographs whether produced by digital or film photography for hard copy submittals. Submit digital Joint Photographic Experts Group (JPEG) images for electronic submittals.

a. Prints.

- 1) Submit Preconstruction Photograph prints in three-hole punched plastic pockets or sleeves, bound in a three-ring notebook, four photos each on the front and back of each plastic sheet (eight photos total per sheet). Minimum size for Preconstruction photograph prints shall be 3-inches by 5-inches on photographic-quality paper. Preconstruction photographs must be taken prior the first construction activities in the field and submitted prior to the first Pay Application being made by the Contractor.
- 2) Submit Progress Photograph prints in three-hole punched plastic pockets or sleeves, bound in a three ring notebook, one photo per sheet. Produce prints on photographic-quality paper approved by the Owner's Representative. Minimum size for Progress photograph prints shall be 8-inches by 10-inches.
- 3) Submit proofs of Completed Project photos for review and selection by the Owner's Representative. After selection of the proofs submit Completed Project prints. Minimum size for Completed Project photograph prints shall be 11x14 matte finish prints.

b. Media

- 1) Film Photography. If film is used to make photographs, Submit negatives, in 3-hole punched plastic sheets with individual sleeves for each negative. Mark negative sleeves with project name and dates of photos. Use 35mm or larger color film for film photography. If film is used, a digital image of the photograph must also be submitted. Scanned photographs must equal or exceed 400 dots per inch when scanned from 8-inch by 10-inch prints
- 2) Digital Photography. Use at least 6.0 megapixel density for photographs. Submit digital photographic files on compact disks (CD) in JPEG format. Submit disks in 3-hole punched plastic sheets with a maximum of two CD's per sheet. Mark disks with project name and dates of photos.
3. Submit Preconstruction Photograph digital images with embedded GPS coordinates (latitude, longitude and compass direction of view) shown on the image. In addition to the Compact Disk submittal, Contractor shall download digital images and GPS coordinates to the Owner's GIS system if directed by the Owner's Representative.
4. Submit Progress Photograph digital images with embedded GPS coordinates (latitude, longitude and compass direction of view) shown on the image.
5. Submit Completed Project Photograph images. GPS coordinates shall not be shown on Completed Project digital images.
6. Submittal Quantities and Frequencies

- a. Preconstruction photographs: Submit one set of photo prints and one set of digital images. All photos(images) shall have embedded GPS coordinates (latitude, longitude) and the compass bearing (N, NE, E...) such that this information appears on the print (image).
  - 1) For Facility Projects, multiple photographs shall be taken of the project site to document existing facilities, parking areas, driveways, surface features such as building, trees and other vegetation or landscaping. This shall be accomplished through the use of a 100 foot interval grid (50 foot grid for sites less than 1 acre) imposed on the site with photos taken at each node point along the grid lines (4 photos per node) or by other means as approved by the Owner's Representative.
- b. Progress Photographs: Submit one set of Progress Photos prints and one set of digital images each month with each Application for Payment. Monthly Applications for Payment shall be deemed incomplete if not accompanied by the required Progress Photographs. Contractor's failure or election to not submit a monthly Application for Payment shall not affect the requirement for monthly Progress Photographs:
  - 1) For Facility Contracts with a Total Bid Price over \$100,000, at least once each month during construction: Provide five (5) progress photos as directed by Owner's Representative.
  - 2) For Facility Contracts with a Total Bid Price over \$2,000,000, at least once each month during construction: Provide a commercial photographer to take progress photos as directed by Owner's Representative. Provide ten (10) ground level color photos (printed 8" x 10") and digital images per month from fixed vantage points, with vantage points approved by the Owner's Representative.
  - 3) For Facility Contracts with Total Bid Price over \$10,000,000 in addition to ground level photos: Provide at least two (2) color aerial photos prints and digital images taken at;
    - a) At 0 percent complete
    - b) At three (3) month intervals after the initial set
    - c) At substantial completion
    - d) In the first summer operational season but at least six (6) months after facility start up. Submittal of these photos may extend past the final completion of the project and shall not prevent project closeout.
- c. Completed Project Photographs:

- 1) For Facility Contracts submit two sets of Completed Project Photographs, after Date of Substantial Completion and prior to final payment. Two sets of Completed Project photos shall be taken from two vantage points. Each of the two vantage points pre-approved by the Owner. Vantage points for Finished Photographs will be approved separately from vantage points approved for Progress Photographs.

7. Labeling:

- a. Photo Prints; Place a label on the back of each photographic print, applied so as to not to show through on the front. Labels shall contain the following information:

- 1) Name of Project and Project Number, unless embedded on the print
- 2) Name of Contractor.
- 3) Date photograph was taken, unless embedded on the print or image.
- 4) Location of the photograph (station or coordinates or other notation, unless embedded on the print or image)
- 5) Short description of photo subject.
- 6) Name and address of commercial photographer who took the photograph, if applicable.

- b. Digital Images: Place a label on the CD, Labels shall contain the following information:

- 1) Name of Project and Project Number
- 2) Name of Contractor.
- 3) Name and address of commercial photographer who took the photograph, if applicable
- 4) For each digital image create a file name which has as part of the name the date the photograph was taken and the location of the photograph by station, coordinates or other unique identifier

8. Hand-deliver or transmit Completed Project Photo prints in standard photographic mailers marked "Photographs - Do Not Bend."
9. Photographic prints, negatives, photographic files and disks become the property of the Owner with all rights of reproduction to the Owner. Do not publish photographs without written consent by the Owner.

B. Quality Assurance:

1. Contractor shall be responsible for the quality of and timely execution and submittal of photographs.
2. Contractor shall schedule and coordinate photographer with Owner's Representative.



**PART 2 - PRODUCTS (NOT USED)**

**PART 3 - EXECUTION (NOT USED)**

**END OF SECTION**

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**SECTION 01 33 00**

**SUBMITTALS**

**PART 1 - GENERAL**

**1.1 SUMMARY**

A. Section Includes:

1. Mechanics and administration of the submittal process for:
  - a. Shop Drawings.
  - b. Samples.
  - c. Miscellaneous submittals.
  - d. Operation and Maintenance Manuals.
2. General content requirements for Shop Drawings.
3. Content requirements for Operation and Maintenance Manuals.

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

1. Division 00 - Bidding Requirements, Contract Forms, and Conditions of the Contract.
2. Division 01 - General Requirements.
3. Sections in Divisions 02 through 48 identifying required submittals.

**1.2 MEASUREMENT AND PAYMENT**

- A. No separate payment will be made for this item. Include the cost in associated items for this project.

**1.3 SUBMITTALS (NOT USED)**

**1.4 DEFINITIONS**

A. Shop Drawings:

1. See General Conditions.
2. Product data and samples are Shop Drawing information.

B. Operation and Maintenance (O&M) Manuals:

1. Contain the information required for proper installation and maintenance of building materials and finishes.
2. Contain the technical information required for proper installation, operation and maintenance of process, electrical and mechanical equipment and systems.

C. Miscellaneous Submittals:

1. Submittals other than Shop Drawings and O&M Manuals.

2. Representative types of miscellaneous submittal items include but are not limited to:
  - a. Construction schedule.
  - b. Facility Shutdown Plan(s)
  - c. Installed equipment and systems performance test reports.
  - d. Manufacturer's installation certification letters.
  - e. Warranties.
  - f. Service agreements.
  - g. Construction photographs.
  - h. Record Documents.
  - i. Cost breakdown (Schedule of Values).
  - j. Safety Plan(s).
  - k. Care of Water Plan.
  - l. Utility Relocation Plan.

### **1.5 SUBMITTAL SCHEDULE**

- A. Schedule of Shop Drawings:
  1. Submitted and approved within 20 days of receipt of Notice to Proceed.
  2. Account for multiple transmittals under any specification section where partial submittals will be transmitted.
- B. Shop Drawings: Submittal and approval prior to 50 percent completion.
- C. Operation and Maintenance Manuals and Completed Equipment Record Sheets: Initial submittal within 60 days after date Shop Drawings are approved.

### **1.6 PREPARATION OF SUBMITTALS**

- A. General:
  1. All submittals and all pages of all copies of a submittal shall be completely legible.
  2. Submittals which, in the Owner's Representative's or Principal Architect/Engineer's sole opinion, are illegible will be returned without review.
- B. Shop Drawings:
  1. Scope of any submittal and shop drawing transmittal:
    - a. Submit shop drawings utilizing Owner's standard Submittal Transmittal Form.
    - b. Limited to one (1) Specification Section.

- c. Do not submit under any Specification Section entitled (in part) "Basic Requirements" unless the product or material submitted is specified, in total, in a "Basic Requirements" Section.
2. Numbering letter of transmittal:
  - a. Include a series number, "xx", beginning with "01" and increasing sequentially with each additional transmittal.
  - b. Assign consecutive series numbers to subsequent transmittals.
3. Describing transmittal contents:
  - a. Provide listing of each component or item in submittal capable of receiving an independent review action.
  - b. Identify for each item:
    - 1) Manufacturer and Manufacturer's Drawing or data number.
    - 2) Contract Document tag number(s).
    - 3) Unique page numbers for each page of each separate item.
    - 4) Use divider sheets with labeled tabs to separate independent items within a single submittal.
  - c. When submitting "or-equal" items that are not the products of named manufacturers, include the words "or-equal" in the item description.
4. Contractor stamping:
  - a. General:
    - 1) Contractor's review and approval stamp shall be applied either to the letter of transmittal or a separate sheet preceding each independent item in the submittal.
      - a) Contractor's signature and date shall be wet ink signature. Is an electronic signature acceptable as most submittals are uploaded to SharePoint as a .PDF electronic document?
      - b) Shop Drawing submittal stamp shall read "(Contractor's Name) has satisfied Contractor's obligations under the Contract Documents with respect to Contractor's review and approval as stipulated under General Conditions Paragraph 6.20.4."
    - 2) Submittals containing multiple independent items shall be prepared with an index sheet for each item listing the discrete page numbers for each page of that item, which shall be stamped with the Contractor's review and approval stamp.
      - a) Individual pages or sheets of independent items shall be numbered in a manner that permits Contractor's review and approval stamp to be associated with the entire contents of a particular item.

- b) Use divider sheets with labeled tabs to separate independent items within a single submittal.
- b. Electronic stamps:
  - 1) Contractor may electronically embed Contractor's review and approval stamp to either the Submittal Transmittal Form or a separate index sheet preceding each independent item in the submittal.
  - 2) Contractor's signature and date on electronically applied stamps may be wet ink or electronic signature.
- 5. Resubmittals:
  - a. Number with original root number and a suffix letter starting with "A" on a new Submittal Transmittal Form.
  - b. Do not increase the scope of any prior transmittal.
  - c. Account for all components of prior transmittal.
    - 1) If items in prior transmittal received "A" or "B" Action code, list them and indicate "A" or "B" as appropriate (See also 1.6, this Section).
      - a) Do not include submittal information for items listed with prior "A" or "B" in resubmittal.
    - 2) Indicate items to be resubmitted "at a later date" for any prior "C" or "D" Action item not included in resubmittal.
      - a) Obtain Principal Architect/Engineer's approval to exclude items.
- 6. Electronic submittals utilizing web based document management system (SharePoint®):
  - a. Shop drawing submittals shall be produced (scanned) in Adobe Acrobat's Portable Document Format (PDF) Version 5.0 or higher.
  - b. Do not password protect and/or lock the PDF document.
  - c. Create one (1) PDF document (PDF file) for each submittal.
  - d. Drawings or other graphics must be converted to PDF format and made part of the single (one [1]) PDF document.
    - 1) Scanning to be used only where actual file conversion is not possible.
  - e. Limit PDF document size to 5MB.
  - f. Rotate pages that must be viewed in landscape to the appropriate position for easy reading.
  - g. Images only shall be scanned at a resolution of 300 dpi or greater.
    - 1) Perform Optical Character Recognition (OCR) capture on all images.
    - 2) Achieve OCR with the "original image with hidden text" option.

- 3) Word searches of the PDF document must operate successfully to demonstrate OCR compliance.
- h. Create bookmarks in the navigation frame, for each entry in the Table of Contents/Index.
  - 1) Normally three (3) levels deep (i.e., "Chapter," "Section," "Sub-section").
- i. Thumbnails must be generated for each PDF file.
- j. Set the opening view for PDF files as follows:
  - 1) Initial view: Bookmarks and Page.
  - 2) Magnification: Fit in Window.
  - 3) Page layout: Single page.
  - 4) Set the file to open to the cover page of the submittal with bookmarks to the left, and the first bookmark linked to the cover page.
- k. All PDF documents shall be set with the option "Fast Web View" to open the first pages of the document for the viewer while the rest of the document continues to load.
- l. File naming conventions:
  - 1) File names shall use a "nine dot three" convention (XXXXXX-YY-Z.PDF) where XXXXXX is the Specification Section number, YY is the Shop Drawing Root series number and Z is an ID number used to designate the associated volume.
    - a) Example 1:
      - (1) Two (2) pumps submitted as separate Shop Drawings under the same Specification Section:
        - (a) Pump 1 = 43 21 21-01-1.pdf.
        - (b) Pump 2 = 43 21 21-02-1.pdf.
    - b) Example 2:
      - (1) Control system submitted as one (1) Shop Drawing but separated into two (2) shop drawing submittals:
        - (a) Volume 1 = 40 90 00-01-1.pdf.
        - (b) Volume 2 = 40 90 00-01-2.pdf.
7. Provide clear space (3 In Sq) for Principal Architect/Engineer stamping of each component defined in the PREPARATION OF SUBMITTALS Article – Contractor Stamping.
8. Contractor shall not use red color for marks on transmittals.
  - a. Duplicate all marks on all copies transmitted, and ensure marks are photocopy reproducible.

- b. Outline Contractor marks on reproducible transparencies with a rectangular box.
9. Transmittal contents:
- a. Coordinate and identify Shop Drawing contents so that all items can be easily verified by the Owner's Representative and the Principal Architect/Engineer.
  - b. Identify equipment or material use, tag number, Drawing detail reference, weight, and other Project specific information.
  - c. Provide sufficient information together with technical cuts and technical data to allow an evaluation to be made to determine that the item submitted is in compliance with the Contract Documents.
  - d. Submit items such as equipment brochures, cuts of fixtures, product data sheets or catalog sheets on 8-1/2 x 11 In pages.
    - 1) Clearly mark (indicate) exact item or model and all options proposed.
  - e. When a Shop Drawing submittal is called for in any Specification Section, include as appropriate, scaled details, sizes, dimensions, performance characteristics, capacities, test data, anchoring details, installation instructions, storage and handling instructions, color charts, layout Drawings, rough-in diagrams, wiring diagrams, controls, weights and other pertinent data in addition to information specifically stipulated in the Specification Section.
    - 1) Arrange data and performance information in format similar to that provided in Contract Documents.
    - 2) Provide, at minimum, the detail specified in the Contract Documents.
  - f. Provide warranty information.
  - g. If proposed equipment or materials deviate from the Contract Drawings or Specifications in any way, clearly note the deviation and justify the said deviation in detail in a separate letter immediately following transmittal sheet.
10. Samples:
- a. Identification:
    - 1) Identify sample as to transmittal number, manufacturer, item, use, type, project designation, tag number, standard Specification Section or Drawing detail reference, color, range, texture, finish and other pertinent data.
    - 2) If identifying information cannot be marked directly on sample without defacing or adversely altering samples, provide a durable tag with identifying information securely attached to the sample.
  - b. Include application specific brochures, and installation instructions.



- c. Provide Contractor's stamp of approval on samples or transmittal form as indication of Contractor's checking and verification of dimensions and coordination with interrelated work.
  - d. Resubmit samples of rejected items.
- C. Miscellaneous Submittals:
- 1. Prepare in the format and detail specified in Specification requiring the miscellaneous submittal.
- D. Operation and Maintenance Manuals:
- 1. Owner's use of manufacturer's Operation and Maintenance materials:
    - a. Materials are provided for Owner's use, reproduction and distribution as training and reference materials within Owner's organization.
      - 1) Applicable to hard copy or electronic media.
      - 2) Applicable to materials containing copyright notice as well as those with no copyright notice.
    - b. Notify manufacturer of this intended use of materials provided under the Contract.
  - 2. Number each Operation and Maintenance Manual transmittal with the original root number of the associated Shop Drawing.
    - a. Identify resubmittals with the original number plus a suffix letter starting with "A."
  - 3. Submittal format:
    - a. Interim submittals: Submit two (2) paper copies until manual is approved.
    - b. Final submittals:
      - 1) Within 30 days of receipt of approval, submit one (1) additional paper copy and two (2) electronic copies to the Owner's Document Management System (SharePoint) in Portable Document Format (PDF).
        - a) Compact discs to be secured in jewel cases.
      - 2) Electronic copies will be reviewed for conformance with the approved paper copy and the electronic copy (PDF) requirements of this Specification.
      - 3) Non-conforming CDs will be returned with comments.
        - a) Provide final CDs within 30 days of receipt of comments.
  - 4. Electronic copy submittals:
    - a. Electronic copies of the approved paper copy Operation and Maintenance Manuals are to be produced in Adobe Acrobat's Portable Document Format (PDF) Version 5.0 or higher.

- b. Do not password protect and/or lock the PDF document.
- c. Create one (1) PDF document (PDF file) for each equipment O&M Manual.
- d. Drawings or other graphics must be converted to PDF format and made part of the one (1) PDF document.
  - 1) Scanning to be used only where actual file conversion is not possible.
- e. Rotate pages that must be viewed in landscape to the appropriate position for easy reading.
- f. Images only shall be scanned at a resolution of 300 dpi or greater.
  - 1) Perform Optical Character Recognition (OCR) capture on all images.
  - 2) Achieve OCR with the "original image with hidden text" option.
  - 3) Word searches of the PDF document must operate successfully to demonstrate OCR compliance.
- g. Create bookmarks in the navigation frame, for each entry in the Table of Contents/Index.
  - 1) Normally three (3) levels deep (i.e., "Chapter," "Section," "Sub-section").
- h. Thumbnails must be generated for each PDF file.
- i. Set the opening view for PDF files as follows:
  - 1) Initial view: Bookmarks and Page.
  - 2) Magnification: Fit in Window.
  - 3) Page layout: Single page.
  - 4) Set the file to open to the cover page of the manual with bookmarks to the left, and the first bookmark linked to the cover page.
- j. All PDF documents shall be set with the option "Fast Web View" to open the first pages of the document for the viewer while the rest of the document continues to load.
- k. File naming conventions:
  - 1) File names shall use a "ten dot three" convention (XXXXXX-YY-Z.PDF) where XXXXXX is the Specification Section number, YY is the Shop Drawing Root number and Z is an ID number used to designate the associated volume.
    - a) Example 1:
      - (1) Two (2) pumps submitted as separate Shop Drawings under the same Specification Section:
        - (a) Pump 1 = 43 21 21-01-1.pdf.

(b) Pump 2 = 43 21 21-02-1.pdf.

b) Example 2:

(1) Control system submitted as one (1) Shop Drawing but separated into two (2) O&M volumes:

(a) Volume 1 = 40 90 00-01-1.pdf.

(b) Volume 2 = 40 90 00-01-2.pdf.

l. Labeling:

1) As a minimum, include the following labeling on all CD-ROM discs and jewel cases:

a) Project Name.

b) Equipment Name and Project Tag Number.

c) Project Specification Section.

d) Manufacturer Name.

e) Vendor Name.

m. Binding:

1) Include labeled CD(s) in labeled jewel case(s).

a) Bind jewel cases in standard three-ring binder Jewel Case Page(s), inserted at the front of the Final paper copy submittal.

b) Jewel Case Page(s) to have means for securing Jewel Case(s) to prevent loss (e.g., flap and strap).

5. Operation and Maintenance Manuals for Materials and Finishes:

a. Building Products, Applied Materials and Finishes:

1) Include product data, with catalog number, size, composition and color and texture designations.

2) Provide information for re-ordering custom manufactured products.

b. Instructions for Care and Maintenance:

1) Include manufacturer's recommendations for cleaning agents and methods, precautions against detrimental agents and methods and recommended schedule for cleaning and maintenance.

c. Moisture Protection and Weather Exposed Products:

1) Include product data listing, applicable reference standards, chemical composition, and details of installation.

2) Provide recommendations for inspections, maintenance and repair.

d. Additional requirements as specified in individual product specifications.

6. Operation and Maintenance Manuals for Equipment and Systems:

- a. Submission of Operation and Maintenance Manuals for equipment and systems is applicable but not necessarily limited to:
  - 1) Major equipment.
  - 2) Equipment powered by electrical, pneumatic or hydraulic systems.
  - 3) Specialized equipment and systems including instrumentation and control systems and system components for HVAC process system control.
  - 4) Valves and water control gates.
- b. Equipment and Systems Operation and Maintenance Manuals shall include, but not necessarily be limited to, the following completed forms and detailed information, as applicable:
  - 1) Fully completed type-written copies of the associated Equipment Record(s), Exhibits A1, A2 and A3, shall be included under the first tab following the Table of Contents of each Operation and Maintenance Manual.
    - a) Each section of the Equipment Record must be completed in detail.
      - (1) Simply referencing the related manual for nameplate, maintenance, spare parts or lubricant information is not acceptable.
    - b) For equipment items involving components or subunits, a fully completed Equipment Record Form is required for each operating component or subunit.
    - c) Submittals that do not include the associated Equipment Record(s) will be rejected without further content review.
    - d) Electronic copies of the Exhibits may be obtained by contacting the Project Manager.
  - 2) Equipment function, normal operating characteristics, limiting operations.
  - 3) Assembly, disassembly, installation, alignment, adjustment, and checking instructions.
  - 4) Operating instructions for start-up, normal operation, control, shutdown, and emergency conditions.
  - 5) Lubrication and maintenance instructions.
  - 6) Troubleshooting guide.
  - 7) Parts lists:
    - a) Comprehensive parts and parts price lists.
    - b) A list of recommended spare parts.

- c) List of spare parts provided as specified in the associated Specification Section.
- 8) Outline, cross-section, and assembly Drawings; engineering data; and electrical diagrams, including elementary diagrams, wiring diagrams, connection diagrams, word description of wiring diagrams and interconnection diagrams.
- 9) Test data and performance curves.
- 10) As-constructed fabrication or layout Drawings and wiring diagrams.
- 11) Instrumentation or tag numbers assigned to the equipment by the Contract Documents are to be used to identify equipment and system components.
- 12) Additional information as specified in the associated equipment or system Specification Section.

## **1.7 TRANSMITTAL OF SUBMITTALS**

### **A. Shop Drawings, Samples and Operation and Maintenance Manuals:**

- 1. Transmit all submittals via Owner's Document Management System (SharePoint).
- 2. Utilize SJRA Standard Submittal Transmittal Form (to be provided by Owner) to transmit all Shop Drawings, Samples and Operation and Maintenance Manuals.
- 3. All submittals must be from Contractor.
  - a. Submittals will not be received from or returned to subcontractors.
  - b. Operation and Maintenance Manual submittal stamp may be Contractor's standard approval stamp.
- 4. Provide submittal information defining specific equipment or materials utilized on the Project.
  - a. Generalized product information, not clearly defining specific equipment or materials to be provided, will be rejected.

### **B. Miscellaneous Submittals:**

- 1. Transmit under Contractor's standard Submittal Transmittal Form or letterhead.
- 2. Submit in triplicate or as specified in individual Specification Section.
- 3. Transmit to the address provided below.

Grady Garrow, CPPB  
San Jacinto River Authority

1577 Dam Site Road  
Conroe, TX 77304

4. Provide copy of Submittal Transmittal without attachments to Owner's Representative.
- C. Expedited Return Delivery:
1. Include prepaid express envelope or airbill in submittal transmittal package for any submittals Contractor expects or requires express return mail.
  2. Inclusion of prepaid express envelope or airbill does not obligate Owner's Representative or Principal Architect/Engineer to conduct expedited review of submittal.
- D. Fax Transmittals:
1. Permitted on a case-by-case basis to expedite review when approved by Principal Architect/Engineer.
  2. Requires hard copy transmittal to immediately follow.
    - a. Principal Architect/Engineer will proceed with review of fax transmittal.
    - b. Principal Architect/Engineer 's approval or rejection comments will be recorded and returned on hard copy transmittal.
  3. Provisions apply to both:
    - a. Initial transmittal contents.
    - b. Supplemental information required to make initial transmittal contents complete.

## **1.8 PRINCIPAL ARCHITECT/ENGINEER 'S REVIEW ACTION**

- A. Shop Drawings and Samples:
1. Items within transmittals will be reviewed for overall design intent and will receive one of the following actions:
    - a. NO EXCEPTION.
    - b. EXCEPTIONS AS NOTED.
    - c. REVISE & RESUBMIT
    - d. REJECTED - RESUBMIT.
    - e. ACKNOWLEDGE RECEIPT.
    - f. FOR INFORMATION PURPOSES ONLY.
    - g. SUPPLEMENTARY INFORMATION.
  2. Submittals received will be initially reviewed to ascertain inclusion of Contractor's approval stamp.

- a. Submittals not stamped by the Contractor or stamped with a stamp containing language other than that specified herein will not be reviewed for technical content and will be returned without any action.
3. In relying on the representation on the Contractor's review and approval stamp, Owner and Principal Architect/Engineer reserve the right to review and process poorly organized and poorly described submittals as follows:
  - a. Submittals transmitted with a description identifying a single item and found to contain multiple independent items:
    - 1) Review and approval will be limited to the single item described on the transmittal letter.
    - 2) Other items identified in the submittal will:
      - a) Not be logged as received by the Principal Architect/Engineer.
      - b) Be removed from the submittal package and returned without review and comment to the Contractor for coordination, description and stamping.
      - c) Be submitted by the Contractor as a new series number, not as a re-submittal number.
  - b. Principal Architect/Engineer, at Principal Architect/Engineer's discretion, may revise the transmittal letter item list and descriptions, and conduct review.
    - 1) Unless Contractor notifies Principal Architect/Engineer in writing that the Principal Architect/Engineer's revision of the Submittal Transmittal Form item list and descriptions was in error, Contractor's review and approval stamp will be deemed to have applied to the entire contents of the submittal package.
4. Submittals returned with Action "A" or "B" are considered ready for fabrication and installation.
  - a. If for any reason a submittal that has an "A" or "B" Action is resubmitted, it must be accompanied by a letter defining the changes that have been made and the reason for the resubmittal.
  - b. Destroy or conspicuously mark "SUPERSEDED" all documents having previously received "A" or "B" Action that are superseded by a resubmittal.
5. Submittals with Action "A" or "B" combined with Action "C" (Revise and Resubmit) or "D" (Rejected) will be individually analyzed giving consideration as follows:
  - a. The portion of the submittal given "C" or "D" will not be distributed (unless previously agreed to otherwise at the Preconstruction Conference).
    - 1) One (1) copy or the one (1) transparency of the "C" or "D" Drawings will be marked up and returned to the Contractor.

- a) Correct and resubmit items so marked.
- b. Items marked "A" or "B" will be fully distributed.
- c. If a portion of the items or system proposed are acceptable, however, the major part of the individual Drawings or documents are incomplete or require revision, the entire submittal may be given "C" or "D" Action.
  - 1) This is at the sole discretion of the Principal Architect/Engineer.
  - 2) In this case, some Drawings may contain relatively few or no comments or the statement, "Resubmit to maintain a complete package."
  - 3) Distribution to the Owner and field will not be made (unless previously agreed to otherwise).
6. Failure to include any specific information specified under the submittal paragraphs of the Specifications will result in the submittal being returned to the Contractor with "C" or "D" Action.
7. Calculations: Requirements for the submittal of calculations in the individual Specification Sections shall be satisfied through the submittal of a certification sealed by the Principal Architect/Engineer that the calculations have been performed. Certification will be received for information purposes only and will be returned stamped "D. ACKNOWLEDGE RECEIPT".
8. Transmittals of submittals which the Principal Architect/Engineer considers as "Not Required" submittal information, which is supplemental to but not essential to prior submitted information, or items of information in a transmittal which have been reviewed and received "A" or "B" Action in a prior submittal, will be returned with Action "E. Acknowledge Receipt" (Principal Architect/Engineer 's Review Not Required).
9. Samples may be retained for comparison purposes.
  - a. Remove samples when directed.
  - b. Include in bid all costs of furnishing and removing samples.
10. Approved samples submitted or constructed, constitute criteria for judging completed work.
  - a. Finished work or items not equal to samples will be rejected.

## **PART 2 - PRODUCTS (NOT USED)**

## **PART 3 - EXECUTION (NOT USED)**



## EXHIBIT A1 Equipment Record

### Equipment Data and Spare Parts Summary

Project Name		Specification Section:
Equipment Name		Year Installed:
Project Equipment Tag No(s).		
Equipment Manufacturer		Project/Order No.
Address		Phone
Fax	Web Site	E-mail
Local Vendor/Service Center		
Address		Phone
Fax	Web Site	E-mail

#### MECHANICAL NAMEPLATE DATA

Equip.		Serial No.		
Make		Model No.		
ID No.	Frame No.	HP	RPM	Cap.
Size	TDH	Imp. Sz.	CFM	PSI
Other:				

#### ELECTRICAL NAMEPLATE DATA

Equip.		Serial No.						
Make		Model No.						
ID No.	Frame No.	HP	V.	Amp.	HZ	PH	RPM	SF
Duty	Code	Ins. Cl.	Type	NEMA	C Amb.	Temp. Rise	Rating	
Other:								

#### SPARE PARTS PROVIDED PER CONTRACT

Part No.	Part Name	Quantity

#### RECOMMENDED SPARE PARTS

Part No.	Part Name	Quantity



**EXHIBIT A3  
 Equipment Record  
 Lubrication Summary**

Equipment Description	Project Equip. Tag No(s).
-----------------------	---------------------------

Lubricant Point							
Lubricant Type	Manufacturer		Product	AGMA #	SAE #	ISO	
	1						
	2						
	3						
	4						
	5						
Lubricant Point							
Lubricant Type	Manufacturer		Product	AGMA #	SAE #	ISO	
	1						
	2						
	3						
	4						
	5						
Lubricant Point							
Lubricant Type	Manufacturer		Product	AGMA #	SAE #	ISO	
	1						
	2						
	3						
	4						
	5						
Lubricant Point							
Lubricant Type	Manufacturer		Product	AGMA #	SAE #	ISO	
	1						
	2						
	3						
	4						
	5						
Lubricant Point							
Lubricant Type	Manufacturer		Product	AGMA #	SAE #	ISO	
	1						
	2						
	3						
	4						
	5						
Lubricant Point							
Lubricant Type	Manufacturer		Product	AGMA #	SAE #	ISO	
	1						
	2						
	3						
	4						
	5						

**END OF SECTION**

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## **SECTION 01 35 05**

### **ENVIRONMENTAL PROTECTION AND SPECIAL CONTROLS**

#### **PART 1 - GENERAL**

##### **1.1 SUMMARY**

A. Section Addresses:

1. Minimizing the pollution of air, water, or land; control of noise, the disposal of solid waste materials, and protection of deposits of historical or archaeological interest.

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

1. Division 00 – Proposing Requirements, Contract Forms, and Conditions of the Contract.
2. Division 01 – General Requirements.

##### **1.2 MEASUREMENT AND PAYMENT**

- A. No separate payment will be made for this item. Include the cost of same in associated items for this project.

##### **1.3 SUBMITTALS**

A. Shop Drawings:

1. See Specification Section 01 33 00 – Submittals for requirements for the mechanics and administration of the submittal process.
2. Prior to the start of any construction activities submit:
  - a. A detailed proposal of all methods of control and preventive measures to be utilized for environmental protection.
  - b. A drawing of the work area, haul routes, storage areas, access routes and current land conditions including trees and vegetation.
  - c. Submit manufacturer's catalog sheets and other product data on dispensing equipment, pump, and aboveground fuel storage tanks, indicating capacity and dimensions of tank.
  - d. Submit drawings to show location of tank protection area and driveway. Indicate nearest inlet or channelized flow area. Clearly dimension distances and measurements.
  - e. Submit list of spill containment equipment, and quantities thereof, located at fueling area.

##### **1.4 ENVIRONMENTAL CONTROLS**

- A. Provide and maintain methods, equipment, and temporary construction as necessary for controls over environmental conditions at construction site and adjacent areas.
- B. Work to minimize impact to surrounding environment. Adopt construction procedures that do not cause unnecessary excavation and filling of terrain, indiscriminate destruction of vegetation, air or stream pollution, nor harassment or destruction of wildlife.
- C. Recognize and adhere to environmental requirements of Project. Limit disturbed areas to boundaries established by Contract. Avoid pollution of “on-site” streams, sewers, wells, or other water sources.
- D. Burning of rubbish, debris, or waste materials is not permitted.

### **1.5 POLLUTION CONTROL**

- A. Provide methods, means, and facilities required to prevent contamination of soil, water, or atmosphere by discharge of noxious substances from construction operations.
- B. Provide equipment and personnel to perform required emergency measures to contain spillage, and to remove contaminated soils or liquids. Excavate and dispose of contaminated earth off-site, and replace with suitable compacted fill and topsoil.
- C. Provide systems for control of atmospheric pollutants.
  - 1. Prevent toxic concentrations of chemicals.
  - 2. Prevent harmful dispersal of pollutants into atmosphere.
- D. Use equipment that conforms to current Federal, State, and local laws and regulations.
- E. Install or otherwise implement positive controls to prevent hazardous materials migrating from Work area.

### **1.6 PEST AND RODENT CONTROL**

- A. Provide rodent and pest control as necessary to prevent infestation of construction or storage areas.
- B. Employ methods and use materials which will not adversely affect conditions at site or on adjoining properties.

### **1.7 NOISE CONTROL**

- A. Highlands Main Canal has no official noise limit, but is governed by state regulations that dictate a maximum level of 85 decibels at any time of the day or night. Local municipal noise limits may be more restrictive and shall be followed as required.
- B. Provide vehicles, equipment, and construction activities that minimize noise to greatest degree practicable. Conform noise levels to latest OSHA standards.

Do not permit noise levels to interfere with Work or create nuisance in surrounding areas.

- C. Conduct construction operations during daylight hours except as approved by Owner's Representative.
- D. Select construction equipment to operate with minimum noise and vibration. When in opinion of Owner's Representative, objectionable noise or vibration is produced by equipment, rectify conditions without additional cost to Owner. Sound Power Level (PWL) of equipment shall not exceed 85 dbA (re: 10-12 watts) measured 5 feet from piece of equipment. Explicit equipment noise requirements are specified with equipment specifications.

### **1.8 DUST CONTROL**

- A. Control objectionable dust caused by operation of vehicles and equipment. Apply water or use other methods, subject to approval of Owner's Representative, to control amount of dust generated.

### **1.9 WATER RUNOFF AND EROSION CONTROL**

- A. Comply with Texas Pollutant Discharge Elimination System (TPDES) permit when required.
- B. In addition to TPDES requirements:
  - 1. Provide methods to control surface water, runoff, subsurface water, and water from excavations and structures to prevent damage to Work, site, or adjoining properties.
  - 2. Control fill, grading and ditching to direct water away from excavations, pits, tunnels, and other construction areas; and to direct drainage to proper runoff courses so as to prevent erosion, sedimentation or damage.
  - 3. Provide, operate, and maintain equipment and facilities of adequate size to control surface water.
  - 4. Dispose of drainage water in manner to prevent flooding, erosion, or other damage to portion of site or to adjoining areas and in conformance with environmental requirements.
  - 5. Retain existing drainage patterns external to construction site by constructing temporary earth berms, sedimentation basins, retaining areas, and temporary ground cover as needed to control conditions.
  - 6. Plan and execute construction and earth work by methods to control surface drainage from cuts and fills, and from borrow and waste disposal areas, to prevent erosion and sedimentation.
    - a. Minimize area of bare soil exposed at one time.
    - b. Provide temporary control measures, as berms, dikes, and drains.
  - 7. Construct fills and waste areas by selective placement to eliminate erosion of surface silts or clays.

8. Inspect earthwork periodically to detect evidence of start of erosion. Apply corrective measures as required to control erosion.

### **1.10 QUALITY ASSURANCE**

- A. Person conducting visual examination for pollutant shall be fully knowledgeable about the TPDES Construction General Permit, detecting sources of storm water contaminants, inspection of aboveground storage tank and appurtenances for leakage, and the day-to-day operations that may cause unexpected pollutant releases.

## **PART 2 - PRODUCTS**

### **2.1 ABOVEGROUND FUEL STORAGE TANK**

- A. Tank Assembly: Must be listed with UL 1709 and UL 2085.
- B. Inner Steel Storage Tank: Follow UL 142, with minimum thickness of 1/8-inch welded construction.
- C. Tank Encasement: Either concrete or steel to provide minimum of 110 percent containment of inner tank capacity. Provide 5-gallon overspill containment pan for tank refueling.
- D. Dispenser Pump: For submersible pump, UL listed emergency shut-off valve to be installed at each dispenser. For suction pump, UL listed vacuum-activated shut-off valve, with shear section, is to be installed at each dispenser. Fuel may not be dispensed from tank by gravity flow or by pressurization of tank. Means must be provided to prevent release of fuel by siphon flow.
- E. Representative Manufacturers: Convault, Fireguard, Ecovault, SuperVault, or equal.

### **2.2 CONCRETE**

- A. Provide concrete with minimum strength of 4,000 psi at 28 days.

### **2.3 AGGREGATES**

- A. Coarse aggregate shall consist of crushed stone, gravel, crushed blast furnace slag, or combination of these materials. Aggregate shall be composed of clean, hard, durable materials, free from adherent coatings, salt, alkali, dirt, clay, loam, shale, soft or flaky materials, or organic and injurious matter.



B. Coarse aggregates shall conform to following gradation requirements.

<b>Sieve Size</b> <u>(Square Mesh)</u>	<b>Percent Retained</b> <u>(By Weight)</u>
2-1/2"	0
2"	0 - 20
1-1/2"	15 - 50
3/4"	60 - 80
No. 4	95 - 100

### **PART 3 - EXECUTION**

#### **3.1 INSTALLATION**

- A. Employ and utilize environmental protection methods, obtain all necessary permits, and fully observe all local, state, and federal regulations.
- B. No clearing and grubbing or rough cutting permitted until erosion and sediment control systems are in place, other than site Work specifically directed by Owner's Representative to allow soil testing and surveying.
- C. Prohibit equipment and vehicles from maneuvering on areas outside of dedicated rights-of-way and easements for construction. Immediately repair damage caused by construction traffic to erosion and sediment control systems.
- D. Maintain existing erosion and sediment control systems located within project site until acceptance of Project or until directed by Owner's Representative to remove and discard existing system.
- E. Regularly inspect and repair or replace damaged components of erosion and sediment control systems as specified in this Section. Unless otherwise directed, maintain erosion and sediment control systems until project area stabilization is accepted by the Owner. Remove erosion and sediment control systems promptly when directed by Owner's Representative. Discard removed materials off site.
- F. Remove and dispose sediment deposits at designated spoil site for Project. If a project spoil site is not designated on Drawings, dispose of sediment off site at location not in or adjacent to stream or flood plain. Assume responsibility for off-site disposal. Spread sediment evenly throughout site, compacted and stabilized. Prevent sediment from flushing into a stream or drainage way. If sediment has been contaminated, dispose of in accordance with existing federal, state, and local rules and regulations.
- G. Assume responsibility for collecting, storing, hauling, and disposing of spoil, silt, and waste materials as specified in this or other Specifications and in compliance with applicable federal, state, and local rules and regulations.

- H. Employ protective measures to avoid damage to existing trees to be retained on project site. Conduct construction operations under this Contract in conformance with erosion control practices described in Drawings and this or other Specifications.
- I. Prepare spill response and containment procedures to be implemented in event of significant materials spill. Significant materials include but are not limited to: raw materials; fuels; materials such as solvent, detergents, and plastic pellets; finished materials such as metallic products; raw materials used in food processing or production; hazardous substances designated under Section 101(14) of CERCLA; chemical required to be reported pursuant to Section 313 of Title III of SARA; fertilizers; pesticides, and waste products such as slag, ashes and sludge that have potential to be released with storm water discharges. Spill containment procedures shall be kept on-site or in construction field office.
- J. Spill containment equipment appropriate to size of operation is to be located in close proximity of fueling area. Such equipment includes, but not limited to, suitable waste containers for significant materials, drip pans, booms, inlet covers, or absorbent.
- K. Properly label significant materials or waste containers used for construction activities and stored on-site overnight.
- L. Install, maintain, and inspect erosion, sediment control measures and practices as specified in Drawings and in this or other Specifications
- M. Land Protection:
  - 1. Except for any work or storage area and access routes specifically assigned for the use of the Contractor, the land areas outside the limits of construction shall be preserved in their present condition.
    - a. Contractor shall confine his construction activities to areas defined for work within the Contract Documents.
  - 2. Manage and control all borrow areas, work or storage areas, access routes and embankments to prevent sediment from entering nearby water or land adjacent to the work site.
  - 3. Restore all disturbed areas including borrow and haul areas and establish permanent type of locally adaptable vegetative cover.
  - 4. Unless earthwork is immediately paved or surfaced, protect all side slopes and backslopes immediately upon completion of final grading.
  - 5. Plan and execute earthwork in a manner to minimize duration of exposure of unprotected soils.
  - 6. Except for areas designated by the Contract Documents to be cleared and grubbed, the Contractor shall not deface, injure or destroy trees and vegetation, nor remove, cut, or disturb them without approval of the Owner's Representative.

- a. Any damage caused by the Contractor's equipment or operations shall be restored as nearly as possible to its original condition at the Contractor's expense.
  7. Utilize, as necessary, erosion control methods to protect side and backslopes, minimize and the discharge of sediment to the surface water leaving the construction site as soon as rough grading is complete.
    - a. These controls shall be maintained until the site is ready for final grading and landscaping or until they are no longer warranted and concurrence is received from the Owner's Representative.
    - b. Physically retard the rate and volume of run-on and runoff by:
      - 1) Implementing structural practices such as diversion swales, terraces, straw bales, silt fences, berms, storm drain inlet protection, rocked outlet protection, sediment traps and temporary basins.
      - 2) Implementing vegetative practices such as temporary seeding, permanent seeding, mulching, sod stabilization, vegetative buffers, hydroseeding, anchored erosion control blankets, sodding, vegetated swales or a combination of these methods.
      - 3) Providing Construction sites with graveled or rocked access entrance and exit drives and parking areas to reduce the tracking of sediment onto public or private roads.
  8. Discharges from the construction site shall not contain pollutants at concentrations that produce objectionable films, colors, turbidity, deposits or noxious odors in the receiving stream or waterway.
- N. Solid Waste Disposal:
1. Collect solid waste on a daily basis.
  2. Provide disposal of degradable solid waste to an approved solid waste disposal site.
  3. Provide disposal of nondegradable solid waste to an approved solid waste disposal site or in an alternate manner approved by Owner's Representative and regulatory agencies.
  4. No building materials wastes or unused building materials shall be buried, dumped, or disposed of on the site.
- O. Fuel and Chemical Handling:
1. Store and dispose of chemical wastes in a manner approved by regulatory agencies.
  2. Take special measures to prevent chemicals, fuels, oils, greases, herbicides, and insecticides from entering drainage ways.
  3. Do not allow water used in onsite material processing, concrete curing, cleanup, and other waste waters to enter a drainage way(s) or stream.

4. The Contractor shall provide containment around fueling and chemical storage areas to ensure that spills in these areas do not reach waters of the state.

P. Control of Dust:

1. The control of dust shall mean that no construction activity shall take place without applying all such reasonable measures as may be required to prevent particulate matter from becoming airborne so that it remains visible beyond the limits of construction.
  - a. Reasonable measures may include paving, frequent road cleaning, planting vegetative groundcover, application of water or application of chemical dust suppressants.
  - b. The use of chemical agents such as calcium chloride must be approved by the State of Texas DOT.
2. Utilize methods and practices of construction to eliminate dust in full observance of agency regulations.
3. The Owner's Representative will determine the effectiveness of the dust control program and may request the Contractor to provide additional measures, at no additional cost to Owner.

Q. Burning:

1. Do not burn material on the site.
2. If the Contractor elects to dispose of waste materials by burning, make arrangements for an off-site burning area and conform to all agency regulations.

R. Control of Noise:

1. Control noise by fitting equipment with appropriate mufflers.

S. Completion of Work:

1. Upon completion of work, leave area in a clean, natural looking condition.
2. Ensure all signs of temporary construction and activities incidental to construction of required permanent work are removed.

T. Historical Protection:

1. If during the course of construction, evidence of deposits of historical or archaeological interests is found, cease work affecting find and notify Owner's Representative.
  - a. Do not disturb deposits until written notice from Owner's Representative is given to proceed.
2. The Contractor will be compensated for lost time or changes in construction to avoid the find based upon normal change order procedures.

### **3.2 TOPSOIL PLACEMENT FOR EROSION AND SEDIMENT CONTROL SYSTEMS**

- A. When topsoil is specified as a component of another Specification, conduct erosion control practices described in this Specification during topsoil placement operations.
- B. When placing topsoil, maintain erosion and sediment control systems consisting of swales, grade stabilization structures, berms, dikes, waterways, and sediment basins.
- C. Maintain grades which have been previously established on areas to receive topsoil.
- D. After areas to receive topsoil have been brought to grade, and immediately prior to dumping and spreading topsoil, loosen subgrade by discing or by scarifying to a depth of at least 2 inches to permit bonding of topsoil to subsoil. Compact by passing bulldozer up and down slope, tracking over entire surface area of slope to create horizontal erosion control slots.
- E. No sod or seed shall be placed on soil which has been treated with soil sterilants until sufficient time has elapsed to permit dissipation of toxic materials.

### **3.3 DUST CONTROL**

- A. Implement dust control methods to control dust creation and movement on construction sites and roads and to prevent airborne sediment from reaching receiving streams or storm water conveyance systems, to reduce on-site and off-site damage, to prevent health hazards, and to improve traffic safety.
- B. Control blowing dust by using one or more of following methods:
  - 1. Mulches bound with chemical binders such as Carasol, Terratack, or equal.
  - 2. Temporary vegetative cover.
  - 3. Spray-on adhesives on mineral soils when not used by traffic.
  - 4. Tillage to roughen surface and bring clods to surface.
  - 5. Irrigation by water sprinkling.
  - 6. Barriers using solid board fences, snow fences, burlap fences, crate walls, bales of hay, or similar materials.
- C. Implement dust control methods immediately whenever dust can be observed blowing on project site.

### **3.4 KEEPING STREETS CLEAN**

- A. Keep streets clean of construction debris and mud carried by construction vehicles and equipment. If necessary, install stabilized construction exits at construction, staging, storage, and disposal areas. Vehicle/equipment wash area (stabilized with coarse aggregate) may be installed adjacent to stabilized construction exit, as needed. Release wash water into a drainage swale or inlet protected by erosion and sediment control measures. Construction exit specified in Section 01 57 13.02 - Stabilized Construction Access.

- B. In addition to stabilized construction exits, shovel or sweep pavement to extent necessary to keep street clean. Water hosing or sweeping of debris and mud off of street into adjacent areas is not allowed.

### **3.5 EQUIPMENT MAINTENANCE AND REPAIR**

- A. Confine maintenance and repair of construction machinery and equipment to areas specifically designated for that purpose. Locate areas so that oils, gasoline, grease, solvents, and other potential pollutants cannot be washed directly into receiving streams or storm water conveyance systems. Provide these areas with adequate waste disposal receptacles for liquid as well as solid waste. Clean and inspect maintenance areas daily.
- B. On construction site where designated equipment maintenance areas are not feasible, take precautions during each individual repair or maintenance operation to prevent potential pollutants from washing into streams or conveyance systems. Provide temporary waste disposal receptacles.

### **3.6 WASTE COLLECTION AND DISPOSAL**

- A. Formulate and implement a plan for collection and disposal of waste materials on construction site. In plan, designate locations for trash and waste receptacles and establish a collection schedule. Specify and carry out methods for ultimate disposal of waste in accordance with applicable local, state, and federal health and safety regulations. Make special provisions for collection and disposal of liquid wastes and toxic or hazardous materials.
- B. Keep receptacles and waste collection areas neat and orderly to extent possible. Waste shall not be allowed to overflow its container or accumulate from day-to-day. Locate trash collection points where they shall least likely be affected by concentrated storm water runoff.

### **3.7 WASHING AREAS**

- A. Avoid washing concrete delivery trucks or dump trucks and other construction equipment at locations where runoff shall flow directly into a watercourse or storm water conveyance system. Designate special areas for washing vehicles. Locate these areas where wash water shall spread out and evaporate or infiltrate directly into ground, or where runoff can be collected in temporary holding or seepage basin. Beneath wash areas construct a gravel or rock base to minimize mud production.

### **3.8 STORAGE OF CONSTRUCTION MATERIALS AND CHEMICALS**

- A. Isolate sites where chemicals, cements, solvents, paints, or other potential water pollutants are stored in areas where they shall not cause runoff pollution.
- B. Store toxic chemicals, materials, pesticides, paints, and acids in accordance with manufacturers' guidelines. Protect groundwater resources from leaching by placing a plastic mat, packed clay, tar paper, or other impervious materials on areas where toxic liquids are to be opened and stored.

### **3.9 DEMOLITION AREAS**

- A. Demolition activities which create large amounts of dust with significant concentrations of heavy metals or other toxic pollutants shall use dust control techniques to limit transport of airborne pollutants. However, retain water or slurry used to control dust contaminated with heavy metals or toxic pollutants on site, and prevent runoff directly into watercourses or storm water conveyance systems. Carry out methods of ultimate disposal of these materials in accordance with applicable local, state, and federal health and safety regulations.

### **3.10 SANITARY FACILITIES**

- A. Provide construction sites with adequate portable toilets for workers in accordance with applicable health regulations.

### **3.11 PESTICIDES**

- A. Use and store pesticides during construction in accordance with manufacturers' guidelines and with local, state, and federal regulations. Avoid overuse of pesticides which could produce contaminated runoff. Take great care to prevent accidental spillage. Never wash pesticide containers in or near flowing streams or storm water conveyance systems.

### **3.12 CONSTRUCTION METHODS**

- A. Provide fuel tank protection area and driveway as shown on Drawings.
- B. Do not locate fueling area in or near channelized flow area or close to storm sewer conveyance system. Provide sufficient space to allow installation of other erosion and sediment controls to protect those areas.
- C. Clear and grub fueling area to remove unsuitable materials. Place geotextile fabric as permeable separator to prevent mixing of coarse aggregate with underlying soil. Overlap fabric minimum of 6 inches. Place coarse aggregate on top of geotextile fabric to minimum depth of 8 inches.
- D. Grade protection area and driveway to provide sufficient drainage away from stabilized areas. Use sandbags, gravel, boards, or similar methods to prevent sediment from entering public right-of-way, receiving stream or storm water conveyance system. Provide driveway to fuel tank area with minimum width of 15 feet for one-way traffic and 30 feet for two-way traffic.
- E. Place aboveground storage tank on top of cast-in-place or pre-cast foundation. Base size and thickness of foundation on size and weight of tank to be used, with minimum thickness of 6 inches. Enclose concrete foundation by 5-inch by 5-inch concrete curb and extend minimum of 1 foot beyond tank and dispenser assemblies, so that leak and drip can be contained within concrete foundation.
- F. Slope concrete foundation minimum of 1 percent toward 6-inch wide by 12-inch long by 4-inch deep sump pit. Install minimum of 2-inch pipe inside sump pit with valve on outside of curb to allow draining of concrete foundation.

- G. Install portable concrete Jersey Barrier around concrete foundation. Provide minimum clearance of 2 feet from edge of foundation. In lieu of Jersey barrier, install 4-inch diameter steel pipe bollards around foundation. Bury bollards minimum of 3 feet deep, 3 feet above ground, and 4 feet on center, encased in 12-inch wide concrete foundation.

### **3.13 MAINTENANCE**

- A. Inspections shall be conducted by designated health and safety officer qualified to conduct health and safety inspections.
- B. Inspect stabilized areas after every storm event and at least once a week. Provide periodic top dressing with additional coarse aggregate to maintain required depth. Repair and clean out damaged control measures used to trap sediment.
- C. Inspect fuel tank foundation's bermed area after every storm event and at least once a week. Visually examine storm water contained in tank's bermed foundation area for oil sheen or other obvious indicators of storm water pollution. Properly dispose of storm water when pollutant is present. Record visual examination of storm water discharge in Report noting date and time of examination, name of examiner, observations of water quality, and volume of storm water discharged from bermed area. Keep Report with other storm water pollution control inspection reports on site, in readily accessible location.

### **3.14 TEMPORARY FUELING AREA CLOSURE**

- A. Dispose of temporary vehicle and equipment fueling area by removal of sediment and erosion controls properly off site. Owner's Representative will inspect top soils in fueling area and immediate vicinity for evidence of fuel leaks. If Owner's Representative determines that sufficient pollutants have been released, remove soil and properly dispose offsite. Other remediation methods may be required.

**END OF SECTION**



**SECTION 01 45 16.32**

**CONTRACTOR'S QUALITY CONTROL**

**PART 1 - GENERAL**

**1.1 SUMMARY**

- A. Section Includes
  - 1. Measurement and Payment
  - 2. Quality Assurance/Control of Installation
  - 3. References
  - 4. Manufacturer's Field Services and Reports
- B. Related Specification Sections include but are not necessarily limited to:
  - 1. Division 00 – Bidding Requirements, Contract Forms, and Conditions of the Contract.
  - 2. Division 01 – General Requirements.

**1.2 MEASUREMENT AND PAYMENT**

- A. No separate payment will be made for this item. Include the cost in associated items for this project.

**1.3 SUBMITTALS (NOT USED)**

**1.4 QUALITY ASSURANCE/CONTROL OF INSTALLATION**

- A. Monitor quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce Work of specified quality at no additional cost to the Owner.
- B. Comply fully with manufacturers' installation instructions, including each step in sequence.
- C. Request clarification Owner's Representative before proceeding when manufacturers' instructions conflict with Contract.
- D. Comply with specified standards as minimum requirements for Work except when more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.
- E. Perform Work by persons qualified to produce specified level of workmanship.

**1.5 REFERENCES**

- A. Obtain copies of standards and maintain at job site when required by individual Specification sections.

**1.6 MANUFACTURERS' FIELD SERVICES AND REPORTS**

- A. When specified in individual Specification sections or as required by Owner's Representative, provide material or product suppliers' or manufacturers' technical representative to observe site conditions, conditions of surfaces and installation, quality of workmanship, start-up of equipment, operator training, test, adjust and balance of equipment as applicable and to initiate operation, as required. Conform to minimum time requirements for start-up operations and operator training when defined in Specification sections.
- B. At Owner's Representative's request, submit qualifications of manufacturers' representative to Owner's Representative 15 days in advance of required representatives' services. Representative is subject to approval by Owner's Representative.
- C. A manufacturers' representative is to report observations and site decisions or instructions given to applicators or installers that are supplemental or contrary to a manufacturer's written instructions. Submit report within 14 days of observation to Owner's Representative for review.

**PART 2 - PRODUCTS (NOT USED)**

**PART 3 - EXECUTION (NOT USED)**

**END OF SECTION**

**SECTION 01 45 29**  
TESTING LABORATORY SERVICES

**PART 1 - GENERAL**

**1.1 SUMMARY**

A. Section Includes:

1. Testing laboratory services
2. Requirements of this section apply to testing laboratories employed by the Contractor for approval of manufactured products, materials, including mix designs and quality control of materials
3. Requirements of this section also apply to testing laboratories employed by the Owner for approval of materials and the constructed Work on site.

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

1. Division 00 – Proposing Requirements, Contract Forms, and Conditions of the Contract.
2. Division 01 – General Requirements.

**1.2 MEASUREMENT AND PAYMENT**

A. No separate payment will be made for this item. Include the cost in associated items for this project.

**1.3 QUALITY ASSURANCE**

A. Reference Standards

1. ASTM C 1077 – Standard Practice for Laboratories Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Laboratory Evaluation.
2. ASTM D 3666 – Standard Specification for Minimum Requirements for Agencies Testing and Inspecting Bituminous Paving Materials.
3. ASTM D 3740 – Standard Practice for Minimum Requirements for Agencies Engaged in the Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction
4. ASTM E 329 – Standard Specification for Minimum Requirements for Agencies Engaged the Testing and/or Inspection of Materials Used in Construction.
5. ISO/IEC 17025 – General Requirements for the Competence of Calibration and Testing Laboratories.

**1.4 RELATED REQUIREMENTS**

A. To test products and materials and provide certifications as identified in Part 2

- Products, in the individual Specification sections, the Contractor shall either
1. Select, employ and pay for services of an independent testing laboratory or laboratories, or
  2. Cause its suppliers to perform required inspection and testing using an independent testing laboratory or a qualified in-house laboratory.
- B. Owner's Representative may, at its option, observe or witness any and all testing of materials and products which are to be utilized in the construction of the Work as they are being tested by the Contractor's laboratories.
- C. Owner will select, employ, and pay for services of an independent testing laboratory to perform inspection and testing identified in Part 3 of individual Specification sections.
- D. Employ and pay for services of independent testing laboratory or laboratories to perform inspection and testing identified in Part 2 of individual Specification sections.
- E. Employment of testing laboratory by Owner does not relieve the Contractor of obligation to perform the Work in accordance with requirements of Contract Documents.
- F. Owner's Representative schedules and monitors Owner's testing laboratory. Provide minimum 24 hours notice of testing to Owner's Representative to avoid delay of the Work.

### **1.5 QUALIFICATION OF LABORATORY**

- A. Meet laboratory qualification requirements of ASTM E 329 and applicable requirements of ASTM C 1077, ASTM D 3666, and ASTM D 3740.
- B. Meet ISO/IEC 17025 conditions for accreditation by the American Association for Laboratory Accreditation (A2LA) in specific fields of testing required in individual Specification sections.
- C. If laboratory subcontracts are part of testing services, such work will be placed with laboratory complying with requirements of this Section.

### **1.6 LABORATORY**

- A. Owner's testing laboratory will provide and distribute copies of laboratory reports to the distribution list provided by Owner's Representative at the preconstruction conference. Distribution will include download to the Owner's electronic document management system (SharePoint) for the Project.
- B. Keep one copy of each laboratory report at site field office for duration of project.
- C. Contractor's testing laboratory will provide and distribute copies of laboratory test reports for materials to be incorporated into this Work to the distribution list provided by Owner's Representative at the preconstruction conference.

Distribution will include download to the Owners electronic document management system (SharePoint) for the Project

- D. Laboratories will email material supplier, Contractor, and Owner's Representative no later than close of business on working day following test completion and review, reports which indicate failing test results.

### **1.7 LIMITS ON TESTING LABORATORY AUTHORITY**

- A. Laboratory may not release, revoke, alter, or enlarge requirements of Contract.
- B. Laboratory may not approve or accept any portion of the Work.
- C. Laboratory may not assume duties of Contractor or the Owner
- D. Laboratory has no authority to stop the Work.

### **1.8 SUBMITTALS (NOT USED)**

### **1.9 CONTRACTOR RESPONSIBILITIES**

- A. Provide safe access to the Work and to manufacturer's facilities for Owner's Representative, and for testing laboratory personnel.
- B. Provide testing laboratory with copy of construction schedule and copy of each update to construction schedule.
- C. Notify Owner's Representative and testing laboratory during normal working hours of the day previous to expected time for operations requiring inspection and testing services. When Contractor fails to make timely prior notification, then do not proceed with operations requiring inspection and testing services.
- D. Notify Owner's Representative 24 hours in advance when Specification requires presence of Owner's Representative for sampling or testing.
- E. Request and monitor testing as required to provide timely results and avoid delay to the Work. Where specified, provide samples to laboratory in sufficient time to allow required test to be performed in accordance with specified test methods before intended use of material.
- F. Cooperate with laboratory personnel in collecting samples on site. Provide incidental labor and facilities for safe access to the Work to be tested; to obtain and handle samples at site or at source of products to be tested; and to facilitate tests and inspections including storage and curing of test samples.
- G. Arrange with laboratory through Owner's Representative. Payment for additional testing will be made in accordance with Document 00 72 00 - General Conditions of the Contract:
  - 1. Retesting required for failed tests
  - 2. Retesting for nonconforming Work
  - 3. Additional sampling and tests requested beyond specified requirements
  - 4. Insufficient notification of cancellation of tests for Work scheduled but not performed.

**PART 2 - PRODUCTS (NOT USED)**

**PART 3 - EXECUTION**

**3.1 CONDUCTING TESTING**

- A. Conform laboratory sampling and testing specified in individual Specification sections to latest issues of ASTM standards, TxDOT methods, or other recognized test standards as approved by Owner's Representative.
- B. Requirements of this section also apply to those tests for approval of materials, for mix designs and for quality control of materials as performed by employed testing laboratories.

**END OF SECTION**

**SECTION 01 55 26**  
**TRAFFIC CONTROL**

**PART 1 - GENERAL**

**1.1 SUMMARY**

- A. Section includes traffic control requirements for signs, signals, control devices, flares, lights, as well as construction parking control, English-speaking flagpersons, peace officers, designated haul routes and bridging of trenches and excavations.
- B. Related Specification Sections include but are not necessarily limited to:
  - 1. Division 00 – Proposing Requirements, Contract Forms, and Conditions of the Contract.
  - 2. Division 01 – General Requirements.

**1.2 MEASUREMENT AND PAYMENT**

- A. Traffic Control and Regulation. Measurement is on a lump sum basis for traffic control and regulation, including submittal of traffic control plan if different from plan shown on Drawings, provision of traffic control devices, and provision of equipment and personnel as necessary to protect Work and public. Amount invoiced shall be based on Schedule of Values submitted for traffic control and regulation.

**1.3 SUBMITTALS**

- A. Conform to requirements of Section 01 33 00 – Submittals.
- B. Traffic control plan responsive to the current Texas Manual on Uniform Traffic Control Devices (TMUTCD) sealed by Registered Professional Engineer is incorporated into Drawings. If Contractor proposes to implement traffic control without modification to plan provided, submit a letter confirming decision. If Contractor proposes to implement traffic control different than plan provided, submit a traffic control plan in conformance with TMUTCD sealed by Registered Professional Engineer.
- C. Submit copies of approved lane closure permits.
- D. For both traffic control plan and flagperson use, submit Schedules of values within 30 days following notice to proceed. Refer to Section 01 29 73 – Schedule of Values.
- E. Provide information and records regarding use of qualified flagmen to verify use of “peace officers” as flagmen in compliance with Contract and Texas law, including but not limited to, Article 4413 (29bb), commonly referred to as Private Investigators and Private Security Agencies Act, and Article 2.12, Texas Code of Criminal Procedure.

- F. Provide information and records regarding use of qualified flagmen to verify Contractor's use of "certified flagmen" as flagmen is in compliance with Contract.

#### **1.4 FLAGMEN**

- A. Use flagmen, qualified as described under Paragraph 1.4.B, Uniformed Peace Officers, and Paragraph 1.4.C, Certified Flagmen, to control, regulate, and direct even flow and movement of vehicular and pedestrian traffic when construction operations encroach on public traffic lanes.
- B. Uniformed Peace Officer: Individual who has full-time employment as peace officer and receives compensation as flagman for private employment as individual employee or independent contractor. Private employment may be either employee-employer relationship or on an individual basis. Flagman may not be in employ of another peace officer and may not be a reserve peace officer.
  - 1. Peace officer is defined as:
    - a. Sheriffs and their deputies
    - b. Constables and deputy constables
    - c. Marshals or police officers of an incorporated city, town, or village
    - d. As otherwise provided by Article 2.12, Texas Code of Criminal Procedure, as amended
  - 2. Individual who has full-time employment as a peace officer is one who is actively employed in a full-time capacity as a peace officer working, on average, a minimum of 32 paid hours per week, being paid a rate of pay not less than prevailing minimum hourly wage rate set by federal Wage and Hour Act and entitled to full benefits of participation in retirement plan, vacation, holidays, and insurance benefits. A reserve peace officer does not qualify, under this definition, as a peace officer.
- C. Certified Flagman: Individual who receives compensation as flagman and meets the following qualifications and requirements:
  - 1. Formally trained and certified in traffic control procedures.
  - 2. Required to wear distinctive uniform, bright-colored vest, and be equipped with appropriate flagging and communication devices
  - 3. English speaking, with Spanish as advantageous, but not required, primary, or secondary language.
  - 4. Paid as Certified Flagman, equivalent to hourly wage rate set for Rough Carpenter under Specification Section 00 73 43 – Wage Scale for Construction.
  - 5. Required to carry proof of training/certification and photographic identification card issued by training institute to allow Owner's Representative to easily determine necessary full-time traffic control is



actually provided when and where construction work encroaches upon traffic lanes.

## **PART 2 - PRODUCTS**

### **2.1 SIGNS, SIGNALS, AND DEVICES**

- A. Comply with Texas State Manual on Uniform Traffic Control Devices.
- B. Traffic Barriers, Cones and Drums, Flares and Lights: As approved by local jurisdictions.

## **PART 3 - EXECUTION**

### **3.1 PUBLIC ROADS**

- A. Abide by laws and regulations of governing authorities when using public roads. If Work requires public roads be temporarily impeded or closed, obtain approvals from governing authorities and pay permits before starting any Work. Coordinate activities with Owner's Representative.
- B. Maintain 10-foot-wide, all-weather lane adjacent to Work areas for use of emergency vehicles. Keep all-weather lane free of construction equipment and debris.
- C. Cover or remove the permanent signs and construction signs that are incorrect or that do not apply to the current situation for a particular phase. Do not mount signs on drums or barricades, except those listed in the latest Barricades and Construction standard sheets.
- D. Place positive barriers to protect drop-off conditions greater than 1 FT within the clear zones that remain overnight.
- E. Construction activities not to obstruct normal flow of traffic from 6:00 a.m. to 8:00 a.m. and 5:00 p.m. to 6:30 p.m. on designated major arterials or as directed by the Owner.
- F. Maintain local driveway access to residential and commercial properties adjacent to Work areas at all times. Use all-weather materials as approved by Owner's Representative when maintaining temporary driveway access to commercial and residential driveways.
- G. Cleanliness of Surrounding Streets: Keep streets used for entering and leaving job area free of excavated material, debris, and foreign material resulting from construction operations.
- H. Provide Owner's Representative 1-week notice prior to implementing each approved traffic control phase.
- I. Notify local schools, churches, bus lines, police department, commercial businesses, and fire department in writing of construction a minimum of 5 working days prior to beginning Work.
- J. Remove existing signing and striping that are in conflict with construction activities or may cause driver confusion.

- K. Provide safe access for pedestrians along major cross streets.
- L. Alternate closures of cross streets so that two adjacent cross streets are not closed simultaneously.
- M. Do not close more than two consecutive esplanade openings at a time without prior approval by Owner's Representative.

### **3.2 CONSTRUCTION PARKING CONTROL AND ACCESS**

- A. Control vehicular parking to prevent interference with public traffic and parking, and access by emergency vehicles.
- B. Monitor parking of construction personnel's vehicles in existing facilities. Maintain vehicular access to and through parking areas.
- C. Prevent parking on or adjacent to access roads or in non-designated areas.
- D. Contractor and all personnel shall not utilize adjacent private driveways for access to project site unless Contractor receives written approval from landowner(s).

### **3.3 FLARES AND LIGHTS**

- A. Provide flares and lights during hours of low visibility to delineate traffic lanes and to guide traffic.

### **3.4 HAUL ROUTES**

- A. Utilize haul routes designated by authorities or shown on Drawings for construction traffic.
- B. Confine construction traffic to designated haul routes.
- C. Provide traffic control at critical areas of haul routes to regulate traffic and minimize interference with public traffic.

### **3.5 TRAFFIC SIGNS AND SIGNALS**

- A. Construct necessary traffic control devices for temporary signals including but not limited to loop detectors, traffic signal conduits, traffic signal wiring, and crosswalk signals required to complete Work. Notify, a minimum of 60 days in advance, the agency concerning control boxes and switchgear. The agency will perform service, programming, or adjustments, to signal boxes and switchgear should this work be required during construction.
- B. Install and operate traffic control signals to direct and maintain orderly flow of traffic in areas under Contractor's control and areas affected by Contractor's operations. Establish notices, signs, and traffic controls before moving into next phase of traffic control.
- C. Relocate traffic signs and signals as Work progresses to maintain effective traffic control.
- D. Unless otherwise approved by Owner's Representative, provide driveway signs with name of business that can be accessed from particular cross-over. Use two signs for each cross-over.

- E. Replace existing traffic control devices in project area.
- F. Owner's Representative may direct Contractor to make minor traffic control sign adjustments to eliminate driver confusion and maintain traffic safety during construction at no additional payment.

### **3.6 BRIDGING TRENCHES AND EXCAVATIONS**

- A. Whenever necessary, bridge trenches and excavation to permit an unobstructed flow of traffic. Provide steel plates that can be laid across construction areas and major drives of commercial businesses.
- B. Secure bridging against displacement by using adjustable cleats, angles, bolts, or other devices whenever bridge is installed:
  - 1. On existing bus route.
  - 2. When more than 5 percent of daily traffic is comprised of commercial or truck traffic.
  - 3. When more than two separate plates are used for bridge.
  - 4. When bridge is to be used for more than 5 consecutive days.
- C. Install bridging to operate with minimum noise.
- D. Adequately shore trench or excavation to support bridge and traffic.
- E. Extend steel plates used for bridging a minimum of 1 foot beyond edges of trench or excavation. Use temporary paving materials (premix) to feather edges of plates to minimize wheel impact on secured bridging.
- F. Use steel plates of sufficient thickness to support H-20 loading, truck or lane, that produces maximum stress.

### **3.7 REMOVAL**

- A. Remove equipment and devices when no longer required.
- B. Repair damage caused by installation.
- C. Remove post settings to a depth of 2 feet.

### **3.8 TRAFFIC CONTROL, REGULATION, AND DIRECTION**

- A. Use flagmen to control, regulate, and direct even flow and movement of vehicular and pedestrian traffic including but not limited to the following conditions:
  - 1. Where multi-lane vehicular traffic must be diverted into single lane vehicular traffic
  - 2. Where vehicular traffic must change lanes abruptly
  - 3. Where construction equipment must enter or cross vehicular traffic lanes and walks
  - 4. Where construction equipment may intermittently encroach on vehicular traffic lanes and unprotected walks and crosswalks

5. Where traffic regulation is needed due to rerouting of vehicular traffic around Work site.
  6. Other areas of Work where construction activities might affect public safety and convenience.
- B. Use and maintain flagmen at points for periods of time as may be required to provide for public safety and convenience of travel.
- C. Use of flagmen is for purpose of assisting in regulation of traffic flow and movement and does not relieve Contractor of full responsibility for taking other steps and providing other flaggers or personnel as Contractor may deem necessary to protect Work and public.

### **3.9 INSTALLATION STANDARDS**

- A. Work in other phases shall be permitted, provided 1) phases are not continuous to one work is being done in presently, 2) installation of utility occurs in only one phase. Keep work and operation in second phase to an absolute minimum. Perform work in no more than two phases at a time. Authorization to perform work in second phase shall not relieve any responsibility of completing backfilling and paving operations in accordance with Contract.
- B. Place temporary pavement with a single lane closure, in accordance with TMUTCD.
- C. Reinstall temporary and permanent pavement markings as directed by Owner's Representative. Alternative markings shall be considered when marking manufacturer's weather conditions cannot be met. These alternatives are to be submitted and approved by Owner's Representative prior to installation. No extra payment will be made for use of alternative markings.

### **3.10 MAINTENANCE OF EQUIPMENT AND MATERIAL**

- A. Designate individual to be responsible for maintenance of traffic handling around construction area. Individual must be accessible at all times to immediately correct any deficiencies in equipment and materials used to handle traffic including missing, damaged, or obscured signs, drums, barricades, or pavement markings. Give name, address, and telephone number of designated individual to Owner's Representative.
- B. Make daily inspections of signs, barricades, drums, lamps, and temporary pavement markings to verify that these are visible, in good working order, and conform with traffic handling plans and directions of Owner's Representative. When not in compliance, immediately bring equipment and materials into compliance by replacement, repair, cleaning, relocation, and realignment.
- C. Keep equipment and materials, especially signs and pavement markings, clean and free of dust, dirt, grime, oil, mud, or debris.
- D. Owner's Representative shall decide if damaged or vandalized signs, drums, and barricades can be reused.

### **END OF SECTION**

**SECTION 01 56 39**

**TEMPORARY TREE AND PLANT PROTECTION**

**PART 1 - GENERAL**

**1.1 SUMMARY**

- A. Section includes requirements for tree and plant protection.
- B. Related Specification Sections include but are not necessarily limited to:
  - 1. Division 00 – Proposal Requirements, Contract Forms, and Conditions of the Contract.
  - 2. Division 01 – General Requirements.

**1.2 MEASUREMENT AND PAYMENT**

- A. Stipulated Price (Lump Sum). If Contract is Stipulated Price Contract, payment for work in this Section is included in total Stipulated Price.

**1.3 SUBMITTALS**

- A. Conform to requirements of Specification Section 01 33 00 – Submittals.
- B. Submit name and experience of qualified Arborist to Owner's Representative.

**1.4 PROJECT CONDITIONS WHEN TREES AND PLANTS ARE IDENTIFIED TO REMAIN**

- A. Preserve and protect existing trees and plants from foliage, branch, trunk, or root damage that could result from construction operations when trees and plants are identified to remain.
- B. Do not allow any vehicular traffic, construction equipment, parking of vehicles or stockpiling of excavated material or construction materials within protected tree root zone areas. Refer to Section 1.6 DEFINITIONS, for Dripline/Root Zone Area definition.
- C. Prevent the following types of damage:
  - 1. Compaction of root zone area by equipment, vehicles, foot traffic or materials storage.
  - 2. Suffocating roots by placing soil in excess of three inches (3") within root zone areas, including placement of any select fill or soil with high clay content.
  - 3. Trunk and limb damage resulting from contact with equipment and vehicles.
  - 4. Poisoning by pouring solvents, fuel, and other injurious materials on or near root zone areas or in areas where such materials will leak or wash into root zone areas.
  - 5. Changing soil pH within root zones by depositing concrete, powdered lime or other materials used to stabilize or dehydrate soils.

6. Cutting roots measuring one inch (1") in diameter and larger within protected areas unless required for root pruning.
7. Scorching of foliage, twigs and limbs caused by direct contact with expulsion of hot exhaust from equipment or vehicles.
8. Branch damage due to improper pruning or trimming.
9. Damage from permanently altering drainage patterns near root zones.
10. Trunk and branch damage resulting from nailing or bolting.

### **1.5 DAMAGE ASSESSMENT**

- A. When trees other than those designated for removal are destroyed or badly damaged as result of construction operations, remove and replace with same size, species, and variety up to and including 8 inches in trunk diameter. Any tree larger than 8 inches in diameter shall be replaced with 8-inch diameter tree of same species and variety and total contract amount shall be reduced by amount determined from following International Shade Tree Conference formula:  $0.7854 \times D^2 \times \$38.00$  where D is diameter in inches of tree or shrub trunk measured 12 inches above grade.

### **1.6 DEFINITIONS**

- A. Dripline/Root Zone Area - The ground area delineated by the branch spread of a single plant or group of plants. This area is considered the most critical area of roots and should be protected, excluding the area within the street located between curbs.
- B. Zero Curb Cut - The process in which required street work is conducted without cutting or otherwise disturbing soil located immediately behind the existing curb.

## **PART 2 - PRODUCTS**

### **2.1 MATERIALS**

- A. Protection Fencing - Orange, plastic mesh fencing, four feet (4') in height with six feet (6') high steel T-bar posts. Set posts eighteen inches (18") into ground. Stretch fencing material taut prior to securing.
- B. Fertilizer - A low salt, slow release fertilizer containing twenty-seven percent (27%) nitrogen, nine percent (9%) phosphorus and nine percent (9%) potassium (potash) or similar.
- C. Plastic Vapor Barrier - Polyethylene sheeting at least 6-mil thickness and three feet width to prevent leaching of stabilized material into native soil.
- D. Tree Replacements - Shall be as approved by Owner's Representative as necessary.

## **PART 3 - EXECUTION**

### **3.1 PROTECTION AND MAINTENANCE OF EXISTING TREES AND SHRUBS**

- A. Except for trees shown on Drawings or determined by Owner's Representative to be removed or relocated, trees within Project area are to remain in place, protected from damage and maintained by Contractor.
- B. If required by the Project specifications, employ a qualified Arborist. The Arborist must be approved by Owner's Representative and shall have a minimum of 5 (five) years of experience in the field of tree protection.
- C. Perform the following services as required by construction activities for trees that remain:
  1. Trimming
    - a. Trees shall be pruned in accordance ANSI A300 (Part 1) - 2001 Pruning Revision of ANSI A300-1995 Tree, Shrub and Other Woody Plant Maintenance - Standard Practices. Pruning shall be done by a professional arborist who has received training in proper pruning techniques.
    - b. Pruning shall not alter the natural shape or character of the tree or leave holes in the canopy. Trees and shrubs should be pruned for balance as well as to maintain proper form and branching habit.
    - c. Cut limbs at branch collar. No stubs should remain on trees. Branch cuts should not gouge outer layer of tree structure or trunk.
  2. Root Pruning
    - a. When excavating with equipment within the root zone area is unavoidable and roots cannot be preserved, root prune prior to excavation to minimize damage to the portion of the root system that will remain.
    - b. Prune roots using a conventional trenching machine. Trench along the proposed edge of excavation limits to a depth of three feet (3'). Do not allow ripping of roots with a backhoe or other equipment.
    - c. Following trenching with the machine, re-cut roots measuring one inch (1") in diameter and larger using appropriate sharpened, pruning shears or pruning saws to make a clean, smooth-cut surface. Cut roots flush with edge of soil to limit root exposure.
    - d. Backfill trench in a manner that will not allow settling using clean, native soil.
  3. Fertilizing and Watering
    - a. Trees should be fertilized in accordance with the American National Standard for tree fertilization ANSI A300 (Part 2) - 1998 Tree, Shrub and Other Woody Plant Maintenance - Standard Practices (Fertilization).
    - b. Deep root fertilize all trees that have received disturbance or damage to their root zone area.
    - c. Fertilize entire root zone area within the dripline of the tree and continue ten feet (10') beyond the dripline.

- d. Mixture shall be injected into the top ten inches (10") of soil, under pressure of one hundred and fifty pounds per square inch (150 psi) to two hundred pounds per square inch (200 psi). Mix and apply per product label instructions.
  - e. Inject one-half gallon (1/2) of solution at a depth of ten inches (10") on spacing of three feet (3') between injection points.
  - f. Fertilizer shall be mixed in a tank with mechanical agitation.
  - g. Fertilizer to be added to tank and mixed on site.
  - h. During periods of inadequate rainfall, water trees once weekly to saturate soil to a depth of six inches (6") to eight inches (8") within root zones. Allow soils to dry between watering. Do not allow soils to remain wet.
4. Water areas currently being served by private sprinkler systems to maintain health of existing landscapes if the affected systems are temporarily taken out of service due to construction activities.
  5. Contractor's option with Owner's Representative's permission, shrubs to remain may be temporarily transplanted and returned to original positions under supervision of professional horticulturist.

## **3.2 PROTECTION**

### **A. Construction Methods**

#### **1. General**

- a. Contractor shall attend a pre-construction meeting conducted by the Owner's Representative to review tree preservation requirements and sequence of services for the construction process.
- b. Protect tree limbs, trunks and foliage from direct exposure to hot exhaust from equipment and vehicles by providing adequate exhaust pipe deflectors.
- c. Cover exposed roots within 24 hours to reduce damage caused by desiccation. Roots may be covered with soil or mulch to help protect them from drying.
- d. Protect root zone areas from damage that may result from soil compaction or from noxious materials in solution caused by run-off or spillage during mixing and placement of construction materials, or drainage from stored materials.
- e. Minimize cut to two inches (2") below grade when installing silt fence within tree root zones or anchor base of fabric on grade using gravel or staples. Do not cut roots 1" in diameter or larger.
- f. Site preparation work and/or construction work shall not begin in any area where tree preservation measures have not been completed and approved by the Owner's Representative.



2. Preparation

- a. Contractor shall not allow any vehicular traffic, parking of vehicles or stockpiling of excavated material or construction material within the root zone area of trees to be preserved.
- b. When access within protected root zone areas by equipment traffic or frequent foot traffic cannot be avoided, contact Owner's Representative for review prior to entrance. Place a three-quarter inch (3/4") thick layer of plywood over an 8-inch layer of bark mulch within root zones to minimize soil compaction. Overlap edges of plywood by six inches (6") to twelve inches (12") to ensure adequate coverage. This is not acceptable bridging for driving over exposed tree roots. Exposed roots should not be driven over.
- c. Contractor shall notify Owner's Representative if existing tree locations differ from locations represented on construction drawings. The tree location and dripline/root zone area as observed in the field shall supersede that outlined on construction plans.

3. Tree Protection Fencing

- a. Each tree located adjacent to proposed soil excavation shall be protected with a tree protection fence or as designated on the plans. Fence locations shall be approved by Owner's Representative.
- b. Contractor shall not remove or relocate tree protection fencing and shall not operate within the limits shown without approval of the Owner's Representative.
- c. Fences shall be placed in continuous alignment to protect a tree or group of trees.
- d. Posts shall be installed on eight-foot (8') centers at eighteen inches (18") below grade. The fencing shall be continuous between posts, shall be pulled taut prior to securing to posts, and shall be firmly attached to the posts with a minimum of three (3) wire ties.
- e. Place fencing in a manner that will not obstruct traffic site lines at curbs, intersections or driveways.
- f. Fencing shall be removed only after all work within the immediate area is complete.
- g. Contractor shall immediately repair fences if damage occurs at no additional charge to Owner.

4. Excavation within Root Zone Areas

- a. For excavation within root zone areas, where required for personal safety, provide excavation protection by using vertical-wall-shoring techniques at excavations to minimize excavation width. Do not bench cut or step cut edge where such techniques will encroach on root zone areas.

- b. If roots are encountered and must be severed, roots measuring one inch (1") in diameter and larger shall be cut using a sharpened pruning instrument to leave a smooth, clean-cut surface.
5. Zero Curb Cut and Vapor Barrier Installation
  - a. Where existing curb is to be removed within tree root zone areas, do not disturb soil immediately back of curb. Do not allow forms and stakes to disturb roots.
  - b. A vapor barrier shall be installed to provide a non-leaching barrier between any stabilized material and/or concrete and tree roots and soils.
  - c. Vapor barrier shall be installed vertically to a depth of five inches (5") below limits of stabilized material. Vapor barrier to be extended ten inches (10") above natural grade and ten feet (10') beyond the dripline limits of the tree. Trim vertical vapor barrier to approximately one inch (1") above grade after installation of final grade.
6. Boring/Tunneling
  - a. In areas indicated, bore under root systems of trees at a minimum depth of four feet (4') from the top of pipe to the soil surface at natural grade.
  - b. Bore pits and receiving pits shall be located outside of protected root zone areas.
  - c. Equipment and material shall be positioned outside of protected root zone areas. When access within protected root zone area by equipment traffic or frequent foot traffic cannot be avoided, place a three-quarter inch (3/4") thick layer of plywood on natural grade within root zones to minimize soil compaction, refer to Section 3. 2, A, 2.
7. Trunk Barricading
  - a. Install trunk barricading to protect trees in close proximity of moving or mechanical equipment and construction work when work is required within the tree protection fencing as shown on the plans.
  - b. Place trunk barricading around entire tree trunks to protect tree trunks located within five feet (5') of construction activities.
  - c. Install 2x4's or 2x6's (5-foot to 6-foot lengths) spaced 3 inches (3") apart around the circumference of the tree trunk.
  - d. Tie in place with 9 to 12 gauge steel wire.
- B. Sequence of Tree Protection and Services
  1. Fertilize trees affected by construction between the months of October and May.
  2. Prune/trim trees for clearance and safety.
  3. Root Prune trees.

4. Place tree protection fence and trunk barricades to protect trees. Place fencing prior to any construction activities.
5. Remove tree protection upon completion of project.

**C. Existing Stressed and Declining Trees**

1. Prior to beginning the construction phase, trees located within the right-of-way should be reviewed and trees that appear to be stressed or declining in health should be documented. Immediately notify the Owner's Representative of any dead and dying trees.

**D. Accidental Spills of Toxic Materials**

1. Concrete, lime or other chemicals placed or accidentally spilled within root zone protection areas shall be completely removed. Contaminated soil shall be completely removed at the time of the spill and removed by hand shovel. Fresh soil shall be added as necessary to bring the soil level to that of natural grade.

**3.3 MAINTENANCE OF NEWLY PLANTED TREES AND REPLANTED TREES**

- A. Show proof of capacity to water during dry periods.
- B. Guarantee trees planted for this Project shall remain alive and healthy at least until end of 1-year warranty period.
  1. Within 4 weeks' notice from Owner's Representative, replace dead trees or trees that in opinion of Owner's Representative have become unhealthy, unsightly or have lost their natural shape as result of additional growth, improper pruning, maintenance or weather conditions.
  2. When tree must be replaced, guarantee period begins on date of tree replacement, subject to Owner's Representative's inspection, for no less than 1 year.
  3. Straighten leaning trees and bear entire cost.
  4. Dispose of trees rejected by Owner's Representative and bear entire cost.

**END OF SECTION**

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**SECTION 01 57 13.01**  
TPDES REQUIREMENTS

**PART 1 - GENERAL**

**1.1 SUMMARY**

A. Section Includes:

Preparation of Storm Water Pollution Prevention Plan and notifications to TCEQ.

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

1. Division 00 – Bidding Requirements, Contract Forms, and Conditions of the Contract.
2. Division 01 – General Requirements.

**1.2 MEASUREMENT AND PAYMENT**

A. Stipulated Price (Lump Sum). If Contract is a Stipulated Price Contract, payment for Work in this Section is included in total Stipulated Price.

**1.3 DEFINITIONS**

A. Commencement of Construction Activities: The exposure of soil resulting from activities such as clearing, grading, and excavating.

B. Large Construction Activity: Project that:

1. Disturbs 5 acres or more, or
2. Disturbs less than 5 acres but is part of a larger common plan of development that will disturb 5 acres or more of land.

C. Small Construction Activity: Project that:

1. Disturbs 1 or more acres but less than 5 acres, or
2. Disturbs less than 1 acre but is part of a larger common plan of development that will ultimately disturb 1 or more acres but less than 5 acres.

D. TPDES Operator:

1. The person or persons who have day-to-day operational control of the construction activities which are necessary to ensure compliance with the SWP3 for the site or other Construction General Permit conditions.

**1.4 SUBMITTALS (NOT USED)**

**PART 2 - PRODUCTS (NOT USED)**

**PART 3 - EXECUTION**

**3.1 SITE SPECIFIC STORM WATER POLLUTION PREVENTION PLAN (SWP3)**

- A. Prepare a SWP3 following Part III of the Construction General Permit.
- B. Update or revise the SWP3 as needed during the construction following Part III, Section E of the Construction General Permit.
- C. Submit the SWP3 and any updates or revisions to Owner's Representative for review and address comments prior to commencing, or continuing, construction activities.

**3.2 NOTICE OF INTENT FOR LARGE CONSTRUCTION ACTIVITY**

- A. Fill out, sign, and date TCEQ Form 20022 (3/5/2008) Notice of Intent (NOI) for Storm Water Discharges Associated with Construction Activity under the TPDES Construction General Permit (TXR150000), **ATTACHMENT 1** of this Section 01 57 13.01 – TPDES Requirements.
- B. Submit the Notice of Intent by one of the following methods:
  - 1. Submit online at TCEQ ePermits ([www6.tceq.state.tx.us/steers](http://www6.tceq.state.tx.us/steers)) and pay the \$225 application fee. Transmit a copy of the electronic certificate provided by TCEQ to Owner's Representative.
  - 2. Send a \$325 check and completed TCEQ Form 20022 (3/5/2008) to the Texas Commission on Environmental Quality. Transmit a copy of the check and completed form to Owner's Representative.
- C. Owner will complete a separate Owner's copy of TCEQ Form 20022 (3/5/2008) for NOI, and will submit Notice, along with application fee, to the TCEQ.
- D. Submission of the Notice of Intent form by Contractor to TCEQ is required a minimum of 7 days before Commencement of Construction Activities.

**3.3 CONSTRUCTION SITE NOTICE FOR SMALL CONSTRUCTION ACTIVITY**

- A. Fill out, sign, and date the Construction Site Notice, Attachment 2 to TPDES General Permit TXR150000, "Construction Site Notice," **ATTACHMENT 2** of this Section 01 57 13.01 – TPDES Requirements.
- B. Transmit the signed Construction Site Notice to Owner's Representative at least 7 days prior to Commencement of Construction Activity.

**3.4 CERTIFICATION REQUIREMENTS**

- A. Fill out TPDES Operator's Information form, **ATTACHMENT 3** of this Section 01 57 13.01 – TPDES Requirements, including Contractor's name, address, and telephone number and the names of persons or firms responsible for maintenance and inspection of erosion and sediment control measures. Use multiple copies as required to document full information.
- B. Contractor and Subcontractors shall sign and date the Contactor's/Subcontractor's Certification for TPDES Permitting, **ATTACHMENT**

4 of this Section 01 57 13.01 – TPDES Requirements. Include this certification with other Project certification forms.

- C. Submit properly completed certification forms to Owner's Representative for review before beginning construction operations.
- D. Conduct inspections in accordance with TCEQ requirements. Ensure persons or firms responsible for maintenance and inspection of erosion and sediment control measures read, fill out, sign, and date the Erosion Control Contractor's Certification for Inspection and Maintenance. Use the EPA NPDES Construction Inspection Form, **ATTACHMENT 5** of this Section 01 57 13.01 – TPDES Requirements; to record maintenance inspections and repairs.

### **3.5 RETENTION OF RECORDS**

- A. Keep a copy of this document and the SWP3 in a readily accessible location at the construction site from Commencement of Construction Activity until submission of the Notice of Termination (NOT) for Storm Water Discharges Associated with Construction Activity under TPDES Construction General Permit (TXR150000). Contractors with day-to-day operational control over SWP3 implementation shall have a copy of the SWP3 available at a central location, on-site, for the use of all operators and those identified as having responsibilities under the SWP3. Upon submission of the NOT, submit all required forms and a copy of the SWP3 with all revisions to Owner's Representative.

### **3.6 REQUIRED NOTICES**

- A. Post the following notices from the effective date of the SWP3 until the date of final site stabilization as defined in the Construction General Permit:
  - 1. Post the TPDES permit number for Large Construction Activity, or a signed TCEQ Construction Site Notice for Small Construction Activity. Signed copies of the Contractor's NOI must also be posted.
  - 2. Post notices near the main entrance of the construction site in a prominent place for public viewing. Post name and telephone number of Contractor's local contact person, brief project description and location of the SWP3.
    - a. If posting near a main entrance is not feasible due to safety concerns, coordinate posting of notice with Owner's Representative to conform to requirements of the Construction General Permit.
    - b. If Project is a linear construction project (e.g., road, utilities, etc.), post notice in a publicly accessible location near active construction. Move notice as necessary.
  - 3. Post a notice to equipment and vehicles operators, instructing them to stop, check, and clean tires of debris and mud before driving onto traffic lanes. Post at each stabilized construction exit area.
  - 4. Post a notice of waste disposal procedures in a readily visible location on site.

### **3.7 ON-SITE WASTE MATERIAL STORAGE**

- A. On-site waste material storage shall be self-contained and shall satisfy appropriate local, state, and federal rules and regulations.
- B. Prepare list of waste material to be stored on-site. Update list as necessary to include up-to-date information. Keep a copy of updated list with the SWP3.
- C. Prepare description of controls to reduce pollutants generate from on-site storage. Include storage practices necessary to minimize exposure of materials to storm water, and spill prevention and response measures consistent with best management practices. Keep a copy of the description with the SWP3.



### **3.8 NOTICE OF TERMINATION**

- A. Submit a N.O.T., **ATTACHMENT 6** of this Section 01 57 13.01 – TPDES Requirements, to Owner’s Representative within 10 days after:
  - 1. Final stabilization has been achieved on all portions of the site that are the responsibility of the Contractor; or
  - 2. Another operator has assumed control over all areas of the site that have not been stabilized; and
  - 3. All silt fences and other temporary erosion controls have either been removed scheduled to be removed as defined in the SWP3, or transferred to a new operator, if the new operator has sought permit coverage.
- B. Owner’s Representative will complete NOT and submit Contractor’s notices to the TCEQ and MS4 entities.

**END OF SECTION**



**ATTACHMENT 1**

	<p><b>Notice of Intent (NOI) for Storm Water Discharges Associated with Construction Activity under TPDES General Permit (TXR150000)</b></p>	<p><b>TCEQ Office Use Only</b>                  Permit No.: TXR15                  RN:                  CN:                  Ref No:</p>												
	<p><b>Sign up now for ePermits NOI at <a href="http://www6.tceq.state.tx.us/steers">www6.tceq.state.tx.us/steers</a></b>  <b>Get Instant Permit Coverage and only pay a \$225 application fee.</b></p> <p>If filing a paper NOI you can pay the application fee on line? Go to <a href="http://www.tceq.state.tx.us/epay">www.tceq.state.tx.us/epay</a>                  Select Fee Type: GENERAL PERMIT CONSTRUCTION STORM WATER DISCHARGE NOI APPLICATION                  If submitting a paper NOI, coverage under the general permit starts seven (7) days after the date postmarked for delivery to TCEQ.</p>	<div style="border: 1px solid black; padding: 2px; display: inline-block;"><b>Reset Form</b></div>												
<p><b>IMPORTANT:</b></p> <ul style="list-style-type: none"> <li>•Use the <b>INSTRUCTIONS</b> to fill out each question in this form.</li> <li>•Use the attached <b>CUSTOMER CHECKLIST</b> to make certain all you filled out all required information.</li> <li>•Incomplete applications <b>WILL</b> delay approval or result in <b>automatic Denial</b>.</li> </ul>														
<p><b>Renewal of General Permit</b>                  Is this NOI to renew an ACTIVE permit?</p> <p><input type="checkbox"/> Yes - What is your permit number? <b>Permit No. TXR15</b> _____</p> <p><input type="checkbox"/> No - a permit number will be issued.</p>														
<p><b>Application Fee if mailing a paper NOI:</b>                  You must pay the <b>\$325</b> Application Fee to TCEQ for the application to be considered complete.                  Payment and NOI must be mailed to separate addresses. See instructions for correct mailing addresses.</p>														
<p><b>Provide your payment information below, for us to verify payment of the application fee:</b></p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 10%;"><input type="checkbox"/> Mailed:</td> <td style="width: 30%;">Check/Money Order No.:</td> <td style="width: 60%;">Company Name on checking account:</td> </tr> <tr> <td><input type="checkbox"/> EPAY:</td> <td>Voucher No.:</td> <td>Is the Payment Voucher copy attached? <input type="checkbox"/> Yes</td> </tr> </table>			<input type="checkbox"/> Mailed:	Check/Money Order No.:	Company Name on checking account:	<input type="checkbox"/> EPAY:	Voucher No.:	Is the Payment Voucher copy attached? <input type="checkbox"/> Yes						
<input type="checkbox"/> Mailed:	Check/Money Order No.:	Company Name on checking account:												
<input type="checkbox"/> EPAY:	Voucher No.:	Is the Payment Voucher copy attached? <input type="checkbox"/> Yes												
<p><b>A. OPERATOR (applicant)</b></p>														
<p>1. If the applicant is currently a customer with TCEQ, what is the Customer Number (CN) issued to this entity?                  CN <span style="color: red;">(Search Central Registry)</span></p>														
<p>2. What is the Legal Name of the entity (applicant) applying for this permit?   <i>(The legal name must be spelled exactly as filed with the Texas Secretary of State, County, or in the legal document forming the entity.)</i></p>														
<p>3. What is the name and title of the person signing the application?  <i>(The person must be an official meeting signatory requirements in TAC 305.43(a).)</i></p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%;">Name:</td> <td style="width: 50%;">Job Title:</td> </tr> </table>			Name:	Job Title:										
Name:	Job Title:													
<p>4. What is the Operator's (applicant) mailing address as recognized by the <b>US Postal Service?</b> <span style="color: red;">(verify at <a href="http://USPS.com">USPS.com</a>)</span></p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 60%;">Address:</td> <td style="width: 40%;">Suite No./Bldg. No./Mail Code:</td> </tr> <tr> <td>City:</td> <td>State: ZIP Code:</td> </tr> <tr> <td>Country Mailing Information (if outside USA):</td> <td>Country Code: Postal Code:</td> </tr> </table>			Address:	Suite No./Bldg. No./Mail Code:	City:	State: ZIP Code:	Country Mailing Information (if outside USA):	Country Code: Postal Code:						
Address:	Suite No./Bldg. No./Mail Code:													
City:	State: ZIP Code:													
Country Mailing Information (if outside USA):	Country Code: Postal Code:													
<p>5. Phone No.: ( ) Extension:</p>														
<p>6. Fax No.: ( ) E-mail Address:</p>														
<p>7. Indicate the type of Customer:</p> <table style="width: 100%;"> <tr> <td><input type="checkbox"/> Individual</td> <td><input type="checkbox"/> Sole Proprietorship-D.B.A.</td> <td><input type="checkbox"/> Limited Partnership</td> </tr> <tr> <td><input type="checkbox"/> Corporation</td> <td><input type="checkbox"/> Federal Government</td> <td><input type="checkbox"/> General Partnership</td> </tr> <tr> <td><input type="checkbox"/> State Government</td> <td><input type="checkbox"/> County Government</td> <td><input type="checkbox"/> City Government</td> </tr> <tr> <td><input type="checkbox"/> Other Government</td> <td><input type="checkbox"/> Other (describe):</td> <td></td> </tr> </table>			<input type="checkbox"/> Individual	<input type="checkbox"/> Sole Proprietorship-D.B.A.	<input type="checkbox"/> Limited Partnership	<input type="checkbox"/> Corporation	<input type="checkbox"/> Federal Government	<input type="checkbox"/> General Partnership	<input type="checkbox"/> State Government	<input type="checkbox"/> County Government	<input type="checkbox"/> City Government	<input type="checkbox"/> Other Government	<input type="checkbox"/> Other (describe):	
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<input type="checkbox"/> State Government	<input type="checkbox"/> County Government	<input type="checkbox"/> City Government												
<input type="checkbox"/> Other Government	<input type="checkbox"/> Other (describe):													

**ATTACHMENT 1**

8. Independent Operator: <input type="checkbox"/> Yes <input type="checkbox"/> No (If governmental entity, subsidiary, or part of a larger corporation, check "No".)	
9. Number of Employees: <input type="checkbox"/> 0-20; <input type="checkbox"/> 21-100; <input type="checkbox"/> 101-250; <input type="checkbox"/> 251-500; or <input type="checkbox"/> 501 or higher	
10. Customer Business Tax and Filing Numbers <i>(This item is not applicable to Individuals, Government, GP or Sole Proprietor.)</i> <b>REQUIRED for Corporations and Limited Partnerships (Verify the entity's status and filing no. with TX SOS at 512/463-5555)</b>	
State Franchise Tax ID Number:	Federal Tax ID:
TX SOS Charter (filing) Number:	DUNS Number (if known):
<b>B. APPLICATION CONTACT</b>	
If TCEQ needs additional information regarding this application, who should be contacted?	
1. Name:	Title: Company:
2. Phone No.: ( )	Extension:
3. Fax No.:	E-mail Address:
<b>C. REGULATED ENTITY (RE) INFORMATION ON PROJECT OR SITE</b>	
1. TCEQ Issued RE Reference Number (RN): RN <i>(Search Central Registry)</i>	
2. Name of Project or Site (the name as known by the community where this facility/project is located):  (example: phase and name of subdivision or name of project that's unique to the site)	
3. Does the site have a physical address? <b>If Yes</b> , complete <b>Section A</b> for a physical address. <b>If No</b> , complete <b>Section B</b> for site location information.	
<b>Section A:</b> Enter the physical address for the site. <i>(verify it with <a href="http://USPS.com">USPS.com</a> or other delivery source)</i>	
Street Number:	Street Name:
City:	ZIP Code:
<b>Section B:</b> Enter the site location information.	
If no physical address (Street Number & Street Name), provide a written location access description to the site: (Ex.: phase 1 of Woodland subdivision located 2 miles west from intersection of Hwy 290 & IH35 accessible on Hwy 290 South)	
City where the site is located or nearest city to site:	ZIP Code where site is located:
4. Identify the county where the site is located:	
5. Latitude:    °   '   "    N	Longitude:    °   '   "    W
6. What is the primary business of this entity? In your own words, briefly describe the primary business of the Regulated Entity: (Do not repeat the SIC and NAICS code)	
7. What is the mailing address for the regulated entity? Is the RE mailing address the same as the Operator? <input type="checkbox"/> Yes, address is the same as Operator <input type="checkbox"/> No, provide the address	
Street Number:	Street Name:
City:	State: ZIP Code:
<b>D. GENERAL CHARACTERISTICS</b>	
1. Is the site located on Indian Country Lands? <input type="checkbox"/> No <input type="checkbox"/> Yes – If Yes, do not submit this NOI. Contact EPA, Region VI If the site is on Indian country lands, you must obtain authorization through EPA, Region VI.	
2. What is the Standard Industrial Classification (SIC) code (see instructions for common codes): <i>(Search <a href="http://Osha.gov">Osha.gov</a>)</i> Primary: _____ Secondary: _____	

**ATTACHMENT 1**

3(a) What is the total number of acres disturbed? _____	
3(b) Is the project site part of a larger common plan of development or sale? <input type="checkbox"/> Yes <input type="checkbox"/> No	
If Yes, the total number of acres disturbed can be less than 5 acres.	
If No, the total number of acres disturbed must be 5 or more. If the total number of acres disturbed is less than 5 then the project site does not qualify for coverage through this Notice of Intent. Coverage will be denied. See the requirements in the general permit for small construction sites.	
<b>4. Discharge Information (all information MUST be provided or the permit will be denied)</b>	
4(a) What is the name of the water body(s) to receive the storm water runoff or potential runoff from the site? _____	
4(b) What is the segment number(s) of the classified water body(s) that the discharge or potential discharge will eventually reach? _____	
4(c) Are any of the surface water bodies receiving discharges from the construction site on the latest EPA-approved CWA 303(d) list of impaired waters?  <input type="checkbox"/> Yes <input type="checkbox"/> No	
If Yes, provide the name of the impaired water body(s). _____	
4(d) Is the discharge into an MS4? <input type="checkbox"/> Yes <input type="checkbox"/> No	
If Yes, what is the name of the MS4 Operator? _____	
Note: The general permit requires you to send a copy of the NOI to the MS4 Operator.	
4(e) Is the discharge or potential discharge within the Recharge Zone, Contributing Zone, or Contributing Zone within the Transition Zone of the Edwards Aquifer?  <input type="checkbox"/> Yes <input type="checkbox"/> No	
If the answer is Yes, please note that a copy of the agency approved Plan required by the Edwards Aquifer Rule (30 TAC Chapter 213) must be included or referenced in the Storm Water Pollution Prevention Plan.	
<b>E. CERTIFICATION</b>	
Check "Yes" to the certifications below. <b>Failure to certify to all items will result in denial.</b>	
<input type="checkbox"/> Yes	I certify that I have obtained a copy and understand the terms and conditions of the <a href="#">general permit (TXR150000)</a> .
<input type="checkbox"/> Yes	I certify that the full legal name of the entity (Operator) applying for this permit has been provided and is legally authorized to do business in Texas.
<input type="checkbox"/> Yes	I understand that a Notice of Termination (NOT) must be submitted when this authorization is no longer needed.
<input type="checkbox"/> Yes	I certify that a storm water pollution prevention plan has been developed and implemented prior to construction, and that is compliant with any applicable local sediment and erosion control plans and prepared and implemented as required in the general permit TXR150000.
<b>Operator Certification:</b>	
I, _____ <div style="display: flex; justify-content: space-between; width: 80%; margin: 0 auto;"> <span>Typed or printed name <i>(Required &amp; must be legible)</i></span> <span>Title <i>(Required &amp; legible)</i></span> </div>	
<p>certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.</p> <p>I further certify that I am authorized under <a href="#">30 Texas Administrative Code §305.44</a> to sign and submit this document, and can provide documentation in proof of such authorization upon request.</p>	
Signature: _____ (Use blue ink)	Date: _____



**ATTACHMENT 1**

**Did you complete everything? Use this checklist to be sure!**

Are you ready to mail your form to TCEQ? Go to the General Information Section of the Instructions for mailing addresses.

Customer GP Notice of Intent Checklist TXR150000	
✓	This checklist is for use by the operator to ensure a complete application. Missing information may result in denial of coverage under the permit. (See NOI Process description in the Instructions)
<input type="checkbox"/>	<b>Application Fee of \$325.00</b> was mailed separately to TCEQ's Cashiers's Office (separate from the NOI) or the EPAY payment voucher is attached.
	<b>OPERATOR INFORMATION</b> - Confirm each item is complete: ✓
<input type="checkbox"/>	Customer Number (CN) issued by TCEQ Central Registry
<input type="checkbox"/>	Legal Name as filed to do business in Texas (Call TX SOS 512/463-5555)
<input type="checkbox"/>	Name and Title of person signing the application. This person must meet signatory requirements in 30 TAC Section 305.43
<input type="checkbox"/>	Operator Mailing Address is complete & verifiable with USPS. <a href="http://www.usps.com">www.usps.com</a>
<input type="checkbox"/>	Phone Numbers/E-mail Address
<input type="checkbox"/>	Type of Operator (Entity Type)
<input type="checkbox"/>	Independent Operator
<input type="checkbox"/>	Number of Employees
<input type="checkbox"/>	For Corporations or Limited Partnerships – Tax ID and SOS Filing numbers are REQUIRED
	<b>Application Contact person</b> we can call for questions about this application.
	<b>REGULATED ENTITY (RE) INFORMATION ON PROJECT OR SITE</b> - Confirm each item is complete: ✓
<input type="checkbox"/>	Regulated Entity Reference Number (RN) (if site is already regulated by TCEQ)
<input type="checkbox"/>	Site/Project Name/Regulated Entity
<input type="checkbox"/>	Site/Project (RE) Physical Address Please do not use a rural route or post office box for a site location
<input type="checkbox"/>	Or if no physical address, the location information that includes description, zip code and city is listed.
<input type="checkbox"/>	Latitude and Longitude <a href="#">TCEQ USGS Topographic Map Viewer</a> or <a href="#">TerraServer-USA</a>
<input type="checkbox"/>	Business description
<input type="checkbox"/>	Site Mailing Address (checked same as operator or complete & verifiable with USPS. <a href="http://www.usps.com">www.usps.com</a> )
	<b>GENERAL CHARACTERISTICS</b> - Confirm each item is complete: ✓
<input type="checkbox"/>	Indian Country Lands –the facility is not on Indian Country Lands
<input type="checkbox"/>	Standard Industrial Classification (SIC) code <a href="http://www.osha.gov/oshstats/sicser.html">www.osha.gov/oshstats/sicser.html</a>
<input type="checkbox"/>	Acres Disturbed is provided and qualifies for coverage through a NOI.
<input type="checkbox"/>	Common plan of development or for sale?
<input type="checkbox"/>	Discharge Information:
<input type="checkbox"/>	receiving water body
<input type="checkbox"/>	segment number(s) is REQUIRED
<input type="checkbox"/>	water body on the latest EPA-Approved Clean Water Act 303(d) list of impaired waters
<input type="checkbox"/>	MS4 Operator
<input type="checkbox"/>	Edwards Aquifer Rule
<input type="checkbox"/>	<b>CERTIFICATION</b> Certification statements have been checked indicating "Yes" Signature meets <a href="#">30 Texas Administrative Code (TAC) §305.44</a> and is original and has been provided for the Operator.

ATTACHMENT 1

<b>Notice of Intent (NOI) for Storm Water Discharges Associated with Construction Activity under TPDES General Permit (TXR150000) General Information and Instructions</b>	
<b>GENERAL INFORMATION</b>	
Where to Send the Notice of Intent (NOI) and other related forms:	
BY REGULAR U.S. MAIL Texas Commission on Environmental Quality Storm Water Processing Center (MC228) P.O. Box 13087 Austin, TX 78711-3087	BY OVERNIGHT/EXPRESS MAIL Texas Commission on Environmental Quality Storm Water Processing Center (MC228) 12100 Park 35 Circle Austin, TX 78753
TCEQ Contact list:	
Application Processing Questions relating to the status and form requirements:	512/239-3700, 512/245-0130 or <a href="mailto:swpermit@tceq.state.tx.us">swpermit@tceq.state.tx.us</a>
Technical Questions relating to the general permit:	512/239-4671 or <a href="mailto:swgpp@tceq.state.tx.us">swgpp@tceq.state.tx.us</a>
Environmental Law Division:	512/239-0600
Records Management for obtaining copies of forms submitted to TCEQ:	512/239-0900
Information Services for obtaining reports from program data bases (as available):	512/239-DATA (3282)
Financial Administration's Cashier's office:	512/239-0357 or 512/239-0187
Notice of Intent Process:	
When your NOI is received by the program, the form will be processed as follows:	
1. <b>Administrative Review:</b> Each item on the form will be reviewed for a complete response. In addition, the operator's legal name must be verified with Texas Secretary of State as valid and active (if applicable). The address(s) on the form must be verified with the US Postal service as an address receiving regular mail delivery. Never give an overnight/express mailing address.	
2. <b>Notice of Deficiency:</b> If an item is incomplete or not verifiable as indicated above, a notice of deficiency (NOD) will be mailed to the operator. The operator will have 30 days to respond to the NOD. The response will be reviewed for completeness.	
3. <b>Acknowledgment of Coverage:</b> An Acknowledgment Certificate will be mailed to the operator. This certificate acknowledges coverage under the general permit.	
-or-	
<b>Denial of Coverage:</b> If the application is too incomplete to process, or the operator fails to respond to the NOD or the response is inadequate, coverage under the general permit may be denied. If coverage is denied, the operator will be notified.	
<b>General Permit (Your Permit)</b>	
If filing the NOI through ePermits online application, coverage under the general permit begins the day the NOI is submitted to TCEQ through epermits. <b>Sign up now for on line NOI at <a href="https://www6.tceq.state.tx.us/steers/">https://www6.tceq.state.tx.us/steers/</a></b>	
If mailing a paper NOI, coverage under the general permit begins <b>seven (7) days after a completed NOI is postmarked for delivery to the TCEQ.</b> You should have a copy of your general permit when submitting your application.	
You may view and print your permit for which you are seeking coverage, on the TCEQ web site <a href="http://www.tceq.state.tx.us/permitting/water_quality/stormwater/TXR15_AIR.html">http://www.tceq.state.tx.us/permitting/water_quality/stormwater/TXR15_AIR.html</a> .	
<b>General Permit Forms</b>	
The Notice of Intent (NOI), <a href="#">Notice of Termination (NOT)</a> , and <a href="#">Notice of Change (NOC)</a> #20391 with instructions are available in Adobe Acrobat PDF format on the TCEQ web site <a href="http://www.tceq.state.tx.us/permitting/water_quality/stormwater/TXR15_AIR.html">http://www.tceq.state.tx.us/permitting/water_quality/stormwater/TXR15_AIR.html</a> . Sign up now for on line Notice of Termination application at <a href="https://www6.tceq.state.tx.us/steers/">https://www6.tceq.state.tx.us/steers/</a>	
<b>Change in Operator</b>	
An authorization under the general permit is not transferable. If the operator or owner of the regulated entity changes, the present permittee must submit a Notice of Termination and the new operator must submit a Notice of Intent. The NOT and NOI must be submitted not later than 10 days prior to the change in Operator status.	

**ATTACHMENT 1**

**TCEQ Central Registry Core Data Form**

The Core Data Form has been incorporated into this form. **Do not send a core data form to TCEQ.**

After final acknowledgment of coverage under the general permit, the program will assign a Customer Number (CN) and Regulated Entity Number (RN). For Construction Permits, a new RN will be assigned for each Notice of Intent filed with TCEQ, since construction project sites can overlap with other Customers. The RN assigned to your construction project will not be assigned to any other TCEQ authorization.

You can find the information on the Central Registry web site at [www4.tceq.state.tx.us/crpub](http://www4.tceq.state.tx.us/crpub). You can search by the Regulated Entity (RN), Customer Number (CN) or Name (Permittee), or by your permit number under the search field labeled "Additional ID". Capitalize all letters in the permit number.

The Customer (Permittee) is responsible for providing consistent information to the TCEQ, and for updating all CN and RN data for all authorizations as changes occur. For General Permits, a Notice of Change form must be submitted to the program area.

**Application Fees:**

**\$225.00 application fee** if submitting the NOI through ePermits.  
**\$325.00 application fee** if submitting a paper NOI for processing.

The application fee is required to be paid at the time the NOI is submitted. Failure to submit payment at the time the application is filed will cause delays in acknowledgment or denial of coverage under the general permit.

• **Mailed Payments:**

**DO NOT mail your check with the original Notice of Intent application.**

Use the attached Application Fee payment submittal form if mailing the payment. Do not include a copy of the NOI.

**BY REGULAR U.S. MAIL**

Texas Commission on Environmental Quality  
Financial Administration Division  
Cashier's Office, MC-214  
P.O. Box 13088  
Austin, TX 78711-3088

**BY OVERNIGHT/EXPRESS MAIL**

Texas Commission on Environmental Quality  
Financial Administration Division  
Cashier's Office, MC-214  
12100 Park 35 Circle  
Austin, TX 78753

• **ePAY Electronic Payment:**

Go to [www.tceq.state.tx.us/epay](http://www.tceq.state.tx.us/epay)

Select Water Quality, then select the fee category "GENERAL PERMIT CONSTRUCTION STORM WATER DISCHARGE NOI APPLICATION".

You must include a copy of the payment voucher with your NOI. Your NOI will not be considered complete without the payment voucher.

**The Annual Water Quality Fee has been consolidated into the Application Fee effective March 5, 2008. An annual fee will not be assessed and billed to operators on 9/1/2008. This does not relieve the operator of fees due for prior fiscal year assessments.**

The operator will continue to receive an invoice for payment of any past due annual fee. A 5% penalty will be assessed if the payment is received by TCEQ after the due date. Annual fee assessments cannot be waived as long as the authorization under the general permit was active on September 1 of the FY billed.

ATTACHMENT 1

INSTRUCTIONS FOR FILLING OUT THE NOI FORM	
<b>A. OPERATOR</b> (As defined in the general permit.)	
1. TCEQ Issued <u>Customer Number</u> (CN)	TCEQ's Central Registry will assign each customer a number that begins with "CN," followed by nine digits. <b>This is not a permit number</b> , registration number, or license number.
	<ul style="list-style-type: none"> <li>If this customer has not been assigned a Customer Reference Number, leave the space for the Customer Reference Number blank.</li> <li>If this customer has already been assigned this number, enter the operator's Customer Reference Number in the space provided.</li> </ul>
2. Legal Name	Provide the legal name of the facility operator, as authorized to do business in Texas. The name must be provided exactly as filed with the Texas Secretary of State (SOS), or on other legal documents forming the entity, that is filed in the county where doing business. You may contact the SOS at 512/463-5555, or go to <a href="http://www.sos.state.tx.us/corp/contact.shtml">http://www.sos.state.tx.us/corp/contact.shtml</a> for more information related to filing in Texas. If filed in the county where doing business, provide a copy of the legal documents showing the legal name.
3. Name and Title of person signing the Notice of Intent application form.	Signature meets <u>30 Texas Administrative Code (TAC) §305.44</u>
4. Operator Mailing Address	Provide a complete mailing address for receiving mail from the TCEQ. The address must be verifiable with the US Postal Service at <a href="http://www.usps.com">www.usps.com</a> , for regular mail delivery (not overnight express mail). If you find that the address is not verifiable using the USPS web search, please indicate the address is used by the USPS for regular mail delivery.
5. Phone Number	This number should correspond to this customer's mailing address given earlier. Enter the area code and phone number here. Leave "Extension" blank if this customer's phone system lacks this feature.
6. Fax Number and E-mail Address	This number and E-mail address should correspond to operator's mailing address provided earlier. (Optional Information)
7. Type of Entity	Check only one box that identifies the type of entity. Use the descriptions below to identify the appropriate entity type:  Individual is a customer who has not established a business, but conducts an activity that needs to be regulated by the TCEQ.  Sole Proprietorship— D.B.A. is a customer that is owned by only one person and has not been incorporated. This business may: <ul style="list-style-type: none"> <li>be under the person's name</li> <li>have its own name ("doing business as," or d.b.a.)</li> <li>have any number of employees</li> </ul> Partnership is a customer that is established as a partnership as defined by the Texas Secretary of State's Office.  Corporation the customer meets all of these conditions: <ul style="list-style-type: none"> <li>is a legally incorporated entity under the laws of any state or country</li> <li>is recognized as a corporation by the Texas Secretary of State</li> <li>has proper operating authority to operate in Texas.</li> </ul> Government- Federal, state, county, or city government (as appropriate) the customer is either an agency of one of these levels of government or the governmental body itself.  Other is Estate, Trust, etc. the customer does not fit one of the above descriptions. Enter a short description of the type of customer in the blank provided.
8. Independent Operator	Check "No" if this customer is a subsidiary, part of a larger company, or is a governmental entity. Otherwise, check "Yes."
9. Number of Employees	Check one box to show the number of employees for this customer's entire company, at all locations. This is not necessarily the number of employees at the site named in the NOI.
10. State Franchise Tax ID Number	Corporations and limited liability companies that operate in Texas are issued a franchise tax identification number. If this customer is a corporation or limited liability company, enter this number here.
Federal Tax ID	All businesses, except for some small sole proprietors, individuals, or general partnerships should have a federal taxpayer identification number (TIN). Enter this number here. Use no prefixes, dashes, or hyphens. Sole proprietors, individuals, or general partnerships do not need to provide a federal tax ID.
TX SOS Charter (filing) Number	Corporations and Limited Partnerships required to register with the Texas Secretary of State are issued a charter or filing number. You may obtain further information by calling SOS at 512/463-5555 <a href="http://www.sos.state.tx.us/corp/contact.shtml">http://www.sos.state.tx.us/corp/contact.shtml</a> .



**ATTACHMENT 1**

DUNS Number Most businesses have a DUNS (Data Universal Numbering System) number issued by Dun and Bradstreet Corp. If this customer has one, enter it here.
<b>B. Application Contact</b> Provide the name, title and communication information of the person that TCEQ can contact for additional information regarding this application. <b>If the application is missing information and there is no contact person to call, the application may be denied.</b>
<b>C. REGULATED ENTITY (RE) INFORMATION ON PROJECT OR SITE</b>
1. <u>Regulated Entity Reference Number (RN)</u> This is a number issued by TCEQ's Central Registry to sites (a location where a regulated activity occurs) regulated by TCEQ. This is not a permit number, registration number, or license number. <ul style="list-style-type: none"> <li>• If this Regulated Entity has not been assigned a Regulated Entity Number, leave this space blank.</li> <li>• If this customer has been assigned this number, enter the operator's Regulated Entity Number.</li> </ul>
2. Site/Project Name/Regulated Entity If the site is already regulated by TCEQ, use the same name as on the existing <u>Regulated Entity Reference Number (RN)</u> .  If new, provide the name of the site as known by the public in the area where the site is located. The name you provide on this application will be used in the TCEQ Central Registry as the Regulated Entity.
3. Site/Project (RE) Physical Address  <b>Section A:</b> Enter the complete physical address of where the site is located. This must be a street number and street name for a complete physical address. This address must be validated through US Postal Service or your local police (911 service) as a valid address. Please confirm this to be a complete and valid address. In some rural areas, new addresses are being assigned to replace rural route addresses. <b>Please do not use a rural route or post office box for a site location.</b>  <b>Section B:</b> If a site does not have an actual physical address that includes a street number and street name, then provide a complete written location access description, and the zip code and city where the site is located. For example: "The site is located 2 miles west from intersection of Hwy 290 & IH35, located on the southwest corner of the Hwy 290 South bound lane." This includes authorizations for construction projects such as highways and subdivision.
4. Identify the County where the site is located. If the site covers more than one county, provide the county that is most affected by the authorized activity and list the additional county(s) as secondary.
5. Latitude and Longitude Enter the latitude and longitude of the site in either degrees, minutes, and seconds or decimal form. For help obtaining the latitude and longitude, go to: <a href="#">TCEQ USGS Topographic Map Viewer</a> , or <a href="#">TerraServer-USA</a>
6. Description of Activity Regulated In your own words, briefly describe the primary business being conducted at the site. (A description specific to what you are doing that requires this authorization - Do not repeat the SIC Code(s).)
<b>SITE MAILING ADDRESS</b> Provide a complete mailing address to be used by TCEQ for receiving mail at the site. In most cases, the address is the same as the operator. If so, simply place a check mark in the box. If you provide a different address, please verify the address with USPS as instructed above for the operator address.
<b>D. GENERAL CHARACTERISTICS</b>
1. <b>Indian Country Lands</b> If your site is located on Indian Country Lands, the TCEQ does not have authority to process your application. You must obtain authorization through EPA, Region VI, Dallas. Do not submit this form to TCEQ.  Indian Country means (1) all land within the limits of any American Indian reservation under the jurisdiction of the U.S. government, notwithstanding the issuance of any patent, and including rights-of-way running throughout the reservation; (2) all dependent Indian communities within the borders of the United States whether within the original or subsequently acquired territory thereof, and whether within or outside the limits of a State; and (3) all Indian allotments, the Indian titles which have not been extinguished, including rights-of-way running through the same.  Indian Tribe means any Indian Tribe, band, nation, or community recognized by the Secretary of the Interior and exercising substantial governmental duties and powers.
2. <b>Standard Industrial Classification (SIC) code</b> Provide the SIC code that best describes the construction activity being conducted at the site. Common SIC Codes related to construction activities include: 1521 Construction of Single Family Homes; 1522 Construction of Residential Bldgs. Other than Single Family Homes; 1541 Construction of Industrial Bldgs. and Warehouses; 1542 Construction of Non-residential Bldgs. other than Industrial Bldgs. and Warehouses; 1611 Highway & Street Construction, except Highway Construction; 1622 Bridge, Tunnel, & Elevated Highway Construction; 1623 Water, Sewer, Pipeline & Communications, and Power Line Construction. For help with SIC codes, go to: <a href="http://www.osha.gov/oshstats/sicser.html">www.osha.gov/oshstats/sicser.html</a>

ATTACHMENT 1

<p><b>3. Estimated Area of Land Disturbed</b></p> <p>3(a). Provide the approximate number of acres that the construction site will disturb.</p> <p>3(b). Indicate is the site is part of a common plan of development or for sale.</p> <p>Construction activities that disturb less than one acre, unless they are part of a larger common plan that disturbs more than one acre, do not require permit coverage.</p> <p>Construction activities that disturb between one and five acre, unless they are part of a common plan that disturbs five acres or more acres, do not require submission of an NOI. Therefore, the estimated area of land disturbed should not be less than five, unless the project is part of a larger common plan that disturbs five or more acres.</p> <p>"Disturb" means any clearing, grading, excavating, or other similar activities. If you have any questions about this item, please call the storm water technical staff at (512)239-4671.</p>
<p><b>4. Discharge Information</b></p> <p>4 (a). The storm water may be discharged directly to a receiving stream or through a <b>MS4*</b> from your site. It eventually reaches a receiving water body such as a local stream or lake, possibly via a drainage ditch. You must provide the name of the water body that receives the discharge from the site (a local stream or lake).</p> <p>4 (b). The classified segment number(s) is REQUIRED to get coverage. Go to the link to find the segment number of the classified water body where storm water will flow <a href="http://www.tceq.state.tx.us/compliance/monitoring/water/quality/data/wqm/viewer/viewer.html">http://www.tceq.state.tx.us/compliance/monitoring/water/quality/data/wqm/viewer/viewer.html</a> . Call Water Quality Assessments at 512/239-4671 for further assistance. Another source for segments is: <a href="http://www.tceq.state.tx.us/comm_exec/forms_pubs/pubs/gi/gi-316/index.html">http://www.tceq.state.tx.us/comm_exec/forms_pubs/pubs/gi/gi-316/index.html</a></p> <p>4 (c). If any surface water body(s) receiving discharges from the construction site are on the latest EPA-approved CWA § 303(d) list of impaired waters, provide the name(s) of the water body(s).</p> <p>EPA approved CWA 303d list of impaired waters can be found at: <a href="http://www.tceq.state.tx.us/compliance/monitoring/water/quality/data/wqm/viewer/viewer.html">Texas Water Quality Inventory and 303(d) List - Texas Commission on Environmental Quality - www.tceq.state.tx.us</a></p> <p>4 (d). Identify the <b>MS4*</b> Operator name if the storm water discharge is into an MS4.</p> <p><b>*MS4 is an acronym for Municipal separate storm sewer system. MS4 is defined as</b> a separate storm sewer system owned or operated by a state, city, town, county, district, association, or other public body (created by or pursuant to state law) having jurisdiction over disposal of sewage, industrial wastes, storm water, or other wastes, including special districts under state law such as a sewer district, flood control or drainage district, or similar entity, or an Indian tribe or an authorized Indian tribal organization, that discharges to water in the state.</p> <p><b>For assistance, you may call the technical staff of the Water Quality Assessment &amp; Standards Section at 512/239-4671.</b></p>
<p>4 (e). <b>Edwards Aquifer Rule</b></p> <p>See maps on the TCEQ website to determine if the site is located within the Recharge Zone, Contributing Zone, or Contributing Zone within the Transition Zone of the Edwards Aquifer at <a href="http://www.tceq.state.tx.us/compliance/field_ops/eapp/viewer.html">http://www.tceq.state.tx.us/compliance/field_ops/eapp/viewer.html</a>.</p> <p>If the discharge or potential discharge is within the Recharge Zone, Contributing Zone, or Contributing Zone within the Transition Zone of the Edwards Aquifer, a site specific authorization approved by the Executive Director under the Edwards Aquifer Protection Program (30 TAC Chapter 213) is required before construction can begin.</p> <p>The general permit requires the approved Contributing Zone Plan or Water Pollution Abatement Plan to be included as a part of the Storm Water Pollution Prevention Plan. The certification must be answered "Yes" for coverage under the general permit.</p>
<p><b>E. CERTIFICATIONS</b></p> <p>Failure to indicate "Yes" to ALL of the certification items may result in denial of coverage under the general permit.</p> <p>The certification must bear an original signature of a person meeting the signatory requirements specified under <a href="#">30 Texas Administrative Code §305.44</a></p>
<p><b>IF YOU ARE A CORPORATION:</b></p> <p>The regulation that controls who may sign an NOI or similar form is 30 Texas Administrative Code §305.44(a)(1) (see below). According to this code provision, any corporate representative may sign an NOI or similar form so long as the authority to sign such a document has been delegated to that person in accordance with corporate procedures. By signing the NOI or similar form, you are certifying that such authority has been delegated to you. The TCEQ may request documentation evidencing such authority.</p>
<p><b>IF YOU ARE A MUNICIPALITY OR OTHER GOVERNMENT ENTITY:</b></p> <p>The regulation that controls who may sign an NOI or similar form is 30 Texas Administrative Code §305.44(a)(3) (see below). According to this code provision, only a ranking elected official or principal executive officer may sign an NOI or similar form. Persons such as the City Mayor or County Commissioner will be considered ranking elected officials. In order to identify the principal executive officer of your government entity, it may be beneficial to consult your city charter, county or city ordinances, or the Texas statute(s) under which your government entity was formed. An NOI or</p>

ATTACHMENT 1

similar document that is signed by a government official who is not a ranking elected official or principal executive officer does not conform to §305.44(a)(3). The signatory requirement may not be delegated to a government representative other than those identified in the regulation. By signing the NOI or similar form, you are certifying that you are either a ranking elected official or principal executive officer as required by the administrative code. Documentation demonstrating your position as a ranking elected official or principal executive officer may be requested by the TCEQ.

If you have any questions or need additional information concerning the signatory requirements discussed above, please contact the Texas Commission on Environmental Quality's Environmental Law Division at 512/239-0600.

**30 Texas Administrative Code**  
**§305.44. Signatories to Applications.**

(a) All applications shall be signed as follows.

(1) For a corporation, the application shall be signed by a responsible corporate officer. For purposes of this paragraph, a responsible corporate officer means a president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision-making functions for the corporation; or the manager of one or more manufacturing, production, or operating facilities employing more than 250 persons or having gross annual sales or expenditures exceeding \$25 million (in second-quarter 1980 dollars), if authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures. Corporate procedures governing authority to sign permit or post-closure order applications may provide for assignment or delegation to applicable corporate positions rather than to specific individuals.

(2) For a partnership or sole proprietorship, the application shall be signed by a general partner or the proprietor, respectively.

(3) For a municipality, state, federal, or other public agency, the application shall be signed by either a principal executive officer or a ranking elected official. For purposes of this paragraph, a principal executive officer of a federal agency includes the chief executive officer of the agency, or a senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g., regional administrator of the EPA).

**ATTACHMENT 2**



**CONSTRUCTION SITE NOTICE  
 FOR THE  
 Texas Commission on Environmental Quality (TCEQ)  
 Storm Water Program  
 TPDES GENERAL PERMIT TXR150000**

The following information is posted in compliance with **Part II.D.2** of the TCEQ General Permit Number TXR150000 for discharges of storm water runoff from construction sites. Additional information regarding the TCEQ storm water permit program may be found on the internet at:

[http://www.tceq.state.tx.us/permitting/water\\_quality/stormwater/TXR15\\_AIR.html](http://www.tceq.state.tx.us/permitting/water_quality/stormwater/TXR15_AIR.html)

Contact Name and Phone Number:	
Project Description:  (Physical address or description of the site's location, estimated start date and projected end date, or date that disturbed soils will be stabilized)	
Location of Storm Water Pollution Prevention Plan :	

For Construction Sites Authorized Under Part II.D.2. (Obtaining Authorization to Discharge) the following certification must be completed:

I \_\_\_\_\_ (Typed or Printed Name Person Completing This Certification) certify under penalty of law that I have read and understand the eligibility requirements for claiming an authorization under Part II.D.2. of TPDES General Permit TXR150000 and agree to comply with the terms of this permit. A storm water pollution prevention plan has been developed and implemented according to permit requirements. A copy of this signed notice is supplied to the operator of the MS4 if discharges enter an MS4 system. I am aware there are significant penalties for providing false information or for conducting unauthorized discharges, including the possibility of fine and imprisonment for knowing violations.

\_\_\_\_\_  
 Signature and Title

\_\_\_\_\_  
 Date

**ATTACHMENT 3**  
**TPDES OPERATOR'S INFORMATION**

Owner's Name and Address:

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Telephone:

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Contractor's Names and Addresses:

General Contractor:

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Telephone:

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Site Superintendent:

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Telephone:

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Erosion Control and Maintenance Inspection:

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Telephone:

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Subcontractor's Names and Addresses:

_____	_____
_____	_____
_____	_____
_____	_____
Phone: _____	Phone: _____

**Note: Insert name, address, and telephone number of persons or firms.**

**ATTACHMENT 4**  
**CONTRACTOR'S / SUBCONTRACTOR'S**  
**CERTIFICATION FOR TPDES PERMITTING**

I certify under penalty of law that I understand the terms and conditions of TPDES General Permit No. TXR150000 and the Storm Water Pollution Prevention Plan for the construction site identified as part of this certification.

Signature:

Name: (printed or typed)

Title:

Company:

Address:

Date:

Signature:

Name: (printed or typed)

Title:

Company:

Address:

Date:

Signature:

Name: (printed or typed)

Title:

Company:

Address:

Date:

**ATTACHMENT 5**



**EPA NPDES  
 Construction  
 Inspection Form**



The following inspection is being performed in compliance with Part IV.D.4. of the NPDES Region 6 Storm Water Construction General Permit [63 Fed. Reg. 36502] and being retained in accordance with Part V of the Permit. Qualified personnel (provided by the permittee or cooperatively by multiple permittees) shall inspect disturbed areas of the construction site that have not been finally stabilized, areas used for storage of materials that are exposed to precipitation, placement and effectiveness of structural control measures, and locations where vehicles enter or exit the site. Inspections shall be performed at least once every 14 days and within 24 hours of the end of a storm event of 0.5 inches or greater. Where sites have been temporarily stabilized, runoff is unlikely due to winter conditions, or during seasonal arid periods in arid areas (0-10 inches of rainfall annually) and semi-arid areas (10-20 inches annually) such inspections shall be conducted at least once every month. This form is primarily intended for use with construction projects in Texas and New Mexico. Permittees on Indian Country lands in Oklahoma, Louisiana and Arkansas and some oil and gas facilities in Oklahoma may use this form if they are eligible for this permit. Other facilities need to check with their NPDES authority before using this form.

If you do not know your NPDES Permit Number, contact the NOI Processing Center at (301)495-4145. This form was prepared as an example and it is not a required form for use with the permit. Alternative forms may be used if they contain all of the required information as set forth in the permit. This form and additional information regarding the NPDES Region 6 storm water program may be found on the Internet at <http://www.epa.gov/region6/sw/>. Any person with a complaint about the operation of this facility in regards to this permit should contact EPA Region 6 at (214)665-7112.

Permit Number(s) covered by this inspection (e.g. owners, developers, general contractor, builders)	
Signature and Certification in accordance with Part VI.G of the permit:	I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.  Signature _____ Date _____
Date of Inspection	
Inspector Name	
Is there a copy of the permit language with the SWPPP?	• YES • NO
Is the inspector qualified and are the qualifications documented in the SWPPP?	• YES • NO
Is an NPDES storm water construction sign posted at the entrance for all permittees?	• YES • NO
<p>You may want to use EPA Region 6 construction checklist to assure components of the SWPPP are complete. This form, the construction sign, and the checklist are available on the Region 6 NPDES Storm Water Forms and Documents web page which may be found on the internet at <a href="http://www.epa.gov/earth1r6/6en/w/forms/w.htm">http://www.epa.gov/earth1r6/6en/w/forms/w.htm</a> In addition to the checklist, you should provide a narrative (see next page) on the existing Best Management Practices and Structural Controls found during each inspection. Any problems identified in an inspection should be corrected within 7 days. The inspection should cover all components of the SWPPP and all potential pollutants. While eroded soil is the primary pollutant of concern, do not forget to inspect for other pollutant sources such as fuel tanks, paints, solvents, stabilization materials, concrete hardener, batch plants, and construction debris. The inspector will need to update the SWPPP to reflect findings of the inspection. The site map should be updated after an inspection to show controls that have been added or removed, to ensure the site map is kept current in accordance with Part IV.C. of the permit.</p>	

Revision 4, March 1, 2000





**ATTACHMENT 5**

**Narrative Findings of the inspection:**

Observations should include any findings of Best Management Practices or controls that are not in accordance with the SWPPP. If a control is not in place or failed, observe the reason why. A control removed temporarily for work is not necessarily a violation if properly recorded in the SWPPP. If it has been removed, record why it was removed and, if applicable, when it will be reinstalled. If the control has failed, observe the conditions so a conclusion may be made as to whether the control failed for improper maintenance or improper design. The qualified inspector will know when a failed control is inadequate and should be replaced by an improved control mechanism. Qualified inspectors are to have authority to make changes to the SWPPP to assure compliance. Controls that have not been installed should be given a reason why they are not installed and/or a scheduled date for installation if they are designed for a later phase of construction. After the inspection, the SWPPP and its site map should be updated to reflect current conditions of controls and Best Management Practices at the time of the inspection. This includes removing uninstalled controls from the site map or otherwise denoting on the site map if they are no longer installed if the controls have been removed because they are no longer necessary (e.g. stabilization has been achieved in that area).

Revision 4, March 1, 2000

**ATTACHMENT 6**

	<p><b>Notice of Termination (NOT)                  for Authorizations under                  TPDES General Permit TXR150000</b></p>	<p><b>TCEQ Office Use Only</b>                  Permit No.:                  RN:                  CN:</p>	<div style="border: 1px solid black; padding: 5px; display: inline-block; color: red; font-weight: bold;">Reset Form</div>
	<p><b>Sign up now for on line NOT at <a href="http://www.tceq.state.tx.us/permitting/steers/steers.html">http://www.tceq.state.tx.us/permitting/steers/steers.html</a></b>                  Get your NOT Confirmation letter immediately after submitting the on line NOT form.</p>		
<p><b>What is the permit number to be terminated?</b>                  Processing will be delayed without the permit number. TXR15_____</p>			
<p><b>A. OPERATOR (applicant)</b></p>			
<p>1. What is the Customer Number (CN) issued to this entity? CN _____</p>			
<p>2. What is the full Legal Name of the current permittee?   <i>This must be the current permittee of the permit to be terminated.</i></p>			
<p>3. What is the applicant's mailing address as recognized by the <b>US Postal Service</b>?</p>			
<p>Address: _____ Suite No./Bldg. No./Mail Code: _____</p>			
City: Houston		State: _____	ZIP Code: _____
Country Mailing Information (if outside USA): _____		Country Code: _____	Postal Code: _____
4. Phone No.: ( ) _____		Extension: _____	
5. Fax No.: ( ) _____		E-mail Address: _____	
<p><b>B. REGULATED ENTITY (RE) INFORMATION ON PROJECT OR SITE</b></p>			
<p>1. What is the TCEQ Issued RE Reference Number (RN)? RN _____</p>			
<p>2. Name of Project or Site as currently permitted):                   (example: phase and name of subdivision or name of project that's unique to the site)</p>			
<p>3. Physical Address of Project or Site as currently permitted: (enter in spaces below)</p>			
Street Number: _____		Street Name: _____	
City: _____	ZIP Code: _____	County (Counties if >1): _____	
<p>4. If no physical address (Street Number &amp; Street Name), provide the written location access description to the site:</p>			
<p><b>C. REASON FOR TERMINATION</b></p>			
<p>Check the reason for termination:</p>			
<p><input type="checkbox"/> Final stabilization has been achieved on all portions of the site that are the responsibility of the Operator and all silt fences and other temporary erosion controls have either been removed, or scheduled for removal as defined in the SWP3.</p>			
<p><input type="checkbox"/> Another permitted Operator has assumed control over all areas of the site that have not been finally stabilized, and temporary erosion controls that have been defined in the SWP3 have been transferred to the new Operator.</p>			
<p><input type="checkbox"/> The activity is now authorized under an alternate TPDES permit.</p>			
<p><input type="checkbox"/> The activity never began at this site that is regulated under the general permit.</p>			
<p><b>D. CERTIFICATION</b></p>			
<p>I, _____ Title _____                  _____                  Typed or printed name</p>			
<p>certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.</p>			
<p>I further certify that I am authorized under <b>30 Texas Administrative Code §305.44</b> to sign and submit this document, and can provide documentation in proof of such authorization upon request.</p>			
Signature: _____		Date: _____	
<p>(Use blue ink)</p>			

ATTACHMENT 6

<b>Notice of Termination (NOT) for Authorizations under TPDES General Permit TXR150000 General Information and Instructions</b>	
<b>GENERAL INFORMATION</b>	
Where to Send the Notice of Intent (NOI):	
BY REGULAR U.S. MAIL Texas Commission on Environmental Quality Storm Water Processing Center (MC228) P.O. Box 13087 Austin, TX 78711-3087	BY OVERNIGHT/EXPRESS MAIL Texas Commission on Environmental Quality Storm Water Processing Center (MC228) 12100 Park 35 Circle Austin, TX 78753
TCEQ Contact list:	
Application Processing Questions relating to the status and form requirements:	512/239-4671
Technical Questions relating to the general permit:	512/239-4671
Environmental Law Division:	512/239-0600
Records Management for obtaining copies of forms submitted to TCEQ:	512/239-0900
Information Services for obtaining reports from program data bases (as available):	512/239-DATA (3282)
Financial Administration's Cashier's office:	512/239-0357 or 512/239-0187
<b>Notice of Termination Process:</b>	
A Notice of Termination is <b>effective on the date postmarked for delivery to TCEQ</b> . When your NOT is received by the program, the form will be processed as follows:	
1. <b>Administrative Review:</b> The form will be reviewed to confirm the following:	
<ul style="list-style-type: none"><li>• the permit number is provided</li><li>• the permit is active and has been approved</li><li>• the entity terminating the permit is the current permittee</li><li>• the site information matches the original permit record</li><li>• the form has the required original signature with title and date</li></ul>	
2. <b>Notice of Deficiency:</b> If an item is incomplete or not verifiable as indicated above, a phone call will be made to the applicant to clear the deficiency. A letter will not be sent to the permittee if unable to process the form.	
3. <b>Confirmation of Termination:</b> A Notice of Termination Confirmation letter will be mailed to the operator.	
<b>General Permit (Your Permit)</b> Coverage under the general permit begins <b>48 hours after a completed NOI is postmarked for delivery to the TCEQ</b> . You should have a copy of your general permit when submitting your application. You may view and print your permit for which you are seeking coverage, on the TCEQ web site <a href="http://www.tceq.state.tx.us">www.tceq.state.tx.us</a>	
<b>General Permit Forms</b> The Notice of Intent (NOI), Notice of Termination (NOT), and Notice of Change (NOC) with instructions are available in Adobe Acrobat PDF format on the TCEQ web site <a href="http://www.tceq.state.tx.us">www.tceq.state.tx.us</a> .	
<b>Change in Operator</b> An authorization under the general permit is not transferable. If the operator or owner of the regulated entity changes, the present permittee must submit a Notice of Termination and the new operator must submit a Notice of Intent. The NOT and NOI must be submitted not later than 10 days prior to the change in Operator status.	
<b>TCEQ Central Registry Core Data Form</b> The Core Data Form has been incorporated into this form. <b>Do not send a core data form to TCEQ.</b>	
After final acknowledgment of coverage under the general permit, the program will assign a Customer Number (CN) and Regulated Entity Number (RN). For Construction Permits, a new RN will be assigned for each Notice of Intent filed with TCEQ, since construction project sites can overlap with other Customers. The RN assigned to your construction project will not be assigned to any other TCEQ authorization.	
You can find the information on the Central Registry web site at <a href="https://www6.tceq.state.tx.us/epay/">https://www6.tceq.state.tx.us/epay/</a> . You can search by the Regulated Entity (RN), Customer Number (CN) or Name (Permittee), or by your permit number under the search field labeled "Additional ID" Capitalize all letters in the permit number.	

**ATTACHMENT 6**

The Customer (Permittee) is responsible for providing consistent information to the TCEQ, and for updating all CN and RN data for all authorizations as changes occur. For General Permits, a Notice of Change form must be submitted to the program area.

**Annual Water Quality Fee:** This fee is assessed to operators with an active authorization under the general permit on September 1 of each year. The operator will receive an invoice for payment of the annual fee in November of each year. The payment will be due 30 days from the invoice date. A 5% penalty will be assessed if the payment is received by TCEQ after the due date. Annual fee assessments cannot be waived as long as the authorization under the general permit is active on September 1.

It's important for the operator to submit a **Notice of Termination (NOT)** when coverage under the general permit is no longer required. A NOT is effective on the postmarked date of mailing the form to TCEQ. It is recommended that the NOT be mailed using a method that documents the date mailed and received by TCEQ.

• **Mailed Payments:**

You must return your payment with the billing coupon provided with the billing statement.

• **ePAY Electronic Payment:**

Go to <https://www6.tceq.state.tx.us/epay/>

You must enter your account number provided at the top portion of your billing statement. Payment methods include Mastercard, Visa, and electronic check payment (ACH). A transaction over \$500 can only be made by ACH.

**INSTRUCTIONS FOR FILLING OUT THE NOT FORM**

**A. OPERATOR (current permittee.)**

1. TCEQ Issued Customer Number (CN)

2. Legal Name of Operator

The operator must be the same entity as previously submitted on the original Notice of Intent for the permit number provided.

3. Operator Mailing Address

Provide a complete mailing address for receiving mail from the TCEQ. Update the address if different than previously submitted in the Notice of Intent or Notice of Change.

4. Phone Number, Fax Number, and E-mail Address

Provide updated contact information.

**B. REGULATED ENTITY (RE) INFORMATION ON PROJECT OR SITE**

1. Regulated Entity Reference Number (RN)

2. Site/Project Name/Regulated Entity

Provide the name of the site as previously submitted in the Notice of Intent for the permit number provided.

3. Site/Project (RE) Physical Address

Provide the physical address or location access description as previously submitted for the permit number provided.

**C. REASON FOR TERMINATION**

Indicate the reason for terminating the permit by checking one of the options. If the reason is not listed then provide an attachment that explains the reason for termination.

Please read your general permit carefully to determine when to terminate your permit. Permits will not be reactivated after submitting a termination form. The termination is effective on the date postmarked for delivery to TCEQ.

**D. CERTIFICATIONS**

The certification must bear an original signature of a person meeting the signatory requirements specified under 30 Texas Administrative Code (TAC) §305.44.

**IF YOU ARE A CORPORATION:**

The regulation that controls who may sign an NOI or similar form is 30 Texas Administrative Code §305.44(a)(1) (see below). According to this code provision, any corporate representative may sign an NOI or similar form so long as the authority to sign such a document has been delegated to that person in accordance with corporate procedures. By signing the NOI or similar form, you are certifying that such authority has been delegated to you. The TCEQ may request documentation evidencing such authority.

**IF YOU ARE A MUNICIPALITY OR OTHER GOVERNMENT ENTITY:**

The regulation that controls who may sign an NOI or similar form is 30 Texas Administrative Code §305.44(a)(3) (see below). According to this code provision, only a ranking elected official or principal executive officer may sign an NOI or similar form. Persons such as the City Mayor or County Commissioner will be considered ranking elected officials. In order to identify the principal executive officer of your government entity, it may be beneficial to consult your city charter, county or city ordinances, or the Texas statute(s) under which your government entity was formed. An NOI or similar document that is signed by a government official who is not a ranking elected official or principal executive officer does not conform to

**END OF SECTION**

## **SECTION 01 57 13.02**

### **STABILIZED CONSTRUCTION ACCESS**

#### **PART 1 - GENERAL**

##### **1.1 SUMMARY**

A. Section Includes:

1. Stabilized construction roads, parking areas, exits and truck washing area requirements.

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

1. Division 00 – Bidding Requirements, Contract Forms, and Conditions of the Contract.
2. Division 01 – General Requirements.

##### **1.2 MEASUREMENT AND PAYMENT**

- A. Stipulated Price (Lump Sum). If Contract is Stipulated Price Contract, payment for work in this Section is included in total Stipulated Price.

##### **1.3 SUBMITTALS**

- A. Conform to requirements of Section 01 33 00 – Submittals.
- B. Submit manufacturer's catalog sheets and other product data on geotextile fabric.
- C. Submit sieve analysis of aggregates conforming to requirements of this Specification.

##### **1.4 REFERENCES**

- A. ASTM D4632 – Standard Test Method for Grab Breaking Load and Elongation of Geotextiles.

#### **PART 2 - PRODUCTS**

##### **2.1 GEOTEXTILE FABRIC**

- A. Provide woven or non-woven geotextile fabric made of polypropylene, polyethylene, ethylene, or polyamide material.
- B. Geotextile fabric shall have minimum grab strength of 270 psi in any principal direction (ASTM D4632) and equivalent opening size between 50 and 140.
- C. Geotextile and threads shall be resistant to chemical attack, mildew, and rot and shall contain ultraviolet ray inhibitors and stabilizers to provide minimum of 6 months of expected usable life at temperature range of 0°F to 120°F.
- D. Representative Manufacturers: Mirafi, Inc. or equal.

## **2.2 COARSE AGGREGATES**

- A. Coarse aggregate shall consist of crushed stone, gravel, crushed blast furnace slag, or combination of these materials. Aggregate shall be composed of clean, hard, durable materials free from adherent coatings, salt, alkali, dirt, clay, loam, shale, soft or flaky materials, or organic and injurious matter.
- B. Coarse aggregates shall be 3 inch to 5 inch granular material.

## **PART 3 - EXECUTION**

### **3.1 PREPARATION AND INSTALLATION**

- A. If necessary to keep street clean of mud carried by construction vehicles and equipment, provide stabilized construction roads and exits at construction, staging, parking, storage, and disposal areas. Construct erosion and sediment controls in accordance with requirements shown on Drawings and specified in this Section.
- B. No clearing, grubbing or rough cutting permitted until erosion and sediment control systems are in place, other than as specifically directed by the Owner's Representative to allow soil testing and surveying.
- C. Maintain existing erosion and sediment control systems located within Project site until acceptance of Project or until directed by Owner's Representative to remove and discard existing system.
- D. Regularly inspect, repair, or replace components of stabilized construction exits. Unless otherwise directed, maintain stabilized construction roads and exits until project is accepted by the Owner. Remove stabilized construction roads and exits promptly when directed by Owner's Representative. Discard removed materials off site.
- E. Remove and dispose of sediment deposits at designated spoil site for Project. If project spoil site is not designated on Drawings, dispose of sediment off site at location not in or adjacent to stream or flood plain. Assume responsibility for off site disposal. Spread sediment evenly throughout site, compacted and stabilized. Do not allow sediment to flush into stream or drainage way. If sediment has been contaminated, dispose in accordance with existing federal, state, and local rules and regulations.
- F. Prohibit equipment and vehicles from maneuvering on areas outside of dedicated rights-of-way and easements for construction. Immediately repair damage caused by construction traffic to erosion and sediment control systems.
- G. Conduct construction operation under this Contract in conformance with erosion control practices described in this and other Specifications.

### **3.2 CONSTRUCTION METHODS**

- A. Provide stabilized access roads, subdivision roads, parking areas, and other on-site vehicle transportation routes where shown on Drawings.

- B. Provide stabilized construction exits and truck washing areas when approved by Owner's Representative, of sizes and locations where shown on Drawings or as specified in this Section.
- C. Vehicles leaving construction areas shall have their tires cleaned to remove sediment prior to entrance onto public right-of-way. When washing is needed to remove sediment, construct truck washing area. Truck washing shall be done on stabilized areas which drain into drainage system protected by erosion and sediment control measures.
- D. Details for stabilized construction exit are shown on Drawings. Construct other stabilized areas to same requirements. Maintain roadway width at least 14 feet for one-way traffic and 20 feet for two-way traffic and sufficiently for ingress and egress. Furnish and place geotextile fabric as permeable separator to prevent mixing of coarse aggregate with underlying soil. Maximum exposure of geotextile fabric to elements between laydown and cover of 14 days to minimize damage potential.
- E. Grade roads and parking areas to provide sufficient drainage away from stabilized areas. Use sandbags, gravel, boards, or similar methods to prevent sediment from entering public right-of-way, receiving stream or storm water conveyance system.
- F. Inspect and maintain stabilized areas daily. Provide periodic top dressing with additional coarse aggregates to maintain required depth. Repair and clean out damaged control measures used to trap sediment. Immediately remove sediment spilled, dropped, washed, or tracked onto public right-of-way.
- G. Maintain length of stabilized area as shown on Drawings. Maintain thickness greater than 8 inches. Maintain width as shown on Drawings.
- H. Stabilization for other areas shall have same coarse aggregate, thickness, and width requirements as stabilized construction exit, except where shown otherwise on Drawings.
- I. Stabilized area may be widened or lengthened to accommodate truck washing area when authorized by Owner's Representative.
- J. Alternative methods of construction may be utilized when shown on Drawings, or when approved by Owner's Representative. These methods include following:
  - 1. Cement-Stabilized Soil - Compacted cement-stabilized soil or other fill material in application thickness of at least 8 inches.
  - 2. Wood Mats/Mud Mats - Oak or other hardwood timbers placed edge-to-edge and across support wooden beams which are placed on top of existing soil in application thickness of at least 6 inches.
  - 3. Steel Mats - Perforated mats placed across perpendicular support members.

- K. Provide street cleaning, such as sweeping or vacuuming, at locations around project site where construction traffic has caused tracking of sediments onto roadways. Do not wash or flush sediments into adjacent drainage systems.
- L. Mechanical sweepers shall be vacuum-type or regenerative sweepers. Sweeping speed not to exceed 6 mph. Make two passes.
- M. Clean street daily before end of workday. When excess sediments have tracked onto streets, Owner's Representative may direct contractor to clean street as often as necessary. Remove and dispose of sediments properly.
- N. Use other erosion and sediment control measures to prevent sediment runoff during period of rains and non-working hours and when storm discharges are expected.

**END OF SECTION**



## **SECTION 01 57 23**

### TEMPORARY STORM WATER POLLUTION AND EROSION CONTROL

#### **PART 1 - GENERAL**

##### **1.1 SUMMARY**

A. Section Includes:

1. Construction and maintenance of temporary storm water protection and erosion control devices.

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

1. Division 00 – Bidding Requirements, Contract Forms, and Conditions of the Contract.
2. Division 01 – General Requirements.
3. Section 03 09 00 – Concrete.
4. Section 31 10 00 – Clearing and Grubbing.
5. Section 31 21 33 – Trenching, Backfilling, and Compacting for Utilities.
6. Section 31 23 00 – Earthwork.
7. Section 31 23 16.01 – Roadway Excavation.
8. Section 40 20 13 – Pipe: Miscellaneous Steel.
9. Section 40 20 23 – Pipe: Plastic.
10. Section 40 20 44 – Pipe: Polyethylene (HDPE).

##### **1.2 MEASUREMENT AND PAYMENT**

- A. Stipulated Price (Lump Sum) Contract. If Contract is a Stipulated Price Contract, payment for Work in this Section is included in total Stipulated Price.

##### **1.3 QUALITY ASSURANCE**

A. Reference Standards:

1. ASTM International (ASTM):
  - a. A36 – Standard Specification for Carbon Structural Steel.
  - b. D698 – Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft<sup>3</sup> (600 kN-m/m<sup>3</sup>)).
  - c. D3786 – Standard Test Method for Hydraulic Bursting Strength for Knitted Goods and Nonwoven Fabrics.
  - d. D4355 – Standard Test Method for Deterioration of Geotextiles from Exposure to Ultraviolet Light and Water (Xenon-Arc Type Apparatus).

- e. D4491 – Standard Test Methods for Water Permeability of Geotextiles by Permittivity.
- f. D4632 – Standard Test Method for Grab Breaking Load and Elongation of Geotextiles.
- g. D4833 – Standard Test Method for Index Puncture Resistance of Geotextiles, Geomembranes, and Related Products.
- h. D6382 – Standard Practice for Dynamic Mechanical Analysis and Thermogravimetry of Roofing and Waterproofing Membrane Material.

#### **1.4 DEFINITIONS**

- A. Filter Fabric Fence and Reinforced Filter Fabric Fence: Installed to allow surface or channel runoff percolation through fabric in sheet-flow manner and to retain and accumulate sediment.
- B. Straw Bale Fence: Installed to allow surface runoff percolation through straw in sheet-flow manner and to retain and accumulate sediment.
- C. Interceptor Dikes and Swales: Constructed to direct surface or channel runoff around the project area or runoff from project area into sediment traps.
- D. Drop Inlet Baskets: Installed to allow runoff percolation through the basket and to retain and accumulate sediment.
- E. Sediment Traps: Constructed to pool surface runoff from construction area to allow sediment to settle onto the bottom of trap.

#### **1.5 SUBMITTALS**

- A. Conform to requirements of Specification Section 01 33 00 – Submittals.
- B. Submit manufacturer's literature for product specifications and installation instructions.
- C. Submit manufacturers catalog sheets and other product data on geotextile or filter fabrics, outlet pipe, perforated riser, and connectors.
- D. Submit proposed methods, equipment, materials, and sequence of operations for storm water pollution prevention structures.
- E. Submit shop drawings for Drop Inlet Baskets.

#### **1.6 WARRANTY (NOT USED)**

### **PART 2 - PRODUCTS**

#### **2.1 CONCRETE (NOT USED)**

#### **2.2 AGGREGATE MATERIALS**

- A. Stone: Use open graded aggregates with minimum diameter of 3 inches, and maximum 5 inches in diameter and less than ½ cubic foot in volume unless

otherwise specified. Use clean, hard crushed concrete or stone free from adherent coatings, salt, alkali, dirt, clay, loam, shale, soft or flaky materials, or organic and injurious matter.

- B. Provide gravel lining in accordance with Specification Section 31 21 33 – Trenching, Backfilling, and Compacting for Utilities, or as shown on the Drawings.
- C. Provide clean cobbles and gravel consisting of crushed concrete or stone. Use clean, hard crushed concrete or stone free from adherent coatings, salt, alkali, dirt, clay, loam, shale, soft or flaky materials, or organic matter.
- D. Sediment Pump Pit Aggregate: Use nominal 2-inch diameter river gravel.

### **2.3 PIPE (NOT USED)**

### **2.4 GEOTEXTILE FILTER FABRIC**

- A. Woven or nonwoven geotextile filter fabric made of either polypropylene, polyethylene, ethylene, or polyamide material, in continuous rolls of longest practical length.
- B. Grab Strength: 100 psi in any principal direction (ASTM D4632), Mullen burst strength greater than 200 psi (ASTM D3786), and equivalent opening size between 50 and 140 for soils with more than 15 percent by weight passing No. 200 sieve and between 20 and 50 for soils with less than 15 percent by weight passing No. 200 sieve; and maximum water flow rate of 40 gallons per minute per square foot (ASTM D4491).
- C. Filter fabric material shall contain ultraviolet ray inhibitors and stabilizers to provide a minimum of six months of expected usable construction life at a temperature range of 0°F to 120°F. Ultraviolet stability exceed shall exceed 70% after 500 hours of exposure (ASTM D4355).
- D. Acceptable Manufacturers: Mirafi, Inc., Synthetic Industries, or approved equal.

### **2.5 FENCING**

- A. Wire Fencing: Woven galvanized steel wire, 12½ gauge by 2 inch by 4 inch mesh spacing, minimum 24-inch roll or sheet width of longest practical length.
- B. Fence Stakes: Nominal 2 by 2 inch moisture-resistant treated wood or steel posts (min. of 1.25 lbs. per linear foot and Brinell Hardness greater than 140)

with safety caps on top; length as required for minimum 12 inch bury and full height of filter fabric.

### **PART 3 - EXECUTION**

#### **3.1 PREPARATION, INSTALLATION AND MAINTENANCE**

- A. Provide erosion and sedimentation control systems at the locations shown on Drawings. Construct in accordance with the requirements shown on the Drawings and as specified in this Section.
- B. Control fill, grading and ditching to direct water away from excavations, pits, tunnels, and other construction areas, and to direct drainage to proper runoff courses to prevent erosion, sedimentation or damage.
- C. Do not clear, grub or rough cut until erosion and sediment control systems are in place unless approved by Owner's Representative to allow installation of erosion and sediment control systems, soil testing, and surveying.
- D. Maintain erosion and sediment control systems located within project site until acceptance of project or until directed by Owner's Representative to remove and discard existing system.
- E. Regularly inspect and repair or replace damaged components of erosion and sediment control structures. Unless otherwise directed, maintain erosion and sediment control structure until project area stabilization is accepted. Redress and replace granular fill at outlets as needed to replenish depleted granular fill. Remove erosion and sediment control structures promptly when directed by Owner's Representative. Dispose of materials in accordance with Specification Section 01 74 19 – Construction Waste Management and Disposal.
- F. Remove and dispose sediment deposits at the designated spoil site for the Project. If a project spoil site is not designated on Drawings, dispose of sediment off site at approved location in accordance with Specification Section 01 74 19 – Construction Waste Management and Disposal. Off-site disposal shall be the responsibility of the Contractor. Sediment to be placed at the project site should be spread, compacted and stabilized in accordance with the Owner's Representative directions. Sediment shall not be allowed to flush into streams or drainage ways. If sediment has been contaminated, it needs to be disposed of in accordance with existing federal, state and local regulations.
- G. Unless otherwise shown on the Drawings, compact embankments, excavations, and trenches in accordance with Specification Section 31 21 33 – Trenching, Backfilling, and Compacting for Utilities.
- H. Conduct all construction operations under this Contract in conformance with erosion control practices described in Specification Section 01 35 05 – Environmental Protection and Special Controls.
- I. Prohibit equipment and vehicles from maneuvering on areas outside of dedicated right of way and easements for construction. Immediately repair

damage caused by construction traffic to erosion and sediment control structures.

- J. Protect existing trees and plants in accordance with Specification Section 01 56 39 – Temporary Tree and Plant Protection.
- K. Conduct all construction operations under this Contract in conformance with the erosion control practices required by State and local law.

### **3.2 CONSTRUCTION METHODS**

#### **A. Reinforced Filter Fabric Fence (Type 2):**

1. Attach the filter fabric to 2-inch by 2-inch wooden stakes or equivalent steel posts spaced a maximum of 6 feet apart and embedded a minimum of 1 foot. If filter fabric is factory pre-assembled with support netting, then maximum spacing allowable is 8 feet. The wooden stakes shall be installed at a slight angle toward the source of anticipated runoff.
2. Trench in the toe of the filter fabric fence with a spade or mechanical trencher so that the downward face of the trench is flat and perpendicular to the direction of flow or for V-trench configuration as shown on Drawings. Lay filter fabric along the edges of the trench. Backfill and compact trench.
3. Use galvanized 2-inch by 4-inch welded fabric for woven wire. Securely fasten filter fabric material to woven wire fence with tie wires.
4. Securely fasten filter fabric to stakes using staples or wire ties at 3 inches on center maximum. Filter fabric fence shall have a minimum height of 18 inches and a maximum height of 36 inches above natural ground.
5. The filter fabric should be provided in continuous rolls and cut to the length of the required to minimize the use of joints. When joints are necessary, the fabric should be spliced together only at a support post with a minimum 6-inch overlap, and sealed securely.
6. Inspect sediment filter barrier systems after each rainfall, daily during periods of prolonged rainfall, and at a minimum once a week. Repair or replace damaged section immediately to restore the requirements of this Item. Remove sediment deposits when silt reaches a depth one-third of the height of the fence or 6-inches, whichever is less.
7. When used in swales, ditches or diversions, elevation of barrier at top of filter fabric at flow line location in channel shall be lower than bottom elevation of filter fabric at ends of barrier or top of bank, whichever is less, in order to keep storm water discharge in channel from overtopping bank.

### **3.3 STREET AND SIDEWALK CLEANING**

- A. Keep areas clean of construction debris and mud carried by construction vehicles and equipment. If necessary, install stabilized construction exits at

construction, staging, storage, and disposal areas, following Specification Section 01 57 13.02 – Stabilized Construction Access.

- B. In lieu of or in addition to stabilized construction exits, shovel or sweep pavements as required to keep areas clean. Do not hose or sweep debris and mud off street into adjacent areas, except, hose sidewalks during off-peak hours, after sweeping.

### **3.4 WASTE COLLECTION AREAS**

- A. Prevent water runoff from passing through waste collection areas, and prevent water runoff from waste collection areas migrating outside collection areas.

### **3.5 EQUIPMENT MAINTENANCE AND REPAIR**

- A. Confine maintenance and repair of construction machinery and equipment to areas specifically designated for that purpose, so fuels, lubricants, solvents, and other potential pollutants are not washed directly into receiving streams or storm water conveyance systems. Provide these areas with adequate waste disposal receptacles for liquid and solid waste. Clean and inspect maintenance areas daily.
- B. Where designated equipment maintenance areas are not feasible, take precautions during each individual repair or maintenance operation to prevent potential pollutants from washing into streams or conveyance systems. Provide temporary waste disposal receptacles.

### **3.6 VEHICLE/ EQUIPMENT WASHING AREAS**

- A. Install wash area (stabilized with coarse aggregate) adjacent to stabilized construction exit(s), as required to prevent mud and dirt run-off. Release wash water into drainage swales or inlets protected by erosion and sediment controls. Build wash areas following Specification Section 01 57 13.02 – Stabilized Construction Access. Install gravel or rock base beneath wash areas.
- B. Wash vehicles only at designated wash areas. Do not wash vehicles such as concrete delivery trucks or dump trucks and other construction equipment at

locations where runoff flows directly into watercourses or storm water conveyance systems.

- C. Locate wash areas to spread out and evaporate or infiltrate wash water directly into ground, or collect runoff in temporary holding or seepage basins.

### **3.7 REMOVAL OF CONTROLS**

- A. Remove erosion and sediment controls when the site is finally stabilized, as directed by Owner's Representative.
- B. Dispose of sediments and waste products following Specification Section 01 35 05 – Environmental Protection and Special Controls.

### **3.8 OWNER TRAINING (NOT USED)**

**END OF SECTION**

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**SECTION 01 57 23.02**

**CONTROL OF GROUND WATER AND SURFACE WATER**

**PART 1 - GENERAL**

**1.1 SUMMARY**

A. Section Includes:

Control of ground water and surface water.

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

1. Division 00 – Proposing Requirements, Contract Forms, and Conditions of the Contract.
2. Division 01 – General Requirements.

**1.2 MEASUREMENT AND PAYMENT**

- A. Stipulated Price (Lump Sum). If Contract is a Stipulated Price Contract, payment for this Work is included in the total Stipulated Price.

**1.3 REFERENCES**

- A. ASTM D698 – Standard Test Methods for Laboratory Compaction of Soils Using Standard Effort (12,400 ft-lbf/ft<sup>3</sup> (600kN-m/m<sup>3</sup>).
- B. Federal Regulations 29 CFR Part 1926, Standards-Excavation, Occupational Safety and Health Administration (OSHA).

**1.4 DEFINITIONS**

A. Ground water control includes both dewatering and depressurization of water-bearing soil layers.

1. Dewatering includes lowering water table and intercepting seepage that would otherwise emerge from slopes or bottoms of excavations, or into tunnels and shafts, and disposing of removed water. Intent of dewatering is to increase stability of tunnel excavations and excavated slopes, prevent dislocation of material from slopes or bottoms of excavations, reduce lateral loads on sheeting and bracing, improve excavating and hauling characteristics of excavated material, prevent failure or heaving of bottom of excavations, and to provide suitable conditions for placement of backfill materials and construction of structures and other installations.
2. Depressurization includes reduction in piezometric pressure within strata not controlled by dewatering alone, as required to prevent failure or heaving of excavation bottom or instability of tunnel excavations.

B. Excavation drainage includes keeping excavations free of surface and seepage water.

- C. Surface drainage includes use of temporary drainage ditches and dikes and installation of temporary culverts and sump pumps with discharge lines as required to protect work from any source of surface water.
- D. Equipment and instrumentation for monitoring and control of ground water control system includes piezometers, monitoring wells and flow meters for observing and recording flow rates.
- E. Surface water includes water from rainfall, runoff, the SJRA canal, and all other sources not considered ground water.

### **1.5 PERFORMANCE REQUIREMENTS**

- A. Conduct subsurface investigations to identify groundwater conditions and to provide parameters for design, installation, and operation of groundwater control systems. Submit prepared method and spacing of readings for review prior to obtaining water level readings.
- B. Design ground water control system, compatible with requirements of Federal Regulations 29 CFR Part 1926 and Section 31 41 00 – Trench Safety System to produce following results:
  - 1. Effectively reduce hydrostatic pressure affecting:
    - a. Excavations
    - b. Tunnel excavation, face stability, or seepage into tunnels
  - 2. Develop substantially dry and stable subgrade for subsequent construction operations
  - 3. Preclude damage to adjacent properties, buildings, structures, utilities, installed facilities, and other work
  - 4. Prevent loss of fines, seepage, boils, quick condition, or softening of foundation strata
  - 5. Maintain stability of sides and bottom of excavations
- C. Provide ground water control systems that include single-stage or multiple-stage well point systems, eductor and ejector-type systems, deep wells, or combinations of these equipment types, as appropriate.
- D. Provide drainage of seepage water and surface water, as well as water from any other source entering excavation. Excavation drainage may include placement of drainage materials, crushed stone and filter fabric, together with ditches and sump pumping.
- E. Provide ditches, berms, pumps, and other methods necessary to divert and drain surface water from excavation and other work areas.
- F. Locate ground water control and drainage systems so as not to interfere with utilities, construction operations, adjacent properties, or adjacent water wells.

- G. Assume sole responsibility for ground water control systems and for any loss or damage resulting from partial or complete failure of protective measures and any settlement or resultant damage caused by ground water control operations. Modify ground water control systems or operations if they cause or threaten to cause damage to new construction, existing site improvements, adjacent property, or adjacent water wells, or affect potentially contaminated areas. Repair damage caused by ground water control systems or resulting from failure of system to protect property as required.
- H. Provide adequate number of piezometers installed at proper locations and depths as required to provide meaningful observations of conditions affecting excavation, adjacent structures and water wells.
- I. Provide environmental monitoring wells installed at proper locations and depths as required to provide adequate observations of hydrostatic conditions and possible contaminant transport from contamination sources into work area or ground water control system.
- J. The SJRA canal must stay operational at all times during construction. No shut down of canal flow shall be permitted during construction. **Temporary care of water methods in the SJRA canal must allow a flow rate up to 60 MGD with an *upstream water surface elevation not to exceed 48.2 ft immediately upstream of the siphon.***
- K. Turbidity in the canal downstream of the work may not exceed 150 NTU greater than the upstream turbidity at any time during installation, operation, and removal of any temporary works constructed in the SJRA canal.
- L. Provide standard USGS staff gauge with elevations up to canal top of bank elevation both upstream and downstream of FM 2100 so that water surface elevations can be obtained visually at all times during construction.

## **1.6 SUBMITTALS**

- A. Conform to requirements of Section 01 33 00 – Submittals.
- B. Submit Ground Water and Surface Water Control Plan for review by Owner's Representative prior to start of any field work. Plan shall be signed by Professional Engineer registered in State of Texas. Submit plan to include following:
  - 1. Results of subsurface investigation and description of extent and characteristics of water bearing layers subject to ground water control
  - 2. Names of equipment suppliers and installation subcontractors
  - 3. Description of proposed surface water control systems for bypass of canal flows including location, arrangement, system components, capacity, installation details, staff gauge locations and details, and operation and maintenance procedures.

4. Description of proposed ground water control systems indicating arrangement, location, depth, and capacities of system components, installation details, and criteria and operation and maintenance procedures
  5. Description of proposed monitoring and control system indicating depths and locations of piezometers and monitoring wells, monitoring installation details and criteria, type of equipment and instrumentation with pertinent data and characteristics
  6. Description of proposed filters including types, sizes, capacities, and manufacturer's application recommendations
  7. Certification of design calculations demonstrating adequacy of proposed systems for intended applications. Define potential area of influence of ground water control operation near contaminated areas.
  8. Operating requirements, including piezometric control elevations for dewatering and depressurization
  9. Excavation drainage methods including typical drainage layers, sump pump application and other necessary means
  10. Surface water control and drainage installations
  11. Proposed methods and locations for disposing of removed water
- C. Submit following records upon completed initial installation:
1. Installation and development reports for well points, eductors, and deep wells
  2. Installation reports and baseline readings for piezometers and monitoring wells
  3. Baseline analytical test data of water from monitoring wells
  4. Initial flow rates
- D. Submit the following records weekly during operations:
1. Records of flow rates and piezometric elevations obtained during monitoring of dewatering and depressurization. Refer to Paragraph 3.2, Requirements for Eductor, Well Points, or Deep Wells.
  2. Maintenance records for ground water control installations, piezometers and monitoring wells

## **1.7 ENVIRONMENTAL REQUIREMENTS**

- A. Comply with requirements of agencies having jurisdiction.
- B. Comply with Texas Commission on Environmental Quality regulations and Texas Water Well Drillers Association for development, drilling, and abandonment of wells used in dewatering system.

- C. Obtain necessary permits from agencies with control over use of groundwater and matters affecting well installation, water discharge, and use of existing storm drains and natural water sources. Because review and permitting process may be lengthy, take early action to pursue and submit for required approvals.
- D. Monitor ground water discharge for contamination while performing pumping in vicinity of potentially contaminated sites.
- E. Filter water discharged from dewatering systems prior to entering drainage ways.
- F. Discharge of ground or surface water shall not be permitted in areas designated as potential wetlands in the drawings.

## **PART 2 - PRODUCTS**

### **2.1 EQUIPMENT AND MATERIALS**

- A. Use optional equipment and materials as necessary to achieve desired results for dewatering. Selected equipment and materials are subject to review of Owner's Representative through submittals required in Paragraph 1.6, Submittals.
- B. Eductors, well points, or deep wells, where used, must be furnished, installed and operated by experienced contractor regularly engaged in ground water control system design, installation, and operation.
- C. Equipment must be in good repair and operating order.
- D. Keep sufficient standby equipment and materials available to ensure continuous operation, where required.

## **PART 3 - EXECUTION**

### **3.1 GROUND WATER CONTROL**

- A. Perform subsurface investigation by borings as necessary to identify water bearing layers, piezometric pressures, and soil parameters for design and installation of ground water control systems. Perform pump tests, if necessary to determine draw down characteristics of waterbearing layers. Present results in Ground Water and Surface Water Control Plan (See Paragraph 1.6B.1).
- B. Provide labor, material, equipment, techniques and methods to lower, control and handle ground water in manner compatible with construction methods and site conditions. Monitor effectiveness of installed system and its effect on adjacent property.
- C. Install, operate, and maintain ground water control systems in accordance with Ground Water and Surface Water Control Plan. Notify Owner's Representative

- in writing of changes made to accommodate field conditions and changes to Work. Provide revised drawings and calculations with notification.
- D. Provide for continuous system operation, including nights, weekends, and holidays. Arrange for appropriate backup if electrical power is primary energy source for dewatering system.
  - E. Monitor operations to verify system lowers ground water piezometric levels at rate required to maintain dry excavation resulting in stable subgrade for prosecution of subsequent operations.
  - F. Where hydrostatic pressures in confined water bearing layers exist below excavation, depressurize those zones to eliminate risk of uplift or other instability of excavation or installed works. Define allowable piezometric elevations in Ground Water and Surface Water Control Plan.
  - G. Remove ground water control installations.
    - 1. Remove pumping system components and piping when ground water control is no longer required
    - 2. Remove monitoring wells when directed by Owner's Representative.
    - 3. Grout abandoned well and piezometer holes. Fill piping that is not removed with cement-bentonite non-shrink grout or cement-sand grout along entire shaft length.
  - H. During backfilling, dewatering may be reduced to maintain water level minimum of 5 feet below prevailing level of backfill. However, do not allow that water level to result in uplift pressures in excess of 80 percent of downward pressure produced by weight of structure or backfill in place. Do not allow water levels to rise into cement stabilized sand until at least 48 hours after placement.
  - I. Provide uniform diameter for each pipe drain run constructed for dewatering. Remove pipe drain when it has served its purpose. If removal of pipe is impractical, provide grout connections at 50-foot intervals and fill pipe with cement-bentonite grout or cement-sand grout when pipe is removed from service.
  - J. Extent of construction ground water control for structures with permanent perforated underground drainage system may be reduced, for units designed to withstand hydrostatic uplift pressure. Provide means of draining affected portion of underground system, including standby equipment. Maintain drainage system during operations and remove it when no longer required.
  - K. Remove system upon completion of construction or when dewatering and control of surface or ground water is no longer required.
  - L. Compact backfill to not less than 95 percent of maximum dry density in accordance with ASTM D 698.
  - M. Foundation Beds: Maintain saturation line at least 3 feet below lowest elevations where concrete is to be placed. Drain foundations in areas where

concrete is to be placed before placing reinforcing steel. Keep free from water for 3 days after concrete is placed.

### **3.2 REQUIREMENTS FOR EDUCTOR, WELL POINTS, OR DEEP WELLS**

- A. Design, install, and operate all dewatering wells to prevent the removal of native material except as incidental to well development.
- B. For aboveground piping in ground water control system, include 12-inch minimum length of clear, transparent piping between every eductor well or well point and discharge header to visually monitor discharge from each installation.
- C. Install sufficient piezometers or monitoring wells to show trench or shaft excavations in water bearing materials are pre-drained prior to excavation. Provide separate piezometers for monitoring of dewatering and for monitoring of depressurization. Install piezometers and monitoring wells for tunneling as appropriate for selected method of Work.
- D. Install piezometers or monitoring wells not less than 1 week in advance of beginning associated excavation.
- E. Dewatering may be omitted for portions of under drains or other excavations, but only where auger borings and piezometers or monitoring wells show that soil is predrained by existing system and that criteria of ground water control plan are satisfied.
- F. Replace installations that produce noticeable amounts of sediments after development.
- G. Provide additional ground water control installations, or change methods, in event that installations according to ground water control plan does not provide satisfactory results based on performance criteria defined by plan and by specification. Submit revised plan according to Paragraph 1.6B.

### **3.3 EXCAVATION DRAINAGE**

- A. May use excavation drainage methods if necessary to achieve well drained conditions. Excavation drainage may consist of layer of crushed stone and filter fabric, and sump pumping in combination with sufficient wells for ground water control to maintain stable excavation and backfill conditions.

### **3.4 MAINTENANCE AND OBSERVATION**

- A. Conduct daily maintenance and observation of piezometers or monitoring wells while ground water control installations or excavation drainage are operating in area or seepage into tunnel is occurring. Keep system in good condition.
- B. Replace damaged and destroyed piezometers or monitoring wells with new piezometers or wells as necessary to meet observation schedule.
- C. Cut off piezometers or monitoring wells in excavation areas where piping is exposed, only as necessary to perform observation as excavation proceeds. Continue to maintain and make observations, as specified.

- D. Remove and grout piezometers inside or outside excavation area when ground water control operations are complete. Remove and grout monitoring wells when directed by Owner's Representative. Follow applicable regulations for abandoning piezometers and monitoring wells.

### **3.5 MONITORING AND RECORDING**

- A. Monitor and record average flow rate of operation for each deep well, or for each wellpoint or eductor header used in dewatering system. Also monitor and record water level and ground water recovery. Obtain records daily until steady conditions are achieved, and twice weekly thereafter.
- B. Observe and record elevation of water level daily as long as ground water control system is in operation, and weekly thereafter until Work is completed or piezometers or wells are removed, except when Owner's Representative determines more frequent monitoring and recording are required. Comply with Owner's Representative direction for increased monitoring and recording and take measures necessary to ensure effective dewatering for intended purpose.

### **3.6 SURFACE WATER CONTROL**

- A. Intercept surface water and divert it away from excavations through use of dikes, ditches, curb walls, pipes, cofferdams, sumps or other approved means. Requirement includes temporary works required to protect adjoining properties from surface drainage caused by construction operations.
- B. Provide cofferdams and bypass system to maintain canal flow up to 60 MGD at all times during construction.
- C. Divert surface water and seepage water into sumps and pump it into drainage channels or storm drains, when approved by agencies having jurisdiction. Provide settling basins when required by agencies.
- D. SJRA reserves the right to operate their canal up to the full height of their embankments, however, contractor shall adhere to water surface elevation requirements specified in section 1.5 J.

**END OF SECTION**



**SECTION 01 65 50**

**PRODUCT DELIVERY, STORAGE, AND HANDLING**

**PART 1 - GENERAL**

**1.1 SUMMARY**

- A. Section includes requirements for product delivery, storage and handling.
- B. Related Specification Sections include but are not necessarily limited to:
  - 1. Division 00 - Bidding Requirements, Contract Forms, and Conditions of the Contract.
  - 2. Division 01 - General Requirements.

**1.2 MEASUREMENT AND PAYMENT**

- A. Stipulated Price (Lump Sum). If Contract is a Stipulated Price Contract, payment for Work in this Section is included in total Stipulated Price.
- B. No payment will be made to Contractor for equipment or materials not properly stored and insured or without approved Shop Drawings.
  - 1. Previous payments for items will be deducted from subsequent progress estimate(s) if proper storage procedures are not observed.

**1.3 SUBMITTALS**

- A. Provide Owner project Log Book.

**1.4 TRANSPORTATION**

- A. Make arrangements for transportation, delivery, and handling of equipment and materials required for timely completion of Work.
- B. Transport and handle products in accordance with instructions.
- C. Consign and address shipping documents to proper party giving name of Project, street number, and city. Shipments shall be delivered to Contractor.

**1.5 DELIVERY**

- A. Scheduling: Schedule delivery of products or equipment as required to allow timely inspection and installation, and to avoid prolonged storage, overburdening of limited storage space, conflicts with other contractors on site. Confirm availability of equipment and personnel for handling products prior to delivery.
- B. Packaging: Deliver products or equipment in manufacturer's original unopened and unbroken cartons or other containers designed and constructed to protect the contents from physical or environmental damage.
- C. Identification: Clearly and fully mark and identify as to manufacturer, item, and installation location.

- D. Protection and Handling: Provide manufacturer's instructions for storage and handling.

## **PART 2 - PRODUCTS**

- A. Products: Means material, equipment, or systems forming Work. Does not include machinery and equipment used for preparation, fabrication, conveying, and erection of Work. Products may also include existing materials or components designated for reuse.
- B. For material and equipment specifically indicated or specified to be reused in the work:
  - 1. Use special care in removal, handling, storage and reinstallation, to assure proper function in completed work.
  - 2. Arrange for transportation, storage and handling of products which require offsite storage, restoration or renovation. Pay all costs for such work.
- C. When contract documents require that installation of work comply with manufacturer's printed instructions, obtain and distribute copies of such instructions to parties involved in installation, including two copies to Owner's Representative. Maintain one set of complete instructions at job site during installation until completion.
- D. Provide equipment and components from fewest number of manufacturers as practical, in order to simplify spare parts inventory and allow for maximum interchangeability of components. For multiple components of same size, type, or application, use same make and model of component throughout Project.

## **PART 3 - EXECUTION**

### **3.1 PROTECTION, STORAGE AND HANDLING**

- A. Protection:
  - 1. Protect materials in accordance with manufacturer's recommendations and requirements of these Specifications.
    - a. Store products or equipment in location to avoid loss or physical damage to items while in storage.
  - 2. Protect equipment from exposure to elements and keep thoroughly dry.
  - 3. When space heaters are provided in equipment, connect and operate heaters during storage until equipment is placed in service.
- B. Storage:
  - 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. 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. 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. Arrange storage to provide easy access for inspection.

3. Restrict storage to areas available on construction site for storage of material and equipment as shown on Drawings or approved by Owner's Representative.
4. Provide off-site storage and protection when on-site storage is not adequate. Provide addresses of and access to off-site storage locations for inspection by Owner's Representative.
5. 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.
6. Store in manufacturers' unopened containers.
7. 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. Keep public, private driveways, and street crossings open.
8. Repair or replace damaged lawns, sidewalks, streets, or other improvements to satisfaction of Owner's Representative. 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 Owner's Representative.

C. Handling:

1. Handle materials in accordance with manufacturer's recommendations and requirements of these Specifications.
2. Coordinate off-loading of materials and equipment delivered to job site. If necessary to move stored materials and equipment during construction, relocate materials and equipment at no additional cost to Owner. Do not allow the off-loading of materials in those parking areas used for crew's personal vehicles.
3. Provide equipment and personnel necessary to handle products by methods to prevent damage to products or packaging.
4. Provide additional protection during handling as necessary to prevent breaking, scraping, marring, or otherwise damaging products or surrounding areas.
5. Handle products by methods to prevent over bending or over stressing.
6. Lift heavy components only at designated lifting points.

7. Do not drop, roll, or skid products off delivery vehicles. Hand carry or use suitable materials handling equipment.

### **3.2 STORAGE FACILITIES**

#### **A. Temporary Storage Building (if required):**

1. Provide a weatherproof temporary storage building specifically for the purpose of providing for protection of products and equipment.
  - a. Size building to accommodate anticipated storage items
2. 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.
3. Provide methods of storage of products and equipment off the ground.
4. Provide this structure within 60 days after Notice to Proceed.
  - a. Locate building on-site where shown on the Drawings or in location approved by the Owner's Representative.
  - b. Remove building from site prior to startup and demonstration period.

### **3.3 FIELD QUALITY CONTROL**

#### **A. Inspect Deliveries:**

1. Inspect all products or equipment delivered to the site prior to unloading.
  - a. Reject all products or equipment that are damaged, used, or in any other way unsatisfactory for use on Project.

- #### **B. Monitor Storage Area:** Monitor storage area to ensure suitable temperature and moisture conditions are maintained as required by manufacturer or as appropriate for particular items.

**END OF SECTION**

**SECTION 01 71 13**

**MOBILIZATION**

**PART 1 - GENERAL**

**1.1 SUMMARY**

- A. Section includes requirements for mobilization.
- B. Related Specification Sections include but are not necessarily limited to:
  - 1. Division 00 – Bidding Requirements, Contract Forms, and Conditions of the Contract.
  - 2. Division 01 – General Requirements.

**1.2 MEASUREMENT AND PAYMENT**

- A. Mobilization payments will be included in periodic progress payment upon written application subject to following provisions:
  - 1. Authorization for payment of 50 percent of Contract Price for mobilization will be made upon receipt and approval by Owner’s Representative of the following items, as applicable:
    - a. Schedule of Values submittal in accordance with Section 01 29 73 – Schedule of Values
    - b. Safety Program/Plan submittal in accordance with the Trench Safety Program/Plan in accordance with Section 31 41 00 – Trench Safety System.
    - c. Construction Schedule submittal in accordance with Section 01 32 16 – Construction Progress Schedule
    - d. Confirmation of equipment on-site.
    - e. Control of groundwater and surface water plan in accordance with Section – 1 57 23.02 – Control of Ground Water and Surface Water, when required
  - 2. Authorization for payment of remaining 50 percent of Contract Price for mobilization will be made upon completion of Work amounting to 5 percent of Contract Price less mobilization unit price.
- B. Mobilization payments will be subject to retainage amounts stipulated in Specification Section 00 72 00 – General Conditions of the Contract.

**1.3 SUBMITTALS (NOT USED)**

**PART 2 - PRODUCTS (NOT USED)**

**PART 3 - EXECUTION (NOT USED)**

**END OF SECTION**

**SECTION 01 71 32.16**  
**CONSTRUCTION SURVEYING**

**PART 1 - GENERAL**

**1.1 SUMMARY**

- A. Section includes requirements for construction surveying.
- B. Related Specification Sections include but are not necessarily limited to:
  - 1. Division 00 – Proposing Requirements, Contract Forms, and Conditions of the Contract.
  - 2. Division 01 – General Requirements.

**1.2 QUALITY CONTROL**

- A. Conform to State of Texas laws for surveys requiring licensed surveyors.
- B. Employ land surveyor acceptable to the Owner, if required.

**1.3 MEASUREMENT AND PAYMENT**

- A. No Separate payment will be made for field surveying. Include cost in unit price for Work requiring field surveying.

**1.4 SUBMITTALS**

- A. Conform to requirements of Specification Section 01 33 00 – Submittals.
- B. Submit to Owner's Representative name, address, and telephone number of Surveyor before starting survey work.
- C. Submit documentation verifying accuracy of survey work on request.
- D. Submit certificate signed by surveyor, that elevations and locations of Work are in conformance with Contract.

**1.5 PROJECT RECORD DOCUMENTS**

- A. Maintain complete and accurate log of control and survey Work as it progresses.
- B. Prepare certified survey setting forth dimensions, locations, angles, and elevations of construction and site Work upon completion of foundation walls and major site improvements.
- C. Submit Record Documents under provisions of Section 01 78 39 – Project Record Documents.

**1.6 EXAMINATION**

- A. Verify locations of survey control points prior to starting Work.
- B. Notify Owner's Representative immediately of any discrepancies discovered.

### **1.7 SURVEY REFERENCE POINTS**

- A. Control datum for survey established by provided survey as indicated on Contract Drawings. Inform Owner's Representative in advance of time at which horizontal and vertical control points will be established so verification deemed necessary by Owner's Representative may be done with minimum inconvenience to Owner's Representative and minimum delay to Contractor.
- B. Locate and protect survey control points prior to starting site work; preserve permanent reference points during construction.
- C. Notify Owner's Representative 48 hours in advance of need for relocation of reference points due to changes in grades or other reasons.
- D. Report promptly to Owner's Representative loss or destruction of reference point.
- E. Contractor to replace permanent reference points disturbed by operations, at no additional cost to the Owner.

### **1.8 SURVEY REQUIREMENTS**

- A. Utilize recognized engineering survey practices.
- B. Establish minimum of two permanent bench marks on site, referenced to established control points. Record locations with horizontal and vertical data on Project Record Documents.
- C. Establish elevations, lines, and levels to provide quantities required for measurement and payment and to provide appropriate controls for Work. Locate and lay out by instrumentation and similar appropriate means:
  - 1. Site improvements including pavements; stakes for grading; fill and topsoil placement; utility locations, slopes, and invert elevations
  - 2. Grid or axis for structures
  - 3. Building foundation, column locations, ground floor elevations
- D. Periodically verify layouts by same means.

### **PART 2 - PRODUCTS (NOT USED)**

### **PART 3 - EXECUTION (NOT USED)**

**END OF SECTION**



**SECTION 01 74 19**

CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

**PART 1 - GENERAL**

**1.1 SUMMARY**

- A. Section includes requirements for construction waste management and disposal.
- B. Related Specification Sections include but are not necessarily limited to:
  - 1. Division 00 – Proposing Requirements, Contract Forms, and Conditions of the Contract.
  - 2. Division 01 – General Requirements.

**1.2 MEASUREMENT AND PAYMENT**

- A. No separate payment will be made for waste material disposal under this Section. Include payment in unit price for related sections.

**1.3 SUBMITTALS**

- A. Conform to requirements of Specification Section 01 33 00 – Submittals.
- B. Obtain and submit disposal permits for proposed disposal sites if required by local ordinances. Submit a copy of all disposal permits to the Owner's Representative.
- C. Submit copy of written permission from property owner(s) outside limits of Project, with description of property, prior to disposal of excess material. Submit written and signed release from property owner upon completion of disposal work. Copies of the permission and release documents are to be submitted to the Owner's Representative.

**PART 2 - PRODUCTS (NOT USED)**

**PART 3 - EXECUTION**

**3.1 SALVAGEABLE MATERIAL**

- A. Excavated Material: When indicated on Drawings, load, haul, and deposit excavated material at location or locations shown on Drawings outside limits of Project.
- B. Other Salvageable Materials: Conform to requirements of individual Specification Sections.
- C. Coordinate with the Owner's Representative the loading of salvageable material.

### **3.2 EXCESS MATERIAL**

- A. Remove and legally dispose of vegetation, rubble, broken concrete, debris, asphaltic concrete pavement, excess soil, and other materials not designated for salvage from job site.
- B. Excess soil may be deposited on private property outside the Project limits when written permission is obtained from property owner. See Paragraph 1.3C above.
- C. Verify flood plain status of any proposed disposal site. Do not dispose of excavated materials in area designated as within 100-year Flood Hazard Area unless the proper permit has been obtained. Remove excess material placed in “100-year Flood Hazard Area” at no additional cost to the Owner.
- D. Remove waste materials from site daily, in order to maintain site in neat and orderly condition, unless otherwise authorized by the Owner.

**END OF SECTION**

**SECTION 01 74 23**  
RESTORATION OF SITE

**PART 1 - GENERAL**

**1.1 SUMMARY**

- A. Section includes requirements for the restoration of sites affected by Utility Work, Roadway Reconstruction or Widening, or Facilities Work. Section does not apply to roadway extension projects.
- B. Related Specification Sections include but are not necessarily limited to:
  - 1. Division 00 – Proposing Requirements, Contract Forms, and Conditions of the Contract.
  - 2. Division 01 – General Requirements.
  - 3. Section 02 41 13 13 – Removing Existing Pavements and Structures.
  - 4. Section 31 21 33 – Trenching, Backfilling, and Compacting for Utilities.
  - 5. Section 32 92 13 – Hydro-Mulching.

**1.2 MEASUREMENT AND PAYMENT**

- A. Stipulated Price (Lump Sum) Contract. If Contract is Stipulated Price Contract, payment for Work in this Section is included in total Stipulated Price.

**1.3 REFERENCES**

- A. ANSI Z60.1 – American Standard for Nursery Stock.

**1.4 DEFINITIONS**

- A. Site Restoration is replacement or reconstruction of site improvements to rights-of-way, easements, public property, and private property that are affected or altered by construction operations, with improvements to restore to a condition which is equal to, or better than, that which existed prior to construction operations.
- B. Site Improvement includes but is not limited to pavement, driveways, culverts, headwalls, mail boxes, lighting, signage, fences, lawns, irrigation systems, and landscaping.
- C. Line Segment. Length of pipe and bends as designated on Drawings, and to end of stubs or termination of pipe.
- D. Minimum Trench Width. Allowable trench width for corresponding pipe outside diameter as defined in Specification Section 31 21 33 – Trenching, Backfilling, and Compacting for Utilities, unless otherwise indicated on the Drawings.

## **1.5 SUBMITTALS**

- A. Conform to requirements of Specification Section 01 33 00 – Submittals.
- B. Submit qualifications of nursery or landscaping firm to be used.

## **1.6 QUALITY ASSURANCE**

- A. Have trees, landscape shrubs, and plantings performed by qualified personnel.

## **1.7 SCHEDULING**

- A. After installation of pipe and appurtenances is complete, complete site restoration of disturbed areas.

## **1.8 WARRANTY**

- A. Provide 4-week warranty on plants and sod grasses that die due to shock or damage only.
- B. Replace plants that fail during warranty period according to specifications governing original plants.
- C. At the end of the warranty period, provide written notification to homeowner(s) stating the underlying property owner, advising that home owner is subsequently responsible for watering, maintaining replaced plants and grasses. Provide copy of notice to Owner's Representative. Notice to include date and time notice was provided, who provided the notice and how was delivered.
- D. Damage caused by natural hazards including hail, high winds or storm is not covered by warranty.
- E. Existing plant material required to be moved on site are covered under warranty.

## **PART 2 - PRODUCTS**

### **2.1 MATERIALS**

- A. Seeding and Sodding.
  - 1. Provide hydro-mulching/seeding in accordance with Specification Section 32 92 13 – Hydro-Mulching.

## **PART 3 - EXECUTION**

### **3.1 COORDINATION (NOT USED)**

### **3.2 EXAMINATION**

- A. Construction Site Photographs. Document conditions on and adjacent to construction site with construction photographs as specified in Specification Section 01 32 36.01 – Project Photographs.

- B. Make photographs of all areas where construction operations will be conducted including driveways within or adjacent to Work area.

### **3.3 PREPARATION**

- A. Removing Pavements and Structures.
  - 1. Remove minimum pavement and other structures as required to perform Work. Perform removals in accordance with Specification Section 02 41 13 13 – Removing Existing Pavements and Structures.
- B. Remove or relocate existing fencing, if required, for construction operations. Maintain integrity of private property owner's fencing if needed for protection of children, pets, or property. Notify Property owner and/or resident at least 72 hours in advance before removing fencing and coordinate security needs in accordance with Specification Section 01 14 19 – Use of Premises.

### **3.4 INSTALLATION**

- A. Pavement and Driveway Restoration.
  - 1. Replace pavement, culverts, headwalls, and driveways removed or damaged as result of construction operations.
- B. Seeding and Sodding.
  - 1. Clean up construction debris and level area with bank sand so that resulting surface of new grass matches level of existing grass and maintains pre-construction drainage patterns. Level minor ruts or depressions caused by construction operations where grass is still viable by filling with bank sand.
  - 2. Restore unpaved areas with hydromulch methods conforming to Section 32 92 13 – Hydro-Mulching.
- C. Fence Removal and Replacement.
  - 1. Replace fencing removed or damaged to equal or better than what existed prior to construction, including concrete footings and mow strips. Provide new wood posts, top and bottom railing and panels. Metal fencing material not damaged by Work may be reused.
  - 2. Remove and dispose of damaged or substandard material.

### **3.5 CLEANING**

- A. Remove debris and trash to maintain clean and orderly site as described in General Conditions and Specification Section 01 74 19 – Construction Waste Management and Disposal.

### **3.6 MAINTENANCE**

- A. Maintain shrubs, plantings, sodded areas and seeded areas through warranty period.
- B. Replace shrubs, plantings, and seeded or sodded areas that fail to become established through warranty period.

- C. Maintain newly planted trees, shrubs, and plantings as follows:
  - 1. Water as often as necessary to keep ground and backfill moist until plantings have become established.
  - 2. Repair or replace bracing as necessary.
  - 3. Prune as necessary.
  - 4. Treat plants in accordance with approved methods of horticultural practices where insects or disease affect plants after planting.
- D. Refer to Specification Section 01 56 39 – Temporary Tree and Plant Protection, Specification Section 32 92 13 – Hydro-Mulching for additional maintenance requirements.

**END OF SECTION**

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

**PART 1 - GENERAL**

**1.1 SUMMARY**

- A. Section includes requirements for closeout of a construction project.
- B. Related Specification Sections include but are not necessarily limited to:
  - 1. Division 00 – Introductory Information, Proposing Requirements, Contract Forms, and Conditions of the Contract.
  - 2. Division 01 – General Requirements.

**1.2 MEASUREMENT AND PAYMENT**

- A. No separate payment will be made for this item. Include the cost in associated items for this project.

**1.3 SUBMITTALS (NOT USED)**

**1.4 SUBSTANTIAL COMPLETION**

- A. Comply with Specification Section 00 72 00 – General Conditions of the Contract regarding Substantial Completion when Contractor considers the Work, or portion thereof designated by Owner’s Representative, to be substantially complete.
- B. Insure the following items have been completed when included in the Work, prior to presenting a list of items to be inspected by Owner’s Representative for issuance of a Certificate of Substantial Completion:
  - 1. Cutting, plugging, and abandoning of water, wastewater, and storm sewer lines, as required by specifications for each item;
  - 2. Construction of, and repairs to, pavement, driveways, sidewalks, culverts, headwalls and curbs and gutters;
  - 3. Sodding and hydromulch seeding, unless waived by the Owner in writing;
  - 4. General clean up including signage, lighting, pavement markings, transfer of services, successful testing and landscape;
  - 5. Installation of all bid items included in Specification Section 00 41 00.02 – Proposal Form and approved Contract Document changes.
  - 6. Any additional requirements in Section 01 14 19– Use of Premises.
- C. Assist Owner’s Representative with inspection of Contractor’s list of items and complete or correct the items, including items added by Owner’s Representative, within a time period of 30 days or as mutually agreed.
- D. Should Owner’s Representative’s inspection show failure of Contractor to comply with substantial completion requirements, including those items in

Paragraph 1.2B of this specification, Contractor shall complete or correct the items, before requesting another inspection by Owner's Representative.

### **1.5 CLOSEOUT PROCEDURES**

- A. Comply with Specification Section 00 72 00 – General Conditions of the Contract regarding Final Inspection and Final Payment when Work is complete and ready for Owner's Representative's final inspection.
- B. Provide Project Record Documents in accordance with Specification Section 01 78 39 – Project Record Documents.
- C. Complete or correct items on punch list, with no new items added. Address new items during warranty period.
- D. Owner will occupy portions of Work as specified in other Sections.

### **1.6 FINAL CLEANING**

- A. Execute final cleaning prior to Final Inspection.
- B. Clean debris from drainage systems.
- C. Clean site; sweep paved areas, rake landscaped surfaces clean.
- D. Remove waste and surplus materials, rubbish, and temporary construction facilities from site following final test of utilities and completion of Work.

### **1.7 ADJUSTING (NOT USED)**

### **1.8 OPERATION AND MAINTENANCE DATA (NOT USED)**

### **1.9 WARRANTY**

- A. Provide one original and two copies of each warranty from subcontractors, suppliers, and manufacturers.
- B. Provide Table of Contents and assemble warranties in three-ring/D binder with durable plastic cover.
- C. Submit warranties prior to final progress payment.
- D. Warranties shall commence in accordance with requirements in Specification Section 00 72 00 – General Conditions of the Contract.

### **1.10 SPARE PARTS AND MAINTENANCE MATERIALS**

- A. Provide products, spare parts, maintenance, and extra materials in quantities specified in individual Specification sections.
- B. Deliver to location as directed by Owner's Representative; obtain receipt prior to final Payment Application.

### **1.11 TEXAS DEPARTMENT OF LICENSING AND REGULATION (TDLR) INSPECTION (NOT USED)**

### **1.12 FINAL PHOTOS**



A. Provide per Specification Section 01 32 36.01 – Project Photographs.

**1.13 PROJECT RECORD DOCUMENTS**

A. Provide per Specification Section 01 78 39 – Project Record Documents.

**PART 2 - PRODUCTS (NOT USED)**

**PART 3 - EXECUTION (NOT USED)**

**END OF SECTION**

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**SECTION 01 78 39**  
PROJECT RECORD DOCUMENTS

**PART 1 - GENERAL**

**1.1 SUMMARY**

A. Section Includes:

1. Maintenance and Submittal.
2. Recording.
3. Submittals.

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

1. Division 00 – Bidding Requirements, Contract Forms, and Conditions of the Contract.
2. Division 01 – General Requirements.

**1.2 MEASUREMENT AND PAYMENT**

- A. No separate payment will be made for this item. Include the cost in associated items for this project.

### **1.3 MAINTENANCE OF DOCUMENTS AND SAMPLES**

- A. Maintain one record copy of documents at site in accordance with Specification Section 00 72 00 – General Conditions of the Contract.
- B. Store Record Documents and samples in field office when field office is required by Contract, or in secure location. Provide files, racks, and secure storage for Record Documents and samples.
- C. Label each document “PROJECT RECORD” in neat, large, printed letters.
- D. Maintain Record Documents in clean dry and legible condition. Do not use Record Documents for construction purposes.
- E. Keep Record Documents and Samples available for inspection by Owner’s Representative.
- F. Bring Record Drawings to progress review meetings for viewing by Owner’s Representative.

### **1.4 RECORDING**

- A. Record information concurrently with construction progress. Do not conceal Work until required information is recorded.
- B. Contract Drawings: Legibly mark each item to record actual construction, or “as built” conditions, including:
  - 1. Measured depths of elements of foundation in relation to finish first floor datum.
  - 2. Measured horizontal locations and elevations of underground utilities and appurtenances, referenced to permanent surface improvements.
  - 3. Elevations of underground utilities referenced to bench mark utilized for Project.
  - 4. Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of construction.
  - 5. Field changes of dimension and detail.
  - 6. Modifications made by Change Order.
  - 7. Details not on original Contract Drawings.
  - 8. References to related shop drawings and modifications.
- C. Maintain on site at all times an instrument for accurately measuring elevations. Survey every joint of water main at time of construction and record on drawings water main invert elevation, including elevation top of manway and centerline horizontal location relative to baseline.
- D. Record information with red felt-tip marking pen on set of blue line opaque drawings.

- E. Legibly mark Record Drawings to record:
  - 1. Manufacturer, trade name, catalog number, and supplier of each product and item of equipment actually installed.
  - 2. Changes made by Change Order or Field Order.
  - 3. Other matters not originally specified.
- F. Legibly annotate shop drawings to record changes made after review.

**1.5 SUBMITTALS**

- A. At Contract closeout, deliver Project Record Documents to Owner's Representative.

**PART 2 - PRODUCTS (NOT USED)**

**PART 3 - EXECUTION (NOT USED)**

**END OF SECTION**

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**DIVISION 02**  
EXISTING CONDITIONS

**SECTION 02 41 13.13**

**REMOVING EXISTING PAVEMENTS AND STRUCTURES**

**PART 1 - GENERAL**

**1.1 SUMMARY**

- A. Section Includes
  - 1. Removing pipe culverts and associated pipe bends .
  - 2. Removing miscellaneous structures of concrete or masonry.
  - 3. Regulatory Requirements
- B. Related Specifications Sections include but are not necessarily limited to:
  - 1. Division 00 – Proposing Requirements Contract Forms and Conditions of the Contract
  - 2. Division 01 – General Requirements
  - 3. Section 31 23 16.16 – Structural Excavation for Minor Structures

**1.2 MEASUREMENT AND PAYMENT**

- A. Stipulated Price (Lump Sum). If Contract is a Stipulated Price Contract, payment for Work in this Section is included in total Stipulated Price.

**1.3 SUBMITTALS (NOT USED)**

**1.4 WORK INCLUDED**

- A. Furnish labor, materials, equipment and incidentals necessary for every type of required demolition.
- B. Furnish equipment of every type required to demolish and transport construction debris away from the Site.

**1.5 STANDARDS**

- A. Work shall be performed in accordance with the codes and ordinances of the agency having jurisdiction over the Place of Record.
- B. Coordinate removal work with utility companies.
- C. Occupational Safety and Health Association (OSHA), 29CFR Parts 1010 and 1926, "Occupational Exposure to Asbestos, Tremolite, Anthophyllite, and Actinolite", 40 CFR Part 61 - "National Emission Standard for Hazardous Air Pollutants"

**1.6 DELIVERY AND STORAGE**

- A. Stockpile construction debris at the Site only as long as necessary to haul to a disposal site. Stack materials neatly and handle in an orderly manner until removed from the Site.



## **1.7 JOB CONDITIONS**

- A. Contractor shall visit the Site and determine the extent of demolition required and the Site conditions that might affect his proposal. Include costs of covering all aspects of the demolition as part of the proposal.
- B. The Drawings shall be carefully reviewed to determine the extent of necessary demolition and to identify elements of the existing construction which are to remain in place. Report any discrepancies to Owner and Engineer before disturbing existing conditions. Property lines and limits of demolition shall be accurately located prior to beginning site demolition. Start of demolition activities shall represent confirmation by Contractor that existing conditions are as presented in the Contract Documents. Demolition outside the limits indicated on the Drawings, or outside the property lines shall not be performed.
- C. Material removed during demolition, and any equipment not otherwise designated to remain the property of the Owner, shall become the property of the Contractor and shall be promptly removed from the Site.
- D. Equipment and material designated as remaining the property of the Owner shall be removed from the structure and transported to a designated location on the Site and stored for the Owner's use. Store on wood runners raised above the surrounding grade and cover with weather resistant covering that is tied securely in place.
- E. Take necessary precautions in removing Owner designated property to prevent damage during the demolition process. Equipment shall be removed in one piece. Loose components may be removed separately. Controls and electrical equipment may be removed from the equipment and handled separately. Large units, such as motor driven pumps, may be dismantled and motors handled separately. Do not use a cutting torch to separate the Owner's equipment or material. Salvaged piping shall be taken apart at flanges or fittings and removed in sections.
- F. The Owner's designated property shall include:
  - 1. Cattle/driveway gate located at the northwest entrance to SJRA's easement from FM 2100.
  - 2. Signs located on the west side of FM 2100.

## **1.8 HAZARDOUS MATERIALS**

- A. If materials suspected of containing hazardous materials are encountered, do not disturb; immediately notify Principal Architect/Engineer and Owner. Hazardous materials will be removed by Owner under a separate contract.

## **1.9 WARRANTY (NOT USED)**

## **PART 2 - PRODUCTS**

- A. New materials and equipment for patching and extending work shall meet the requirements of the individual Sections in these Contract Documents. For materials not addressed in these documents, materials used shall meet or exceed the dimensions and quality of the existing work.

## **PART 3 - EXECUTION**

### **3.1 PREPARATION**

- A. Obtain advance approval from Owner's Representative for dimensions and limits of removal work.
- B. Contractor shall be responsible for obtaining location of underground utilities at the Site and stake and flag locations. Known existing underground utilities as shown in Construction Drawings are based on best available information at the time of preparation of these construction documents. Arrange for all applicable utility companies to accurately locate underground piping and set color-coded flags along the project limits. Investigate utility company's records to ascertain depths and sizes of piping and other ancillary features.
  - 1. In the event that exact location of utility cannot be obtained, dig test holes as necessary to establish location of utility. Contractor shall not use mechanical digging machines within 6 feet of any active buried utility. For a distance of 4 feet on either side of buried utility, all digging shall be by hand excavation. If the utility is not active, or is to be abandoned or removed, any form of excavation may be used.

### **3.2 PROTECTION**

- A. Protect following from damage or displacement:
  - 1. Adjacent public and private property.
  - 2. Trees, plants, and other landscape features designated to remain.
  - 3. Utilities designated to remain.
  - 4. Pavement and utility structures designated to remain.
  - 5. Bench marks, monuments, and existing structures designated to remain.

### **3.3 REMOVALS**

- A. Remove pavements and structures by methods that will not damage appurtenant structures/systems or underground utilities. Do not use drop hammer near existing underground utilities.
- B. Minimize amount of earth loaded during removal operations.
- C. Removal of Existing Site Structures, and Appurtenances

1. Remove concrete structures where indicated or where such structures will interfere with new construction as shown on Drawings. Where structures are a part of an active underground utility system, repair piping to prevent blockage in the flow.
2. Remove concrete structures as required for temporary care of water. Concrete structures not designated for removal on Drawings shall be approved by Owner prior to removal.

**D. Removal of Pipe**

1. Remove minimum length of existing 60-inch RCP siphon to facilitate other work as designated on the Drawings by carefully excavating surrounding backfill material. Remove pipe using protective measures which prevent damage to other infrastructure to remain in place. Piping shall be disconnected at joints (or saw cut at joint or as close as possible to appropriate joint).

**3.4 BACKFILL**

- A. Backfill cavities resulting from demolition. Fill cavities occurring within the limits of buildings, structures, or pavements in accordance with the requirements Specification Section 31 23 16.16 – Structural Excavation for Minor Structures. Backfill and compact cavities outside the construction limits to the same density as the surrounding earth. No testing is required for backfill outside the limits of new construction.

**3.5 DISPOSAL**

- A. Disposal shall be in accordance with requirements of Specification Section 01 74 19 – Construction Waste Management and Disposal.
- B. Remove from site, debris resulting from work under this section in accordance with requirements of Specification Section 01 74 19 – Construction Waste Management and Disposal.

**3.6 OWNER TRAINING (NOT USED)**

**END OF SECTION**

**DIVISION 03**  
CONCRETE

**SECTION 03 09 00**

CONCRETE

**PART 1 - GENERAL**

**1.1 SUMMARY**

A. Section Includes:

1. Cast-in-place concrete and grout.
2. Reinforcing bar requirements for concrete construction.
3. Formwork requirements for concrete construction.
4. Testing requirements during concrete construction.

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

1. Division 00 - Proposing Requirements, Contract Forms, and Conditions of the Contract.
2. Division 01 - General Requirements.

**1.2 MEASUREMENT AND PAYMENT**

- A. Stipulated Price (Lump Sum). If Contract is a Stipulated Price Contract, payment for Work in this Section is included in total Stipulated Price.

**1.3 QUALITY ASSURANCE**

A. Referenced Standards:

1. American Concrete Institute (ACI):
  - a. 116R, Cement and Concrete Terminology.
  - b. 211.1, Standard Practice for Selecting Proportions for Normal, Heavyweight and Mass Concrete.
  - c. 212.3R, Chemical Admixtures for Concrete.
  - d. 304R, Guide for Measuring, Mixing, Transporting, and Placing Concrete.
  - e. 304.2R, Placing Concrete by Pumping Methods.
  - f. 305R, Hot Weather Concreting.
  - g. 306R, Cold Weather Concreting.
  - h. 308, Standard practice for Curing Concrete
  - i. 309R, Guide for Consolidation of Concrete
  - j. 318, Building Code Requirements for Structural Concrete.
  - k. 350, Building Code Requirements for Environmental Concrete Structures.

- l. 347R, Recommended Practice for Concrete Formwork.
- m. SP 66, ACI Detailing Manual
- 2. ASTM International (ASTM):
  - a. A82, Standard Specification for Steel Wire, Plain, for Concrete Reinforcement.
  - b. A185, Standard Specification for Steel Welded Wire Reinforcement, Plain, for Concrete.
  - c. A497, Standard Specification for Steel Welded Wire Reinforcement, Deformed, for Concrete.
  - d. A615, Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement.
  - e. A706, Standard Specification for Low-Alloy Steel Deformed and Plain Bars for Concrete Reinforcement
  - f. A775, Standard Specification for Epoxy-Coated Steel Reinforcing Bars.
  - g. C31, Standard Practice for Making and Curing Concrete Test Specimens in the Field.
  - h. C33, Standard Specification for Concrete Aggregates.
  - i. C39, Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens.
  - j. C94, Standard Specification for Ready-Mixed Concrete.
  - k. C138, Standard Method of Test for Density (Unit Weight), Yield, and Air Content (Gravimetric) of Concrete.
  - l. C143, Standard Test Method for Slump of Hydraulic Cement Concrete.
  - m. C150, Standard Specification for Portland Cement.
  - n. C157, Standard Test Method for Length Change of Hardened Hydraulic-Cement, Mortar, and Concrete.
  - o. C172, Standard Practice for Sampling Freshly Mixed Concrete.
  - p. C173, Standard Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method.
  - q. C231, Standard Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method.
  - r. C260, Standard Specification for Air-Entraining Admixtures for Concrete.
  - s. C289, Standard Test Method for Potential Alkali-Silica Reactivity of Aggregates (Chemical Method).
  - t. C309, Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete.

- u. C494, Standard Specification for Chemical Admixtures for Concrete.
  - v. C618, Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete.
  - w. C1315, Standard Specification for Liquid Membrane-Forming Compounds Having Special Properties for Curing and Sealing Concrete.
  - x. D882, Standard Test Method for Tensile Properties of Thin Plastic Sheeting.
  - y. D994, Standard Specification for Preformed Expansion Joint Filler for Concrete (Bituminous Type).
  - z. D1056, Standard Specification for Flexible Cellular Materials-Sponge or Expanded Rubber.
  - aa. D1709, Standard Test Methods for Impact Resistance of Plastic Film by the Free-Falling Dart Method.
  - bb. D1751, Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types).
  - cc. E96, Standard Test Methods for Water Vapor Transmission of Materials.
  - dd. E329, Standard Specification for Agencies Engaged in Construction Inspection and/or Testing.
  - ee. E1745, Standard Specification for Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill Under Concrete Slabs.
3. American Welding Society (AWS):
- a. D1.4, Structural Welding Code, Reinforcing Steel
4. Concrete Reinforcing Steel Institute (CRSI):
- a. Manual of Standard Practice
5. Corps of Engineers (COE):
- a. CRD-C572, Specifications for Polyvinylchloride Waterstops.
  - b. CRD-C621, Standard Specification for Packaged, Dry, Hydraulic-Cement Grout (Nonshrink).
6. National Ready Mixed Concrete Association (NRMCA)
- a. Checklist for Certification of Ready Mixed Concrete Production Facilities.
- B. Quality Control:
1. Concrete testing agency:
- a. Contractor to employ and pay for services of a testing laboratory to:
    - 1) Perform materials evaluation.
    - 2) Design concrete mixes.

- b. Concrete testing agency to meet requirements of ASTM E329.
  2. Do not begin concrete production until proposed concrete mix design has been approved by Owner's Representative.
    - a. Approval of concrete mix design by Owner's Representative does not relieve Contractor of his responsibility to provide concrete that meets the requirements of this Specification.
  3. Adjust concrete mix designs when material characteristics, job conditions, weather, strength test results or other circumstances warrant.
    - a. Do not use revised concrete mixes until submitted to and approved by Owner's Representative.
  4. Perform structural calculations as required to prove that all portions of the structure in combination with remaining forming and shoring system has sufficient strength to safely support its own weight plus the loads placed thereon.
- C. Qualifications:
1. Ready mixed concrete batch plant certified by National Ready Mixed Concrete Association (NRMCA).
  2. Formwork, shoring and reshoring for slabs and beams except where cast on ground to be designed by a professional engineer currently registered in the state where the Project is located.
  3. Welding operators, processes and procedures to be qualified in accordance with AWS D1.4. Welding operators to have been qualified during the previous 12 months prior to commencement of welding.

#### 1.4 DEFINITIONS

- A. Per ACI 116R except as modified herein:
1. Concrete fill: Non-structural concrete.
  2. Concrete Testing Agency: Testing agency employed to perform materials evaluation, design of concrete mixes or testing of concrete placed during construction.
  3. Exposed concrete: Exposed to view after construction is complete.
  4. Indicated: Indicated by Contract Documents.
  5. Lean concrete: Concrete with low cement content.
  6. Nonexposed concrete: Not exposed to view after construction is complete.
  7. Required: Required by Contract Documents.
  8. Specified strength: Specified compressive strength at 28 days.
  9. Submitted: Submitted to Owner's Representative.



## 1.5 SUBMITTALS

### A. Shop Drawings:

1. See Specification Section 01 33 00 – Submittals for requirements for the mechanics and administration of the submittal process.
2. Concrete mix designs proposed for use.
  - a. Concrete mix design submittal to include the following information:
    - 1) Place no concrete until approval of mix designs has been received in writing.
    - 2) Ready mix concrete plant certification.
    - 3) Sieve analysis and source of fine and coarse aggregates.
    - 4) Certification that the class of coarse aggregate meets the requirements of ASTM C33 for type and location of concrete construction.
    - 5) Test for aggregate organic impurities.
    - 6) Test for deleterious aggregate per ASTM C289.
    - 7) Proportioning of all materials.
    - 8) Type of cement with mill certificate for cement.
    - 9) Type of fly ash with certificate of conformance to specification requirements.
    - 10) Slump.
    - 11) Air content.
    - 12) Brand, type, ASTM designation, and quantity of each admixture proposed for use.
    - 13) 28-day cylinder compressive test results of trial mixes per ACI 318 and as indicated herein.
    - 14) Shrinkage test results.
    - 15) Standard deviation value for concrete production facility.
3. Product technical data including:
  - a. Acknowledgement that products submitted meet requirements of standards referenced.
  - b. Manufacturer's installation instructions.
  - c. Manufacturers and types:
    - 1) Form materials
    - 2) Form ties
    - 3) Form coating material

- 4) Joint fillers.
  - 5) Curing agents.
  - 6) Chemical sealer.
  - 7) Bonding and patching mortar.
  - 8) Construction joint bonding adhesive.
  - 9) Non-shrink grout with cure/seal compound.
  - 10) Waterstops.
4. Reinforcing steel:
- a. Acknowledgement that products submitted meet requirements of standards referenced.
  - b. Manufacturers installation instructions.
  - c. Qualifications of welding operators, welding processes and procedures.
  - d. Shop drawings that show grade, sizes, number, configuration, spacing, location and all fabrication and placement details.
  - e. Shop drawings shall have sufficient detail to permit installation of reinforcing without having to make reference to Contract Drawings. Shop drawings shall not be prepared by reproducing the plans and details indicated on the Contract Drawings but shall consist of completely redrawn plans and details as necessary to indicate complete fabrication and installation of all reinforcing steel.
  - f. Obtain approval of Shop Drawings by Owner's Representative before fabrication.
  - g. Mill certificates.
5. Strength test results of in place concrete including slump, air content and concrete temperature.

## **1.6 DELIVERY, STORAGE, AND HANDLING**

### **A. Storage of Material:**

1. Cement and fly ash:
  - a. Store in moistureproof, weathertight enclosures.
  - b. Do not use if caked or lumpy.
2. Aggregate:
  - a. Store to prevent segregation and contamination with other sizes or foreign materials.
  - b. Obtain samples for testing from aggregates at point of batching.
  - c. Do not use frozen or partially frozen aggregates.
  - d. Do not use bottom 6 IN of stockpiles in contact with ground.

- e. Allow sand to drain until moisture content is uniform prior to use.
- 3. Admixtures:
  - a. Protect from contamination, evaporation, freezing, or damage.
  - b. Maintain within temperature range recommended by manufacturer.
  - c. Completely mix solutions and suspensions prior to use.
- 4. Reinforcing steel:
  - a. Support and store all rebars above ground.
- B. Delivery:
  - 1. Concrete:
    - a. Batch, mix and transport in accordance with ASTM C94.
    - b. Time limit for discharging concrete from mixer trucks:
      - 1) Agitated:
        - a) 90 minutes below 75 DegF
        - b) 60 minutes at or above 75 DegF and up to 90 DegF
        - c) A set-retarder may be used to extend delivery time by 30 minutes
      - 2) Non-Agitated:
        - a) 30 minutes below 80 DegF
        - b) 15 minutes at or above 80 DegF
    - c. Prepare a delivery ticket for each load for ready-mixed concrete.
    - d. Truck operator shall hand ticket to Owner's Representative at the time of delivery.
    - e. Ticket to show:
      - 1) Mix identification mark.
      - 2) Quantity delivered.
      - 3) Amount of each material in batch.
      - 4) Outdoor temp in the shade.
      - 5) Time at which cement was added.
      - 6) Numerical sequence of the delivery.
      - 7) Amount of water added.
      - 8) Time of delivery.
      - 9) Time of discharge
      - 10) Amount of water that may be added at the site without exceeding the specified water-cement ratio.

2. Reinforcing steel:
  - a. Ship to jobsite with attached plastic or metal tags with permanent mark numbers.
  - b. Mark numbers to match Shop Drawing mark number.

## 1.7 WARRANTY (NOT USED)

## PART 2 - PRODUCTS

### 2.1 ACCEPTABLE MANUFACTURERS

- A. Subject to compliance with the Contract Documents, the following products and manufacturers are acceptable:
  1. Nonshrink, nonmetallic grout:
    - a. Sika "SikaGrout 212."
    - b. Euclid Chemical "NS Grout."
    - c. BASF Admixtures, Inc. "Masterflow 713."
  2. Epoxy grout:
    - a. BASF Admixtures, Inc. "Brutem MPG."
    - b. Euclid Chemical Company, "E3-G."
    - c. Fosroc, "Conbextra EPHF".
  3. Expansion joint fillers:
    - a. Permaglaze Co.
    - b. Rubatex Corp.
    - c. Williams Products, Inc.
  4. Waterstops, PVC:
    - a. Greenstreak Plastic Products, Inc.
    - b. W.R.Meadows, Inc.
    - c. Burke Company.
  5. Form coating:
    - a. Richmond "Rich Cote."
    - b. Industrial Lubricants "Nox-Crete Form Coating."
    - c. Euclid Chemical "Eucoslip VOX."
  6. Prefabricated forms:
    - a. Simplex "Industrial Steel Frame Forms."

- b. Symons "Steel Ply."
- c. Universal "Uniform."
- 7. Chemical sealer:
  - a. L&M Construction Chemicals, Inc.
  - b. Euclid Chemical Company.
  - c. Dayton Superior.
- 8. Bonding agent:
  - a. Euclid Chemical Co.
  - b. BASF Admixtures, Inc.
  - c. L&M Construction Chemicals Inc.
- B. Submit request for substitution in accordance with Specification Section 01 25 13 – Product Substitutions.

## 2.2 MATERIALS

- A. Portland Cement: Conform to ASTM C150 Type I, II, I/II.
  - 1. Cement type used shall correspond to that upon which selection of concrete proportions was based in the mix design.
- B. Fly Ash:
  - 1. ASTM C618, Class F or Class C.
  - 2. Nonstaining.
    - a. Hardened concrete containing fly ash to be uniform light gray color.
  - 3. Maximum loss on ignition: 4 percent.
  - 4. Compatible with other concrete ingredients.
  - 5. Fly ash type used shall correspond to that upon which selection of concrete proportions was based in the mix design.
- C. Admixtures:
  - 1. Air entraining admixtures: ASTM C260.
  - 2. Water reducing, retarding, and accelerating admixtures:
    - a. ASTM C494 Type A through E.
    - b. Conform to provisions of ACI 212.3R.
    - c. Do not use retarding or accelerating admixtures unless specifically approved in writing by Owner's Representative and at no cost to Owner.
    - d. Follow manufacturer's instructions.
    - e. Use chloride free admixtures only.

3. Maximum total water soluble chloride ion content contributed from all ingredients of concrete including water, aggregates, cementitious materials and admixtures by weight percent of cement:
    - a. 0.10 allconcrete.
  4. Do not use calcium chloride.
  5. Pozzolanic admixtures: ASTM C618.
  6. Provide admixtures of same type, manufacturer and quantity as used in establishing required concrete proportions in the mix design.
- D. Water: Potable, clean, free of oils, acids and organic matter.
- E. Aggregates:
1. Normal weight concrete: ASTM C33, except as modified below.
  2. Fine aggregate:
    - a. Clean natural sand.
    - b. No manufactured or artificial sand.
  3. Coarse aggregate:
    - a. Crushed rock, natural gravel, or other inert granular material.
    - b. Maximum amount of clay or shale particles: 1 percent.
  4. Gradation of coarse aggregate:
    - a. Lean concrete and concrete topping: Size #7.
    - b. All other concrete: Size #57 (maximum 1 inch) or #67 (maximum  $\frac{3}{4}$  inch).
- F. Concrete Grout:
1. Nonshrink nonmetallic grout:
    - a. Nonmetallic, noncorrosive, nonstaining, premixed with only water to be added.
    - b. Grout to produce a positive but controlled expansion.
    - c. Mass expansion not to be created by gas liberation.
    - d. Minimum compressive strength of nonshrink grout at 28 days: 6500 psi.
    - e. In accordance with COE CRD-C621.
  2. Epoxy grout:
    - a. 3-component epoxy resin system.
      - 1) Two liquid epoxy components.
      - 2) One inert aggregate filler component.
    - b. Each component packaged separately for mixing at jobsite.
- G. Reinforcing Steel:

1. Reinforcing bars: ASTM A615, Grade 60, deformed.
2. Reinforcing bars to be welded: ASTM A706, Grade 60, deformed.
3. Welded wire reinforcement: ASTM A185 or ASTM A497.
  - a. Minimum yield strength: 60,000 psi.

H. Forms:

1. Prefabricated or job built.
2. Wood forms:
  - a. New 5/8 or 3/4 IN 5-ply structural plywood of concrete form grade.
  - b. Built-in-place or prefabricated type panel.
  - c. 4 x 8 FT sheets for built-in-place type except where smaller pieces will cover entire area.
  - d. When approved, plywood may be reused.
3. Metal forms:
  - a. Metal forms excluding aluminum may be used.
  - b. Forms to be tight to prevent leakage, free of rust and straight without dents to provide members of uniform thickness.
4. Chamfer strips: Clear white pine, surface against concrete planed.
5. Form ties:
  - a. Commercially fabricated for use in form construction.
    - 1) Do not use wire ties.
  - b. Removable end, permanently embedded body type with cones on outer ends not requiring auxiliary spreaders.
  - c. Cone diameter: 3/4 IN minimum to 1 IN maximum.
  - d. Embedded portion 1-1/2 IN minimum back from concrete face.
  - e. If not provided with threaded ends, constructed for breaking off ends without damage to concrete.
  - f. Provide ties with built-in waterstops at all walls that will be in contact with process liquid during plant operation.
6. Form release: Nonstaining and shall not prevent bonding of future finishes to concrete surface.

I. Waterstops:

1. Plastic: COE CRD-C572.
2. Serrated with center bulb.
3. Thickness: 3/8 IN.

4. Length (general use): 6 IN unless indicated otherwise.
  5. Expansion joints:
    - a. Length: 9 IN.
    - b. Center bulb: 1 IN OD x 1/2 IN ID.
  6. Provide hog rings or grommets spaced at maximum 12 IN OC along the length of the water stop.
  7. Provide factory made waterstop fabrications at all changes of direction, intersections and transitions leaving only straight butt splices for the field.
- J. Chairs, Runners, Bolsters, Spacers, and Hangers:
1. Stainless steel, epoxy coated, plastic, brick, or plastic coated metal.
    - a. Plastic coated: Rebar support tips in contact with the forms only.
    - b. Plastic coating meeting requirements of CRSI Manual of Standard Practice.
- K. Chemical Floor Sealer:
1. Colorless low VOC water-based solution containing acrylic copolymers.
    - a. ASTM C1315, Class B, minimum 30 percent solids.
  2. L&M Construction Chemicals Inc. Dress & Seal WB 30.
- L. Vapor Retarder:
1. ASTM E1745, Class A, minimum 15 mil thickness.
  2. Water vapor permeance: 0.03 maximum per ASTM E96.
  3. Puncture resistance: ASTM D1709, Method B, 2200 grams.
  4. Minimum tensile strength: 45 LBS/IN, ASTM D882.
  5. Vapor retarder tape: As recommended by vapor retarder manufacturer.
- M. Membrane Curing Compound:
1. ASTM C309, Type I-D.
  2. Resin based, dissipates upon exposure to UV light.
  3. Curing compound shall not prevent bonding of any future coverings, coatings or finishes.
  4. Curing compounds used in water treatment plant construction to be nontoxic and taste and odor free.
- N. Bonding Agent:
1. High solids acrylic latex base liquid for interior or exterior application as a bonding agent to improve adhesion and mechanical properties of concrete patching mortars.
  2. Euclid Chemical Co. "Flex-Con."



- 3. BASF Admixtures, Inc. "Acryl-Set."
- 4. L&M Construction Chemicals "Everbond."
- 5. Thoro System Products "Acryl 60."
- O. Expansion Joint Filler:
  - 1. In contact with water or sewage:
    - a. Closed cell neoprene.
    - b. ASTM D1056, Class SC (oil resistant and medium swell) of 2 to 5 psi compression deflection (Grade SCE41).
  - 2. Exterior driveways, curbs and sidewalks:
    - a. Asphalt expansion joint filler.
    - b. ASTM D994.
  - 3. Other use:
    - a. Fiber expansion joint filler.
    - b. ASTM D1751.

**2.3 CONCRETE MIXES**

- A. General:
  - 1. All concrete to be ready mixed concrete conforming to ASTM C94.
  - 2. Provide concrete of specified quality capable of being placed without segregation and, when cured, of developing all properties required.
  - 3. All concrete to be normal weight concrete , weighing approximately 145 to 150 LBS per cubic foot at 28 days after placement.
- B. Strength:
  - 1. Provide specified strength and type of concrete for each use in structure(s) as follows:

TYPE	WEIGHT	SPECIFIED STRENGTH*
Concrete fill	Normal weight	3000 psi
Lean concrete	Normal weight	3000 psi
Concrete topping	Normal weight	4000 psi
Precast concrete	Normal weight and lightweight	5000 psi
All other general use concrete	Normal weight	4000 psi

\* Minimum 28-day compressive strength.

C. Air Entrainment:

1. Provide air entrainment in all concrete resulting in a total air content percent by volume as follows:

MAX AGGREGATE SIZE	TOTAL AIR CONTENT PERCENT
1 IN or 3/4 IN	5 to 7
1/2 IN	5 1/2 to 8

2. Air content to be measured in accordance with ASTM C231, ASTM C173, or ASTM C138.

D. Slump - 4 IN maximum, 1 IN minimum:

1. Measured at point of discharge of the concrete into the concrete construction member.
2. Concrete of lower than minimum slump may be used provided it can be properly placed and consolidated.
3. Pumped concrete:
  - a. Provide additional water at batch plant to allow for slump loss due to pumping.
  - b. Provide only enough additional water so that slump of concrete at discharge end of pump hose does not exceed maximum slump specified above.
4. Determine slump per ASTM C143.

E. Selection of Proportions:

1. General:
  - a. Proportion ingredients to:
    - 1) Produce proper workability, durability, strength, and other required properties.
    - 2) Prevent segregation and collection of excessive free water on
2. Minimum cement contents and maximum water cement ratios for concrete to be as follows:

SPECIFIED STRENGTH	MINIMUM CEMENT, LB/CY MAXIMUM AGGREGATE SIZE			MAXIMUM WATER CEMENT RATIO BY WEIGHT
	1/2 IN	3/4 IN	1 IN	
3000	---	517	517	0.45
4000	611	611	611	0.45
5000	---	686	665	0.45

3. Substitution of fly ash: Maximum of 25 percent by weight of cement at rate of 1 LB fly ash for 1 LB of cement. If fly ash is used, the water to fly ash plus cement ratio not to exceed the maximum water cement ratio specified in this Specification Section.
4. Sand cement grout:
  - a. Three parts sand.
  - b. One part Portland cement.
  - c. Entrained air: Six percent plus or minus one percent.
  - d. Sufficient water for required workability.
  - e. Minimum 28-day compressive strength: 3,000 psi.
5. Pan stair fill:
  - a. Coarse aggregate: 100 percent passing a 1/2 IN sieve.
  - b. Proportions:
    - 1) 1 sack cement.
    - 2) 150 LBS coarse aggregate.
    - 3) 150 LBS fine aggregate (sand).
  - c. Adjust mix to obtain satisfactory finishing.
6. Normal weight concrete:
  - a. Proportion mixture to provide desired characteristics using one of methods described below:
    - 1) Method 1 (Trial Mix): Per ACI 318, Chapter 5, except as modified herein.
      - a) Air content within range specified above.
      - b) Record and report temperature of trial mixes.
      - c) Proportion trial mixes per ACI 211.1.
    - 2) Method 2 (Field Experience): Per ACI 318, Chapter 5, except as modified herein:
      - a) Field test records must be acceptable to Owner's Representative to use this method.
      - b) Test records shall represent materials, proportions and conditions similar to those specified.

7. Required average strength to exceed the specified 28-day compressive strength by the amount determined or calculated in accordance with the requirements of Paragraph 5.3 of ACI 318 using the standard deviation of the proposed concrete production facility as described in Paragraph 5.3.1 of ACI 318.

F. Allowable Shrinkage: 0.048 percent per ASTM C157.

## **PART 3 - EXECUTION**

### **3.1 FORMING AND PLACING CONCRETE**

#### **A. Formwork:**

1. Contractor is responsible for design and erection of formwork.
2. Construct formwork so that concrete members and structures are of correct size, shape, alignment, elevation and position.
  - a. Allowable tolerances: As recommended in ACI 347R.
3. Provide slabs and beams of minimum indicated depth when sloping foundation base slabs or elevated floor slabs to drains.
  - a. For slabs on grade, slope top of subgrade to provide floor slabs of minimum uniform indicated depth.
  - b. Do not place floor drains through beams.
4. Openings: Provide openings in formwork to accommodate work of other trades.
  - a. Accurately place and securely support items built into forms.
5. Chamfer strips: Place 3/4 IN chamfer strips in forms to produce 3/4 IN wide beveled edges on permanently exposed corners of members.
6. Clean and adjust forms prior to concrete placement.
7. Tighten forms to prevent mortar leakage.
8. Coat form surfaces with form release agents prior to placing reinforcing bars in forms.
9. Clean surfaces of forms, reinforcing steel and other embedded materials of any accumulated mortar or grout from previous concreting and of all other foreign material before concrete is placed.

#### **B. Reinforcement:**

1. Rebar support:
  - a. Uncoated rebar:

- 1) Support rebars and fasten together to prevent displacement by construction loads or placing of concrete.
  - a) Locate and support reinforcement with bar supports to maintain minimum concrete cover.
  - b) Set wire ties with ends directed into concrete, not toward exposed concrete surfaces.
- 2) On ground, provide supporting concrete blocks or metal bar supports with bottom plate.
  - a) Do not use concrete blocks to support slab-on-grade reinforcing.
- 3) Over formwork, provide plastic-coated metal chairs, runners, bolsters, spacers, hangers and other rebar support.
  - a) Only tips in contact with the forms need to be plastic coated.
2. Locate and support with chairs, runners, bolsters, spacers and hangers, as required.
3. Set wire ties so ends do not touch forms and are directed into concrete, not toward exposed concrete surfaces.
4. Lap splice lengths: ACI 318 Class B top bar tension splices unless indicated otherwise on the Drawings.
5. Extend reinforcement to within 2 IN of concrete perimeter edges.
  - a. If perimeter edge is earth formed, extend reinforcement to within 3 IN of the edge.
6. Minimum concrete protective covering for reinforcement: As shown on Drawings.
7. Assure that reinforcement at time concrete is placed is free of mud, oil or other materials that may affect or reduce bond.
8. Reinforcement with surface rust, mill scale or a combination of both will be accepted as being satisfactory without cleaning or brushing provided dimensions and weights including heights of deformations on a cleaned sample is not less than required by applicable ASTM specification that governs for the rebar supplied.
9. Do not weld reinforcing bars.
10. Do not bend reinforcement after embedding in hardened concrete unless approved by Engineer. Do not bend reinforcing by means of heat.
11. Welded wire reinforcement:
  - a. Install welded wire reinforcement in maximum practical sizes.
  - b. Splice sides and ends with a splice lap length measured between outermost cross wires of each fabric sheet not less than:
    - 1) One spacing of cross wires plus 2 IN.

- 2) 1.5 x development length.
  - 3) 6 IN.
- c. Development length: ACI 318 basic development length for the specified fabric yield strength.
12. Provide at locations indicated.
  13. Locate wall vertical construction joints at 30 FT maximum centers and wall horizontal construction joints at 10 FT maximum centers.
  14. Locate construction joints in floor slabs and foundation base slabs so that concrete placements are approximately square and do not exceed 2500 SF.
  15. Install construction joints perpendicular to main reinforcement with all reinforcement continued across construction joints.
  16. At least 48 HRS shall elapse between placing of adjoining concrete construction.
  17. Thoroughly clean and remove all laitance and loose and foreign particles from construction joints.
  18. Before new concrete is placed, coat all construction joints with an approved bonding adhesive used and applied in accordance with manufacturer's instructions.
- C. Embedments:
1. Set and build in anchorage devices and other embedded items required for other work that is attached to, or supported by concrete.
  2. Use setting diagrams, templates and instructions for locating and setting.
  3. Secure waterstops in correct position using hog rings or grommets spaced along the length of the waterstop and wire tie to adjacent reinforcing steel.
- D. Placing Concrete:
1. Obtain approval of subgrade compaction density prior to placing concrete.
  2. Maintain subgrade temperature above 32 DegF before placing concrete for a sufficient amount of time to remove frost.
  3. Moisten subgrade to eliminate absorption. Keep subgrade moist during placement. Allow no free-standing water on subgrade or soft, muddy spots where concrete is placed.
  4. Place concrete in compliance with ACI 304R and ACI 304.2R.
  5. Place in a continuous operation within planned joints or sections.
  6. Begin placement when work of other trades affecting concrete is completed.
  7. Place concrete by methods which prevent aggregate segregation.
  8. Do not allow concrete to free fall more than 4 FT.

9. Where free fall of concrete will exceed 4 FT, place concrete by means of tremie pipe or chute.
- F. Handle concrete from mixer to place of final deposit by methods which will prevent segregation or loss of ingredients and in a manner which will assure that required quality of concrete is maintained.
1. The sum of time for transporting in agitating and non-agitating devices may not exceed the maximum agitated concrete time allowed.
  2. Use truck mixers, agitators, and non-agitating units in accordance with ASTM C94.
  3. Horizontal belt conveyors:
    - a. Mount at a slope which will not cause segregation or loss of ingredients.
    - b. Protect concrete against undue drying or rise in temperature.
    - c. Use an arrangement at discharge end to prevent segregation.
    - d. Do not allow mortar to adhere to return length of belt.
    - e. Discharge conveyor runs into equipment specially designed for spreading concrete.
  4. Metal or metal lined chutes:
    - a. Slope not exceeding 1 vertical to 2 horizontal and not less than 1 vertical to 3 horizontal.
    - b. Chutes more than 20 FT long and chutes not meeting slope requirements may be used provided they discharge into a hopper before distribution.
    - c. Provide end of each chute with a device to prevent segregation.
  5. Pumping or pneumatic conveying equipment:
    - a. Designed for concrete application and having adequate pumping capacity.
    - b. Control pneumatic placement so segregation is avoided in discharged concrete.
    - c. Loss of slump in pumping or pneumatic conveying equipment shall not exceed 1-1/2 IN.
    - d. Do not convey concrete through pipe made of aluminum or aluminum alloy.
    - e. Provide pumping equipment without Y sections.
- E. Consolidation: Consolidate all concrete using mechanical vibrators supplemented with hand rodding and tamping, so that concrete is worked around reinforcement and embedded items into all parts of forms.
- F. Protection:
1. Protect concrete from physical damage or reduced strength due to weather extremes.

- 2. In cold weather comply with ACI 306R except as modified herein.
  - a. Do not place concrete on frozen ground or in contact with forms or reinforcing bars coated with frost, ice or snow.
  - b. Minimum concrete temperature at the time of mixing:

OUTDOOR TEMPERATURE AT PLACEMENT (IN SHADE)	CONCRETE TEMPERATURE AT MIXING
Below 30 DegF	70 DegF
Between 30-45 DegF	60 DegF
Above 45 DegF	50 DegF

- c. Do not place heated concrete that is warmer than 80 DegF.
  - d. If freezing temperatures are expected during curing, maintain the concrete temperature at or above 50 DegF for 7 days or 70 DegF for 3 days.
  - e. Do not allow concrete to cool suddenly.
- 3. In hot weather comply with ACI 305R except as modified herein.
  - a. At air temperature of 95 DegF and above, keep concrete as cool as possible during placement and curing.
  - b. Do not allow concrete temperature to exceed 95 DegF at placement.
  - c. Prevent plastic shrinkage cracking due to rapid evaporation of moisture.
  - d. Do not place concrete when the actual or anticipated evaporation rate equals or exceeds 0.2 LBS/SF/HR as determined from ACI 305R, Figure 2.1.5.

G. Curing:

- 1. Begin curing concrete as soon as free water has disappeared from exposed surfaces.
- 2. Cure concrete by use of moisture retaining cover, burlap kept continuously wet or by membrane curing compound.
- 3. Provide protection as required to prevent damage to concrete and to prevent moisture loss from concrete during curing period.
- 4. Provide curing for minimum of 7 days.
- 5. Form materials left in place may be considered as curing materials for surfaces in contact with the form materials except in periods of hot weather.
- 6. In hot weather follow curing procedures outlined in ACI 305R.
- 7. In cold weather follow curing procedures outlined in ACI 306R.



8. If forms are removed before 7 days have elapsed, finish curing of formed surfaces by one of above methods for the remainder of the curing period.
9. Curing vertical surfaces with a curing compound:
  - a. Cover vertical surfaces with a minimum of two coats of the curing compound.
  - b. Allow the preceding coat to completely dry prior to applying the next coat.
  - c. Apply the first coat of curing compound immediately after form removal.
  - d. Vertical surface at the time of receiving the first coat shall be damp with no free water on the surface.
  - e. A vertical surface is defined as any surface steeper than 1 vertical to 4 horizontal.

H. Form Removal:

1. Remove forms after concrete has hardened sufficiently to resist damage from removal operations or lack of support.
2. Where no reshoring is planned, leave forms and shoring used to support concrete until it has reached its specified 28-day compressive strength.
3. Where reshoring is planned, supporting formwork may be removed when concrete has sufficient strength to safely support its own weight and loads placed thereon.
  - a. While reshoring is underway, no superimposed loads shall be permitted on the new construction.
  - b. Place reshores as soon as practicable after stripping operations are complete but in no case later than the end of working day on which stripping occurs.
  - c. Tighten reshores to carry their required loads.
  - d. Leave reshores in place until concrete being supported has reached its specified 28-day compressive strength.

### 3.2 CONCRETE FINISHES

A. Tolerances:

1. Class B: 1/4 IN in 10 FT.

B. Surfaces Exposed to View:

1. Provide a smooth finish for exposed concrete surfaces and surfaces that are:
  - a. To be covered with a coating or covering material applied directly to concrete.
  - b. Scheduled for grout cleaned finish.

2. Remove fins and projections, and patch voids, air pockets, and honeycomb areas with cement grout.
  3. Fill tie holes with nonshrink nonmetallic grout.
- C. Surfaces Not Exposed to View:
1. Patch voids, air pockets and honeycomb areas with cement grout.
  2. Fill tie holes with nonshrink nonmetallic grout.
- D. Grout Cleaned Finish:
1. Mix one part Portland cement and 1-1/2 parts fine sand with sufficient bonding agent/water mixture to produce a grout with the consistency of thick paint.
    - a. White Portland cement shall be substituted for gray Portland cement to produce a color that matches color of surrounding concrete as determined by trial patch for areas not to be painted.
  2. Wet surface of concrete to prevent absorption of water by grout and uniformly apply grout with brushes or spray gun.
  3. Immediately scrub the surface with a cork float or stone to coat and fill air bubbles and holes.
  4. While grout is still plastic, remove all excess grout by working surface with rubber float, sack or other approved means.
  5. After the surface whitens from drying, rub vigorously with clean burlap.
  6. Keep final finish damp for a minimum of 36 HRS after final rubbing.
- E. Slab Float Finish:
1. After concrete has been placed, consolidated, struck off, and leveled, do no further work until ready for floating.
  2. Begin floating when water sheen has disappeared and surface has stiffened sufficiently to permit operation.
  3. During or after first floating, check planeness of entire surface with a 10 FT straightedge applied at not less than two different angles.
  4. Cut down all high spots and fill all low spots during this procedure to produce a surface within Class B tolerance throughout.
  5. Refloat slab immediately to a uniform sandy texture.

### 3.3 GROUT

- A. Preparation:
1. Nonshrinking nonmetallic grout:
    - a. Clean concrete surface to receive grout.
    - b. Saturate concrete with water for 24 HRS prior to grouting.

2. Rock anchors:
    - a. Clean rock anchors of all loose material.
    - b. Orient hook or bends in anchor bars to clear anchor bolts, reinforcements, and other embedments to be installed later.
  3. Epoxy grout: Apply only to clean, dry, roughened, sound surface.
- B. Application:
1. Nonshrinking nonmetallic grout:
    - a. Mix in a mechanical mixer.
    - b. Use no more water than necessary to produce flowable grout.
    - c. Place in accordance with manufacturer's instructions.
    - d. Completely fill all spaces and cavities below the bottom of baseplates.
    - e. Provide forms where baseplates and bedplates do not confine grout.
    - f. Where exposed to view, finish grout edges smooth.
    - g. Except where a slope is indicated on Drawings, finish edges flush at the baseplate, bedplate, member, or piece of equipment.
    - h. Protect against rapid moisture loss by covering with wet rags or polyethylene sheets.
    - i. Wet cure grout for seven (7) days, minimum.
  2. Epoxy grout:
    - a. Mix and place in accordance with manufacturer's instructions.
    - b. Completely fill all cavities and spaces around dowels and anchors without voids.
    - c. Obtain manufacturer's field technical assistance as required to ensure proper placement.

### 3.4 FIELD QUALITY CONTROL

- A. Owner will employ and pay for services of a concrete testing laboratory to perform testing of concrete placed during construction.
1. Contractor to cooperate with Owner in obtaining and testing samples.
- B. Tests During Construction:
1. Strength test - procedure:
    - a. Three cylinders, 6 IN DIA x 12 IN high, will be taken from each sample per ASTM C172 and ASTM C31.
    - b. Cylinders will be tested per ASTM C39:
      - 1) One at 7 days.
      - 2) Two at 28 days.

2. Strength test - frequency:
    - a. Not less than one test each day concrete placed.
    - b. Not less than one test for each 50 CY or major fraction thereof placed in one day.
    - c. Not less than one test for each type of concrete poured.
    - d. Not less than one test for each concrete structure exceeding 2 CY volume.
  3. Slump test:
    - a. Per ASTM C143.
    - b. Determined for each strength test sample.
    - c. Additional slump tests may be taken.
  4. Air content:
    - a. Per ASTM C231, ASTM C173, and ASTM C138.
    - b. Determined for each strength test sample.
  5. Temperature: Determined for each strength test sample.
- C. Evaluation of Tests:
1. Strength test results:
    - a. Average of 28-day strength of two cylinders from each sample.
      - 1) If one cylinder manifests evidence of improper sampling, molding, handling, curing or testing, strength of remaining cylinder will be test result.
      - 2) If both cylinders show any of above defects, test will be discarded.
- D. Acceptance of Concrete:
1. Strength level of each type of concrete shall be considered satisfactory if both of the following requirements are met:
    - a. Average of all sets of three consecutive strength tests equals or exceeds the required specified 28-day compressive strength.
    - b. No individual strength test falls below the required specified 28-day compressive strength by more than 500 psi.
  2. If tests fail to indicate satisfactory strength level, perform additional tests and/or corrective measures as directed by Owner's Representative.
    - a. Perform additional tests and/or corrective measures at no additional cost to Owner.
- E. A. Reinforcement Congestion and Interferences:
1. Notify Owner's Representative whenever the specified clearances between rebars cannot be met.

2. Do not place any concrete until the Owner's Representative submits a solution to rebar congestion problem.
3. Rebars may be moved as necessary to avoid interference with other reinforcing steel, conduits, or embedded items. Verify with Owner's Representative for control steel design.
4. If rebars are moved more than one bar diameter, obtain Owner's Representative's approval of resulting arrangement of rebars.
5. No cutting of rebars shall be done without written approval of Owner's Representative.

### 3.5 SCHEDULES

#### A. Form Types:

1. Surfaces exposed to view:
  - a. Prefabricated or job-built wood forms.
  - b. Laid out in a regular and uniform pattern with long dimensions vertical and joints aligned.
  - c. Produce finished surfaces free from offsets, ridges, waves, and concave or convex areas.
  - d. Construct forms sufficiently tight to prevent leakage of mortar.
2. Surfaces normally submerged or not normally exposed to view: Wood or steel forms sufficiently tight to prevent leakage of mortar.
3. Other types of forms may be used:
  - a. For surfaces not restricted to plywood or lined forms.
  - b. As backing for form lining.

#### B. Grout:

1. Nonshrinking nonmetallic grout: General use.
2. Epoxy grout:
  - a. Grouting of dowels and anchor bolts into existing concrete.
  - b. Other uses indicated on Drawings.
3. Sand cement grout: Keyways of precast members.

#### C. Concrete:

1. Precast concrete: Where indicated on Drawings.
2. Lean concrete: Where indicated on Drawings.
3. Concrete fill: Where indicated on Drawings.
4. Lightweight concrete: Where indicated on Drawings.
5. Normal weight concrete: All concrete

6. Concrete pan fill: Stair and landings where indicated on Drawings.
7. General use concrete: All other locations.

D. Concrete Finishes:

1. Grout cleaned finish: Where indicated on Drawings.
2. Slab finishes:
  - a. Use following finishes as applicable, unless otherwise indicated:
    - 1) Floated finish: Surfaces intended to receive roofing, concrete topping, lean concrete, concrete fill and waterproofing.
    - 2) Troweled finish: Interior floor slabs, exposed roof slabs and base slabs of structures, equipment bases, and column bases.
    - 3) Broom finish: Sidewalks, docks, concrete stairs, and ramps.

**3.6 OWNER TRAINING (NOT USED)**

**END OF SECTION**

**DIVISION 10**  
**SPECIALTIES**

**SECTION 10 14 53**  
**TRAFFIC SIGNAGE**

**PART 1 - GENERAL**

**1.1 SUMMARY**

- A. Section Includes:
1. Furnish labor, materials, equipment and incidentals necessary to furnish and install traffic signs, complete with posts, supports, fittings and concrete bases, where required, in accordance with these specifications and to the dimensions and details, and at the locations shown on the plans, or as directed.
- B. Related Specification Sections include but are not necessarily limited to:
1. Division 00 – Proposing Requirements, Contract Forms, and Conditions of the Contract.
  2. Division 01 – General Requirements.

**1.2 MEASUREMENT AND PAYMENT**

- A. Stipulated Price (Lump Sum). If Contract is a Stipulated Price Contract, payment for Work in this Section is included in total Stipulated Price.

**1.3 QUALITY ASSURANCE**

- A. Contractor shall submit a Certified Test Report for reflectors sheeting and sign panels to the Principal Architect/Engineer for approval.

**1.4 SUBMITTALS**

- A. Submittals shall be in accordance with Specification Section 01 33 00 – Submittals and shall include shop drawings showing arrangements and spacing of letters, symbols, and borders for each type of sign, details of supports for each type of sign, and the proposed method of attaching signs to supports.

**1.5 STANDARDS (NOT USED)**

- A. Manual on Uniform Traffic Control Devices (MUTCD) October 2014 (Revision 2)

**1.6 DELIVERY AND STORAGE**

- A. Signs shall have heavy cardboard separator sheets between finished faces during transit. Signs shall remain inside protective cartons until installed and shall be stored on wood runners above grade and covered with protective coverings.

**1.7 WARRANTY (NOT USED)**



## **PART 2 - PRODUCTS**

### **2.1 FABRICATIONS**

- A. Signs: Aluminum; reflectorized; meeting the requirements of the MUTCD; conforming to the details in the Standard Highway Signs manual published by the Federal Highway Administration, Texas Department of Transportation (TxDOT).
- B. Sign Panels:
  - 1. Standard signs shall be fabricated without stiffeners on the back and shall be fabricated aluminum alloy (ASTM B2 09, Alloy 5052 H38) and shall consist of a single sheet of aluminum. The sign blank shall be 0.080-inch thick. Sign blanks shall be flat and straight and within commercial tolerances established by the aluminum industry.
  - 2. Sign panels to which reflective sheeting is to be applied shall be degreased, etched, and anodized.
  - 3. All fabrication, including cutting and punching of holes, shall be completed prior to metal degreasing, etching, anodizing and the application of reflective sheeting.
  - 4. Sign panels shall be free of buckles, warp, dents, burrs and defects resulting from fabrication. The surface of all sign panels shall be flat.
- C. Reflective Sheeting:
  - 1. The reflective sheeting for signs shall be Type II Engineering Grade Reflective Sheeting. The reflective sheeting material shall comply with all applicable requirements for Type II, as set forth in Standard Specifications for Construction of Roads and Bridges on Federal Highway Projects, 1985 (FP-85), Section 633 and Section 718. Type II enclosed lens reflective sheeting shall consist of spherical lens elements embedded within a transparent plastic having a smooth, flat outer surface as exposed in use. Type II reflective sheeting shall be weather resistant and have a protected pre-coated adhesive backing.
  - 2. Reflective sheeting shall be applied to properly treated sign panels with mechanical equipment in a manner specified by the sheeting manufacturer. Sign faces comprising two or more pieces or panels of reflective sheeting shall be carefully matched for color at the time of sign fabrication to provide uniform appearance and brilliance both day and night. At splices, sheeting shall be overlapped no less than 3/16 inch. Alternate successive width sections of either sheeting or panels must be reversed and consecutive to insure that corresponding edges of reflective sheeting lie adjacent on the sign. Non-conformance may result in non-uniform shading and an undesirable contrast between adjacent widths of applied sheeting which shall not be acceptable.

## **2.2 COLOR**

- A. Colors for signs shall match the colors specified in the MUTCD. The color and size of letters, symbols, borders, and background on sign shall be as shown in FHWA “Standard Highway Signs”, unless otherwise specified on the plans.

## **2.3 LEGEND**

- A. The legend shall include letters, numerals, symbols and arrows. The border shall have a regular outline and be clean cut and sharp. The border shall have a continuous stroke and without ragged or torn edges.
- B. The legend on guide signs shall be of the size shown on the plans. The legend on standard signs shall meet the requirements of the latest revision of FHWA “Standard Highway Signs.”
  - 1. Silk Screen Process: The letters, numerals, arrows, symbols, border and other features shall be produced on reflective sheeting of the sign field by a silk screen process approved by the Principal Architect/Engineer. Sign messages and borders of a color darker than the sign field shall be applied to the reflective sheeting by direct process. Sign messages and borders of a color lighter than the sign field shall be produced by the reverse process in which the message and border are outlined by applying darker transparent color to the reflective sheeting of the sign field.
  - 2. Transparent Colors: Inks and paints used in the silk screen process shall be of the type and quality recommended by the manufacturer of the reflective sheeting, and shall conform to red, blue, yellow and green colors approved by the FHWA shown in the MUTCD and FHWA “Standard Highway Signs.”
  - 3. Direct Applied Legend: The legend and other features of the sign message shall be cut from Type II reflective sheeting with a pre-coated pressure sensitive adhesive backing (Class 1).

## **2.4 DELINEATORS AND OBJECT MARKERS**

- A. Delineators: Consisting of one or two reflector units of the color specified for the various types as shown on the plans.
- B. Object Markers: Consisting of reflector units or reflectorized panels of the color specified for the various types as shown on the plans.
- C. Supply: Reflector units supplied to the project shall be of the same type and manufacturer.
- D. Reflector Units: Center-mount acrylic plastic, prismatic reflector units.

## **PART 3 - EXECUTION**

### **3.1 INSTALLATION**

- A. Erect signs at the specified location, plumb and to the specified vertical and horizontal clearances as shown on the plans, or as directed by the Principal Architect/Engineer. Install signs with the specified fasteners and brackets.
- B. Erect signs normally so that the sign face is vertical and at 93 degrees away from the center of the lane which the sign serves, and away from the direction of travel. Where lanes divide or on curves, orient the sign face to be most effective both day and night and to avoid the possibility of specular reflection.
- C. Perform field drilling of holes in any part of the sign support structure only when specified in the plans, or as directed by the Principal Architect/Engineer.

### **3.2 FIELD QUALITY CONTROL**

- A. After sign installation is complete, the signs will be inspected by the Principal Architect/Engineer. If specular reflecting is apparent on any sign, adjust its position to eliminate this condition.

### **3.3 OWNER TRAINING (NOT USED)**

**END OF SECTION**

**DIVISION 31**  
EARTHWORK

**SECTION 31 11 00**  
**CLEARING AND GRUBBING**

**PART 1 - GENERAL**

**1.1 SUMMARY**

- A. Section Includes:
  - 1. Clearing and Grubbing
- B. Related Specification Sections include but are not necessarily limited to:
  - 1. Division 00 – Proposing Requirements, Contract Forms, and Conditions of the Contract.
  - 2. Division 01 – General Requirements.

**1.2 MEASUREMENT AND PAYMENT**

- 1. Stipulated Price (Lump Sum). If Contract is a Stipulated Price Contract, payment for Work in this Section is included in total Stipulated Price.

**1.3 WORK INCLUDED**

- A. Provide labor, materials, equipment and incidentals necessary to perform operations in connection with clearing, grubbing, and disposal of cleared and grubbed materials.

**1.4 QUALITY ASSURANCE; DEFINITIONS**

- A. Clearing: Clearing is defined as the removal of trees, shrubs, bushes, and other organic matter at or above original ground level.
- B. Grubbing: Grubbing is defined as the removal of stumps, roots, boards, logs, and other organic matter found at or below ground level.

**1.5 WARRANTY (NOT USED)**

**PART 2 - PRODUCTS (NOT USED)**

**PART 3 - EXECUTION**

**3.1 PREPARATION**

- A. Mark areas to be cleared and grubbed prior to commencing clearing operations. The Owner's Representative shall approve clearing and grubbing limits prior to commencement of clearing operations.
- B. Trees and shrubs outside of the clearing limits, which are within 10 feet of the clearing limits, shall be clearly marked to avoid damage during clearing and grubbing operations.

- C. Remove trees and brush outside the clearing limits, but within the immediate vicinity of the work, upon receipt of approval by the Owner's Representative, when the trees or brush interfere with the progress of construction operations.
- D. Clearly mark trees and shrubs within the clearing limits, which are to remain, and protect the trees and shrubs from damage during the clearing and grubbing operations.
- E. The clearing and grubbing limits shall not extend beyond the project limits of construction as shown on the Drawings.

### **3.2 INSTALLATION**

- A. Clearing: Clearing shall consist of the felling, cutting up, and the satisfactory disposal of trees and other vegetation, together with the down timber, snags, brush, rubbish, fences, and debris occurring within the area to be cleared.
- B. Grubbing:
  - 1. Grubbing shall consist of the removal and disposal of stumps and roots larger than 1 inch in diameter.
  - 2. Extend grubbing to the depth indicated below: In the case of multiple construction items, the greater depth shall apply.
    - a. Footings: 18 inches below the bottom of the footing.
    - b. Embankments: 24 inches below existing ground.
    - c. Concrete Structures: 36 inches below the bottom of the concrete.

### **3.3 FIELD QUALITY CONTROL**

- A. Completely remove timber, logs, roots, brush, rotten wood, and other refuse from the Owner's property.

### **3.4 OWNER TRAINING (NOT USED)**

**END OF SECTION**

**SECTION 31 21 33**

**TRENCHING, BACKFILLING, AND COMPACTING FOR UTILITIES**

**PART 1 - GENERAL**

**1.1 SUMMARY**

- A. Section Includes:
1. Excavation, trenching, backfilling and compacting for all underground utilities.
- B. Related Specification Sections include but are not necessarily limited to:
1. Division 00 – Proposing Requirements, Contract Forms, and Conditions of the Contract.
  2. Division 01 – General Requirements.
  3. Section 03 09 00 – Concrete.
  4. Section 31 23 00 – Earthwork.
  5. Section 32 11 13.13 – Lime Treated Subgrades.

**1.2 MEASUREMENT AND PAYMENT**

- A. Stipulated Price (Lump Sum). If Contract is a Stipulated Price Contract, payment for Work in this Section is included in total Stipulated Price.

**1.3 QUALITY ASSURANCE**

- A. Referenced Standards:
1. ASTM International (ASTM):
    - a. C33 – Standard Specification for Concrete Aggregates.
    - b. C40 – Standard Test Method for Organic Impurities in Fine Aggregates for Concrete.
    - c. C94 – Standard Specification for Ready-Mixed Concrete.
    - d. C123 – Standard Test Method for Lightweight Particles in Aggregate.
    - e. C131 – Standard Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine.
    - f. C136 – Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
    - g. C142 – Standard Test Method for Clay Lumps and Friable Particles in Aggregates.
    - h. D558 – Standard Test Methods for Moisture-Density (Unit Weight) Relations of Soil-Cement Mixtures.

- i. D698 – Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft<sup>3</sup> (600 kN-m/m<sup>3</sup>)).
  - j. D1140 – Standard Test Methods for Amount of Material in Soils Finer than No. 200 Sieve.
  - k. D1557 – Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft<sup>3</sup> (2,700 kN-m/m<sup>3</sup>)).
  - l. D2487 – Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System).
  - m. D2922 – Standard Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).
  - n. D4253 – Standard Test Methods for Maximum Index Density and Unit Weight of Soils Using a Vibratory Table.
  - o. D4254 – Standard Test Methods for Minimum Index Density and Unit Weight of Soils and Calculation of Relative Density.
  - p. D4318 – Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.
2. Texas Department of Transportation (TxDOT):
    - a. Tex-101-E – Preparing Soil and Flexible Base Materials for Testing.
    - b. Tex-110-E – Particle Size Analysis of Soils.
    - c. Tex-460-A – Determining Crushed Face Particle Count.
  3. Occupational Safety and Health Administration (OSHA):
    - a. Federal Regulations – 29 CFR Part 1926,
  4. AWWA Standards – Excavation:
    - a. AWWA M9 – Concrete Pressure Pipe
    - b. AWWA M11 – Steel Water Pipe
- B. Qualifications:
1. Testing and analysis of backfill materials for soil classification and compaction during construction will be performed by an independent laboratory provided by the Owner.
  2. Contractor shall provide licensed professional engineer licensed in Texas for design of trench shoring systems or other trench safety plans.



## **1.4 DEFINITIONS**

- A. Classification of Excavation: Excavation shall be "unclassified" and involves the removing of the necessary materials to provide the trench to the required width and depth. The Contractor, prior to submitting a proposal, must satisfy himself as to the actual subsurface conditions. No extra or separate payments shall be made for rock, dewatering, or any other condition.

## **1.5 SUBMITTALS**

A. Shop Drawings:

1. See Specification Section 01 33 00 – Submittals for requirements for the mechanics and administration of the submittal process.
2. Submit planned typical method of excavation, backfill placement and compaction including:
  - a. Trench widths.
  - b. Procedures for foundation and pipe zone bedding placement, and trench backfill compaction
  - c. Procedures for assuring compaction against undisturbed soil when pre-manufactured trench safety systems are proposed.
3. Submit respective pipe or conduit manufacturer's data regarding bedding methods of installation and general recommendations.
4. Submit backfill material sources and product quality information in accordance with requirements of this section.
5. Submit sieve analysis reports on all granular materials.
6. Certified Test Reports for embedment material, coarse gravel, and flexbase. Certified Test Reports shall be from an independent laboratory. Test reports shall include sieve analysis, Atterburg limits, and results of an Abrasion test.

B. Miscellaneous Submittals:

1. See Specification Section 01 33 00 – Submittals for requirements for the mechanics and administration of the submittal process.
2. Submit record of location of utilities as installed, referenced to survey control points. Include locations of utilities encountered or rerouted. Give stations, horizontal dimensions, elevations, inverts and gradients.
3. Submit 11-inch by 17-inch copy of Drawing with plotted utility or obstruction location titled Critical Location Report to Owner's Representative as described in 1.6.D.1. Drawing shall be signed and sealed by R.P.L.S.
4. Submit trench excavation safety program.
5. Submit trench shield (trench box) certification if employed:
  - a. Specific to Project conditions.
  - b. Re-certified if members become distressed.

- c. Certification by licensed professional structural engineer, licensed in the State of Texas
- d. Owner's Representative and Owner are not responsible to, and will not, review and approve.

## **1.6 SITE CONDITIONS**

- A. Avoid overloading or surcharge a sufficient distance back from edge of excavation to prevent slides or caving.
  - 1. Maintain and trim excavated materials in such manner to be as little inconvenience as possible to public and adjoining property owners.
- B. Provide full access to public and private premises and fire hydrants, at street crossings, sidewalks and other points as designated by Owner's Representative to prevent serious interruption of travel.
- C. Protect and maintain bench marks, monuments or other established points and reference points and if disturbed or destroyed, replace items to full satisfaction of Owner's Representative and controlling agency.
- D. Protection of Existing Structures and Utilities
  - 1. The Contractor shall advise the Owner's Representative of any existing utilities that are not shown on the Drawings, or are shown incorrectly, that affect the structure layout. Contractor shall also propose a resolution to the utility conflict for the Owner's Representative's review. The Owner's Representative will determine whether the utility will be relocated or the proposed structure location revised. If the structure location is revised, an adjustment to the Contract price will be agreed to as described in the General Conditions. If the proposed structure grade is adjusted by 2 vertical feet or less, no Contract Price adjustment will be made. If the proposed structure grade is adjusted by more than 2 vertical feet, a Contract Price adjustment will be agreed to as described in the General Conditions.
  - 2. Utilities that affect the structure layout will be interpreted by the Owner's Representative as follows:
    - a. Utilities that conflict with the grade of the proposed structure will be interpreted as affecting the structure layout.
    - b. Utilities that conflict with the operations and maintenance of the proposed structure will be interpreted as affecting the structure layout.
- E. Where excavation endangers adjacent structures and utilities, the Contractor shall, at his own expense, carefully support and protect such structures and/or utilities so that there shall be no damage. In the case where the structure cannot be protected and must be temporarily or permanently relocated, Contractor will be compensated for actual cost only once approved by the Owner's Representative.

- F. If in the opinion of the Owner's Representative, concrete backfill is necessary for the support of utility lines crossing trenches, the Owner's Representative may direct 2000 psi concrete backfill to be used. Payment shall be made to the Contractor at the unit price bid for the installation of such quantity of the concrete backfill as directed by the Owner's Representative.

## **1.7 WARRANTY (NOT USED)**

## **PART 2 - PRODUCTS**

### **2.1 MATERIAL CLASSIFICATIONS**

- A. Classify materials for backfill for purpose of quality control in accordance with Unified Soil Classification Symbols as defined in ASTM D 2487. Material use and application is defined in utility installation specifications and Drawings either by class, as described in Paragraph 2.1B, or by product descriptions, as given in Paragraph 2.2.
- B. Class Designations Based on Laboratory Testing:
1. Class I: Well-graded gravels and sands, gravel-sand mixtures, crushed well-graded rock, little or no fines (GW, SW):
    - a. Plasticity index: non-plastic.
    - b. Gradation:  $D_{60}/D_{10}$  - greater than 4 percent; amount passing No. 200 sieve - less than or equal to 5 percent.
  2. Class II: Poorly graded gravels and sands, silty gravels and sands, little to moderate fines (GM, GP, SP, SM):
    - a. Plasticity index: non-plastic to 4.
    - b. Gradations:
      - 1) Gradation (GP, SP): amount passing No. 200 sieve - less than 5 percent.
      - 2) Gradation (GM, SM): amount passing No. 200 sieve - between 12 percent and 50 percent.
      - 3) Borderline gradations with dual classifications (e.g., SP-SM): amount passing No. 200 sieve - between 5 percent and 12 percent.
  3. Class III: Clayey gravels and sands, poorly graded mixtures of gravel, sand, silt, and clay (GC, SC, and dual classifications, e.g., SP-SC):
    - a. Plasticity index: greater than 7.
    - b. Gradation: amount passing No. 200 sieve - between 12 percent and 50 percent.
  4. Class IVA: Lean clays (CL).
    - a. Plasticity Indexes:

- 1) Plasticity index: greater than 7, and above A line.
- 2) Borderline plasticity with dual classifications (CL-ML): PI between 4 and 7.
  - b. Liquid limit: less than 50.
  - c. Gradation: amount passing No. 200 sieve - greater than 50 percent.
  - d. Inorganic.
5. Class IVB: Fat clays (CH).
  - a. Plasticity index: above A line.
  - b. Liquid limit: 50 or greater.
  - c. Gradation: amount passing No. 200 sieve - greater than 50 percent.
  - d. Inorganic.
6. Use soils with dual class designation according to ASTM D 2487, and which are not defined above, according to more restrictive class.

## **2.2 MATERIALS**

- A. Soils classified as silt (ML), elastic silt (MH), organic clay and organic silt (OL, OH), and organic matter (PT) are not acceptable as backfill materials.
  1. These soils may be used for site grading and restoration in unimproved areas as approved by the Owner's representative.
  2. Soils in Class IVB, fat clay (CH) may only be used as backfill materials outside of roadways and where otherwise allowed by this Specification Section.
- B. Provide backfill material that is free of stones greater than 2 IN, free of roots, waste, debris, trash, organic material, unstable material, non-soil matter, hydrocarbon or other contamination, conforming to the following limits for deleterious materials:
  1. Clay lumps: Less than 0.5 percent for Class I, and less than 2.0 percent for Class II, when tested in accordance with ASTM C142.
  2. Lightweight pieces: Less than 5 percent when tested in accordance with ASTM C123.
  3. Organic impurities: No color darker than standard color when tested in accordance with ASTM C40.
  4. Clay Clods: Less than 4 inches in least dimension.
  5. In no case will the above materials be permitted in the pipe zone.
- C. Manufactured materials, such as crushed concrete, may be substituted for natural soil or rock products where indicated in the product specification, and approved by the Owner's representative, provided that the physical property criteria are determined to be satisfactory by testing.

- D. Bank Run Sand: Durable bank run sand classified as SP, or SW by the Unified Soil Classification System (ASTM D2487) meeting the following requirements:
1. Less than 15 percent passing the number 200 sieve when tested in accordance with ASTM D 1140.
    - a. The amount of clay lumps or balls not exceeding 2 percent.
  2. Material passing the number 40 sieve shall meet the following requirements when tested in accordance with ASTM D4318:
    - a. Liquid limit: not exceeding 25 percent.
    - b. Plasticity index: not exceeding 7.

- E. Concrete Sand: Natural sand, manufactured sand, or a combination of natural and manufactured sand conforming to the requirements of ASTM C33 and graded within the following limits when tested in accordance with ASTM C136:

Sieve	Percent Passing
3/8 IN	100
No. 4	95 to 100
No. 8	80 to 100
No. 16	50 to 85
No. 30	25 to 60
No. 50	10 to 30
No. 100	2 to 10

- F. Gem Sand: Sand conforming to the requirements of ASTM C33 for course aggregates specified for number 8 size and graded within the following limits when tested in accordance with ASTM C136:

Sieve	Percent Passing
3/8 IN	95 to 100
No. 4	60 to 80
No. 8	15 to 40

- G. Pea Gravel: Durable particles composed of angular gravels and graded within the following limits when tested in accordance with ASTM C136:

Sieve	Percent Passing
1/2 IN	100
3/8 IN	85 to 100
No. 4	10 to 30
No. 8	0 to 10
No. 16	0 to 5

- H. Crushed Aggregates: Crushed aggregates consist of durable particles obtained from an approved source and meeting the following requirements:

1. Materials of one product delivered for the same construction activity from a single source.
2. Non-plastic fines.
3. Los Angeles abrasion test wear not exceeding 45 percent when tested in accordance with ASTM C131.
4. Crushed aggregate shall have a minimum of 90 percent of the particles retained on the No. 4 sieve with 2 or more crushed faces as determined by Test Method TxDOT Tex-460-A, Part I.

5. Crushed stone:

- a. Produced from oversize plant processed stone or gravel, sized by crushing to predominantly angular particles from a naturally occurring single source.
- b. Uncrushed gravel are not acceptable materials for embedment where crushed stone is shown on the applicable utility embedment drawing details.
- c. Where coarse gravel is required for water drainage, restoration of trench foundation, or other uses, it shall be crushed stone in compliance with ASTM C33 for Coarse Concrete Aggregate. Gradation shall be ASTM C33 No. 57, No. 67, or as follows:

Sieve Size Sq. Openings	Amount Passing Percent by Weight
1"	95-100
3/4"	55-85
1/2"	25-50
No. 4	0-5

6. Crushed Concrete:

- a. The Owner’s Representative will make a determination as to whether crushed concrete can be allowed and what the acceptable gradation is.
- b. Gradation and quality control test requirements are the same as crushed stone.
- c. Provide crushed concrete produced from normal weight concrete of uniform quality; containing particles of aggregate and cement material, free from other substances such as asphalt, reinforcing steel fragments, soil, waste gypsum (calcium sulfate), or debris.

7. Gradations, as determined in accordance with TxDOT Tex-110-E.

Sieve	Percent Passing by Weight for Pipe Embedment by Ranges of Nominal Pipes Sizes		
	>15 IN	15 IN - 8 IN	<8 IN
1 IN	95 - 100	100	-
3/4 IN	60 - 90	90 - 100	100
1/2 IN	25 - 60	-	90 - 100
3/8 IN	-	20 - 55	40 - 70
No. 4	0 - 5	0 - 10	0 - 15
No. 8	-	0 - 5	0 - 5

- I. Select Backfill: Class III clayey gravel or sand or Class IV lean clay with a plasticity index between 7 and 20 or clayey soils treated with lime to meet plasticity criteria.
- J. Native Backfill: Any suitable soil or mixture of soils initially excavated during trench excavation, meeting the requirements of section 2.2 B of this Specification, and within Classes I, II, III and IV; or fat clay (CH) where allowed by this Specification Section.
- K. Cement Stabilized Sand:
  - 1. Sand-cement mixture shall produce a minimum unconfined compressive strength of at least 100 pounds per square inch in 48 hours and contain not less than 2.0 sacks of cement per ton of dry sand.
    - a. Design will be based on strength specimens molded in accordance with ASTM D558 at a moisture content within 2 percent of optimum and within 4 hours of batching.
    - b. Determine minimum cement content from production data and statistical history.
    - c. Granular material to be used as cement stabilized sand should be well graded and have the grain size characteristics as listed below:

Sieve	Percent Passing
No. 4	55 to 100
No. 10	37 to 100
No. 40	24 to 100
No. 200	10 to 20

- 2. Cement: Type I Portland cement conforming to ASTM C150.
- 3. Sand: Clean, durable sand meeting grading requirements for fine aggregates of ASTM C33, or requirements for Bank Run Sand of this Specification Section and the following requirements:
  - a. Classified as SW, SP, SW-SM, SP-SM, or SM by the United Soil Classification System of ASTM D2487.
  - b. Deleterious materials:
    - 1) Clay lumps, ASTM C142; less than 0.5 percent.
    - 2) Lightweight pieces, ASTM C123; less than 5.0 percent.
    - 3) Organic impurities, ASTM C40, color no darker than the standard color.
  - c. Plasticity index of 4 or less when tested in accordance with ASTM D4318.
    - 1) Water: Potable water, free of oils, acids, alkalies, organic matter, or other deleterious substances, meeting requirements of ASTM C94.



- L. Subgrade Stabilization Materials: Provide subgrade stabilization material per Specification Section 32 11 13.13 – Lime Treated Subgrade as required.
- M. Granular Embedment Material: Granular embedment material may be pea gravel or bank run sand as defined in sections 2.2 G and 2.2 D, respectively. Additionally, granular embedment material shall be free from large stones, clay, and organic material. Granular embedment material shall be a soil classification of GW, GP, SW, or SP as determined by ASTM D2487. The granular embedment material shall be such that when wet, the fine material shall not form mud or muck. The granular embedment material shall be composed of angular, tough durable particles, free from thin, flat and elongated pieces, of suitable quality to insure permanence in the trench and have a percentage of wear of not more than 40 percent when tested in accordance with ASTM C131 or ASTM C535. The P.I. of the fines shall not exceed 3. Light weight aggregate is not acceptable for granular embedment. Material used for granular embedment shall have a resistivity of not less than 5000 ohms/cm as measured by ASTM G57.
- N. Well-graded Crushed Stone Bedding Material:
  - 1. ASTM C33, gradation 67 (3/4 IN to No. 4 sieve) defined below:

Sieve	Percent
1"	100
3/4"	90 to 100
3/8"	20 to 55
No. 4	0 to 10

- O. Lime Stabilized Clay Backfill.
  - 1. Clayey material hydrated lime or quicklime to achieve a pH of 12.4 and a plasticity index (PI) of less than 20 in accordance with ASTM D 4318.
  - 2. The optimum lime content to be determined by lime optimization curve using specific soil sample and proposed lime additive.
- P. Flowable fill: Provide Flowable Fill in accordance with Specification Section 03 31 31 – Concrete Mixing, Placing, Jointing, and Curing as required.

## **PART 3 - EXECUTION**

### **3.1 GENERAL**

- A. Remove and dispose of unsuitable materials as directed by Owner’s Representative to site provided by Contractor.
- B. Establish traffic control when working within the public right of way per applicable specifications. Maintain barricades and warning lights for streets and intersections affected by Work, and are considered hazardous to traffic movements.

- C. Perform work to conform to applicable safety standards and regulations. Employ trench safety system as designed by the Contractor's engineer licensed in the State of Texas.
- D. Immediately notify agency or company owning any existing utility line which is damaged, broken or disturbed. Obtain approval from Owner's Representative and agency for any repairs or relocations, either temporary or permanent.
- E. Maintain permanent benchmarks, monumentation and other reference points. Unless otherwise directed in writing, replace those which are damaged or destroyed.
- F. Limit pavement removal to less than five pipe laying days in advance of pipe laying.

### **3.2 EXCAVATION**

- A. Unclassified Excavation: Remove rock excavation, clay, silt, sand, gravel, hard pan, loose shale, and loose stone to required lines and grades, or as directed by Owner's Representative.
- B. Upon discovery of unknown utilities, badly deteriorated utilities not designated for removal, or concealed conditions, discontinue work at that location. Notify Owner's Representative and obtain instructions before proceeding.
- C. Excavation for Appurtenances:
  - 1. 12 IN (minimum) clear distance between outer surface and embankment.
  - 2. See Specification Section 31 23 00 – Earthwork for applicable requirements.
- D. Groundwater Dewatering:
  - 1. Shall be in accordance with Specification Section 01 57 23.02 – Control of Ground Water and Surface Water
  - 2. Where groundwater is, or is expected to be, encountered during excavation, install a dewatering system to prevent softening and disturbance of subgrade, to allow subgrade stabilization, pipe, bedding, embedment, and backfill material to be placed in a dry, stable trench.
  - 3. Groundwater shall be drawn down and maintained at least 3 FT below the bottom of any trench or manhole excavation prior to excavation.
  - 4. Review soils investigation before beginning excavation and determine where groundwater is likely to be encountered during excavation.
    - a. Employ dewatering specialist for selecting and operating dewatering system.
  - 5. Keep dewatering system in operation until dead load of pipe, structure and backfill exceeds possible buoyant uplift force on pipe or structure.
  - 6. Dispose of groundwater to an area which will not interfere with construction operations or damage existing construction.

7. Install groundwater monitoring wells as necessary.
8. Shut off dewatering system at such a rate to prevent a quick upsurge of water that might weaken the subgrade.
9. No additional payment for groundwater dewatering.

E. Critical Location Investigation

1. Prior to manufacturing pipe, the contractor shall properly locate and identify all existing utilities in proximity to the structure. The contractor shall confirm utilities using vacuum excavation or other suitable excavation method and provide a submittal to the Owner with their findings and proof of completion.
2. Horizontal and vertical location of various underground lines shown on Drawings, including but not limited to water lines, gas lines, storm sewers, sanitary sewers, telecommunication lines, electric lines or power ducts, pipelines, concrete and debris, are based on best information available but are only approximate locations. Unless otherwise approved by Owner's Representative, at Critical Locations shown on Drawings, perform vacuum excavation to field verify horizontal and vertical locations of such lines within zone of 2 feet vertically and 4 feet horizontally of proposed work.
  - a. Verify location of existing utilities prior to manufacturing pipe and prior to beginning installation of auger pit or tunnel shaft. Use extreme caution and care when uncovering utilities designated by Critical Locate.
  - b. Notify Owner's Representative in writing immediately upon identification of obstruction. In event of failure to identify obstruction in minimum of 7 days, Contractor will not be entitled to extra cost for downtime including, but not limited to, payroll, equipment, overhead, demobilization and remobilization, until 7 days has passed from time Owner's Representative is notified of obstruction.
3. Notify involved utility companies of date and time that investigation excavation will occur and request that their respective utility lines be marked in field. Comply with utility or pipeline company requirements that their representative be present during excavation. Provide Owner's Representative with 48 hours notice prior to field excavation or related work.
4. Survey vertical and horizontal locations of obstructions relative to project baseline and datum and plot on 11 inch by 17 inch copy of Drawings.

F. Protection

1. Protect trees, shrubs, lawns, existing structures, and other permanent objects outside of grading limits and within grading limits as designated on Drawings, and in accordance with requirements of Section 01 56 39 – Temporary Tree and Plant Protection.
2. Protect and support above-grade and below-grade utilities which are to remain.

3. Restore damaged permanent facilities to pre-construction conditions unless replacement or abandonment of facilities is indicated on Drawings.
4. Take measures to minimize erosion of trenches. Do not allow water to pond in trenches. Where slides, washouts, settlements, or areas with loss of density or pavement failures or potholes occur, repair, recompact, and pave those areas at no additional cost to Owner.

G. Trench Excavation:

1. Excavate trenches by open cut method to depth shown on Drawings and necessary to accommodate work.
  - a. Support existing utility lines where proposed work crosses at a lower elevation.
    - 1) Stabilize excavation to prevent undermining of existing utility.

H. Pipe Trench:

1. The “pipe zone” shall be defined as the zone from 12 inches below the bottom of the pipe to 12 inches above the top of the pipe, unless otherwise noted on Drawings.
2. Trench walls above the pipe zone may be laid back or benched where room permits as necessary to meet the requirements of OSHA.
3. For semi-rigid pipe or flexible pipe (including AWWA C200 steel pipe, AWWA C303 bar-wrapped concrete cylinder pipe, PVC, Ductile Iron, and other pipe materials as listed in appropriate specifications), where the character of the trench walls is loose, unstable, saturated soft clays, quicksand or otherwise unable to provide adequate side support to maintain the required pipe deflection, the Contractor shall modify the backfill to keep the pipe within the limits of the specified pipe deflection.
  - a. Contractor shall widen the trench excavation to accommodate modified backfill procedure.
  - b. Contractor shall protect exterior pipe coating, and shall repair any damage caused by backfilling.
  - c. Concrete encasement, soil cement, flowable fill or some other method approved by the Owner’s Representative may be used in lieu of this procedure.

I. Pipe Foundation:

1. Excavate the trench to an even grade so that the full length of the pipe barrel is supported and joints make up properly. Excavate the trench to the line and grade indicated and as directed by the Owner’s Representative. Grades shall be uniform between high points and low points to eliminate intermediate “highs and lows.”

2. The trench shall be “rough cut” a minimum of 12 inches below the bottom of the pipe, unless otherwise noted on drawings. The “rough cut” dimension shall be increased as necessary to provide a minimum clearance of 2 inches from the bottom of the trench to the bottom of the bells, flanges, valves, fittings, etc.
3. The entire foundation area in the bottom of all excavations shall be firm, stable material. Loose material shall be removed, leaving a clean, flat trench bottom, and material shall not be disturbed below required sub grade except as hereinafter described. If the subgrade is soft, spongy, disintegrated, or where the character of the foundation materials is such that a proper foundation cannot be obtained at the elevation specified, then when directed by the Owner’s Representative the Contractor shall deepen the excavation to a depth where a satisfactory foundation can be obtained. The subgrade shall then be brought back to the required grade with the well-graded crushed stone bedding materials and construction methods specified in section 3.3 and 3.4 of this specification. Payment for additional excavation and backfill shall be made at the unit price bid in the Proposal.
4. Remove soft, loose or spongy foundation soil caused by Contractor failure to dewater, rainfall, or Contractor operations. Replace with well-graded crushed stone bedding material, as noted above, with no additional compensation.
5. If over excavation does not yield satisfactory foundation conditions, then construct the foundation in accordance with section 3.3 J. of this specification.

J. Correcting Faulty Grade:

1. If the trench is excavated to a faulty grade (at a lower elevation than indicated), correct the faulty grade as specified below:
  - a. In uniform, stable dry soils, correct the faulty grade with embedment material thoroughly compacted, as defined in sections 3.3 and 3.4 of this specification.
  - b. In soft spongy disintegrated soils or where necessary to allow proper drainage, correct the faulty grade using well-graded crushed stone bedding in accordance with section 3.3 J. of this specification.
  - c. Maximum allowable loose lift thickness for embedment or well-graded crushed stone bedding material shall be 8 inches.

K. Blasting Procedure: Blasting shall not be allowed.

L. Bell Holes Required:

1. Bell holes of ample dimension shall be dug in trenches at each joint of pipe to permit the jointing to be made properly, visually inspected, and so that the pipe will rest on the full length of the barrel.

2. Pipe with field-applied exterior coatings shall have the joints excavated to sufficient depth to allow proper cleaning, application, testing and inspection of the field-applied coating system.
- M. Care of Surface Material for Reuse: Surface materials such as topsoil in its natural state, suitable for reuse in restoring the excavated surface, shall be kept separate from the general excavation material. The top 12 inches of the trench backfill shall be considered topsoil. Save the topsoil to be used as backfill of the top 12 inches of the trench after pipe laying.
- N. Manner of Piling Excavated Material: Place excavated material so that Work is not endangered or interferes with public traffic, or the stability of excavations and open trenches. Do not place excavated material over buried pipelines or existing utilities unless adequate provisions are made to protect those pipelines and/or utilities. Roads and driveways must be kept open in every case. Keep drainage channels clear of obstructions or make other satisfactory provisions for drainage.
- O. Trenching by Machine or by Hand: The use of trench digging machinery is approved except in places where operations of same will cause damage to existing structures above or below ground, in which case employ hand methods.

### **3.3 BACKFILLING OF TRENCHES OUTSIDE ROADWAYS**

- A. General: This Section is intended to cover the requirements for trench backfill where trench is in open fields, unimproved alleys, fields, and other similar open areas, except public and private roadways.
- B. Time of Backfilling: Backfill operations shall immediately follow pipe jointing, joint coating application, and curing.
- C. Braced and Sheeted Trenches: Remove sheeting and shoring as backfilling operations progress. Incorporate methods so that a good bond is obtained between the backfill material and the undisturbed trench walls.
- D. Protection of Pipe during Backfilling Operations: Take the necessary precautions to protect the pipe during backfilling operations. Take care to prevent damage to the pipe or to the pipe coating, and repair any damaged pipe before being “covered up”. Backfill the trench to prevent the deformation or otherwise deflection of the cylindrical shape of the pipe by more than the allowable pipe deflection as specified elsewhere. Use methods such as stulling or ellipsing as necessary.
- E. Site and Preparation: In addition to clearing and grubbing of brush and trees along the right of way for this Project, alteration to the topography shall be done if indicated on the Drawings, at the locations and to the extent shown.
- F. Compaction: All compaction shall be in accordance with specification 3.6 of this specification. See specification section 3.6 for density and testing requirements.

G. Backfill Procedure for pipes:

1. Embedment material for structures shall be cement stabilized sand as shown on Drawings. Place the first lift of cement stabilized sand material (bedding layer) to a depth slightly above the bottom of pipe grade and compact. Lay pipe on this material to the indicated grade. Provide bell holes to permit the pipe to rest on the full length of the barrel and to permit joint make-up.
2. Place subsequent lifts of cement stabilized sand uniformly on both sides of the pipe to a depth of 12 inches above the structures. Compact using low ground pressure vibration or mechanical tamping in 6 to 8 inch loose lifts. Contractor shall take precautions to ensure no voids occur under the haunches of the pipe and to prevent disturbance of the pipe alignment. The Contractor shall be responsible for any damage that may occur to the pipe.
3. Backfill above pipe zone
  - a. Under unimproved areas: After placement and compaction of the granular embedment, place native backfill in the trench for the full width of the trench to the top of the trench. Consolidate this material by mechanical compaction in 6 to 8 inch loose lifts. The Contractor shall be responsible for any damage that may occur to the pipe.

H. Surface Material Replacement:

1. The top 12 inches of the trench backfill shall be composed of the original surface material or topsoil excavated from the trench. Place the topsoil over the consolidated trench backfill material and neatly round over the trench to a sufficient height to allow settlement to grade after consolidation. Grade the surface to allow drainage in the same manner as existed prior to construction.
2. Top soil shall not contain rocks or clods larger than those adjacent to the trench in the undisturbed condition.

I. Backfill in Wet Conditions:

1. If wet conditions are encountered, backfill utilities lines in accordance with details provided in the Drawings for wet trench construction.

J. Cement Stabilized Sand:

1. Backfill the pipe trench with cement stabilized sand to 12 inches above the top of the pipe. Pipe shall be blocked up on soil pads to allow a minimum of 12 inches of cement stabilized sand below the pipe.
2. Discharge from a mixer by any means acceptable to the Owner's Representative into the area to be filled.
3. Conform to appropriate requirements of Specification Section 31 32 13.16 – Cement Stabilized Sand.

4. Conform to appropriate requirements of Specification Section 31 23 00 Earthwork.

K. Flowable Fill:

1. Backfill with flowable fill as shown in construction drawings.
2. Do not place flowable fill on frozen ground.
3. Place flowable fill on subgrade free of disturbed or softened material and water.
4. Start flowable fill batching, mixing, and placing if weather conditions are favorable, and the air temperature is 34 DegF and rising.
5. Temperature of flowable fill at the time of placement: At least 40 DegF.
6. Stop mixing and placing when the air temperature is 38 DegF or less and falling.
7. Each filling stage shall be as continuous an operation as is practicable.
8. Prevent traffic contact with flowable fill for at least 24 HRS after placement or until flowable fill is hard enough to prevent rutting by construction equipment.
9. Do not place flowable fill until water has been controlled or groundwater level has been lowered in conformance with the requirements of the Groundwater Dewatering paragraph in this Specification Section.

**3.4 BACKFILL PROCEDURE FOR UTILITIES UNDER EXISTING PUBLIC AND PRIVATE ROADS OR UNDER OTHER UTILITIES (NOT USED)**

**3.5 TRENCH SHORING AND BACKFILL**

A. Shoring of Trench Walls.

1. Install Special Shoring in advance of trench excavation or simultaneously with trench excavation, so that soils within full height of trench excavation walls will remain laterally supported at all times.
2. For all types of shoring, support trench walls in pipe embedment zone throughout installation. Provide trench wall supports sufficiently tight to prevent washing trench wall soil out from behind trench wall support.
3. Leave sheeting driven into or below pipe embedment zone in place to preclude loss of support of foundation and embedment materials, unless otherwise directed by Owner's Representative. Leave rangers, walers, and braces in place as long as required to support sheeting, which has been cut off, and trench wall in vicinity of pipe zone.
4. Employ special methods for maintaining integrity of embedment or foundation material. Before moving supports, place and compact embedment to sufficient depths to provide protection of pipe and stability of trench walls. As supports are moved, finish placing and compacting embedment.



5. If sheeting or other shoring is used below top of pipe embedment zone, do not disturb pipe foundation and embedment materials by subsequent removal. Maximum thickness of removable sheeting extending into embedment zone shall be equivalent of 1-inch-thick steel plate. As sheeting is removed, fill in voids left with grouting material.
- B. Use of Trench Shields. When trench shield (trench box) is used as worker safety device, the following requirements apply:
1. Make trench excavations of sufficient width to allow shield to be lifted or pulled freely, without damage to trench sidewalls.
  2. Move trench shields so that pipe, and backfill materials, after placement and compaction, are not damaged nor disturbed, nor degree of compaction reduced. Recompact after shield is moved if soil is disturbed.
  3. When required, place, spread, and compact pipe foundation and bedding materials beneath shield. For backfill above bedding, lift shield as each layer of backfill is placed and spread. Place and compact backfill materials against undisturbed trench walls and foundation.
  4. Maintain trench shield in position to allow sampling and testing to be performed in safe manner.
  5. Conform to applicable Government regulations.
- C. Voids under paving area outside shield caused by Contractor's work will require removal of pavement, consolidation and replacement of pavement in accordance with Contract Documents. Repair damage resulting from failure to provide adequate supports.
- D. Place sand or soil behind shoring or trench shield to prevent soil outside shoring from collapsing and causing voids under pavement. Immediately pack suitable material in outside voids following excavation to avoid caving of trench walls.
- E. Coordinate excavation within 15 feet of pipeline with company's representative. Support pipeline with methods agreed to by pipeline company's representative. Use small, rubber-tired excavator, such as backhoe, to do exploratory excavation. Bucket that is used to dig in close proximity to pipelines shall not have teeth or shall have guard installed over teeth to approximate bucket without teeth. Excavate by hand within 1 foot of pipeline company's line. Do not use larger excavation equipment than normally used to dig trench in vicinity of pipeline until pipelines have been uncovered and fully exposed. Do not place large excavation and hauling equipment directly over pipelines unless approved by pipeline company's representative.

### **3.6 COMPACTION**

- A. General:

1. Place and assure bedding, backfill, and fill materials achieve an equal or higher degree of compaction than undisturbed materials adjacent to the work.
2. In no case shall degree of compaction below minimum compactions specified be accepted.

**B. Compaction Requirements:**

1. Unless noted otherwise on Drawings or more stringently by other Specification Sections, comply with following minimum trench compaction criteria.

LOCATION	MATERIAL	COMPACTION DENSITY
All applicable areas	Bank sand	95 percent of standard proctor density, +2 to -1% optimum density, by ASTM D698 and ASTM D2922
	Pea gravel	95 percent of maximum relative density by ASTM D4253 and ASTM D4254
	Well-graded crushed stone	95 percent of maximum relative density by ASTM D4253 and ASTM D4254
	Native backfill	95 percent of standard proctor density, +2 to -1% optimum density, by ASTM D698 and ASTM D2922
	Cement stabilized sand	95 percent of standard proctor density, +2 to -1% optimum density, by ASTM D558 and ASTM D2992

**3.7 FIELD QUALITY CONTROL**

**A. Testing:**

1. In-place density tests of compacted materials will be performed by Owner’s Representative according to the standards provided in section 3.6, and at the following frequencies and conditions.
2. Owner will provide a recognized testing laboratory capable of performing a full range of testing procedures complying with the standards or testing procedures specified. The testing lab shall provide certified technicians that are trained and knowledgeable in, in-trench nuclear density testing, sand cone, concrete sampling and testing, ASTM D698 and D1557 proctors at a minimum.
3. Testing Frequency: Accommodate the Owner’s Representative in performing the following:
  - a. Testing: Pothole every 1000 feet and grab Samples at pipe level for materials testing and proctors.
  - b. Owner’s Representative shall take a minimum of three in-trench/ pipe zone nuclear density tests every 150 feet of installed pipe.
  - c. Owner’s Representative shall take a minimum of three nuclear density tests above the pipe zone for every 150 feet.

- d. Owner's Representative shall take a minimum of three in-trench/pipe zone nuclear density test and a minimum of three above pipe zone nuclear density test at all open cut road crossings.
- e. Contractor to update his field "as-built" drawings with density test locations in the profile.
4. When requested by Owner's Representative, Contractor shall excavate test pits after the backfill has been placed and compacted in the pipe zone for the purpose of taking field density tests and inspecting the haunch areas under the pipe for voids.
5. When requested by Owner's Representative, Contractor shall excavate the test pits to a depth and area of sufficient size to allow the inspector to visually inspect the haunch area of the pipe for voids or loose material next to the pipe and to make a field density test. Provide a safety trench shield to protect the inspector while in the pit.
6. After inspection, backfill and compact the test pit area in accordance with the applicable specification herein.
7. Dig one test pit for inspection of each day's work, if deemed necessary, as determined by the Owner's Representative. Repair and replace areas that are found not to be in compliance with the Specification requirements, until satisfactory results are consistently and uniformly attained.
8. Special care should be taken by the Contractor to ensure the backfill material flows under the pipe haunches. The Contractor's method and procedures used to accomplish this will be observed to confirm that adequate results are being achieved. This may require the removal of pipe joints to observe the results and make density tests. Pipe laying shall not begin until satisfactory results are achieved by the Contractor's proposed method. Perform additional tests as directed until compaction meets or exceeds requirements.
  - a. Cost associated with "Failing" tests shall be paid by Contractor.
9. Assure Owner's representative has immediate access for testing of all soils related work.
10. Ensure excavations are safe for testing personnel.

### **3.8 OWNER TRAINING (NOT USED)**

**END OF SECTION**

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**SECTION 31 23 00**  
**EARTHWORK**

**PART 1 - GENERAL**

**1.1 SUMMARY**

- A. Section Includes:
  - 1. Earthwork.
- B. Related Specification Sections include, but are not necessarily limited to:
  - 1. Division 00 – Proposal Requirements, Contract Forms, and Conditions of the Contract.
  - 2. Division 01 – General Requirements.
  - 3. Section 31 21 33 – Trenching, Backfilling, and Compaction for Utilities.
  - 4. Section 31 24 00.01 – Borrow

**1.2 MEASUREMENT AND PAYMENT**

- A. Stipulated Price (Lump Sum). If Contract is a Stipulated Price Contract, payment for Work in this Section is included in total Stipulated Price.

**1.3 QUALITY ASSURANCE**

- A. Referenced Standards:
  - 1. ASTM International (ASTM):
    - a. C33 – Standard Specification for Concrete Aggregates.
    - b. D698 – Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft<sup>3</sup>).
    - c. D1557 – Standard Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft<sup>3</sup>(2,700 kN-m/m)).
    - d. D3786 – Standard Test Method for Hydraulic Bursting Strength of Knitted Goods and Nonwoven Fabrics: Diaphragm.
    - e. D4253 – Standard Test Methods for Maximum Index Density and Unit Weight of Soils Using a Vibratory Table.
    - f. D4254 – Standard Test Methods for Minimum Index Density and Unit Weight of Soils and Calculation of Relative Density.
    - g. D4632 – Standard Test Method for Grab Breaking Load and Elongation of Geotextiles.

**1.4 SUBMITTALS**

- A. Shop Drawings:

1. See Specification Section 01 33 00 – Submittals for requirements for the mechanics and administration of the submittal process.
  2. Product technical data including:
    - a. Acknowledgement that products submitted meet requirements of standards referenced.
    - b. Manufacturer's installation instructions.
  3. Certifications.
  4. Test reports:
    - a. Soils inspection and testing results.
- B. Samples:
1. Submit samples and source of fill and backfill materials proposed for use.
  2. Submit samples and source of borrow materials proposed for use.

## **1.5 WARRANTY (NOT USED)**

## **PART 2 - PRODUCTS**

### **2.1 MATERIALS**

- A. Fill and Backfill: Selected material approved by Owner's representative (Soils Engineer) from site excavation or from off site borrow.
- B. Granular Fill Under Building Floor Slabs-On-Grade: Clean, crushed, nonporous rock, crushed or uncrushed gravel complying with ASTM C33 gradation size No. 67, 3/4 IN to No. 4.
- C. Granular Fill Under Base Slabs with Pressure Relief Valves:
  1. Drainage material: Conform to ASTM C33, Size No. 67.
  2. Filter material: Conform to ASTM C33 requirements for fine aggregate.
- D. Geotextile Filter Fabric:
  1. Non-woven type.
  2. Equivalent opening size: 50-100 (U.S. Standard Sieve).
  3. Permeability coefficient (cm/second): 0.07 minimum, 0.30 maximum.
  4. Grab strength: 180 LBS minimum in either direction in accordance with ASTM D4632 requirements.
  5. Mullen burst strength: 290 psi minimum in accordance with ASTM D3786 requirements.

## **PART 3 - EXECUTION**

### **3.1 PROTECTION**

- A. Protect existing surface and subsurface features on-site and adjacent to site as follows:
  - 1. Provide barricades, coverings, or other types of protection necessary to prevent damage to existing items indicated to remain in place.
  - 2. Protect and maintain bench marks, monuments or other established reference points and property corners.
    - a. If disturbed or destroyed, replace at own expense to full satisfaction of Owner and controlling agency.
  - 3. Verify location of utilities.
    - a. Omission or inclusion of utility items does not constitute non-existence or definite location.
    - b. Secure and examine local utility records for location data.
    - c. Take necessary precautions to protect existing utilities from damage due to any construction activity.
    - d. Repair damages to utility items at own expense.
    - e. In case of damage, notify Owner's Representative at once so required protective measures may be taken.
  - 4. Maintain free of damage, existing sidewalks, structures, and pavement, not indicated to be removed.
    - a. Any item known or unknown or not properly located that is inadvertently damaged shall be repaired to original condition.
    - b. All repairs to be made and paid for by Contractor.
  - 5. Provide full access to public and private premises, fire hydrants, street crossings, sidewalks and other points as designated by Owner to prevent serious interruption of travel.
  - 6. Maintain stockpiles and excavations in such a manner to prevent inconvenience or damage to structures on-site or on adjoining property.
  - 7. Avoid surcharge or excavation procedures which can result in heaving, caving, or slides.
- B. Salvageable Items: Carefully remove items to be salvaged, and store on Owner's premises unless otherwise directed.
- C. Dispose of waste materials, legally, off site.
  - 1. Burning, as a means of waste disposal, is not permitted.

### **3.2 SITE EXCAVATION AND GRADING**

- A. The work includes all operations in connection with excavation, borrow, construction of fills and embankments, rough grading, and disposal of excess materials in connection with the preparation of the site(s) for construction of the proposed facilities.
- B. Excavation and Grading: Perform as required by the Contract Drawings.
  - 1. Contract Drawings may indicate both existing grade and finished grade required for construction of Project.
    - a. Stake all units, structures, piping, roads, parking areas and walks and establish their elevations.
    - b. Perform other layout work required.
    - c. Replace property corner markers to original location if disturbed or destroyed.
  - 2. Preparation of ground surface for embankments or fills:
    - a. Before fill is started, scarify to a minimum depth of 6 IN in all proposed embankment and fill areas.
    - b. Where ground surface is steeper than one vertical to four horizontal, plow surface in a manner to bench and break up surface so that fill material will bind with existing surface.
  - 3. Protection of finish grade:
    - a. During construction, shape and drain embankment and excavations.
    - b. Maintain ditches and drains to provide drainage at all times.
    - c. Protect graded areas against action of elements prior to acceptance of work.
    - d. Reestablish grade where settlement or erosion occurs.
- C. Borrow:
  - 1. Provide necessary amount of approved fill compacted to density equal to that indicated in this Specification Section and in Specification Section 31 21 33 – Trenching, Backfilling, and Compacting for Utilites.
  - 2. Include cost of all borrow material in original proposal.
  - 3. Fill material to be approved by Owner’s Representative (Soils Engineer) prior to placement.
- D. Construct embankments and fills as required by the Contract Drawings:
  - 1. Construct embankments and fills at locations and to lines of grade indicated.
    - a. Completed fill shall correspond to shape of typical cross section or contour indicated regardless of method used to show shape, size, and extent of line and grade of completed work.



2. Provide approved fill material which is free from roots, organic matter, trash, frozen material, and stones having maximum dimension greater than 6 IN.
  - a. Ensure that stones larger than 3/4 IN are not placed in upper 6 IN of fill or embankment.
  - b. Do not place material in layers greater than 8 IN loose thickness.
  - c. Place layers horizontally and compact each layer prior to placing additional fill.
3. Compact by sheepsfoot, pneumatic rollers, vibrators, or by other equipment as required to obtain specified density.
  - a. Control moisture for each layer necessary to meet requirements of compaction.

### **3.3 ROCK EXCAVATION (NOT USED)**

### **3.4 USE OF EXPLOSIVES**

- A. Blasting with any type of explosive is prohibited.

### **3.5 FIELD QUALITY CONTROL**

- A. Do not include in bid price the cost of inspection services indicated herein as being performed by the Owner's Representative (Soils Engineer).
- B. Moisture density relations to be established by the Owner's Representative (Soils Engineer) required for all materials to be compacted.
- C. Extent of compaction testing will be as necessary to assure compliance with Specifications.
- D. Give minimum of 24 HR advance notice to Owner's Representative (Soils Engineer) when ready for compaction or subgrade testing and inspection.
- E. Should any compaction density test or subgrade inspection fail to meet Specification requirements, perform corrective work as necessary.
- F. Pay for all costs associated with corrective work and retesting resulting from failing compaction density tests.

### **3.6 COMPACTION DENSITY REQUIREMENTS**

- A. Obtain approval from Owner's Representative (Soils Engineer) with regard to suitability of soils and acceptable subgrade prior to subsequent operations.
- B. Provide dewatering system necessary to successfully complete compaction and construction requirements.
- C. Remove frozen, loose, wet, or soft material and replace with approved material as directed by Owner's Representative (Soils Engineer).
- D. Stabilize subgrade with well graded granular materials as directed by Owner's Representative (Soils Engineer).

E. Assure by results of testing that compaction densities comply with the following requirements:

1. Sitework:

LOCATION	COMPACTION DENSITY
Under Paved Areas, Sidewalks and Piping:	
Cohesive soils	100 percent per ASTM D698
Cohesionless soils	75 percent relative density per ASTM D4253 and ASTM D4254
Unpaved Areas:	
Cohesive soils	85 percent of ASTM D698
Cohesionless soils	60 percent relative density per ASTM D4253 and ASTM D4254
Levees, Dams and Canals:	
Cohesive soils	Average (10 test running average) of 98% per ASTM D698
Cohesionless soils	75 percent relative density per ASTM D4253 and ASTM D4254

2. Structures:

LOCATION	COMPACTION DENSITY
Inside of structures under foundations, under equipment support pads, under slabs-on-grade and scarified existing subgrade under fill material	95 percent per ASTM D1557
Outside structures next to walls, piers, columns and any other structure exterior member	90 percent per ASTM D1557

3. Specific areas:

LOCATION	COMPACTION DENSITY
Outside structures under equipment support foundations	95 percent per ASTM D1557
Under void	85 percent per ASTM D1557
Granular fill under base slabs with pressure relief valves, and under building floor slabs-on-grade	75 percent relative density per ASTM D4253 and ASTM D4254

F. Compaction density requirements for utilities are not included with this specification but are found in Specification Section 31 21 33 – Trenching, Backfilling and Compaction for Utilities.

**3.7 EXCAVATION, FILLING, AND BACKFILLING FOR STRUCTURES**

A. General:

1. In general, work includes, but is not necessarily limited to, excavation for structures and retaining walls, removal of underground obstructions and undesirable material, backfilling, filling, and fill, backfill, and subgrade compaction.
  2. Obtain fill and backfill material necessary to produce grades required.
    - a. Materials and sources to be approved by Owner's Representative (Soils Engineer).
    - b. Excavated material approved by Owner's Representative (Soils Engineer) may also be used for fill and backfill.
  3. In this Specification Section, the word "foundations" includes footings, base slabs, foundation walls, mat foundations, grade beams, piers and any other support placed directly on soil.
  4. In this Specification Section, the word "soil" also includes any type of rock subgrade that may be present at or below existing subgrade levels.
- B. Excavation Requirements for Structures:
1. General:
    - a. Do not commence excavation for foundations for structures until Owner's Representative (Soils Engineer) approves:
      - 1) The removal of topsoil and other unsuitable and undesirable material from existing subgrade.
      - 2) Density and moisture content of site area compacted fill material meets requirements of specifications.
      - 3) Site surcharge or mass fill material can be removed from entire construction site or portion thereof.
      - 4) Surcharge or mass fill material has been removed from construction area or portions thereof.
    - b. Owner's Representative grants approval to begin excavations.
  2. Dimensions:
    - a. Excavate to elevations and dimensions indicated or specified.
    - b. Allow additional space as required for construction operations and inspection of foundations.
  3. Removal of obstructions and undesirable materials in excavation includes, but is not necessarily limited to, removal of old foundations, existing construction, unsuitable subgrade soils, expansive type soils, and any other materials which may be concealed beneath present grade, as required to execute work indicated on Contract Drawings.

- a. If undesirable material and obstructions are encountered during excavation, remove material and replace as directed by Owner's Representative (Soils Engineer).
4. Level off bottoms of excavations to receive foundations, floor slabs, equipment support pads, or compacted fill.
  - a. Remove loose materials and bring excavations into approved condition to receive concrete or fill material.
  - b. Where compacted fill material must be placed to bring subgrade elevation up to underside of construction, scarify existing subgrade upon which fill material is to be placed to a depth of 6 IN and then compact to density stated in this Specification Section before fill material can be placed thereon.
  - c. Do not carry excavations lower than shown for foundations except as directed by Owner's Representative (Soils Engineer).
  - d. If any part of excavations is carried below required depth without authorization, maintain excavation and start foundation from excavated level with concrete of same strength as required for superimposed foundation, and no extra compensation will be made to Contractor therefore.
5. Make excavations large enough for working space, forms, dampproofing, waterproofing, and inspection.
6. Notify Owner's Representative (Soils Engineer) as soon as excavation is completed in order that subgrades may be inspected.
  - a. Do not commence further construction until subgrade under compacted fill material, under foundations, under floor slabs-on-grade, under equipment support pads, and under retaining wall footings has been inspected and approved by the Owner's Representative (Soils Engineer) as being free of undesirable material, being of compaction density required by this Specification Section, and being capable of supporting the allowable foundation design bearing pressures and superimposed foundation, fill, and building loads to be placed thereon.
  - b. Owner's Representative (Soils Engineer) shall be given the opportunity to inspect subgrade below fill material both prior to and after subgrade compaction.
  - c. Place fill material, foundations, retaining wall footings, floor slabs-on-grade, and equipment support pads as soon as weather conditions permit after excavation is completed, inspected, and approved and after forms and reinforcing are inspected and approved.
  - d. Before concrete or fill material is placed, protect approved subgrade from becoming loose, wet, frozen, or soft due to weather, construction operations, or other reasons.

7. Dewatering:
  - a. Where groundwater is or is expected to be encountered during excavation, install a dewatering system to prevent softening and disturbance of subgrade below foundations and fill material, to allow foundations and fill material to be placed in the dry, and to maintain a stable excavation side slope.
  - b. Groundwater shall be maintained at least 3 FT below the bottom of any excavation.
  - c. Review soils investigation before beginning excavation and determine where groundwater is likely to be encountered during excavation.
  - d. Employ dewatering specialist for selecting and operating dewatering system.
  - e. Keep dewatering system in operation until dead load of structure exceeds possible buoyant uplift force on structure.
  - f. Dispose of groundwater to an area which will not interfere with construction operations or damage existing construction.
    - 1) Install groundwater monitoring wells as necessary.
  - g. Shut off dewatering system at such a rate to prevent a quick upsurge of water that might weaken the subgrade.
8. Subgrade stabilization:
  - a. If subgrade under foundations, fill material, floor slabs-on-grade, or equipment support pads is in a frozen, loose, wet, or soft condition before construction is placed thereon, remove frozen, loose, wet, or soft material and replace with approved compacted material as directed by Owner's Representative (Soils Engineer).
  - b. Provide compaction density of replacement material as stated in this Specification Section.
  - c. Loose, wet, or soft materials, when approved by Owner's Representative (Soils Engineer), may be stabilized by a compacted working mat of well graded crushed stone.
  - d. Compact stone mat thoroughly into subgrade to avoid future migration of fines into the stone voids.
  - e. Remove and replace frozen materials as directed by Owner's Representative (Soils Engineer).
  - f. Method of stabilization shall be performed as directed by Owner's Representative (Soils Engineer).
  - g. Do not place further construction on the repaired subgrades, until the subgrades have been approved by the Owner's Representative (Soils Engineer).

9. Do not place floor slabs-on-grade including equipment support pads until subgrade below has been approved, piping has been tested and approved, reinforcement placement has been approved, and Contractor receives approval to commence slab construction.
  - a. Do not place building floor slabs-on-grade including equipment support pads when temperature of air surrounding the slab and pads is or is expected to be below 40 DegF during the day of placement unless heated to a temperature of at least 50 DegF.
10. Protection of structures:
  - a. Prevent new and existing structures from becoming damaged due to construction operations or other reasons.
  - b. Prevent subgrade under new and existing foundations from becoming wet and undermined during construction due to presence of surface or subsurface water or due to construction operations.
11. Shoring:
  - a. Shore, sheet pile, slope, or brace excavations as required to prevent them from collapsing.
  - b. Remove shoring as backfilling progresses, but only when banks are stable and safe from caving or collapse.
12. Drainage:
  - a. Control grading around structures so that ground is pitched to prevent water from running into excavated areas or damaging structures.
  - b. Maintain excavations where foundations, floor slabs, equipment support pads or fill material are to be placed free of water.
  - c. Provide pumping required to keep excavated spaces clear of water during construction.
  - d. Should any water be encountered in the excavation, notify Owner's Representative (Soils Engineer).
  - e. Provide free discharge of water by trenches, pumps, wells, well points, or other means as necessary and drain to point of disposal that will not damage existing or new construction or interfere with construction operations.
13. Frost protection:
  - a. Do not place foundations, slabs-on-grade, equipment support pads, or fill material on frozen ground.
  - b. When freezing temperatures may be expected, do not excavate to full depth indicated, unless foundations, floor slabs, equipment support pads, or fill material can be placed immediately after excavation has been completed and approved.

- c. Protect excavation from frost if placing of concrete or fill is delayed.
  - d. Where a concrete slab is a base slab-on-grade located under and within a structure that will not be heated, protect subgrade under the slab from becoming frozen until final acceptance of the Project by the Owner.
- C. Fill and Backfill Inside of Structure and Below Foundations, Base Slabs, Floor Slabs, Equipment Support Pads and Piping:
- 1. General:
    - a. Subgrade to receive fill or backfill shall be free of undesirable material as determined by Owner's Representative (Soils Engineer) and scarified to a depth of 6 IN and compacted to density specified herein.
    - b. Surface may be stepped by at not more than 12 IN per step or may be sloped at not more than 2 percent.
    - c. Do not place any fill or backfill material until subgrade under fill or backfill has been inspected and approved by Owner's Representative (Soils Engineer) as being free of undesirable material and compacted to specified density.
  - 2. Obtain approval of fill and backfill material and source from Owner's Representative (Soils Engineer) prior to placing the material.
  - 3. Granular fill under floor slabs-on-grade: Place all floor slabs-on-grade on a minimum of 6 IN of granular fill unless otherwise indicated.
  - 4. Fill and backfill placement:
    - a. Prior to placing fill and backfill material, optimum moisture and maximum density properties for proposed material shall be obtained from Owner's Representative (Soils Engineer).
    - b. Place fill and backfill material in thin lifts as necessary to obtain required compaction density.
    - c. Compact material by means of equipment of sufficient size and proper type to obtain specified density.
    - d. Use hand operated equipment for filling and backfilling next to walls.
    - e. Do not place fill and backfill when the temperature is less than 40 DegF and when subgrade to receive fill and backfill material is frozen, wet, loose, or soft.
    - f. Use vibratory equipment to compact granular material; do not use water.
  - 5. Where fill material is required below foundations, place fill material, conforming to the required density and moisture content, outside the exterior limits of foundations located around perimeter of structure the following horizontal distance whichever is greater:
    - a. As required to provide fill material to indicated finished grade.

- b. 5 FT.
  - c. Distance equal to depth of compacted fill below bottom of foundations.
  - d. As directed by Owner's Representative (Soils Engineer).
- D. Filling and Backfilling Outside of Structures.
- 1. This paragraph of this Specification Section applies to fill and backfill placed outside of structures above bottom level of both foundations and piping, but not under paving.
  - 2. Provide material as approved by Owner's Representative (Soils Engineer) for filling and backfilling outside of structures.
  - 3. Fill and backfill placement:
    - a. Prior to placing fill and backfill material, obtain optimum moisture and maximum density properties for proposed material from Owner's Representative (Soils Engineer).
    - b. Place fill and backfill material in thin lifts as necessary to obtain required compaction density.
    - c. Compact material with equipment of proper type and size to obtain density specified.
    - d. Use only hand operated equipment for filling and backfilling next to walls and retaining walls.
    - e. Do not place fill or backfill material when temperature is less than 40 DegF and/or when subgrade to receive material is frozen, wet, loose, or soft.
    - f. Use vibratory equipment for compacting granular material; do not use water.
  - 4. Backfilling against walls:
    - a. Do not backfill around any part of structures until each part has reached specified 28-day compressive strength and backfill material has been approved.
    - b. Do not start backfilling until concrete forms have been removed, trash removed from excavations, pointing of masonry work, concrete finishing, dampproofing and waterproofing have been completed.
    - c. Do not place fills against walls until floor slabs at top, bottom, and at intermediate levels of walls are in place and have reached 28-day required compressive strength to prevent wall movement.
    - d. Bring backfill and fill up uniformly around the structures and individual walls, piers, or columns.
- E. Backfilling Outside of Structures Under Piping or Paving:



1. When backfilling outside of structures requires placing backfill material under piping or paving, the material shall be placed from bottom of excavation to underside of piping or paving at the density required for fill under piping or paving as indicated in this Specification Section.
2. This compacted material shall extend transversely to the centerline of piping or paving a horizontal distance each side of the exterior edges of piping or paving equal to the depth of backfill measured from bottom of excavation to underside of piping or paving.
3. Provide special compacted bedding or compacted subgrade material under piping or paving as required by other Specification Sections in the Project.

### **3.8 SPECIAL REQUIREMENTS**

#### **A. Erosion Control:**

1. Conduct work to minimize erosion of site.
2. Construct stilling areas to settle and detain eroded material.
3. Remove eroded material washed off site.
4. Clean streets daily of any spillage of dirt, rocks or debris from equipment entering or leaving site.

### **3.9 OWNER TRAINING (NOT USED)**

**END OF SECTION**

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**SECTION 31 23 16.16**

**STRUCTURAL EXCAVATION FOR MINOR STRUCTURES**

**PART 1 - GENERAL**

**1.1 SUMMARY**

A. Section Includes:

1. Structural excavation for minor structures.

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

1. Division 00 –Proposing Requirements, Contract Forms, and Conditions of the Contract.
2. Division 01 – General Requirements.
3. Section 02 41 13.13 – Removing Existing Pavements and Structures.
4. Section 31 21 33 – Trenching, Backfilling and Compacting for Utilities.
5. Section 31 32 13.16 – Cement Stabilized Sand.
6. Section 31 38 25 – Geotextiles.
7. Section 31 41 00 – Trench Safety System.

**1.2 MEASUREMENT AND PAYMENT**

A. Stipulated Price (Lump Sum). If Contract is a Stipulated Price Contract, payment for Work in this Section is included in total Stipulated Price.

**1.3 DEFINITIONS**

A. Unsuitable Material: Unsuitable soil materials are the following:

1. Materials that are classified as ML, CL-ML, MH, PT, OH, and OL according to ASTM D 2487.
2. Materials that cannot be compacted to required density due to gradation, plasticity, or moisture content.
3. Materials that contain large clods, aggregates, stones greater than 4 inches in any dimension, debris, vegetation, waste or any other deleterious materials.
4. Materials that are contaminated with hydrocarbons or other chemical contaminants.

B. Suitable Material: Suitable soil materials are those meeting specification requirements. Unsuitable soils meeting specification requirements for suitable soils after treatment with lime or cement shall be considered suitable, unless otherwise indicated.

C. Select Material: Material as defined in Specification Section 31 21 33 – Trenching, Backfilling and Compacting for Utilities.

- D. Backfill: Material meeting specified quality requirements, placed and compacted under controlled conditions around structures.
- E. Foundation Backfill Materials: Natural soil or manufactured aggregate meeting Class I requirements and geotextile filter fabrics as required, to control drainage and material separation. Foundation backfill material is placed and compacted as backfill where needed to provide stable support for structure foundation base. Foundation backfill materials may include concrete fill and seal slabs.
- F. Foundation Base: For foundation base material, use crushed stone aggregate with filter fabric as required, cement stabilized sand, or concrete seal slab. Foundation base provides smooth, level working surface for construction of concrete foundation.
- G. Foundation Subgrade: Foundation subgrade is surface of natural soil which has been excavated and prepared to support foundation base or foundation backfill, where needed.
- H. Ground Water Control Systems: Installations external to excavation such as well points, eductors, or deep wells. Ground water control includes dewatering to lower ground water, intercepting seepage which would otherwise emerge from side or bottom of excavation, and depressurization to prevent failure or heaving of excavation bottom. Refer to Specification Section 01 57 23.02 - Control of Ground Water and Surface Water.
- I. Surface Water Control: Diversion and drainage of surface water runoff and rain water away from excavation. Remove rain water and surface water which accidentally enters excavation as part of excavation drainage.
- J. Excavation Drainage: Removal of surface and seepage water in excavation by sump pumping and using French drains surrounding foundation to intercept water.
- K. Over-Excavation and Backfill: Excavation of subgrade soils with unsatisfactory bearing capacity or composed of otherwise unsuitable materials below foundation as shown on Drawings, and backfilled with foundation backfill material.
- L. Shoring System: Structure that supports sides of an excavation to maintain stable soil conditions and prevent cave-ins.

#### **1.4 QUALITY ASSURANCE**

- A. Referenced Standards:
  - 1. ASTM International (ASTM):
    - a. D 698 – Standard Test Methods for Laboratory Compaction of Soil Using Standard Effort (12,400 ft-lbf/ft<sup>3</sup> (600kN-m/m<sup>3</sup>)).
    - b. D 1556 – Standard Test Method for Density and Unit Weight of Soil in Place by Sand-Cone Method.

- c. D 6938 – Standard Test Methods for In-Place Density and Water Content of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depths).
  - d. D 4318 – Standard Test Method for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.
2. Texas Department of Transportation (TxDOT):
    - a. Tex-101-E – Preparing Soil and Flexible Base Materials for Testing.
    - b. Tex-110-E – Particle Size Analysis of Soils.
  3. Occupational Safety and Health Administration (OSHA):
    - a. Federal Regulations, 29 CFR, Part 1926, Standards - Excavation, Occupational Safety and Health Administration (OSHA).

## **1.5 SUBMITTALS**

- A. Conform to requirements of Specification Section 01 33 00 – Submittals.
- B. Submit work plan for excavation and backfill for each structure with complete written description which identifies details of proposed method of construction and sequence of operations for construction relative to excavation and backfill activities. Use descriptions, with supporting illustrations, sufficiently detailed to demonstrate to Owner's representative that procedures meet requirements of Specifications and Drawings.
- C. Submit excavation safety system plan.
  1. Submit excavation safety system plan in accordance with applicable OSHA requirements for excavations.
  2. Submit excavation safety system plan using information in Specification Section 31 41 00 – Trench Safety System, for excavations that fall under State and Federal trench safety laws.
- D. Submit ground and surface water control plan in accordance with requirements in this Section and Specification Section 01 57 23.02 – Control of Ground Water and Surface Water.
- E. Submit backfill material sources and product quality information in accordance with requirements of Specification Section 31 21 33 – Trenching, Backfilling and Compacting for Utilities.
- F. Submit project record documents under provisions of Specification Section 01 78 39 – Project Record Documents. Record location of utilities, as installed, referenced to survey benchmarks. Include location of utilities encountered or rerouted. Give horizontal dimensions, elevations, inverts and gradients.

## **1.6 TESTS**

- A. Testing and analysis of backfill materials for soil classification and compaction during construction will be performed by an independent laboratory in accordance with requirements of Specification Section 01 45 29 – Testing Laboratory Services and as specified in this Section.
- B. Perform embedment and backfill material source qualification testing in accordance with requirements of Specification Section 31 21 33 – Trenching, Backfilling, and Compacting for Utilities.

## **1.7 WARRANTY (NOT USED)**

## **PART 2 - PRODUCTS**

### **2.1 EQUIPMENT**

- A. Perform excavation with equipment suitable for achieving requirements of this Specification.
- B. Use equipment which will produce degree of compaction specified. Compact backfill within 3 feet of walls with hand operated equipment. Do not use equipment weighing more than 10,000 pounds closer to walls than a horizontal distance equal to depth of fill at that time. Use hand operated power compaction equipment where use of heavier equipment is impractical or restricted due to weight limitations.

### **2.2 MATERIAL CLASSIFICATIONS**

- A. Use backfill materials conforming to classifications and product descriptions of Specification Section 31 21 33 – Trenching, Backfilling, and Compacting for Utilities. Use classification or product description for backfill applications as shown on Drawings and as specified.

## **PART 3 - EXECUTION**

### **3.1 PREPARATION**

- A. Conduct an inspection to determine condition of existing structures and other permanent installations.
- B. Set up necessary street detours and barricades in preparation for excavation if construction will affect traffic. Conform to requirements of Specification Section 01 55 26 – Traffic Control. Maintain barricades and warning devices at all times for streets and intersections where work is in progress, or where affected by Work, and is considered hazardous to traffic movements.
- C. Perform work in accordance with OSHA standards. Employ an excavation safety system using information in Specification Section 31 41 00 – Trench Safety System.

- D. Remove existing pavements and structures, including sidewalks and driveways, in accordance with requirements of Specification Section 02 41 13.13 – Removing Existing Pavements and Structures.
- E. Install and operate necessary dewatering and surface water control measures in accordance with requirements of Specification Section 01 57 23.02 – Control of Ground Water and Surface Water.

### **3.2 PROTECTION**

- A. Protect trees, shrubs, lawns, existing structures, and other permanent objects outside of grading limits and within grading limits as designated on Drawings, and in accordance with requirements of Specification Section 01 56 39 – Temporary Tree and Plant Protection.
- B. Protect and support above-grade and below-grade utilities which are to remain.
- C. Restore damaged permanent facilities to pre-construction conditions unless replacement or abandonment of facilities is indicated on Drawings.
- D. Prevent erosion of excavations and backfill. Do not allow water to pond in excavations.
- E. Maintain excavation and backfill areas until start of subsequent work. Repair and recompact slides, washouts, settlements, or areas with loss of density at no additional cost to Owner.

### **3.3 EXCAVATION**

- A. Perform excavation work so that underground structure can be installed to depths and alignments shown on Drawings. Use caution during excavation work to avoid disturbing surrounding ground and existing facilities and improvements. Keep excavation to absolute minimum necessary. No additional payment will be made for excess excavation not authorized by Owner's Representative.
- B. Upon discovery of unknown utilities, badly deteriorated utilities not designated for removal, or concealed conditions, discontinue work at that location. Notify Owner's Representative and obtain instructions before proceeding in such areas.
- C. Immediately notify agency or company owning any line which is damaged, broken, or disturbed. Obtain approval from Owner's Representative and agency for any repairs or relocations, either temporary or permanent.
- D. Avoid settlement of surrounding soil due to equipment operations, excavation procedures, vibration, dewatering, or other construction methods.
- E. Provide surface drainage during construction to protect work and to avoid nuisance to adjoining property. Where required, provide proper dewatering and piezometric pressure control during construction.

- F. Conduct hauling operations so that trucks and other vehicles do not create dirt nuisance in streets. Verify that truck beds are sufficiently tight and loaded in such a manner such that objectionable materials will not spill onto streets. Promptly clear away any dirt, mud, or other materials that spill onto streets or are deposited onto streets by vehicle tires.
- G. Maintain permanent benchmarks, monumentation, and other reference points. Unless otherwise directed, replace those which are damaged or destroyed by Work.
- H. Provide sheeting, shoring, and bracing where required to safely complete Work, to prevent excavation from extending beyond limits indicated on Drawings, and to protect Work and adjacent structures or improvements. Use sheeting, shoring, and bracing to protect workmen and public using information in Specification Section 31 41 00 – Trench Safety System.
- I. Prevent voids from forming outside of sheeting. Immediately fill voids with grout, cement stabilized sand, or other material approved by Owner's Representative and compact to 95 percent standard density.
- J. After completion of structure, remove sheeting, shoring, and bracing unless shown on Drawings to remain in place or directed by Owner's Representative in writing that such temporary structures may remain. Remove sheeting, shoring and bracing in such a manner as to maintain safety during backfilling operations and to prevent damage to Work and adjacent structures or improvements.
- K. Immediately fill and compact voids left or caused by removal of sheeting with cement stabilized sand or other material approved by Owner's Representative and compact to 95 percent standard density.

### **3.4 HANDLING EXCAVATED MATERIALS**

- A. Classify excavated materials. Place material which is suitable for use as backfill in orderly piles at sufficient distance from excavation to prevent slides or cave-ins.

### **3.5 DEWATERING**

- A. Provide ground water control per Specification Section 01 57 23.02 – Control of Ground Water and Surface Water.
- B. Keep ground water surface elevation minimum of 3 feet below bottom of foundation base.
- C. Maintain ground water control as directed by Specification Section 01 57 23.02 – Control of Ground Water and Surface Water and until structure is sufficiently complete to provide required weight to resist hydrostatic uplift with minimum safety factor of 1.2.

### **3.6 FOUNDATION EXCAVATION**

- A. Notify Owner's Representative at least 48 hours prior to planned completion of foundation excavations. Do not place foundation base until excavation is accepted by Owner's Representative.



- B. Excavate to elevations shown on Drawings, as needed to provide space for foundation base, forming level undisturbed surface, free of mud or soft material. Remove pockets of soft or otherwise unstable soils and replace with foundation backfill material or material as directed by Owner's Representative. Prior to placing material over it, recompact sub grade where indicated on Drawings, scarifying as needed, to 95 percent of maximum Standard Dry Density according to ASTM D 698. If specified level of compaction cannot be achieved, moisture condition subgrade and recompact until 95 percent is achieved, over-excavate to provide minimum layer of 24 inches of foundation backfill material, or other means acceptable to Owner's Representative.
- C. Fill unauthorized excessive excavation with foundation backfill material or other material as directed by Owner's Representative.
- D. Protect open excavations from rainfall, runoff, freezing groundwater, or excessive drying so as to maintain foundation subgrade in satisfactory, undisturbed condition. Keep excavations free of standing water and completely free of water during concrete placement.
- E. Remove soils which become unsuitable due to inadequate dewatering or other causes, after initial excavation to required subgrade, and replace with foundation backfill material, as directed by Owner's Representative, at no additional cost to Owner.
- F. Place foundation base, or foundation backfill material where needed, over subgrade on same day that excavation is completed to final grade. Where base of excavations are left open for longer periods, protect them with seal slab or cement-stabilized sand.
- G. Use filter fabric as specified in Specification Section 31 38 25 - Geotextiles to separate crushed aggregate, and other free draining Class I materials from native soils or select material backfill. Overlap fabric minimum of 12 inches beyond where another material stops contact with soil.
- H. Place crushed aggregate, and other Class I materials, in uniform layers of 8-inch maximum thickness. Perform compaction by means of at least two passes of vibratory compactor.

### **3.7 FOUNDATION BASE.**

- A. Place foundation base after sub grade is properly prepared, including placement of foundation backfill where needed. Use foundation base consisting of 12-inch layer of crushed stone aggregate or cement stabilized sand. Alternately, seal slab with minimum thickness of 4 inches may be placed. Extend foundation base minimum of 12 inches beyond edge of structure foundation, unless shown otherwise on Drawings.
- B. Where foundation base and foundation backfill are of same material, both can be placed in one operation.

### **3.8 BACKFILL**

- A. Complete backfill to surface of natural ground or to lines and grades shown on Drawings. Remove forms, lumber, trash and debris from structures.
  - 1. Unless otherwise shown on Drawing, for structures under pavement or within one foot back of curb, use cement stabilized sand up to pavement base or subgrade.
  - 2. Unless otherwise shown on Drawing, for structures not under pavement, use cement stabilized sand to within 2 feet of final grade. Use random backfill of suitable material for top two feet.
- B. Do not place backfill against concrete walls or similar structures, until laboratory test breaks indicate that concrete has reached minimum of 85 percent of specified compressive strength. Where walls are supported by slabs or intermediate walls, do not begin backfill operations until slab or intermediate walls have been placed and concrete has attained sufficient strength.
- C. Remove concrete forms before starting backfill and remove shoring and bracing as work progresses.
- D. Maintain backfill material at no less than 2 percent below nor more than 2 percent above optimum moisture content, unless otherwise approved by Owner's Representative. Place fill material in uniform 8-inch maximum loose layers. Compact fill to at least 95 percent of maximum Standard Proctor Density according to ASTM D 698 below paved areas. Compact fill to at least 95 percent around structures below unpaved areas.
- E. Where backfill is placed against sloped excavation surface, run compaction equipment across boundary of cut slope and backfill to form compacted slope surface for placement of next layer of backfill.
- F. Place backfill using cement stabilized sand in accordance with Specification Section 31 32 13.16 – Cement Stabilized Sand.

### **3.9 FIELD QUALITY CONTROL**

- A. Testing will be performed under provisions of Specification Section 01 45 29 – Testing Laboratory Services.
- B. Tests will be performed initially on minimum of one different sample of each material type for plasticity characteristics, in accordance with ASTM D 4318, and for gradation characteristics, in accordance with Tex-101-E and Tex-110-E. Additional classification tests will be performed whenever there is noticeable change in material gradation or plasticity.
- C. In-place density tests of compacted sub grade and backfill will be performed according to ASTM D 1556, or ASTM D 6938, and at following frequencies and conditions:
  - 1. Minimum of one test for every 50 to 100 cubic yards of compacted backfill material as directed by Owner's Representative.

2. A minimum of three density tests for each full work shift.
  3. Density tests will be performed in all placement areas.
  4. Number of tests will be increased when inspection determines that soil types or moisture contents are not uniform or when compacting effort is variable and not considered sufficient to attain uniform density.
  5. Identify elevation of test with respect to natural ground.
  6. Record approximate depth of lift tested.
- D. At least one test for moisture-density relationships will be initially performed for each type of backfill material in accordance with ASTM D 698. Perform additional moisture-density relationship test once a month or whenever there is noticeable change in material gradation or plasticity.
- E. When tests indicate work does not meet specified compaction requirements, recondition, recompact, and retest at Contractor's expense.

### **3.10 DISPOSAL OF EXCESS MATERIAL**

- A. Dispose of excess materials in accordance with requirements of Specification Section 01 74 19 – Construction Waste Management and Disposal.

### **3.11 OWNER TRAINING (NOT USED)**

**END OF SECTION**

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**SECTION 31 23 23.33**

FLOWABLE FILL

**PART 1 - GENERAL**

**1.1 SUMMARY**

A. Section Includes:

- a. Furnish labor, materials, equipment, and incidentals necessary to place and mix a flowable mortar fill consisting of Portland cement, fine aggregate, fly ash, and water in the proper proportions as specified within this specification. Controlled Low-Strength Material (Flowable Fill) shall be used to bed and backfill around piping and utilities where indicated.

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

1. Division 00 – Proposal Requirements, Contract Forms, and Conditions of the Contract.
2. Division 01 – General Requirements.
3. Section 03 09 00 – Concrete.
4. Section 31 21 33 – Trenching Backfilling and Compacting for Utilities.
5. Section 31 23 01 – Earthwork.

**1.2 MEASUREMENT AND PAYMENT**

- A. Stipulated Price (Lump Sum). If Contract is a Stipulated Price Contract, payment for Work in this Section is included in total Stipulated Price.

**1.3 QUALITY ASSURANCE**

A. Referenced Standards:

1. ASTM International (ASTM):
  - a. C 31 – Making and Curing Concrete Test Specimens in the field.
  - b. C 33 – Standard Specification for Concrete Aggregates (Fine Aggregate).
  - c. C 39 – Compressive Strength of Cylindrical Concrete Specimens.
  - d. C 40 – Standard Test Method for Organic Impurities in Fine Aggregates for Concrete.
  - e. C 94 – Ready-Mixed Concrete.
  - f. C 150 – Standard Specification for Portland Cement.
  - g. C 192 – Making and Curing Concrete Test Specimens in the Laboratory.
  - h. C 292 – Air-Entraining Admixtures for Concrete.
  - i. C 494 – Chemical Admixtures for Concrete.

- j. C 618 – Specification for Fly Ash and Raw or Calcined Natural Pozzolan for Use as Mineral Admixture in Portland Cement Concrete.
- k. C 4318 – Liquid Limit, Plastic Limit and Plasticity Index of Soils.
- 2. Corps of Engineers (COE):
  - a. CRD-C611 – Test Method for Flow of Grout Mixtures (Flow-Cone Method)
- B. Factory Testing: The Contractor shall be responsible for the design of the material. A trial mix shall be designed by an independent testing laboratory, retained by the Contractor. The testing laboratory shall submit verification that the materials and proportions of the trial mix design meet the requirement given in the specifications. Concrete mix additives such as “Darafill” manufactured by Grace Construction Products or approved equal products may be required to achieve the minimum strength and flowability requirements. In lieu of trial mix design, Contractor may submit a mix design used successfully in previous similar work, for similar applications, for approval by Principal Architect/Engineer. The Contractor shall not make changes in materials, either in gradation, source, or brand, or proportions of the mixture after having been approved, except by specific approval of the Principal Architect/Engineer.
- C. Pre-Job Testing: Pre-job testing for excavatability with actual equipment and intended configuration of concrete sample is required. The testing equipment and configuration of concrete sample shall be determined by the Owner’s Representative.
- D. Owner Testing: It is the responsibility of the Contractor to achieve and maintain the quality of material required by this Section of the specifications. However, the Owner may secure the services of an independent testing laboratory to verify the quality of the material. The Owner shall have the right to require additional testing, strengthening, or replacement of material which has failed to meet the minimum requirements of this Section.

#### **1.4 SUBMITTALS**

- A. See Specification Section 01 33 00 – Submittals for requirements for the mechanics and administration of the submittal process.
- B. Submit material trial mix design on material.
- C. Submit a copy of delivery tickets accompanied by batch tickets to Owner’s Representative at the time of delivery.

#### **1.5 DESIGN REQUIREMENTS**

- A. Design Criteria; Concrete Proportions and Consistency:
  - 1. Concrete shall be proportioned to provide necessary workability and strength and shall conform to the following governing requirements:

28-Day Compressive Strength-psi	Min. Cement Pounds Per Cu. Yd.	Fine Aggregate Pounds Per Cu. Yd.	Max. Water Pounds Per Cu. Yd.	Max. Fly Ash Pounds per Cu. Yd.
70-150	50	2720	290	150

**PART 2 - PRODUCTS**

**2.1 MATERIALS**

- A. Cement: Portland cement conforming to the specifications and test for Type I Portland cement of the American Society for Testing and Materials, Designation C150 (ASTM C150).
- B. Fine Aggregate: Fine aggregate consisting of natural, washed and screened sand having clean, hard, strong, durable, uncoated grains complying with the requirements for ASTM C33. The sand shall generally be of such size that 100 percent will pass a 3/8-inch sieve, at least 95 percent will pass a 1/4-inch sieve, at least 80 percent will pass a No. 8 sieve, and 0 – 10 percent will pass a No. 200 sieve. Aggregate shall not contain strong alkali, or organic material which gives a color darker than the standard color when tested in accordance with ASTM C40.
- C. Fly Ash/Pozzolans: Fly ash shall be an ASTM C618, Class “C” fly ash. The fly ash may be used in controlled low-strength material.
- D. Water: Water for material shall be clean and free from oil, acid, alkali, organic matter, or other harmful impurities. Water which is suitable for drinking or for ordinary household use will be acceptable for material. Where available, water shall be obtained from mains of a waterworks system.
- E. Additives: As required to meet specification requirements:
  - 1. “Darafill” by Grace Construction Products.
  - 2. Rheocell Rheofill by BASF The Chemical Company.
  - 3. Sika Lightcrete Powder by Sika Corporation.
  - 4. Or approved equal.

**2.2 MIXES**

- A. In the determination of the amount of water required for mix, consideration shall be given to the moisture content of the aggregate. The net amount of water in the mix will be the amount added at the mixer; plus the free water in the aggregate; and minus the absorption of the aggregate, based on a 30 minute absorption period. No water allowance shall be made for evaporation after batching.

- B. The methods of measurement of materials shall be such that the proportions of water to cement can be closely controlled during the progress of the work and easily checked at any time by the Owner's Representative. To avoid unnecessary or haphazard changes in consistency, the aggregate shall be obtained from sources which will ensure a uniform quality and grading during any single day's operation, and shall be delivered to the work and handled in such a manner that the variation in moisture content will not interfere with the steady production of concrete of reasonable degree of uniformity. Sources of supply shall be approved by the Owner's Representative.
- C. The proportions of the mix shall be such as to produce material that can be placed readily into the void area without spading or vibrating, and without segregation or undue accumulation of water or laitance of the surface.
- D. When additive is contained in the mixture, the additive ingredients, proportions, and placement of the additive shall be per manufacturer's recommendations.

### **PART 3 - EXECUTION**

#### **3.1 PLACING**

- A. Contractor shall give the Owner's Representative sufficient advance notice before starting to place material in any area, to permit inspection of the area, and preparation for pouring.
- B. Conduct the operation of depositing the material so as to form a compact, dense, impervious mass.
- C. Flowable fill shall be uniformly placed to the depth shown on the plans. The fill shall be brought up uniformly to the top of excavation elevation. Placement of flowable fill shall then cease and the fill protected from traffic for a period of 72 hours.
- D. The material shall be placed against undisturbed soil.
- E. Material shall be placed in a manner to prevent pipe flotation. If multiple lifts are used, material shall be allowed to harden before placing next lift.

#### **3.2 FIELD QUALITY CONTROL**

- A. Perform concrete tests per Specification Section 03 09 00 – Concrete.
- B. Perform strength test on any concrete to which water has been added at the jobsite.

#### **3.3 OWNER TRAINING (NOT USED)**

**END OF SECTION**



**SECTION 31 24 00.01**  
**BORROW**

**PART 1 - GENERAL**

**1.1 SUMMARY**

- A. Section Includes
  - 1. Borrow
- B. Related Specification Sections include, but are not necessarily limited to:
  - 1. Division 00 –Proposing Requirements, Contract Forms, and Conditions of the Contract.
  - 2. Division 01 – General Requirements.
  - 3. Section 31 23 00 – Earthwork

**1.2 MEASUREMENT AND PAYMENT**

- A. Stipulated Price (Lump Sum). If Contract is a Stipulated Price Contract, payment for Work in this Section is included in total Stipulated Price

**1.3 QUALITY ASSURANCE**

- A. Referenced Standards:
  - 1. ASTM International (ASTM):
    - a. ASTM D 2216 - Standard Test Methods for Laboratory Determination of Water (Moisture) Content of Soil, and Rock by Mass.
    - b. ASTM D 4318 - Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.

**1.4 SUBMITTALS**

- A. Conform to requirements of Specification Section 01 33 00 – Submittals.
- B. Submit location and description of proposed borrow area for approval.
- C. Submit material samples for testing.

**1.5 WARRANTY (NOT USED)**

**PART 2 - PRODUCTS**

**2.1 SOIL MATERIAL**

- A. Grade borrow material used for embankment free of lumps greater than 6 inches, rocks larger than 3/4 inches, organic material, chemical waste or other contamination, and debris. Take borrow material from sources approved by Owner's Representative.

- B. Use material with plasticity index not less than 12, nor more than 20 when tested in accordance with ASTM D 4318. Maximum liquid limit shall be 45, unless approved by Owner's Representative. Do not use blend of cohesive and granular soils to achieve required plasticity index.

### **PART 3 - EXECUTION**

#### **3.1 PREPARATION**

- A. Notify Owner's Representative and testing laboratory 5 days in advance of opening borrow source to permit obtaining samples for qualification testing. When material does not meet specification requirements, locate another source of borrow.
- B. Clear approved source area of trees, stumps, brush, roots, vegetation, organic matter, and other unacceptable material before excavation.

#### **3.2 TESTS**

- A. Test and analyze soil materials in accordance with ASTM D 4318 and ASTM D 2216 under provisions of Specification Section 01 45 29 - Testing Laboratory Services.

#### **3.3 EXCAVATION**

- A. Provide adequate drainage of surface water, so that surface water run off does not enter borrow pit excavation.

#### **3.4 HAULING**

- A. Use covered trucks. Conform to requirements of Specification Section 01 55 26 – Traffic Control.

#### **3.5 EMBANKMENT**

- A. Conform to requirements of Specification Section 31 23 00 – Earthwork.

#### **3.6 OWNER TRAINING (NOT USED)**

**END OF SECTION**

**SECTION 31 32 13.16**  
**CEMENT STABILIZED SAND**

**PART 1 - GENERAL**

**1.1 SUMMARY**

- A. Section Includes:
  - 1. Cement Stabilized Sand
- B. Related Specification Sections include, but are not necessarily limited to:
  - 1. Division 00 – Bidding Requirements, Contract Forms, and Conditions of the Contract.
  - 2. Division 01 – General Requirements.
  - 3. Section 31 23 33 – Trenching, Backfilling, and Compacting for Utilities.

**1.2 MEASUREMENT AND PAYMENT**

- A. Stipulated Price (Lump Sum). If Contract is a Stipulated Price Contract, payment for Work in this Section is included in total Stipulated Price.

**1.3 REFERENCES**

- A. C 33 – Standard Specification for Concrete Aggregates (Fine Aggregate).
- B. C 40 – Standard Test Method for Organic Impurities in Fine Aggregates for Concrete.
- C. C 42 – Standard Test Method for Obtaining and Testing Drilled Cores and Sawed Beams of Concrete.
- D. C 94 – Standard Specification for Ready-Mixed Concrete.
- E. C 123 – Standard Test Method for Lightweight Particles in Aggregate.
- F. C 142 – Standard Test Method for Clay Lumps and Friable Particles in Aggregates.
- G. C 150 – Specification for Portland Cement.
- H. D 558 – Standard Test Method for Moisture-Density (Unit Weight) Relations of Soil Cement-Mixtures.
- I. D 1632 – Standard Practice for Making and Curing Soil-Cement Compression and Flexure Test Specimens in the Laboratory.
- J. D 1633 – Standard Test Methods for Compressive Strength of Molded Soil-Cement Cylinders.
- K. D 2487 – Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System).

- L. D 6938 – Standard Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).
- M. D 3665 – Standard Practice for Random Sampling of Construction Materials.
- N. D 4318 – Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.

#### **1.4 SUBMITTALS**

- A. Conform to requirements of Specification Section 01 33 00 – Submittals.
- B. Submit proposed target cement content and production data for sand-cement mixture in accordance with requirements of Paragraph 2.3, Materials Qualification.

#### **1.5 DESIGN REQUIREMENTS**

- A. Use sand-cement mixture producing minimum unconfined compressive strength of 100 pounds per square inch (psi) in 48 hours containing no less than 2.5 sacks of cement per cubic yard of mixture.
  - 1. Where potable water lines cross wastewater lines, embed wastewater line with cement stabilized sand in accordance with Texas Administrative Code §290.44(e)(4)(B):
    - a. Provide minimum of 10% cement per cubic yard of cement stabilized sand mixture, based on loose dry weight volume. Use at least 2.5 sacks of cement per cubic yard of mixture (2 sacks per ton of dry sand).
    - b. Unless otherwise shown on Drawings, embed wastewater main or lateral minimum of six inches above and below.
    - c. Use brown coloring in cement stabilized sand for wastewater main or lateral bedding for identification of pressure rated wastewater mains during future construction.
- B. Design will be based on strength specimens molded in accordance with ASTM D558 at moisture content within 3 percent of optimum and within 4 hours of batching.

#### **1.6 WARRANTY (NOT USED)**

### **PART 2 - PRODUCTS**

#### **2.1 MATERIALS**

- A. Cement: Type I Portland cement conforming to ASTM C 150.

- B. Sand: Clean, durable sand meeting grading requirements for fine aggregates of ASTM C 33, or requirements for bank run sand of Specification Section 31 23 33 – Trenching, Backfilling, and Compacting for Utilities, and the following requirements:
  - 1. Classified as SW, SP, SW-SM, SP-SM, or SM by United Soil Classification System of ASTM D 2487.
  - 2. Deleterious materials:
    - a. Clay lumps, ASTM C 142; less than 0.5 percent.
    - b. Lightweight pieces, ASTM C 123; less than 5.0 percent.
    - c. Organic impurities, ASTM C 40, color no darker than standard color.
  - 3. Plasticity index of 4 or less when tested in accordance with ASTM D 4318.
- C. Water: Potable water, free of oils, acids, alkalis, organic matter or other deleterious substances, meeting requirements of ASTM C 94.

## **2.2 MIXING MATERIALS**

- A. Add required amount of water and mix thoroughly in pugmill-type mixer.
- B. Stamp batch ticket at plant with time of loading. Reject material not placed and compacted within 4 hours after mixing.

## **2.3 MATERIAL QUALIFICATION**

- A. Determine target cement content of material as follows:
  - 1. Obtain samples of sand-cement mixtures at production facility representing range of cement content consisting of at least three points.
  - 2. Complete molding of samples within 4 hours after addition of water.
  - 3. Perform strength tests (average of two specimens) at 48 hours and 7 days.
  - 4. Perform cement content tests on each sample.
  - 5. Perform moisture content tests on each sample.
  - 6. Plot average 48-hour strength vs. cement content.
  - 7. Record scale calibration date, sample date, sample time, molding time, cement feed dial settings, and silo pressure (if applicable).
- B. Test raw sand for following properties at point of entry into pug-mill:
  - 1. Gradation
  - 2. Plasticity index
  - 3. Organic impurities

4. Clay lumps and friable particles
  5. Lightweight pieces
  6. Moisture content
  7. Classification
- C. Present data obtained in format similar to that provided in sample data form attached to this Section.
- D. The target content may be adjusted when statistical history so indicates. For determination of minimum product performance use formula:

$$f'_c + \frac{1}{2} \text{ standard deviation}$$

### **PART 3 - EXECUTION**

#### **3.1 PLACING**

- A. Place sand-cement mixture in maximum 8-inch-thick loose lifts and compact to 95 percent of maximum density as determined in accordance with ASTM D 558, unless otherwise specified. Refer to related specifications for thickness of lifts in other applications. Target moisture content during compaction is  $\pm 3$  percent of optimum. Perform and complete compaction of sand-cement mixture within 4 hours after addition of water to mix at plant.
- B. Do not place or compact sand-cement mixture in standing or free water.

#### **3.2 FIELD QUALITY CONTROL**

- A. Testing will be performed under provisions of Specification Section 01 45 29 – Testing Laboratory Services.
- B. One sample of cement stabilized sand shall be obtained for each 150 tons of material placed per day with no less than one sample per day of production. Random samples of delivered cement stabilized sand shall be taken in the field at point of delivery in accordance with ASTM 3665. Obtain three individual samples of approximately 12 to 15 pounds each from the first, middle, and last third of the truck and composite them into one sample for test purposes.
- C. Prepare and mold four specimens (for each sample obtained) in accordance with ASTM D 558, Method A, without adjusting moisture content. Samples will be molded at approximately same time material is being used, but no later than 4 hours after water is added to mix.
- D. After molding, specimens will be removed from molds and cured in accordance with ASTM D 1632.

- E. Specimens will be tested for compressive strength in accordance with ASTM D 1633, Method A. Two specimens will be tested at 48 hours plus or minus 2 hours and two specimens will be tested at 7 days plus or minus 4 hours.
- F. A strength test will be average of strengths of two specimens molded from same sample of material and tested at same age. Average daily strength will be average of strengths of all specimens molded during one day's production and tested at same age.
- G. Precision and Bias: Test results shall meet recommended guideline for precision in ASTM D 1633 Section 9.
- H. Reporting: Test reports shall contain, as a minimum, the following information:
  - 1. Supplier and plant number
  - 2. Time material was batched
  - 3. Time material was sampled
  - 4. Test age (exact hours)
  - 5. Average 48-hour strength
  - 6. Average 7-day strength
  - 7. Specification section number
  - 8. Indication of compliance/non-compliance
  - 9. Mixture identification
  - 10. Truck and ticket numbers
  - 11. The time of molding
  - 12. Moisture content at time of molding
  - 13. Required strength
  - 14. Test method designations
  - 15. Compressive strength data as required by ASTM D 1633
  - 16. Supplier Mixture identification
  - 17. Specimen diameter and height, in.
  - 18. Specimen cross-sectional area, sq. in.

### **3.3 ACCEPTANCE**

- A. Strength level of material will be considered satisfactory if:
  - 1. The average 48-hour strength is greater than 100 psi with no individual strength test below 70 psi.

2. All 7-day individual strength tests (average of two specimens) are greater than or equal to 100 psi.
- B. Material will be considered deficient when 7-day individual strength test (average of two specimens) is less than 100 psi, but greater than 70 psi. See Paragraph 3.4 Adjustment for Deficient Strength.
- C. The material will be considered unacceptable and subject to removal and replacement at Contractor's expense when individual strength test (average of two specimens) have 7-day strength less than 70 psi.
- D. When moving average of three daily 48-hour averages falls below 100 psi, discontinue shipment to project until plant is capable of producing material, which exceeds 100 psi at 48 hours. Five, 48-hour strength tests shall be made in this determination with no individual strength tests less than 100 psi.
- E. Testing laboratory shall notify Contractor, Owner's Representative, and material supplier by facsimile of tests indicating results falling below specified strength requirements within 24 hours.
- F. If any strength test of laboratory cured specimen falls below the specified strength, Contractor may, at his own expense, request test of cores drilled from the area in question in accordance with ASTM C42. In such cases, three (3) cores shall be taken for each strength test that falls below the values given in 3.3A.
- G. Cement stabilized sand in an area represented by core tests shall be considered satisfactory if the average of three (3) cores is equal to at least 100 psi and if no single core is less than 70 psi. Additional testing of cores extracted from locations represented by erratic core strength results will be permitted.

### **3.4 ADJUSTMENT FOR DEFICIENT STRENGTH**

- A. When mixture produces 7-day compressive strength greater than or equal 100 pounds per square inch, then material will be considered satisfactory and bid price will be paid in full.
- B. When mixture produces 7-day compressive strength less than 100 pounds per square inch and greater than or equal to 70 pounds per square inch, material shall be accepted contingent on credit in payment. Compute credit by the following formula:

$$\text{Credit per Cubic Yard} = \frac{\$30.00 \times 2 (100 \text{ psi} - \text{Actual psi})}{100}$$

When mixture produces 7-day compressive strength less than 70 pounds per square inch, then remove and replace cement-sand mixture and paving and other necessary work at no cost to the Owner.



**3.5 WARRANTY (NOT USED)**

**END OF SECTION**

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**SECTION 31 37 01**  
**CONCRETE RIPRAP**

**PART 1 - GENERAL**

**1.1 SUMMARY**

- A. Section Includes:
1. Concrete riprap for protection of slopes against erosion.
    - a. Drainage outflow areas.
    - b. Slope armoring.
    - c. Other areas indicated and shown on the Drawings.
- B. Related Specification Sections include, but are not necessarily limited to:
1. Division 00 – Proposal Requirements, Contract Forms, and Conditions of the Contract.
  2. Division 01 – General Requirements.
  3. Section 31 23 00 – Earthwork.
  4. Section 31 38 25 – Geotextiles.

**1.2 MEASUREMENT AND PAYMENT**

- A. Stipulated Price (Lump Sum). If Contract is a Stipulated Price Contract, payment for Work in this Section is included in total Stipulated Price.

**1.3 QUALITY ASSURANCE**

- A. Referenced Standards:
1. ASTM International (ASTM):
    - a. C88 – Standard Test Method for Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate.
    - b. C127 – Standard Test Method for Density, Relative Density (Specific Gravity), and Absorption of Coarse Aggregate.
    - c. C136 – Standard Specification for Sieve Analysis of Fine and Coarse Aggregates.
  2. Corps of Engineers (COE):
    - a. CRD-C100 – Method of Sampling Concrete Aggregate and Aggregate Sources, and Selection of Material for Testing.

**1.4 SUBMITTALS**

- A. Shop Drawings:

1. See Specification Section 01 33 00 – Submittals for requirements for the mechanics and administration of the submittal process.
2. Product technical data including:
  - a. Acknowledgement that products submitted meet requirements of all standards referenced.
  - b. Gradation
  - c. Unit weight
3. Certifications.
4. Test reports.
5. Submit all test reports and certification in a single coordinated submittal.
  - a. Partial submittals will not be accepted.

## **1.5 WARRANTY (NOT USED)**

## **PART 2 - PRODUCTS**

### **2.1 MATERIALS**

#### **A. Riprap:**

1. The broken concrete riprap shall be dense, durable, and hard material free from cracks, seams, and other defects which would tend to increase deterioration from handling and natural conditions.
2. Riprap shall have a minimum unit weight of 150 pounds per solid cubic foot.
3. All exposed metal, including but not limited to rebar and wire mesh, shall be cut off flush with the surface of the block prior to placement.
4. Spalls, fragments, and chips shall not exceed 5% by weight. The dimension and shape limitations do not apply to this portion of the riprap.
5. Riprap blocks shall be provided in cubic form, rather than elongated (flat) shapes. No more than 25% of the blocks may have a length greater than 2.5 times the width or thickness. No length of block shall exceed 3 times the width or thickness.
6. The minimum thickness of each block shall be 6 IN.
7. Riprap shall be well graded and shall conform to the gradation given below. Acceptance of riprap material shall be based upon in-place gradations. The gradation below is to be used in normal applications, and may be noted on the drawings as new riprap, 18 IN thick riprap layer, or other similar designations.

Percent Lighter by Weight	Riprap Weight (LBS)		Volume (CF)		Cubical Shape (Ea. Side, FT)		Spherical Shape (Dia., FT)	
	Lower Limit	Upper Limit	Lower Limit	Upper Limit	Lower Limit	Upper Limit	Lower Limit	Upper Limit
100	180	265	1.20	1.77	1.06	1.21	1.31	1.50
50	80	110	0.53	0.73	0.81	0.90	1.01	1.12
15	40	60	0.27	0.40	0.64	0.74	0.80	0.91

Note: Theoretical cube and sphere dimensions are presented in the table for guidance only. The previously listed size and shape specifications shall govern.

## 2.2 MANUFACTURED PRODUCTS

- A. Shall be in accordance with Specification Section 31 38 25 – Geotextiles.

## 2.3 SOURCE QUALITY CONTROL

- A. Obtain samples in conformance with COE CRD-C100.

B. Source Tests:

1. Supply certified tests and service records to determine acceptability and application of concrete riprap materials.
2. In event suitable test reports or a service record that is satisfactory are not available, as in the case of newly operated sources, subject material to tests necessary to determine its acceptability for use.
3. Tests to which materials are to be subjected include:
  - a. Specific gravity.
  - b. Soundness in magnesium sulfate.
  - c. Such other tests as may be considered necessary to demonstrate satisfactorily that materials are acceptable including petrographic analysis, abrasion, absorption, and wetting and drying.

C. Material Acceptability Tests:

1. Initial test:
  - a. Specific gravity.
  - b. Soundness in magnesium sulfate.
2. Control tests:
  - a. Perform control tests including one specific gravity and one soundness in magnesium sulfate for each type of concrete riprap material for total tonnage of material for this Project.

D. Specific Gravity Test:

1. Conform with ASTM C127.

2. Not less than 2.40 minimum.
- E. Soundness in Magnesium Sulfate:
  1. Conform with ASTM C88, except maintain samples immersed in solution at a temperature of 80 DegF (26 DegC) +2 DegF.
  2. Not more than 12 percent loss at five cycles.

## **PART 3 - EXECUTION**

### **3.1 PREPARATION**

- A. Trim and dress areas on which riprap is to be placed to conform to cross sections shown on the drawings within an allowable tolerance of plus or minus 2 IN from proposed slope lines and grades.
- B. Bring areas that are below allowable minus tolerance limit to grade by filling with material similar to adjacent material.
- C. Compact to density specified for backfill in accordance with Specification Section 31 23 00 – Earthwork.
- D. Do not place any filter cloth, bedding material, or riprap material on prepared base prior to inspection by Owner's Representative.

### **3.2 PLACING OF FILTER CLOTH**

- A. Store and place filter cloth as specified by the Manufacturer. Place the filter cloth after the foundation is prepared. Make a minimum 24 IN lap on all joints. Repair or replace any damaged filter cloth as specified by the Manufacturer.

### **3.3 PLACING OF BEDDING MATERIAL (NOT USED)**

### **3.4 PLACING OF CONCRETE RIPRAP**

- A. Place concrete riprap material on filter cloth, or bedding material within limits indicated on Drawings.
- B. Place on prepared base to produce a well-graded mass of riprap with minimum percentage of voids.
- C. Place to required thickness and grades.
- D. Place to full thickness in a single operation to avoid displacing the underlying material.
- E. Distribute entire mass to conform to gradation specified.
  1. Do not place riprap by dumping into chutes or by similar method likely to cause segregation.
- F. Keep finished riprap free from objectionable pockets of small blocks or clusters of larger blocks.
  1. Hand place as necessary to obtain a well-graded distribution.

- G. Placing riprap by dumping from top of slope, dumping into chutes, or by similar methods likely to cause segregation of the various sizes shall not be permitted.
- H. Elongated riprap blocks shall be well distributed throughout the riprap mat. Individual oversized blocks will not be permitted. These shall be broken to an acceptable size or removed and replaced with riprap within the gradation limits. Surface irregularities shall be minimal.
- I. Ensure a final tolerance of within 2 IN from indicated slope and grade lines.
- J. Place riprap in conjunction with embankment construction to prevent mixture of embankment and concrete riprap materials.
- K. Maintain concrete riprap until accepted by Owner.
- L. Replace any displaced material to lines and grades shown in Contract Documents.
  
- M. Grout fill riprap areas near pipe intake/discharge as shown on Drawings.

**3.5 OWNER TRAINING (NOT USED)**

**END OF SECTION**

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**SECTION 31 38 25**  
**GEOTEXTILES**

**PART 1 - GENERAL**

**1.1 SUMMARY**

- A. Section Includes:
  - 1. Non-woven geotextile material.
- B. Related Specification Sections include, but are not necessarily limited to:
  - 1. Division 00 – Proposing Requirements, Contract Forms, and Conditions of the Contract.
  - 2. Division 01 – General Requirements.
  - 3. Section 31 23 00 – Earthwork.

**1.2 MEASUREMENT AND PAYMENT**

- A. Stipulated Price (Lump Sum). If Contract is a Stipulated Price Contract, payment for Work in this Section is included in total Stipulated Price.

**1.3 QUALITY ASSURANCE**

- A. Referenced Standards:
  - 1. American Association of State Highway Transportation Officials (AASHTO):
    - a. M288 – Standard Specification for Geotextile Specification for Highway Application.
  - 2. ASTM International (ASTM):
    - a. D3786 – Standard Test Method for Hydraulic Bursting Strength of Textile Fabrics-Diaphragm Bursting Strength Tester Method.
    - b. D4355 – Standard Test Method for Deterioration of Geotextiles by Exposure to Light, Moisture and Heat in a Xenon Arc Type Apparatus.
    - c. D4491 – Standard Test Methods for Water Permeability of Geotextiles by Permittivity.
    - d. D4533 – Standard Test Method for Trapezoid Tearing Strength of Geotextiles.
    - e. D4632 – Standard Test Method for Grab Breaking Load and Elongation of Geotextiles.
    - f. D4751 – Standard Test Method for Determining Apparent Opening Size of a Geotextile.
    - g. D4759 – Standard Practice for Determining the Specification Conformance of Geosynthetics.

- h. D4833 – Standard Test Method for Index Puncture Resistance of Geomembranes and Related Products.
- i. D4873 – Standard Guide for Identification, Storage, and Handling of Geosynthetic Rolls and Samples.
- j. D5261 – Standard Test Method for Measuring Mass per Unit Area of Geotextiles.

**B. Qualifications:**

- 1. Each manufacturing, fabricating firm shall demonstrate five (5) years continuous experience, including a minimum of 10,000,000 SF of geotextile installation in the past three (3) years.
- 2. Installing firm shall demonstrate that the site Superintendent or Foreman has had responsible charge for installation of a minimum of three (3) projects in like or similar project scope.

**1.4 DEFINITIONS**

- A. Manufacturer: Manufacturer producing geotextile sheets from resin and additives.
- B. Installer: The Installers are the individuals actually performing the hands-on work in the field.

**1.5 SUBMITTALS**

**A. Shop Drawings:**

- 1. See Specification Section 01 33 00 – Submittals for requirements for the mechanics and administration of the submittal process.
- 2. Manufacturer's documentation that raw materials and roll materials comply with required geotextile physical properties.
- 3. Manufacturer and Installer quality control manuals.
- 4. Original test results for resins, roll material and factory seam tests at frequency specified in respective quality control manuals.
  - a. Results shall include or bracket the rolls delivered for use in the Work.
- 5. Geotextile layout plan with proposed size, number, position and sequencing of geotextile rolls and direction of all field seams.
- 6. Proposed details of anchoring and overlapping if different than included in Contract Documents.

**B. Miscellaneous Submittals:**

- 1. See Specification Section 01 33 00 – Submittals for requirements for the mechanics and administration of the submittal process.

2. For needle punched geotextiles, the Manufacturer shall certify that the geotextile has been continuously inspected using permanent on-line full-width metal detectors and does not contain any needles which could damage other geosynthetic layers.
3. Qualification documentation specified in Section 1.3 Quality Assurance of this specification.

## **1.6 DELIVERY, STORAGE AND HANDLING**

- A. See Specification Section 01 65 50 – Product Delivery Storage and Handling.
- B. Label, handle, and store geotextiles in accordance with ASTM D4873 and as specified herein.
- C. Wrap each roll in an opaque and waterproof layer of plastic during shipment and storage.
  1. Do not remove the plastic wrapping until deployment.
- D. Label each roll with the manufacturer's name, geotextile type, lot number, roll number, and roll dimensions (length, width, gross weight).
- E. Repair or replace geotextile or plastic wrapping damaged as a result of storage or handling, as directed.
- F. Do not expose geotextile to temperatures in excess of 71 DegC (160 DegF) or less than 0 DegC (32 DegF) unless recommended by the manufacturer.
- G. Do not use hooks, tongs or other sharp instruments for handling geotextile.
  1. Do not lift rolls lifted by use of cables or chains in contact with the geotextile.
  2. Do not drag geotextile along the ground.

## **1.7 WARRANTY (NOT USED)**

## **PART 2 - PRODUCTS**

### **2.1 ACCEPTABLE MANUFACTURERS**

- A. Subject to compliance with the Contract Documents, the following manufacturers are acceptable:
  1. GSE Lining Technology.
  2. Propex Geosynthetics.
  3. SKAPS Industries.
  4. TenCate Mirafi.
  5. Tenax.
- B. Submit request for substitution in accordance with Specification Section 01 25 13 – Product Substitutions.

**2.2 MATERIALS AND MANUFACTURE**

A. Geotextile:

1. Non-woven pervious sheet of polymeric material.
2. Geotextile fibers:
  - a. Long-chain synthetic polymer composed of at least 85 percent by weight polyolefins, polyesters, or polyamides.
  - b. Filaments resistant to deterioration by ultraviolet light, oxidation, and heat exposure.
  - c. Do not as reclaimed or recycled fibers or polymer to the formulation.
3. Form geotextile into a network such that the filaments or yarns retain dimensional stability relative to each other, including the selvages.
4. The geotextile physical properties shall equal or exceed the minimum average roll values listed below.
  - a. Values shown are for the weaker principal direction.
  - b. Acceptance of geotextile shall be in accordance with ASTM D4759.
  - c. Type I Geotextile: AASHTO M288 Class 2, for use in demolition fill.

PROPERTY	TEST METHOD	MINIMUM AVERAGE ROLL VALUE
Mass per Unit Area, OZ/SY	ASTM D5261	=10
AOS, U.S. Sieve	ASTM D4751	70-100
Permittivity, SEC-1	ASTM D4491	=0.5
Puncture, LBS	ASTM D4833	=90
Grab Tensile, LBS	ASTM D4632	=250
Trapezoidal Tear, LBS	ASTM D4533	=90
Burst Strength, PSI	ASTM D3786	=190
Ultraviolet Degradation % retained @ 500 HRS	ASTM D4355	=50
Sewn Seam Strength, LBS	ASTM D4632	=220

- d. Type 2 Geotextile: AASHTO M288 Class 2, for use in drainage composite and other areas shown on the Drawings.

PROPERTY	TEST METHOD	MINIMUM AVERAGE ROLL VALUE
Mass per Unit Area, OZ/SY	ASTM D5261	=8
AOS, U.S. Sieve	ASTM D4751	70-100
Permittivity, SEC-1	ASTM D4491	=0.5
Puncture, LBS	ASTM D4833	=90
Grab Tensile, LBS	ASTM D4632	=250
Trapezoidal Tear, LBS	ASTM D4533	=90
Burst Strength, PSI	ASTM D3786	=190
Ultraviolet Degradation % retained @ 500 HRS	ASTM D4355	=50
Sewn Seam Strength, LBS	ASTM D4632	=220

B. Thread:

1. High-strength polyester, nylon, or other approved thread type.
2. Equivalent chemical compatibility and ultraviolet light stability as the geotextile.
3. Contrasting color with the geotextile.

**PART 3 - EXECUTION**

**3.1 PREPARATION**

- A. Construct the surface underlying the geotextiles smooth and free of ruts or protrusions which could damage the geotextiles.

**3.2 INSTALLATION**

- A. Install geotextiles in accordance with manufacturer's written recommendations.
- B. Hand place geotextile.
1. No equipment will be permitted to traffic in direct contact with the geotextile.
- C. Lay geotextile smooth so as to be free of tensile stresses, folds, and wrinkles.

D. Seam Construction:

1. Sew all Type I geotextile seams.
2. Broom clean existing geotextile and cut off to provide a clean area for seaming with the new geotextile.
3. Sew seams continuously using an SSA flat seam with one (1) row of a two-thread 401 chain stitch unless otherwise recommended by the manufacturer.
4. Minimum distance from the geotextile edge to the stitch line nearest to that edge: 2 IN unless otherwise recommended by the manufacturer.
5. Test seams at the frequency specified in the FIELD QUALITY CONTROL Article below.
6. Tie off thread at the end of each seam to prevent unraveling.
7. Construct seams on the top side of the geotextile to allow inspection.
8. Sew skipped stitches or discontinuities with an extra line of stitching with 18 IN of overlap.
9. Type 2 geotextile seams may be sewn or overlapped.
  - a. Construct overlapped seams in accordance with manufacturer's recommendations or as shown on Drawings.

E. Backfill anchor trenches in accordance with Specification Section 31 23 00 – Earthwork.

F. Place cover soil in accordance with Specification Section 31 23 00 – Earthwork.

G. Protect geotextiles from clogging, tears, and other damage during installation.

H. Geotextile Repair:

1. Place a patch of the same type of geotextile which extends a minimum of 24 IN beyond the edge of the damage or defect.
2. Fasten patches continuously using a sewn seam or other approved method.
3. Align machine direction of the patch with the machine direction of the geotextile being repaired.
4. Replace geotextile which cannot be repaired.

I. Use adequate ballast (e.g., sand bags) to prevent uplift by wind.

J. Do not use staples or pins to hold the geotextile in place.

K. Do not leave geotextile uncovered for more than 14 days.

### **3.3 FIELD QUALITY CONTROL**

A. Conduct destructive seam testing at locations identified by Owner's representative.

1. Minimum testing will be at a frequency of one (1) test per 2,000 linear feet of seam.
- B. Provide as-constructed drawing showing roll number; layout; joint locations; and destructive sample repair, and patch locations.

**3.4 OWNER TRAINING (NOT USED)**

**END OF SECTION**

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**SECTION 31 41 00**  
TRENCH SAFETY SYSTEM

**PART 1 - GENERAL**

**1.1 SUMMARY**

A. Section Includes

1. Trench safety system for construction of trench excavations. For structural excavations which fall under provisions of State and Federal trench safety laws.

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

1. Division 00 – [Proposed Bidding Requirements](#), Contract Forms, and Conditions of the Contract.
2. Division 01 – General Requirements.

**1.2 MEASUREMENT AND PAYMENT**

- A. Stipulated Price (Lump Sum). If Contract is a Stipulated Price Contract, payment for Work in this Section is included in total Stipulated Price. Texas law requires Trench Safety to be a separate pay item.

**1.3 DEFINITIONS**

- A. Trench. Narrow excavation (in relation to its depth) made below surface of ground. In general, depth is greater than width, but width of trench (measured at bottom) is not greater than 15 feet.
- B. Trench safety system requirements shall apply to larger open excavations if erection of structures or other installations limits space between excavation slope and installation to dimensions equivalent of a trench as defined.
- C. Trench safety systems include, but are not limited to sloping, sheeting, trench boxes or trench shields, sheet piling, cribbing, bracing, shoring, dewatering or diversion of water to provide adequate drainage. Trench safety system is Contractor's methods and means of construction.
- D. Trench Safety Program is the safety procedures governing the presence and activities of individuals working in and around trench excavations.

**1.4 SUBMITTALS**

- A. Conform to requirements of Specification Section 01 33 00 – Submittals.
- B. Submit trench safety program specifically for construction of trench excavation. Design trench safety program in accordance with OSHA 29 CFR standards.
- C. Trench safety system and special designs containing deviations from OSHA standards to be sealed by a Professional Engineer registered by State of Texas.

- D. Review of trench safety system by Owner's Representative shall only be in regards to compliance with this specification and shall not constitute approval by Owner's Representative nor relieve Contractor of obligations under State and Federal trench safety laws
- E. Submit certification that trench safety system will not be subjected to loads exceeding those which the system was designed to withstand according to the available construction and geotechnical information. When trench box is used in a manner other than what is indicated and certified in manufacturer's technical data, submit trench box manufacturer certifications of proposed usage.

### **1.5 REGULATORY REQUIREMENTS**

- A. Install and maintain trench safety systems in accordance with detail specifications set out in provision of Excavations, Trenching, and Shoring, Federal Occupation Safety and Health Administration (OSHA) Standards, 29CFR, Part 1926, Subpart P, as amended, including Final Rule, published in Federal Register Vol. 54, No. 209 on October 31, 1989. Sections that are incorporated into these specifications by reference include Sections 1926-650 through 1926-652.
- B. Reproduction of OSHA standards included in "Subpart P - Excavations" from Federal Register Vol. 54, No. 209 is available upon request to Contractors bidding on projects. The Owner assumes no responsibility for accuracy of reproduction. Obtain copy of this section of the Federal Register.
- C. Legislation enacted by Texas Legislature with regard to Trench Safety Systems, is hereby incorporated, by reference, into these specifications. Refer to Texas Health and Safety Code Ann., §756.021 (Vernon 1991).

### **1.6 INDEMNIFICATION**

- A. Contractor to indemnify and hold harmless the Owner and the Owner's Representative, its employees and agents, from any and all damages, costs (including, without limitation, legal fees, court costs, and cost of investigation), judgments or claims by anyone for injury or death of persons resulting from collapse or failure of trenches constructed under this Contract.
- B. Contractor acknowledges and agrees that this indemnity provision provides indemnity for the Owner and the Owner's Representative, its employees and agents, in case the Owner and the Owner's Representative is negligent either by act or omission in providing for trench safety, including, but not limited to safety program and design reviews, inspections, failures to issue stop work orders, and hiring of Contractor.

### **1.7 WARRANTY (NOT USED)**

## **PART 2 - PRODUCTS (NOT USED)**

## **PART 3 - EXECUTION**

### **3.1 INSTALLATION**

- A. Install and maintain trench safety systems in accordance with provisions of OSHA 29 CFR.
- B. Install specially designed trench safety systems in accordance with Contractor's trench excavation safety program for locations and conditions identified in program.
- C. A competent person, as identified in Contractor's Trench Safety Program, to verify that trench boxes and other pre-manufactured systems are certified for actual installation conditions.

### **3.2 INSPECTION**

- A. Contractor, or Contractor's independently retained consultant, to make daily inspections of trench safety systems to ensure that installed systems and operations meet OSHA 29 CFR and other personnel protection regulations requirements.
- B. If evidence of possible cave-ins or slides is apparent, immediately stop work in trench and move personnel to safe locations until necessary precautions have been taken to safeguard personnel entering trench.
- C. Maintain permanent record of daily inspections.

### **3.3 FIELD QUALITY CONTROL**

- A. Verify specific applicability of selected or specially designed trench safety systems to each field condition encountered on project.

### **3.4 OWNER TRAINING (NOT USED)**

**END OF SECTION**

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**SECTION 31 62 17**

**DRIVEN STEEL SHEET PILING**

**PART 1 - GENERAL**

**1.1 SUMMARY**

A. Section Includes:

1. Steel sheet piling, steel sheet piling fittings including corners, tees, wyes, crosses, and points as applicable.

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

1. Division 00 – Proposing Requirements, Contract Forms, and Conditions of the Contract.
2. Division 01 – General Requirements.

**1.2 MEASUREMENT AND PAYMENT**

- A. Stipulated Price (Lump Sum). If Contract is a Stipulated Price Contract, payment for Work in this Section is included in total Stipulated Price.

**1.3 QUALITY ASSURANCE**

A. Referenced Standards:

1. American Institute of Steel Construction (AISC):
  - a. Manual of Steel Construction.
2. ASTM International (ASTM):
  - a. A36 – Standard Specification for Carbon Structural Steel.
  - b. A325 – Standard Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength.
  - c. A328 – Standard Specification for Steel Sheet Piling.
3. American Welding Society (AWS):
  - a. D1.1 – Structural Welding Code - Steel.
  - b. D1.3 – Structural Welding Code - Sheet Steel.

B. Qualifications:

1. Sheeting installer must have, as a minimum, three (3) successful past installations of sheet piling of comparable overall heights and sections and comparable penetration into soils similar to these found on the Project.
2. The Contractor shall be responsible for designing the sheet piling and the bracing system to adequately support all loads.
  - a. Design shall conform to the requirements of AISC.

## **1.4 DEFINITIONS**

### A. Installer or Applicator:

1. Installer or applicator is the person actually installing or applying the product in the field at the Project site.
2. Installer and applicator are synonymous.

## **1.5 SUBMITTALS**

### A. Shop Drawings:

1. See Specification Section 01 33 00 – Submittals for requirements for the mechanics and administration of the submittal process.
2. Product technical data including:
  - a. Acknowledgement that products submitted meet requirements of standards referenced.
  - b. Manufacturer's installation instructions.
  - c. Complete list and description of materials for all construction components.
3. Documentation of qualifications required for sheeting installer.
4. Certificate signed and sealed by Professional Engineer registered in Texas that calculations have been performed in accordance with project criteria and standard engineering practices for the design of the braced sheet piling support system, including check of adequacy of existing sheet piling section.
5. Information on the type of driving equipment to be used; including manufacturer of equipment, model number and driving energy to be used.

## **1.6 WARRANTY (NOT USED)**

## **PART 2 - PRODUCTS**

### **2.1 ACCEPTABLE MANUFACTURERS**

#### A. Subject to compliance with the Contract Documents, the following manufacturers are acceptable:

1. Sheet piling:
  - a. Bethlehem Steel Corporation.
2. Sheet piling points:
  - a. Association Pile and Fitting Corporation.

#### B. Submit request for substitution in accordance with Specification Section 01 25 13 – Product Substitutions.

### **2.2 MATERIALS**

#### A. Steel Sheet Piling:

1. ASTM A328.
  2. Piling sections shall be continuously interlocking.
  3. Piling shall be reasonably free-sliding to grade when threaded.
  4. Provide standard handling hole approximately 4 IN from one end.
- B. Corners, Tees and Wyes:
1. As appropriate with ASTM A328 piling.
  2. Fabricated from matching pieces of sheet piling, ASTM A36 plates or angles, and ASTM A325 high-strength bolts.
  3. Bolts shall be furnished with washers.
- C. Welding Electrodes: AWS D1.1 and AWS D1.3, E70 electrode.

## **PART 3 - EXECUTION**

### **3.1 PREPARATION**

- A. Furnish lines and levels as required to install sheet piles at their indicated locations.

### **3.2 INSTALLATION**

- A. Install sheet piles straight and plumb and to the dimensions shown on the Drawings.
- B. Drive sheet piles vertically at locations as required based on Contractor's care of water means and methods.
- C. Provide additional length of sheet piling sufficient to allow cutting off the top of the sheet piling that may be damaged during driving and construction operations.
- D. Sheet piles shall be installed as one (1) continuous member unless splices are permitted by Owner's Representative.
1. Where splices are permitted, make splices by full penetration groove welding the entire cross sectional area of the piles at the splice location.
  2. Perform welding using operators who have passed welding qualification tests during previous 12 month period prior to commencement of required welding.
  3. Welding processes, procedures and welder qualification tests to be in accordance with AWS D1.1 welding code requirements.
- E. Accurately locate and drive sheet piles by such methods and equipment so as not to impair the sheet pile strength or damage sheet piles in any way.
- F. Adequately support and hold sheet piles in correct vertical position during driving by means of adequate driving equipment.

- G. Provide suitable driving heads to prevent damage to sheet pile ends.
- H. Drive sheet piles with equipment capable of driving sheet piles to required final depth or resistance, without damaging sheet piles.
- I. Should any obstruction including, but not limited to boulders, rocks, rubble, existing foundations or timbers be encountered which prevent driving of sheet pile to its required final depth, threaten sheet pile damage or cause sheet pile to drift from required location horizontally, cease driving and take corrective action as directed by Owner's Representative.
- J. Should any sheet pile as determined by Owner's Representative be damaged or otherwise not conform to this Specification Section, withdraw sheet pile and drive another sheet pile in its place.
  - 1. If it is impossible to withdraw damaged or rejected sheet pile, install additional sheet piles at locations indicated by Owner's Representative.
  - 2. Additional sheet piles shall be at Contractor's expense.
- K. Damaged sheet piles include, but are not necessarily limited to sheet piles bent, buckled, cracked, with fabrication tolerances beyond those indicated in ASTM A328, or with any other defect as determined by the Owner's Representative would weaken the sheet pile.

### **3.3 FIELD QUALITY CONTROL**

- A. Inspection:
  - 1. Allow each pile installation to be witnessed by the Owner's Representative (Soils Engineer) who will determine that the required final driving resistance has been obtained and, if necessary, may revise the initially determined final driving resistance depending on driving conditions encountered.

### **3.4 OWNER TRAINING (NOT USED)**

**END OF SECTION**



**SECTION 31 71 02.02**

**TUNNEL AND CASING GROUT**

**PART 1 - GENERAL**

**1.1 SUMMARY**

A. Section Includes

1. Mix design requirements, testing, furnishing, and production of grout for:
  - a. Pressure grouting of jacked-pipe
  - b. Grouting of annular space between carrier pipe and primary tunnel liner
  - c. Grouting voids in ground resulting from caving, loss of ground, or settlement

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

1. Division 00 – Proposal Requirements, Contract Forms, and Conditions of the Contract.
2. Division 01 – General Requirements.
3. Section 03 09 00 – Concrete.

**1.2 MEASUREMENT AND PAYMENT**

- A. Stipulated Price (Lump Sum). If Contract is a Stipulated Price Contract, payment for Work in this Section is included in total Stipulated Price.

**1.3 DEFINITIONS**

- A. Pressure Grouting. Filling void behind liner or pipe with grout under pressure sufficient to ensure void is properly filled, but without overstressing temporary or permanent ground support, or causing ground heave to occur.
- B. Back Grouting. Secondary pressure grouting to ensure that voids have been filled between primary tunnel or shaft liners and surrounding ground.
- C. Annular Grouting. Filling annular space between carrier pipe and primary tunnel liner, casing, or ground, by pumping.
- D. Ground Stabilization Grouting. Filling of voids, fissures, or under-slab settlement due to caving or loss of ground by injecting grout under gravity or pressure to fill void.

**1.4 REFERENCE STANDARDS**

- A. ASTM C138 – Standard Test Method Density for (Unit Weight), Yield, and Air Content (Gravimetric) of Concrete.
- B. ASTM C144 – Standard Specification for Aggregate for Masonry Mortar.

- C. ASTM C150 – Standard Specification for Portland Cement.
- D. ASTM C494 – Standard Specification for Chemical Admixture for Concrete.
- E. ASTM C618 – Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for use in Concrete.
- F. ASTM C869 – Standard Specification for Foaming Agents Used in Making Preformed Foam for Cellular Concrete.
- G. ASTM C937 – Standard Specification for Grout Fluidifier for Preplaced-Aggregate Concrete.
- H. ASTM C942 – Standard Test Method for Compressive Strength of Grouts for Preplaced-Aggregate Concrete in the Laboratory.
- I. ASTM C1017 – Standard Specification for Chemical Admixtures for Use in Producing Flowing Concrete.

### **1.5 SUBMITTALS**

- A. Conform to requirements of Specification Section 01 33 00 – Submittals.
- B. Submit description of materials, grout mix, equipment, and operational procedures to accomplish each grouting operation. Description may include sketches as appropriate, indicating type and location of mixing equipment, pumps, injection points, venting method, flow lines, pressure measurement, volume measurement, grouting sequence, schedule, and stage volumes. Tests and certifications shall have been performed within last 12 months prior to date of submittal.
- C. Submit grout mix design report, including:
  - 1. Grout type and designation.
  - 2. Grout mix constituents and proportions, including materials by weight and volume.
  - 3. Grout densities and viscosities, including wet density at point of placement.
  - 4. Initial set time of grout.
  - 5. Bleeding, shrinkage/expansion.
  - 6. Compressive strength.
  - 7. Detailed description of grout pressure limiting equipment.
- D. For cellular grout, also submit the following:
  - 1. Foam concentrate supplier's certification of dilution ratio for foam concentrate.
  - 2. A description of proposed cellular grout production procedures.

- E. Maintain and submit logs of grouting operations indicating pressure, density, and volume for each grout placement.

## **1.6 WARRANTY (NOT USED)**

## **PART 2 - PRODUCTS**

### **2.1 MATERIALS**

- A. Grouting materials: Conform to Specification Section 03 09 00 – Concrete except as modified in the following paragraphs.
- B. Grout Type Applications.
  - 1. Grout for pressure grouting, backfill grouting, and annular grouting: Sand-cement mortar mix.
  - 2. Grout for annular grouting of sanitary sewer: Low density (cellular) grout, unless otherwise approved by Owner's representative.
  - 3. Grout for filling space around manholes in shafts: Sand-cement mortar mix.
  - 4. Ground stabilization: Sand-cement mortar mix.
- C. Do not include toxic or poisonous substances in grout mix or otherwise inject such substances underground.

### **2.2 GROUT**

- A. Employ and pay for commercial testing laboratory, acceptable to Owner's Representative, to prepare and test grout mix design. Develop one or more mixes based on following criteria as applicable:
  - 1. Size of annular void between carrier pipe and liner, or size of void between primary liner and surrounding soil.
  - 2. Absence or presence of groundwater.
  - 3. Adequate retardation.
  - 4. Non-shrink characteristics.
  - 5. Pumping distances.
- B. Prepare mixes that satisfy required application. Provide materials conforming to the following standards:
  - 1. Cement: ASTM C150.
  - 2. Fly Ash: ASTM C618.
  - 3. Water: Potable.
  - 4. Foam: ASTM C869.

5. Slurry: ASTM C138.
  6. Cellular Grout: ASTM C138.
  7. Sand for sand-cement mortar mix: ASTM C144.
- C. Provide grout meeting the following minimum requirements:
1. Minimum 28-day unconfined compressive strength: 1500 psi for water lines, 1000 psi for other carrier pipes for mortar grout and 300 psi for cellular grout.
  2. Determine strength by ASTM C942.
  3. Maximum allowable density: Less than 130 pcf.
- D. Fluidifier: Provide fluidifier, meeting ASTM C937, that holds solid constituents of grout in colloidal suspension and is compatible with cement and water used in grouting operations.
- E. Admixtures:
1. Use admixtures meeting ASTM C494 and ASTM C1017 as required, to improve pumpability, control time of set, hold sand in suspension and reduce segregation and bleeding.
  2. For cellular grout, do not use foam or admixtures that promote steel corrosion.
  3. Ensure that admixtures used in mix are compatible. Provide written confirmation from admixture manufacturers of their compatibility.

## **PART 3 - EXECUTION**

### **3.1 PREPARATION**

- A. Notify Owner's representative at least 24 hours in advance of grouting operations.
- B. Select and operate grouting equipment to avoid damage to new or existing underground utilities and structures.
- C. In selection of grouting placement consider pipe flotation, length of pipe, length of tunnel, depth from surface, type of carrier pipe, type of pipe blocking, and bulkheading, grout volume and length of pipe to be grouted between bulkheads.
- D. Operate dewatering systems until grouting operations are complete and grout has reached initial set.

### **3.2 EQUIPMENT**

- A. Batch and mix grout in equipment of sufficient size and capacity to provide necessary quality and quantity of grout for each placement stage.

- B. Use equipment for grouting of type and size generally used for work, capable of mixing grout to homogeneous consistency, and providing means of accurately measuring grout component quantities and accurately measuring pumping pressures. Use pressure grout equipment which delivers grout to injection point at steady pressure.

### **3.3 PRESSURE GROUTING FOR PRIMARY TUNNEL AND SHAFT LINER (NOT USED)**

### **3.4 ANNULAR GROUTING FOR CARRIER PIPE IN TUNNELS AND IN CASED OR UNCASED AUGERS**

- A. Fill annular space between carrier pipe and tunnel primary liner, casing or ground, with grout.
- B. Placement.
  - 1. Placement Limits: Predetermine limits of each grout placement stage by size and capacity of batching equipment and initial set time of proposed grout. Under no circumstances shall placement continue at grout port longer than that period of time for mix to take initial set. Locate grout hole spacing and locations according to number of stages necessary to grout tunnel liners. Stage or lift cannot be installed on another lift until proper set has been attained. Have placement procedures approved by admixture or additive manufacturer.
  - 2. Limit pressure on annular space to prevent damage or distortion to pipe or liner. Define limiting and estimated required pressure range. Provide an open ended, high point tap or equivalent vent and monitor it at bulkhead opposite to point of grouting.
  - 3. Pump grout until material discharging is similar in consistency to that at point of injection.
  - 4. In primary lined tunnel, limit length of pipe installed to 200 feet or less before grouting same length of carrier line. Repeat this cycle until all pipe is installed and grouted.
- C. Remove temporary bulkheads installed for grouting.
- D. Batch and mix cellular grout mechanically to ensure consistency of mix. Wet solids thoroughly before introduction of foaming agent. Operate batching system to maintain slurry weight within 3 percent of design density. Introduce foam into slurry in accordance with manufacturer's recommendations.

### **3.5 PRESSURE GROUTING FOR JACKED PIPE**

- A. For jacked pipe 60 inches in diameter or greater, pressure grout annulus after installation, displacing bentonite lubrication. Jacked pipes less than 60-inch

diameter may be left ungrouted unless excavated diameter exceeds external pipe diameter by more than one inch.

- B. Inject grout through grout holes in carrier pipe. Drilling holes from surface or through carrier pipe walls is not allowed. Perform grouting by injecting it at pipe invert with bentonite displacement occurring through high point tap or vent.
- C. Control ground water as necessary to permit completion of grouting without separation of grout materials.
- D. Limit pressures to prevent damage or distortion to pipe or to keep flexible pipe within acceptable tolerances.
- E. Pump grout until material discharging is similar in consistency to that at point of injection.

### **3.6 GROUND STABILIZATION GROUTING**

- A. Completely fill voids outside limits of excavation caused by caving or collapse of ground. Fill with gravity or pressure injected sand-cement grout as necessary to fill void.
- B. Take care in grouting operations to prevent damage to adjacent utilities or public or private property. Grout at pressure that will not distort or imperil portion of work or existing installations or structures.
- C. Verify that void has been filled by volumetric comparisons and visual inspection. In case of settlement under existing slabs, take cores as directed by Owner's representative, at no additional cost to Owner, to demonstrate that void has been filled.

### **3.7 FIELD QUALITY CONTROL**

- A. Annular Grouting for Carrier Line in Tunnels and in Cased or Uncased Augers.
  - 1. Make one set of four compressive test specimens for every 200 feet of carrier pipe installed in primary lined tunnel.
- B. Pressure Grouting for Jacked Pipe. Make one set of four compressive test specimens for every 400 feet of jacked pipe pressure grouting.
- C. Ground Stabilization Grouting: Make one set of four compressive test specimens for every location where ground stabilization grouting is performed.

### **3.8 OWNER TRAINING (NOT USED)**

**END OF SECTION**

**DIVISION 32**  
EXTERIOR IMPROVEMENTS

**SECTION 32 11 00.01**

**RECYCLED CRUSHED CONCRETE BASE COURSE**

**PART 1 - GENERAL**

**1.1 SUMMARY**

A. Section Includes:

1. Foundation course of recycled crushed concrete.

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

1. Division 00 - Proposing Requirements, Contract Forms, and Conditions of the Contract.
2. Division 01 - General Requirements.

**1.2 MEASUREMENT AND PAYMENT**

- A. Stipulated Price (Lump Sum). If Contract is a Stipulated Price Contract, payment for Work in this Section is included in total Stipulated Price.

**1.3 QUALITY ASSURANCE**

1. Texas Department of Transportation (TxDOT):
  - a. Tex-101-E - Preparing Soil and Flexible Base Materials for Testing.
  - b. Tex-106-E - Calculating the Plasticity Index of Soils.
  - c. Tex-110-E - Particle Size Analysis of Soils.
  - d. Tex-113-E - Laboratory Compaction Characteristics and Moisture-Density Relationship of Base Materials.
  - e. Tex-115-E - Field Method for Determining In-place Density of Soils and Base Materials.
  - f. Tex-120-E - Soil-Cement Testing.

**1.4 SUBMITTALS**

- A. Conform to requirements of Specification Section 01 33 00 – Submittals.
- B. Submit Representative samples of crushed concrete for testing.
- C. Submit weight tickets, certified by supplier, for each delivery of recycled crushed concrete, gravel, and soil binder.
- D. Submit manufacturer's description and characteristics for pug mill and associated equipment, mixer trucks, spreading and compaction equipment for approval.

**1.5 TESTS**

- A. Follow Specification Section 01 45 29 - Testing Laboratory Services.



B. Test and analyze aggregate and binder products following TxDOT Tex-110-E.

## **1.6 DELIVERY, STORAGE, AND HANDLING**

- A. Provide materials from stockpiles that are protected during storage from contaminants detrimental to concrete base.
- B. Load material from same area of stockpile to maintain uniformity of each successive delivery to Project site.
- C. Store cement in weatherproof enclosures. Protect from ground dampness.

## **PART 2 - PRODUCTS**

### **2.1 SYSTEM DESCRIPTION**

- A. Provide RCCB with following performance:
  - 1. Minimum 5 percent cement.
  - 2. Minimum compressive strength: 650 psi at 14 days following TxDOT Tex-120-E.
  - 3. Prepare concrete product in on-site or off-site pug mill, or in on-site or off-site portable concrete mixer.
- B. Preliminary Design: Prepare preliminary mix with minimum cement to crushed concrete ratios of 5 percent by dry mass of materials.
  - 1. Designate source of concrete for crushing. Follow Section 01 45 29 - Testing Laboratory Services for tests of concrete from source.
  - 2. Results of laboratory and compression tests will be used by the Engineer to select final mix design.

### **2.2 PORTLAND CEMENT**

A. ASTM C 150 Type I, II, or III; bulk or sacked.

### **2.3 WATER**

A. Potable.

### **2.4 AGGREGATE**

- A. Recycled Crushed Concrete: Material retained on No. 40 Sieve, and durable coarse particles of crusher-run reclaimed cured Portland cement concrete, obtained from approved source. Organic material is prohibited.
  - 1. The crushed concrete shall be substantially free of foreign matter including, but not limited to asphalt, base, and dirt.
  - 2. Obtain Owner's Representative's written approval, prior to crushing salvaged concrete.

- B. Soil Binder (classified below): Meeting following requirements when tested following TxDOT Tex-106-E:
  - 1. Maximum liquid limit: 35
  - 2. Maximum plasticity index: 10
- C. Mixed Aggregate and Soil Binder: Grading following TxDOT Tex-101-E and Tex-110-E within following limits:

Sieve	Percent Crushed Concrete Retained
1¾ inch	0 to 10
No. 4	45 to 75
No. 40	55 to 80; classified as Soil Binder

- 1. Obtain prior permission from Owner’s Representative for use of additives to meet above requirements.
- 2. Bank sand may be added to mix at pug mill with prior written permission of Owner’s Representative.

**2.5 ASPHALTIC SEAL CURE**

- A. Acquire written approval from Owner’s Representative before curing and before proceeding with curing.
- B. Use following as option to curing by sprinkling:
  - 1. Cut-back asphalt: MC30 following Section 32 12 13.19 - Prime Coats.
  - 2. Emulsified petroleum resin: EPR-1 Prime following Section 32 12 13.19 - Prime Coats.

**2.6 MATERIAL MIX**

- A. Design mix for minimum compressive strength of 650 psi at 14 days following TxDOT Tex-120-E unconfined compressive strength.
- B. Cement Ratio: Follow Paragraph 2.1A. Increase cement content in two percent steps up to 9 percent maximum when compressive strength of design mix samples fail TxDOT Tex-120-E test.

**2.7 MIXING EQUIPMENT**

- A. Mix following Paragraph 2.1A, with metering devices adding specified quantities of crushed concrete, cement, and water into mixer. Dry mix crushed concrete and cement prior to adding water. Produce homogeneous and uniformly mixed product.

## **2.8 SOURCE QUALITY CONTROL**

- A. Test following Specification Section 01 45 29 -Testing Laboratory Services.
- B. When directed by Owner’s Representative, test for unconfined compressive strength following Test Method TxDOT Tex-120-E as follows:
  - 1. Mold minimum of three samples each day or for each 500 tons of production or one for each day.
  - 2. Compressive strength: average of 3 specimens for each sample lot.

## **PART 3 - EXECUTION**

### **3.1 EXAMINATION**

- A. Verify buried utility work is complete.
- B. Verify lime treatment of base is complete.
- C. Verify subgrade is ready to support imposed loads.
- D. Verify lines and grades are correct.

### **3.2 PREPARATION**

- A. Complete backfill of new utilities below future grade.
- B. Prepare subgrade in accordance with requirements of Specification Section 32 11 13.13 - Lime Treated Subgrades.
- C. Correct subgrade deviations in excess of plus or minus ¼ inch in cross section, or in 16 foot length by loosening, adding or removing material, reshaping and recompacting by sprinkling and rolling.
- D. Prepare sufficient subgrade in advance of base course for efficient operations.
- E. Have sufficient products and equipment on hand to expeditiously apply base.

### **3.3 MIXING**

- A. Maintain moisture content of between optimum and 5 percent above optimum.

### **3.4 PLACEMENT**

- A. Place mixture with approved spreading equipment. Spread to eliminate planes of weakness or pockets of nonuniformly graded material resulting from hauling and dumping operations.
- B. Transverse and longitudinal joints shall be vertical.
- C. Unless noted otherwise, place recycled crushed concrete base in courses not to exceed 8 inches in depth. All courses shall be placed on same working day unless approved by Owner’s Representative. Construction joints between new base and base previously placed shall be wetted and coated with dry cement prior to addition of new base.

### **3.5 COMPACTION**

- A. Start compaction maximum 3 hours after start of mixing. Compact loose mixture with approved tamping rollers until entire depth is uniformly compacted. Do not allow base to mix with underlying material.
  - 1. Do not rework uncompacted material that has set up for more than 30 minutes.
  - 2. Complete placement and compaction work within 6 hours from start of moist mixing.
- B. Correct irregularities or weak spots immediately by replacing material and recompacting.
- C. Apply water to maintain moisture between optimum and 5 percent above optimum moisture.
- D. Remove and reconstruct sections where average moisture content exceeds ranges specified at time of final compaction.
- E. Finish by blading surface to final grade after compacting final course. Seal with approved pneumatic tired rollers or flat wheel rollers which are sufficiently light to prevent surface hair line cracking.
- F. Compact to minimum density of 95 percent of dry density, following TxDOT Tex-113-E, at moisture content of treated material between optimum and 5 percent above optimum.
- G. Test roadway base course compaction in accordance with TxDOT Tex-115-E.
- H. Maintain surface to required lines and grades throughout operation.

### **3.6 CURING**

- A. Moist cure for minimum of 72 hours before adding pavement courses.
- B. Use sprinkling or, at option, apply following curing membrane as soon as initial set begins, using approved light-weight self-propelled pressure distributor:
  - 1. MC30: 0.1 gallon per square yard.
  - 2. EPR-1 Prime: 0.15 gallon of asphalt residual per square yard.
- C. Do not use cut-back asphalt during period of April 16 through September 15.

### **3.7 TOLERANCES**

- A. Completed Surface: Smooth and conform to typical section and established lines and grades.
- B. Top Surface of Base Course: Plus or minus ¼ inch in cross section or in 16 foot length.

### **3.8 FIELD QUALITY CONTROL**

- A. Test following Specification Section 01 45 29 - Testing Laboratory Services.

- B. Perform compaction tests following TxDOT Tex-113-E at randomly selected locations. Remove and replace areas failing compaction requirements at no additional cost to Owner.

### **3.9 PROTECTION**

- A. Maintain base in proper condition until surface is placed. Surface must be placed within 14 days after final mixing and compaction unless otherwise approved by Owner's Representative. Repair unacceptable base course immediately by replacing base to full depth.
- B. Curing membrane may remain in place at areas where surface courses or other base courses are applied.
- C. Prevent construction traffic on base for minimum 3 days. Light vehicles, used to maintain proper cure, are permitted on base after initial set or as permitted by Owner's Representative.

**END OF SECTION**

**SECTION 32 11 13.13**

**LIME-TREATED SUBGRADES**

**PART 1 - GENERAL**

**1.1 SUMMARY**

A. Section Includes:

1. Foundation course of lime-stabilized subgrade material including application of lime slurry to subgrade, and mixing, compaction, and curing of lime slurry, water, and subgrade into a stabilized foundation.

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

1. Division 00 – Proposing Requirements, Contract Forms, and Conditions of the Contract.
2. Division 01 – General Requirements.

**1.2 MEASUREMENT AND PAYMENT**

- A. Stipulated Price (Lump Sum). If Contract is a Stipulated Price Contract, payment for Work in this Section is included in total Stipulated Price.

**1.3 DEFINITIONS**

- A. Moist Cure: Curing soil and lime to obtain optimum hydration.

**1.4 REFERENCES**

- A. ASTM D 698 – Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft<sup>3</sup> (600 kN-m/m<sup>3</sup>)).
- B. ASTM D 6938 – Standard Test Methods for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth).
- C. ASTM D 4318 – Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.

**1.5 SUBMITTALS**

- A. Conform to requirements of Specification Section 01 33 00 – Submittals.
- B. Submit certification that hydrated lime, quicklime, or commercial lime slurry complies with specifications.
- C. Submit weight tickets, certified by supplier, with each bulk delivery of lime to work site.

**1.6 DELIVERY, STORAGE AND HANDLING**

- A. Bagged lime shall bear manufacturer's name, product identification, and certified weight. Bags varying more than 5 percent of certified weight may be rejected; average weight of 50 random bags in each shipment shall not be less than certified weight.

B. Store lime in weatherproof enclosures. Protect lime from ground dampness.

## **1.7 WARRANTY (NOT USED)**

## **PART 2 - PRODUCTS**

### **2.1 WATER**

A. Water: clean, clear and free from oil, acids, alkali, or organic matter.

### **2.2 LIME**

A. Type A - Hydrated Lime: Dry material consisting essentially of calcium hydroxide or mixture of calcium hydroxide and an allowable percentage of calcium oxide as listed in chemical composition chart.

B. Type B - Commercial Lime Slurry: Liquid mixture consisting essentially of lime solids and water in slurry form. Water or liquid portion shall not contain dissolved material in sufficient quantity to be injurious or objectionable for purpose intended.

C. Type C - Quicklime: Dry material consisting essentially of calcium oxide. Furnish quicklime in either of the following grades:

1. Grade DS: Pebble quicklime of gradation suitable for use in preparation of slurry for wet placing.
2. Grade S: Finely-graded quicklime for use in preparation of slurry for wet placing. Do not use grade S quicklime for dry placing.

D. Conform to the following requirements:

CHEMICAL COMPOSITION	TYPE		
	A	B	C
Active lime content, % by weight $\text{Ca(OH)}_2 + \text{CaO}$	90.0 min <sup>1</sup>	87.0 min <sup>2</sup>	-
Unhydrated lime content, % by weight CaO	5.0 max	-	87.0 min
Free water content, % by weight H <sub>2</sub> O :	5.0 max	-	-
<b>SIZING</b>			
Wet Sieve, as % by weight residue retained:			
No. 6	0.2 max	0.2 max <sup>2</sup>	8.0 max <sup>3</sup>
No. 30	4.0 max	4.0 max <sup>2</sup>	-
Dry sieve, as % by weight residue retained:			
1-inch	-	-	0.0
<sup>3</sup> / <sub>4</sub> -inch	-	-	10.0 max

Notes:

1. Maximum 5.0% by weight CaO shall be allowed in determining total active lime content.
  2. Maximum solids content of slurry.
  3. Total active lime content, as CaO, in material retained on No. 6 sieve shall not exceed 2.0% by weight of original Type C lime.
- E. Deliver lime slurry to job site as commercial lime, or prepare at job site by using hydrated lime or quicklime. Provide slurry free of liquids other than water and of consistency that can be handled and uniformly applied without difficulty.
- F. Lime containing magnesium hydroxide is prohibited.

**2.3 SOIL**

- A. Soil to receive lime treatment may include borrow or existing subgrade material, existing pavement structure, or combination of all three. Where existing pavement or base material is encountered, pulverized or scarify material so that 100 percent of sampled material passes 2-inch sieve.

**PART 3 - EXECUTION**

**3.1 EXAMINATION**

- A. Verify compacted subgrade is ready to support imposed loads.
- B. Verify subgrade lines and grades are correct.



### **3.2 PREPARATION**

- A. Complete backfill of utilities prior to stabilization.
- B. Cut material to bottom of subgrade using an approved cutting and pulverizing machine meeting following requirements:
  - 1. Cutters accurately provide smooth surface over entire width of cut to plane of secondary grade.
  - 2. Provide cut to depth as specified or shown in the Drawings.
- C. Alternatively, scarify or excavate to bottom of stabilized subgrade. Remove material or windrow to expose secondary grade. Obtain uniform stability.
- D. Correct wet or unstable material below secondary grade by scarifying, adding lime, and compacting as directed by Owner's representative.
- E. Pulverize existing material so that 100 percent passes a 1 $\frac{3}{4}$ -inch sieve.

### **3.3 LIME SLURRY APPLICATION**

- A. Apply slurry with distributor truck equipped with an agitator to keep lime and water in consistent mixture. Make successive passes over measured section of roadway to attain proper moisture and lime content. Limit spreading to an area where preliminary mixing operations can be completed on same working day.
- B. Minimum lime content shall be 5 percent of dry unit weight of subgrade as determined by ASTM D 698.

### **3.4 PRELIMINARY MIXING**

- A. Use approved single-pass or multiple-pass rotary speed mixers to mix soil, lime, and water to required depth. Obtain homogeneous friable mixture free of clods and lumps.
- B. Shape mixed subgrade to final lines and grades.
- C. Eliminate following operations and final mixing if pulverization requirements of Paragraph 3.5C can be met during preliminary mixing:
  - 1. Seal subgrade as precaution against heavy rainfall by rolling lightly with light pneumatic rollers.
  - 2. Cure soil-lime material for 24 to 72 hours or as required to obtain optimum hydration. Keep subgrade moist during cure.

### **3.5 FINAL MIXING**

- A. Use approved single-pass or multiple-pass rotary speed mixers to uniformly mix cured soil and lime to required depth.
- B. Add water to bring moisture content of soil mixture to optimum or above.
- C. Mix and pulverize until all material passes 1 $\frac{3}{4}$ -inch sieve; minimum of 85 percent, excluding non-slacking fractions, passes  $\frac{3}{4}$ -inch sieve; and minimum of 60 percent excluding non-slacking fractions passes No. 4 sieve.

- D. Shape mixed subgrade to final lines and grades.
- E. Do not expose hydrated lime to open air for 6 hours or more during interval between application and mixing. Avoid excessive hydrated lime loss due to washing or blowing.

### **3.6 COMPACTION**

- A. Aerate or sprinkle to attain optimum moisture content to 3 percent above optimum, as determined by ASTM D 698 on material sample from roadway after final mix with lime.
- B. Start compaction immediately after final mixing.
- C. Spread and compact in two or more equal layers where total compacted thickness is greater than 8 inches.
- D. Compact with approved heavy pneumatic or vibrating rollers, or combination of tamping rollers and light pneumatic rollers. Begin compaction at bottom and continue until entire depth is uniformly compacted.
- E. Do not allow stabilized subgrade to mix with underlying material. Correct irregularities or weak spots immediately by replacing material and recompacting.
- F. Compact subgrade to minimum density of 95 percent of maximum dry density, according to ASTM D 698, at moisture content of optimum to 3 percent above optimum, unless otherwise indicated on Drawings.
- G. Seal with approved light pneumatic tired rollers. Prevent surface hair line cracking. Rework and recompact at areas where hairline cracking develops.

### **3.7 CURING**

- A. Moist cure for minimum of 3 days before placing base or surface course, or opening to traffic. Subgrade may be opened to traffic after 2 days when adequate strength has been attained to prevent damage. Restrict traffic to light pneumatic rollers or vehicles weighing less than 10 tons.
- B. Keep subgrade surface damp by sprinkling. Roll with light pneumatic roller to keep surface knit together.
- C. Place base or surface within 14 days after final mixing and compaction. Restart compaction and moisture content of base material when time is exceeded.

### **3.8 TOLERANCES**

- A. Completed surface: smooth and conforming to typical section and established lines and grades.
- B. Top of compacted surface: Plus or minus ¼-inch in cross section or in 16-foot length.

### **3.9 FIELD QUALITY CONTROL**

- A. Testing will be performed under provisions of Specification Section 01 45 29 – Testing and Laboratory Services.
- B. Test soils, lime, and mixtures as follows:
  - 1. Tests and analysis of soil materials will be performed in accordance with ASTM D 4318, using the wet preparation method.
  - 2. Sample mixtures of hydrated lime or quicklime in slurry form will be tested to establish compliance with specifications.
  - 3. Moisture-density relationship will be established on material sampled from roadway, after stabilization with lime and final mixing, in accordance with ASTM 698, Moist Preparation Method.

### **3.10 REWORK OF FAILED SECTIONS**

- A. Rework sections that do not meet specified thickness.
- B. Perform the following steps when more than 72 hours have lapsed since completion of compaction.
  - 1. Moist cure for minimum of 3 days after compaction to required density.
  - 2. Add lime at rate of 25 percent of specified rate at no additional cost to Owner.
  - 3. Moisture density test of reworked material must be completed by laboratory before field compaction testing can be completed.

### **3.11 PROTECTION**

- A. Maintain stabilized subgrade to lines and grades and in good condition until placement of base or surface course. Protect asphalt membrane from being picked up by traffic.
- B. Repair defects immediately by replacing material to full depth.

### **3.12 OWNER TRAINING (NOT USED)**

**END OF SECTION**

**SECTION 32 91 05**

**TOPSOILING AND FINISHED GRADING**

**PART 1 - GENERAL**

**1.1 SUMMARY**

A. Section Includes:

1. Topsoiling and finished grading.

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

1. Division 00 – Proposing Requirements, Contract Forms, and Conditions of the Contract.
2. Division 01 – General Requirements.
3. Section 31 10 00 – Clearing and Grubbing.

**1.2 MEASUREMENT AND PAYMENT**

A. Stipulated Price (Lump Sum). If Contract is a Stipulated Price Contract, payment for Work in this Section is included in total Stipulated Price.

**1.3 SUBMITTALS**

A. Shop Drawings:

1. See Specification Section 01 33 00 – Submittal for requirements for the mechanics and administration of the submittal process.
2. Project Data: Test reports for furnished topsoil.

**1.4 SITE CONDITIONS**

- A. Verify amount of topsoil stockpiled and determine amount of additional topsoil, if necessary, to complete work.
- B. Location of Work: All areas within limits of grading and all areas outside limits of grading which are disturbed in the course of the work.

**1.5 WARRANTY (NOT USED)**

**PART 2 - PRODUCTS**

**2.1 MATERIALS**

A. Topsoil:

1. Imported, Original surface soil typical of the area.
2. Existing topsoil stockpiled under Specification Section 31 10 00 – Clearing and Grubbing.
3. Capable of supporting native plant growth.

4. pH: 5.5 to 8.5.
5. Liquid Limit: 50 or less.
6. Plasticity Index: 20 or less.
7. Gradation: maximum of 10 percent passing No. 200 sieve.

## **2.2 TOLERANCES**

- A. Finish Grading Tolerance: 0.1 FT plus/minus from required elevations.

## **PART 3 - EXECUTION**

### **3.1 PREPARATION**

- A. Correct, adjust and/or repair rough graded areas.
  1. Cut off mounds and ridges.
  2. Fill gullies and depressions.
  3. Perform other necessary repairs.
  4. Bring all sub-grades to specified contours, even and properly compacted.
- B. Loosen surface to depth of 2 IN, minimum.
- C. Remove all stones and debris over 2 IN in any dimension.

### **3.2 ROUGH GRADE REVIEW**

- A. Reviewed by Owner's Representative in Specification Section 31 10 00 – Clearing and Grubbing.

### **3.3 PLACING TOPSOIL**

- A. Do not place when subgrade is wet or frozen enough to cause clodding.
- B. Spread to compacted depth of 4 IN for all disturbed earth areas.
- C. If topsoil stockpiled is less than amount required for work, furnish additional topsoil at no cost to Owner.
- D. Provide finished surface free of stones, sticks, or other material 1 IN or more in any dimension.
- E. Provide finished surface smooth and true to required grades.
- F. Restore stockpile area to condition of rest of finished work.

### **3.4 ACCEPTANCE**

- A. Upon completion of topsoiling, obtain Owner's Representative acceptance of grade and surface.
- B. Make test holes where directed to verify proper placement and thickness of topsoil.

**3.5 OWNER TRAINING (NOT USED)**

**END OF SECTION**

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**SECTION 32 92 13**  
**HYDRO-MULCHING**

**PART 1 - GENERAL**

**1.1 SUMMARY**

- A. Section Includes:
  - 1. Seeding, fertilizing, mulching, and maintenance of areas indicated on Drawings.
- B. Related Specification Sections include but are not necessarily limited to:
  - 1. Division 00 – Proposing Requirements, Contract Forms, and Conditions of the Contract.
  - 2. Division 01 – General Requirements.
  - 3. Section 32 91 05 – Topsoiling and Finished Grading.

**1.2 MEASUREMENT AND PAYMENT**

- A. Stipulated Price (Lump Sum). If Contract is Stipulated Price Contract, payment for work in this Section is included in total Stipulated Price.

**1.3 SUBMITTALS**

- A. Conform to requirements of Specification Section 01 33 00 – Submittals.
- B. Submit certification from supplier that each type of seed conforms to these specifications and requirements of Texas Seed Law. Certification shall accompany seed delivery.
- C. Submit certificate stating that fertilizer complies with these specifications and requirements of Texas Fertilizer Law.

**1.4 WARRANTY (NOT USED)**

**PART 2 - PRODUCTS**

**2.1 MATERIALS**

- A. Topsoil: Conform to material requirements of Specification Section 32 91 05 – Topsoiling and Finished Grading.
- B. Seed: Conform to U.S. Department of Agriculture rules and regulations of Federal Seed Act and Texas Seed Law. Seed shall be certified 90 percent pure and furnish 80 percent germination and meet following requirements:



1. Rye: Fresh, clean, Italian rye grass seed (*Lolium multi-florum*), mixed in labeled proportions. As tested, minimum percentages of impurities and germination must be labeled. Deliver in original unopened containers.
2. Bermuda: Extra-fancy, treated, lawn type common bermuda (*Cynodon dactylon*). Deliver in original, unopened container showing weight, analysis, name of vendor, and germination test results.
3. Wet, moldy, or otherwise damaged seed will not be accepted.
4. Seed requirements, application rates, and planting dates are:

TYPE	APPLICATION RATE POUNDS/A	PLANTING DATE
Hulled Common Bermuda Grass 98/88	40	Jan 1 to Mar 31
Unhulled Common Bermuda Grass 98/88	40	
Hulled Common Bermuda Grass 98/88	40	Apr 1 to Sep 30
Hulled Common Bermuda Grass 98/88	40	Oct 1 to Dec 31
Unhulled Common Bermuda Grass 98/88	40	
Annual Rye Grass (Gulf)	30	

C. Fertilizer: Dry and free flowing, inorganic, water soluble commercial fertilizer, which is uniform in composition. Deliver in unopened containers which bear manufacturers guaranteed analysis. Caked, damaged, or otherwise unsuitable fertilizer will not be accepted. Fertilizer shall contain minimum percentages of following elements:

1. Nitrogen: 10 Percent
2. Phosphoric Acid: 20 Percent
3. Potash: 10 Percent

D. Mulch:

1. Virgin wood cellulose fibers from whole wood chips having minimum of 20 percent fibers 0.42 inches in length and 0.01 inches in diameter.
2. Cellulose fibers manufactured from recycled newspaper and meeting same fiber content and size as for cellulose fibers from wood chips.
3. Dye mulch green for coverage verification purposes.

E. Soil Stabilizer: “Terra Tack 1” or approved equal.

F. Weed control agent: Pre-emergent herbicide for grass areas, such as “Benefin,” or approved equal.

## **PART 3 - EXECUTION**

### **3.1 PREPARATION**

- A. Place and compact topsoil in accordance with requirements of Specification Section 32 91 05 – Topsoiling and Finished Grading.
- B. Dispose of objectionable and waste materials in accordance with Specification Section 01 74 19 – Construction Waste Management and Disposal.

### **3.2 APPLICATION**

- A. Seed: Apply uniformly at rates given in Paragraph 2.1 B for type of seed and planting date.
- B. Fertilizer: Apply uniformly at rate of 500 pounds per acre.
- C. Mulch: Apply uniformly at rate of 50 pounds per 1,000 square feet.
- D. Soil Stabilizer: Apply uniformly at rate of 40 pounds per acre.
- E. Weed Control Agent: Apply at manufacturer's recommended rate prior to hydro mulching.
- F. Suspend operations under conditions of drought, excessive moisture, high winds, or extreme or prolonged cold. Obtain Owner's representative approval before resuming operations.

### **3.3 MAINTENANCE**

- A. Maintain grassed areas minimum of 90 days, or as required to establish acceptable growth. For areas seeded in fall, continue maintenance following spring until acceptable lawn is established.
- B. Maintain grassed areas by watering, fertilizing, weeding, and trimming.
- C. Repair areas damaged by erosion by regrading, rolling, and replanting.
- D. Reseed small, sparse grass areas. When sparse areas exceed 20 percent of planted area, reseed by hydro mulch.
- E. Mow grass when height reaches 3½ inches or greater on average before final acceptance. Mow to height of 2½ inches.

### **3.4 OWNER TRAINING (NOT USED)**

**END OF SECTION**

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**DIVISION 33**  
UTILITIES

**Section 33 05 23.19**  
MICROTUNNELING AND PIPE-JACKED TUNNELS

**PART 1 - GENERAL**

**1.1 SUMMARY**

A. Section includes:

1. Tunnel construction of sewer lines by one-pass methods with or without man entry. Construction methods involve jacking pipe following hand-shield excavation or tunnel boring machine (TBM) or micro-tunnel boring machine (MTBM), with pipe serving as both tunnel liner during construction and carrier pipe after completion of construction.
2. Tunnel construction of casings by one-pass methods with or without man entry. Construction method involve jacking pipe following hand-shield excavation or tunnel boring machine (TBM) or microtunnel boring machine (MTBM) with the casing serving as a liner for subsequent installation of a carrier pipe.

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

1. Division 00 - Proposing Requirements, Contract Forms, and Conditions of the Contract.
2. Division 01 - General Requirements.
3. Section 31 71 02.02 - Tunnel and Casing Grout.
4. Section 33 11 13.02 – Steel Pipe and Fittings for Large Diameter Water Lines.

**1.2 MEASUREMENT AND PAYMENT**

- A. Stipulated Price (Lump Sum). If Contract is a Stipulated Price Contract, payment for Work in this Section is included in total Stipulated Price.

**1.3 REFERENCE STANDARDS**

- A. American Association of State Highway and Transportation Officials (AASHTO).
- B. Occupational Safety and Health Administration (OSHA).
- C. National Electrical Code - (NFPA 70).

**1.4 DEFINITIONS**

- A. Work Plan: Written description, together with supporting documentation that defines plans and procedures for microtunnel or pipe jacking method operations which will allow the Owner's Representative and the Engineer to verify the proposed method will meet the requirements of the Drawings and Specifications.

- B. Jacked Pipe. Method for installing casing or carrier pipe that serves as initial construction lining and tunnel support. Pipe is shoved forward, or jacked, as tunnel is advanced. Jacking pipe is not acceptable for use with flexible bell and spigot joint water pipe.
- C. Microtunneling. Method of installing pipe by jacking pipe behind microtunnel boring machine which is connected to and shoved forward by pipe being installed, generally precluding man entry.
- D. Tunnel Boring Machine (TBM). Mechanized excavating equipment that is steerable, guided and articulated, connected to and shoved forward by pipe being installed, with man entry.
- E. Alternate Trenchless Methods: Contractor may propose other alternate trenchless methods. Contractor has the responsibility to demonstrate in the submittal of the Work Plan and other documentation that the alternate method will provide the performance and service life of the one of the approved methods indicated in the Section or the Sections referenced in this paragraph. Jetting of pipe or casings will not be an acceptable trenchless method.
- F. Microtunnel Boring Machine (MTBM). Mechanized excavating equipment that is remotely-controlled, steerable, guided and articulated, connected to and shoved forward by pipe being installed, usually precluding man entry.
- G. Tunneling Methodology. Written description, together with supporting documentation that defines plans and procedures for microtunneling or pipe jacking operations.
- H. Zone of Active Excavation. Area located within radial distance about surface point immediately above face of excavation equal to the depth to bottom of excavation.
- I. Critical Structure. Building, structure, bridge, pier, or similar construction partially or entirely located within zone of active excavation.
- J. Contractor's Engineer: Professional Engineer licensed in the State of Texas employed or subcontracted by the Contractor to prepare designs on behalf of the Contractor

## **1.5 SUBMITTALS**

- A. Conform to requirements of Specification Section 01 33 00 – Submittals.
- B. Submit copies of executed Harris County rights of entry and other permits such as TxDOT right-of-way permit prior to starting construction.

- C. Work Plan: Submit a work plan for work covered under this section. Work Plan shall describe common items of work for all sites on this project and specific items of work for each particular work site if substantially different conditions exist. Contractor shall not commence work on items described in Contractor's Work Plan until submittals have been reviewed and accepted. Review and acceptance by the Owner's Representative and Engineer shall not be construed to relieve Contractor of any responsibilities under Contract. All structural designs and other engineered components prepared by the Contractor must be designed, signed and sealed by the Contractor's Engineer.
1. Include written description identifying details of proposed method of construction and sequence of operations to be performed to demonstrate the proposed materials and procedures will meet requirements of the Drawings and Specifications.
  2. Include arrangement drawings and manufacturer's technical specifications of equipment to be used and a list of experience (projects with similar size and scope) with this type of equipment and method for both Contractor and proposed operator. Capacity of jacking equipment and type of cushioning for the type of pipe and joints proposed.
  3. Include a plan and profile drawing for each microtunnel location that indicates the pit/shaft locations, stationing and elevation of the beginning and end of the carrier pipe and tunnel liner. Include on the plan and profile, locations and elevations of existing utilities and lines from the Critical Location Report (See Specification Section 31 21 33 – Trenching, Backfilling, and Compacting for Utilities) and other utilities as located on the Drawings or as located in the field and the elevations of the proposed tunnel at each of the utility locations.
  4. Provide design details of proposed access pits or shafts including dimensions and elevations with respect to the pipe installation.
    - a. Provide details for closure or sealing of microtunnel openings prior to backfilling shaft or pit.
  5. Include description of the method of controlling line and grade of excavation and the reference points used to check line and grade for each site.
  6. Include description of muck removal methods, including type of equipment type and number and locations of disposal sites.
  7. Include description of ventilation system, lighting system, and electrical system (if applicable)
  8. Include ground water control system details in accordance with Section 01 57 23.02 – Control of Ground Water and Surface Water (if applicable).

9. Include monitoring plan describing monitoring to assess and detect and record ground settlement. Monitoring plans are not required for pipes or casings less 100 feet in length or less than 6 inches in diameter unless required by the Owner, the Engineer, or by a railroad or TxDOT or other agency permit. Plan to indicate location of proposed monitoring points and initial survey readings.
  10. Include description of any special activities at utility crossings or potentially affecting other facilities where special precautions must be taken during construction.
- D. Submit Tunneling Daily reports within 24 hours of each days operations meeting requirements of Paragraph 3.5, Pipe-Jacked and Microtunneling Data and Paragraph 3.6, Control of Tunnel Line and Grade
  - E. Submit within one week of completion, for record purposes only, the results of any additional geotechnical and environmental investigations performed by Contractor as relevant to tunneling in Work Plan.
  - F. Submit Project Safety Plan as required in Specification Section 00 72 00 – General Conditions and include Trenchless Safety components which demonstrate compliance with project criteria, standard practices and all applicable OSHA requirements including:
    1. Confined Space Entry Plan (if applicable) and responsible person(s) for plan implementation.
    2. Protection against soil instability and ground water inflow and flooding.
    3. Safety for shaft access and exit including ladders, stairs, walkways, and hoists.
    4. Protection of pit or shaft including traffic barriers, accidental or unauthorized entry, and falling objects.
    5. Ventilation, lighting, and communication systems.

## **1.6 DESIGN CRITERIA**

- A. Contractor is responsible for selection of appropriate casing, pipe and the casing, or pipe joints to carry thrust of any jacking forces or other construction loads in combination with overburden, earth and hydrostatic loads. Design of any casing or pipe indicated on Drawings considers in-place loads only and does not take into account any construction loads. Criteria for longitudinal loading (jacking forces) on casing or pipe and joints shall be determined, based on selected method of construction. Jacked casing or pipe shall be designed to withstand thrust from MTBM, TBM or shield and casing or pipe advance without damage or distortion. Propulsion jacks shall be configured so that thrust is uniformly distributed and will not damage or distort the casing or pipe.
- B. Take into account loads from handling and storing.
- C. Use HL93 vehicle loading distributions for truck loading criteria in accordance with AASHTO.



- D. Provide pipes of diameter shown on Drawings. Substitution of pipe with larger diameter to suit MTBM or TBM equipment availability will only be permitted if submitted in the Work Plan and demonstrated that design flows and velocities can be achieved.

## **1.7 WARRANTY (NOT USED)**

## **PART 2 - PRODUCTS**

### **2.1 PIPE AND CASING MATERIAL SELECTION**

- A. Pipe: Assume responsibility for selecting appropriate pipe materials and pipe joints to safely carry loads imposed during construction, including jacking forces. Pipe joints shall be flush with outside pipe face when pipes are assembled. Pipe materials shall be selected from following:
  - 1. Pipe, joints, and fittings to be in accordance with Specification Section 33 11 13.02 – Steel Pipe and Fittings for Large Diameter Water Lines.
  - 2. Use pipe that is round with smooth, even outer surface, and has joints that allow for easy connections between pipes. Design pipe ends so that jacking loads are evenly distributed around entire pipe joint and such that point loads will not occur when pipe is installed. Pipe used for pipe jacking shall be capable of withstanding all forces that will be imposed by process of installation, as well as final in-place loading conditions. Protect driving ends of pipe and joints against damage.

## **PART 3 - EXECUTION**

### **3.1 CONSTRUCTION OPERATIONS CRITERIA**

- A. Use methods for microtunneling and pipe-jacked tunneling operations that will minimize ground settlement. Select method which will control flow of water and prevent loss of soil into tunnel and provide stability of face under anticipated conditions.
- B. Conduct tunneling operations in accordance with applicable safety rules and regulations, OSHA standards and Contractor's safety plan. Use methods which include due regard for safety of workmen, adjacent structures, utilities, and public.
- C. Maintain clean working conditions wherever there is man access.
- D. For tunneling under railroad embankments, highways, or streets, perform installation so as to avoid interference with operation of railroads, highways, or streets, except as approved by owner of facility.

### **3.2 GROUND WATER CONTROL**

- A. Provide ground water control measures in conformance with Specification Section 01 57 23.02 – Control of Ground Water and Surface Water, when necessary to perform Work.

### **3.3 EQUIPMENT**

- A. Full directional guidance of shield, TBM, or MTBM is required for this method of construction.
- B. Assume responsibility for selection of tunneling equipment which, based on past experience, has proven to be satisfactory for excavation of soils to be encountered.
- C. Employ tunneling equipment that will be capable of handling various anticipated ground conditions and is capable of minimizing loss of soil ahead of and around machine and shall provide satisfactory support of excavated face.
- D. Tunnel Boring Machine (TBM). A TBM used for pipe-jacking shall conform to shape of tunnel with uniform perimeter that is free of projections that could produce over- excavation or voids. Appropriately sized overcutting head may be provided to facilitate steering. In addition it shall:
  - 1. Be capable of full face closure.
  - 2. Be equipped with appropriate seals to prevent loss of bentonite lubricant.
  - 3. Be capable of correcting roll by reverse drive or fins.
  - 4. Be designed to handle adverse ground conditions including ground water ingress.
  - 5. Be equipped with visual display to show operator actual position of TBM relative to design reference.
- E. Tunnel Shield. If hand shield is used for pipe-jacked tunneling (with or without attached mechanized excavating equipment), shield must be capable of handling various anticipated ground conditions. In addition, shield shall:
  - 1. Conform to shape of tunnel with uniform perimeter that is free of projections that could produce over-excavation or voids. Appropriately-sized overcutting head may be provided to facilitate steering.
  - 2. Be designed to allow face of tunnel to be closed by use of gates or breasting boards without loss of ground.
- F. Microtunneling Equipment. If a MTBM is used, provide a spoil transportation system which:
  - 1. Balances soil and ground water pressures by use of slurry or earth pressure balance system; system shall be capable of adjustments required to maintain face stability for particular soil condition and shall monitor and continuously balance soil and ground water pressure to prevent loss of slurry or uncontrolled soil and ground water inflow, or, in case of slurry spoil transportation system:
    - a. Provides pressure at excavation face by use of slurry pumps, pressure control valves, and flow meter.

- b. Includes slurry bypass unit in system to allow direction of flow to be changed and isolated, as necessary.
    - c. Includes separation process. Design it to provide adequate separation of spoil from slurry so that slurry with sediment content within limits required for successful tunneling can be returned to cutting face for reuse. Appropriately contain spoil at site prior to disposal.
    - d. Uses type of separation process suited to size of tunnel being constructed, soil type being excavated, and work space available at each work area for operating plant.
    - e. Allows composition of slurry to be monitored to maintain slurry weight and viscosity limits required.
2. For a cased auger earth pressure balance system, system shall be capable of adjustments required to maintain face stability for particular soil condition to be encountered. Monitor and continuously balance soil and ground water pressure to prevent loss of soil or uncontrolled ground water inflow.
  - a. In cased auger spoil transportation system, manage pressure at excavation face by controlling volume of spoil removal with respect to advance rate. Monitor speed of rotation of auger flight, and addition of water.
3. Remote Control System. Provide MTBM with a remote control system with following features:
  - a. Allows for operation of system without need for personnel to enter tunnel. Has display available to operator, at remote operation console, showing position of shield in relation to design reference together with other information such as face pressure, roll, pitch, steering attitude, valve positions, thrust force, and cutter head torque; rate of advance and installed length.
  - b. Integrates system of excavation and removal of spoil and its simultaneous replacement by pipe. As each pipe section is jacked forward, control system shall synchronize all of operational functions of system.
4. Active Direction Control. Provide MTBM which includes active direction control system with following features:
  - a. Controls line and grade by guidance system that relates actual position of MTBM to design reference (e.g., by laser beam transmitted from jacking shaft along pipe to target mounted in shield).
  - b. Provides active steering information which shall be monitored and transmitted to operating console.
  - c. Provides positioning and operation information to operator on control console.

5. Use generator which is suitably insulated for noise (“hospital” type) in residential or commercial areas.
- G. Pipe or Casing Jacking Equipment. Provide pipe jacking system with following features:
  1. Has main jacks mounted in jacking frame located in starting shaft.
  2. Has jacking frame which successively pushes string of connected pipes or casing following tunneling excavation equipment towards receiving shaft.
  3. Has sufficient jacking capacity to push tunneling excavation equipment and string of pipe or casing through ground. Incorporates intermediate jacking stations, if required.
  4. Has capacity at least 20 percent greater than calculated maximum jacking load.
  5. Develops uniform distribution of jacking forces on end of pipe or casing by use of spreader rings and packing, measured by operating gauges.
  6. Provides and maintains pipe or casing lubrication system at all times to lower friction developed on surface of pipe or casing during jacking.
  7. Jack Thrust Reactions. Use reactions for pipe or casing jacking that are adequate to support jacking pressure developed by main jacking system. Special care shall be taken when setting pipe or casing guide rails in jacking shaft to ensure correctness of alignment, grade, and stability.
- H. Air Quality. Provide equipment to maintain proper air quality of manned tunnel operations during construction in accordance with OSHA requirements.
- I. Enclose lighting fixtures in watertight enclosures with suitable guards. Provide separate circuits for lighting, and other equipment.
- J. Electrical systems shall conform to requirements of National Electrical Code - NFPA70.

### **3.4 EXCAVATION AND JACKING OF PIPE**

- A. Tunnel Excavation.
  1. Keep tunnel excavation within easements and rights-of-way indicated on Drawings and to lines and grades designated on Drawings.
  2. Perform tunneling operations in manner that will minimize movement of ground in front of and surrounding tunnel. Prevent damage to structures and utilities above and in vicinity of tunneling operations.
  3. Open-face excavations:
    - a. Keep face breasted or otherwise supported and prevent falls, excessive raveling, or erosion. Maintain standby face supports for immediate use when needed.

- b. During shut-down periods, support face of excavation by positive means; no support shall rely solely on hydraulic pressure.
  4. Closed-face excavation:
    - a. Carefully control volume of spoil removed. Advance rate and excavation rate to be compatible to avoid over excavation or loss of ground.
    - b. When cutting head is withdrawn or is open for any purpose, keep excavated face supported and stabilized.
  5. Excavated diameter should be minimum size to permit pipe installation by jacking with allowance for bentonite injection into annular space.
  6. Whenever there is condition encountered which could endanger tunnel excavation or adjacent structures, operate without intermission including 24-hour working, weekends and holidays, until condition no longer exists.
  7. Assume responsibility for damage due to settlement from any construction-induced activities.
- B. Pipe Jacking
1. Cushion pipe joints as necessary to transmit jacking forces without damage to pipe or pipe joints.
  2. Maintain envelope of bentonite slurry around exterior of pipe during jacking and excavation operation to reduce exterior friction and possibility of pipe seizing in place.
  3. If pipe seizes up in place and elect to construct recovery access shaft, obtain approval from Owner's Representative. Coordinate traffic control measures and utility adjustments as necessary prior to commencing work.
  4. In event section of pipe is damaged during jacking operation, or joint failure occurs, as evidenced by inspection, visible ground water inflow or other observations, submit for approval his methods for repair or replacement of pipe.
- C. Grouting requirements are defined in Specification Section 31 71 02.02 – Tunnel and Casing Grout.

### **3.5 PIPE-JACKED AND MICROTUNNELING DATA**

- A. Provide a daily tunnel report to the Owner's Representative describing construction events and observations within 24 hours of operation for at least following:
1. Daily Report
    - a. Location of MTBM or TBM face by station and progress of tunnel drive during shift.
    - b. Completed field forms, such as steering control logs, for checking line and grade of tunneling operation, showing achieved tolerance relative to design alignment

- c. Maximum jacking pressures per drive Location and elevation of significant soil strata boundaries and brief soil descriptions from the spoil removed from the operation.
- d. Ground water control operations, piezometric levels, ground water inflow location, and rates (if applicable)
- e. Operation shut-down periods or other interruptions in work, and reason.
- f. Observation of lost ground and other signs of ground movement.
- g. Any unusual condition or event.
- h. Hours worked per shift on tunneling.

### **3.6 CONTROL OF LINE AND GRADE**

#### **A. Construction Controls:**

- 1. Owner's representative will establish or re-establish baselines and benchmarks indicated on Drawings. Check baselines and benchmarks at beginning of Work and report any errors or discrepancies to Owner's Representative.
- 2. Use baselines and benchmarks established by Owner's representative to establish and maintain construction control points, reference lines and grades for locating casings, carrier pipe, shafts, pits, and structures.
- 3. Establish construction control points sufficiently far from work so as not to be affected by ground movement caused by pipe-jacked tunneling operations.

#### **B. Bench Mark Movement:** If settlement of ground surface occurs during construction which affects accuracy of temporary benchmarks detect, report such movement to the Owner's Representative and reestablish temporary bench marks.

#### **C. Line and Grade:**

- 1. Check and record survey control for tunnels and casings against above-ground undisturbed reference at least once each week and once for each 250 feet of tunnel constructed, or more often as needed or directed by Owner's representative.
- 2. Determine location of tunnel or casing as each section of tunnel or casing is installed or at 50 foot intervals to ensure alignment is within specified tolerances.
- 3. Make immediate correction to alignment before allowable tolerances are exceeded.
- 4. When excavation is off line or grade, make alignment corrections. At maximum rate of 3 inches per 100 feet.
- 5. Alignment adjustments between primary tunnel liner and carrier pipe shall not encroach on minimum required clearance between the carrier pipe and liner or casing.

6. Acceptance criteria for casings for gravity sewers shall be plus or minus 12 inches from theoretical horizontal alignment and 6 inches from theoretical vertical alignment but shall allow the carrier pipe to be installed within its allowable tolerance.
7. Acceptance criteria for carrier pipe for gravity sewers (either without a casing or inside a casing) shall be plus or minus 6 inches in horizontal alignment from theoretical at any point between manholes, including receiving end, and plus or minus 1.5 inches in elevation from theoretical vertical alignment .
8. Acceptance criteria for casings for sewer force mains or waterlines shall be plus or minus 12 inches from theoretical horizontal alignment and 6 inches from theoretical vertical alignment but shall allow the carrier pipe to be installed within its allowable tolerance.
9. Acceptance criteria for carrier pipe for sewer force mains or waterlines shall be plus or minus 6 inches in horizontal alignment from theoretical at any point between casing end points, and plus or minus 3 inches in elevation from theoretical.
10. Should misalignment of tunnel or casing preclude proper installation of carrier pipe, notify Owner's Representative of proposed correction method. Owner's Representative will make final decision on acceptability of correction.
11. Pipe installed outside tolerances and subsequently abandoned shall first be fully grouted, at no additional cost to the Owner.

### **3.7 MONITORING**

#### **A. Earth Movement:**

1. Take precautions to avoid damage or settlement to buildings, structures, roads, and utilities from work in proximity of tunnel. Minimum precautions to include use of construction methods and equipment to minimize loss of earth at tunnel face and settlement of soil around primary tunnel liner.
2. Contractor is responsible for damages due to settlement from construction-induced activities or occurrences and shall submit a monitoring plan for trenchless construction to establish pre construction and post construction conditions of potentially affected facilities and ground surface at the site. Monitoring plan shall include Surface Settlement Monitoring, Building Assessment (if applicable) and Instrumentation Monitoring (if special instrumentation is shown on the Drawings or required in the Specifications)
3. In the event that movement of ground is detected, Owner may order work stopped and secured. Before proceeding, correct cause and damages resulting from movement.

#### **B. Surface Settlement Monitoring:**

1. Monitor ground surface elevation along length of trenchless operation. Locate and record settlement monitoring points with respect to construction baseline and elevations. Record elevations to accuracy of 0.01 feet for each monitoring point location.
    - a. Product pipelines: Directly above and 10 feet before and after utility or pipeline intersection
    - b. TxDOT and County Roads: As specified in the permit requirements
    - c. At other locations requiring trenchless installation of tunnels and casing in excess of 100 feet in length: At 10 feet from each end and at two additional points between each end of each installation (a minimum of 4 points but in no case at more than 50 foot intervals). Establish monitoring points referenced to curbs, or medians or other physical features and control points which can be reestablished after the completion of the Work. For other locations with trenchless installation of pipes or casings less than 100 feet in length, no monitoring points are required except as required in paragraphs a, b and c above.
  2. Reading Frequency and Reporting. Take settlement survey readings:
    - a. Prior to tunnel excavation reaching monitoring point in plan
    - b. After tunnel excavation reaches monitoring point in plan
    - c. After installation of pipe or casing and backfill of pit or shaft is complete
  3. Immediately report to Owner's representative movement, cracking, or settlement which is detected.
  4. Following substantial completion, but prior to final completion, make a final survey of monitoring points and report results to Owner's Representative.
- C. Building and Structures Assessment: Provide preconstruction and post-construction assessment reports for buildings and structures located within distance equal to depth of tunnel, but at least 50 feet in plan from proposed tunnel centerline and shafts. Include photographs or video of existing condition to structures in vicinity of tunnel alignment in assessment reports.
- D. Instrumentation Monitoring. Install special instrumentation (if applicable) as indicated on Drawings. Instrumentation specified shall be accessible at all times to Owner's Representative. Readings shall be submitted promptly to Owner's Representative.
1. Install and maintain indicated instrumentation system to monitor and detect movement of critical structures as documented in the Building and Structures Assessment and/or ground conditions at depths below the ground surface as shown on the Drawings. Establish vertical survey control points at distance from construction areas that avoids disturbance due to ground settlement.



2. Installation of instrumentation shall not preclude Owner's Representative, through independent contractor or consultant, from installing additional instrumentation in, on, near, or adjacent to construction work. Access shall be provided to work for such independent installations.

E. Following substantial completion, but prior to final completion, make final survey of monitoring points.

**3.8 DISPOSAL OF EXCESS MATERIAL**

A. Remove spoil in accordance with Specification Section 01 74 19 – Construction Waste Management and Disposal.

**3.9 OWNER TRAINING (NOT USED)**

**END OF SECTION**

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**SECTION 33 11 13.02**  
**STEEL PIPE AND FITTINGS**  
**FOR LARGE DIAMETER WATER LINES**

**PART 1 - GENERAL**

**1.1 SUMMARY**

- A. Section Includes
1. Large diameter (24 inches and greater) steel pipe and fittings for water lines also referred to as “bypass pipe” and/or “siphon” on the Drawings and in these Specifications..
- B. Related Specification Sections include, but are not necessarily limited to:
1. Division 00 – Proposing Requirements, Contract Forms, and Conditions of the Contract.
  2. Division 01 – General Requirements.
  3. Section 31 21 33 – Trenching, Backfilling, and Compacting for Utilities.
  4. Section 33 05 23.19 Microtunneling and Pipe-Jacked Tunnels

**1.2 MEASUREMENT AND PAYMENT**

- A. Stipulated Price (Lump Sum). If Contract is a Stipulated Price Contract, payment for Work in this Section is included in total Stipulated Price.

**1.3 QUALITY ASSURANCE**

- A. Referenced Standards:
1. American Association of State Highway and Transportation Officials (AASHTO )
    - a. Standard Specifications for Highway Bridges.
  2. ASTM International (ASTM):
    - a. A36 - Standard Specification for Carbon Structural Steel.
    - b. A53 - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.
    - c. A135 - Standard Specification for Electric-Resistance-Welded Steel Pipe.
    - d. A139 – Standard Specification for Electric-Fusion (ARC) - Welded Steel Pipe (NPS 4 and Over).
    - e. A370 – Standard Test Methods and Definitions for Mechanical Testing of Steel Products.
    - f. A1011 – Standard Specification for Steel, Sheet and Strip, Hot-

Rolled, Carbon, Structural, High Strength Low-Alloy, High Strength Low-Allow with Improved Formability and Ultra-High Strength.

- g. A1018 – Standard Specification for Steel, Strip, Heavy-Thickness Coils, Hot-Rolled, Carbon, Commercial, Drawing, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength
  - h. C33 – Standard Specification for Concrete Aggregates (Fine Aggregates).
  - i. C35 – Standard Specification for Inorganic Aggregates for Use in Gypsum Plaster.
  - j. C881 – Standard Specification for Epoxy-Resin-Base Bonding Systems for Concrete.
  - k. D512 – Standard Test Methods for Chloride Ion in Water.
  - l. D1293 – Standard Test Methods for pH of Water.
  - m. D3363 – Standard Test Method for Film Hardness by Pencil Test.
  - n. D4541 – Standard Test Method for Pull-Off Strength of Coatings Using Portable Adhesion Tests.
  - o. D4752 – Standard Test Method for Measuring MEK Resistance of Ethyl Silicate (Inorganic) Zinc-Rich Primers by Solvent Rub.
3. American Water Works Association (AWWA)
- a. C200 – Standard for Steel Water Pipe 6 in. and Larger.
  - b. C206 – Standard for Field Welding of Steel Water Pipe.
  - c. C207 – Standard for Steel Pipe Flanges for Waterworks Service - Sizes 4 in. through 144 in.
  - d. C208 – Standard for Dimensions for Fabricated Steel Water Pipe Fittings; Addendum C 208A.
  - e. C209 – Standard for Cold-Applied Tape Coatings for the Exterior of Special Sections, Connections and Fittings for Steel Water Pipelines.
  - f. C210 – Standard for Liquid Epoxy Coating Systems for the Interior and Exterior of Steel Water Pipelines.
  - g. C604 – Installation of Steel Water Pipe – 4 inch and Larger.
  - h. M11 – Steel Pipe-A Guide for Design and Installation.

#### **1.4 SUBMITTALS**

- A. Conform to requirements of Specification Section 01 33 00 – Submittals.
- B. Submit shop drawings signed and sealed by Professional Engineer registered in State of Texas showing following:

1. Certification that manufacturer's pipe design satisfies project requirements.
  2. Provide lay schedule of pictorial nature indicating alignment and grade, laying dimensions, welding procedures, fabrication, fittings, flange, and special details, with plan view of each pipe segment sketched, detailing pipe invert elevations, horizontal/vertical bends, welded joints, and other critical features. Indicate station numbers for pipe and fittings corresponding to Drawings. Do not start production of pipe and fittings prior to review and approval by Owner's Representative
  3. Include hot tapping procedure.
  4. Certification that thrust restraint calculations for all fittings and valves satisfy project requirements.
- C. Submit mill certificates, including chemical and physical test results for each heat of steel, charpy v-notch tests, and elongation tests.
- D. Submit manufacturer's certifications that pipe and fittings have been hydrostatically tested at factory in accordance with AWWA C 200.
- E. Submit certification from NACE Certified Coatings Inspector, under supervision of inspector having Level III certification for coatings and linings, that steel pipe furnished on project was properly inspected and defective coatings detected properly repaired.
- F. Submit inspection procedures to be used by manufacturer and for quality control and assurance for materials and welding. Submit at least 30 days prior to repair work, procedures that describe in details shop and field work to be performed.
- G. Submit proof of certification for welders. Indicate certified procedures and position each welder is qualified to perform. Ensure welder and welding operator have been certified within past 6 months in accordance with AWWA C206.
- H. Prior to shipment of the pipe, submit affidavit of compliance that materials and work furnished comply with applicable requirements of referenced standards and these specifications. Make available copy of physical and chemical testing reports.
- I. Prior to shipment of the pipe, submit manufacturer's affidavits that linings comply with applicable requirements of referenced standards and these specifications.
- J. Submit certification showing calibration within last 12 months for equipment such as scales, measuring devices, and calibration tools used in manufacture of pipe. Each calibrated device used in manufacture of pipe is required to have tag recording date of last calibration. Devices are subject to inspection by Owner's Representative.

K. Where welded joints are required, provide:

1. The Contractors Proposed Field Welding Procedure in accordance with this Specification, AWWA C206. Field Welding Procedure shall include provisions for thermal stress control and provisions for control of coating damage.
2. Daily welding reports for field welding showing welder and joint welded shall be submitted as approved by Owner's Representative.

## **1.5 QUALITY CONTROL**

- A. Manufacturer to provide permanent quality control department and laboratory facility capable of performing inspections and testing as required by Specifications. Material testing, inspection procedures, and manufacturing process are subject to inspection by Owner's Representative. Owner reserves the right to witness manufacture and/or testing of all pipe materials and fittings. Contractor must notify Owner minimum of two weeks prior to manufacture and testing of products. Perform manufacturer's tests and inspections required by referenced standards and these Specifications, including the following. Correct nonconforming conditions.
1. Steel Plate and Coils: Review mill certifications for conformance to requirements of Specifications; perform physical and chemical testing of each heat of steel for conformance to applicable ASTM standards. The Owner will require the Manufacturer to furnish mill test certificates on reinforcing steel or wire, steel plate, steel coil, and cement. The Manufacturer shall perform the tests described in AWWA C200, for all pipe, fittings, and specials.
  2. Pipe:
    - a. Inspect thickness, circumference, roundness, strength, and size of seam welds (spiral or longitudinal), and squareness of pipe ends to verify compliance with AWWA C200.
    - b. Inspect physical dimensions and overall conditions of all joints for compliance with AWWA C200, approved submittals, and Specifications.
    - c. Hydrostatically test finished pipe section to 75 percent of specified minimum yield strength of steel being used with zero leakage. As a part of testing equipment, the Pipe Manufacturing shall maintain a record of pressure gauge, reference number of pipe tested, etc. The pipe shall be numbered in order that this information can be recorded.
    - d. For wall thickness greater than 1/4-inch perform Charpy V-Notch (CVN). Test in accordance with AWWA C200.
    - e. For the tensile test specified in ASTM A370, 2-inch test specimens

- shall show elongations not less than 22 percent for each heat of steel.
- f. Repair defects such as substandard welds, excessive radial offsets (misalignment), pitting, gouges, cracks, etc.
3. Fittings:
- a. Fittings shall be fabricated from hydrostatically tested pipe. Fittings shall be tested by hydrostatic test, ultrasonic test, or air 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, five 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.
4. Linings:
- a. Inspect unlined pipe for overall condition of inside barrel. Maintain inside barrel free of corrosive products, oil, grease, dirt, chemical, and deleterious material.
- b. Inspect lined pipe for physical dimensions and overall condition of lining, visible surface defects, thickness of lining, and adhesion to steel surface.
- c. Review certifications by manufacturers of lining components for conformance to AWWA standards and these Specifications.
5. Coatings: Measure temperature and dew point of ambient air before applying coatings. Inspect physical dimensions and overall condition of coatings. Inspect for visible surface defects, thickness, and adhesion of coating to surface and between layers.
6. Final Inspection:
- a. Before shipment, inspect finished pipe, fittings, specials and accessories for markings, metal, coating thickness, lining thickness (if shop applied), joint dimensions, and roundness.
- b. Inspect linings for thickness, pitting, scarring, and adhesion.
- B. Shop-applied coatings and linings; provide services of independent coating and lining inspection service or testing laboratory with qualified coating inspectors. Perform inspection by NACE trained inspectors under supervision of NACE Level III Certified Coatings Inspector.
- C. Ensure workmen engaged in manufacturing are qualified and experienced in performance of their specific duties.
- D. Dented steel cylinders will result in rejection of pipe.
- E. Make available copy of physical and chemical testing reports for steel

cylinders and provide reports at request of Owner's Representative.

- F. Check physical dimensions of pipe and fittings. Physical dimensions to include at least pipe lengths, pipe I.D., pipe O.D. and bend angles.
- G. Marking for identification: Each joint of pipe and each fitting shall have plainly marked on the inside of both ends, the class for which it is designed, the date of manufacture, and the identification number as shown on the Shop Drawings. Beveled pipe shall be marked with the amount of bevel. The top centerlines shall be marked on all segments.
- H. Point of Delivery
  - 1. Pipe shall be hauled direct from pipe plant to the Site and strung along pipeline route, thus avoiding rehandling of pipe and the possibility of damage thereto. Where fully loaded truck and trailer cannot operate along the pipeline route, pipe may be unloaded at access points along the route, and brought to the trench side by approved methods; however, the Contractor shall be responsible to ensure that pipe is undamaged at the time of laying.
  - 2. If the pipe cannot be hauled directly from the pipe plant to the laying site, a maximum of two handlings is allowed.
  - 3. Shipment by rail or marine vessel will be unacceptable, unless it can be demonstrated that it will not damage the pipe.

## **1.6 INSPECTION**

- A. Owner's Representative may witness manufacture and fabrication of pipe and appurtenances. Independent testing laboratory under contract to Owner's Representative may perform tests at direction of Owner's Representative to verify compliance with these specifications. Provide assistance to accomplish such testing, including equipment and personnel, at no additional cost to Owner.

## **1.7 WARRANTY (NOT USED)**

# **PART 2 - PRODUCTS**

## **2.1 STEEL PIPE**

- A. Experience Requirements
  - 1. Pipe shall be the product of one manufacturer who has had not less than five (5) years successful experience manufacturing pipe of the particular type and size indicated. Pipe manufacturing operations (pipe, lining, and coating) shall be performed at one (1) location unless otherwise approved by the Owner's Representative. Fittings may be manufactured at an alternate location, provided they are supplied under the responsible authority of the pipe manufacturer. All pipe shall be new and not supplied from inventory. All pipe and



fittings shall be manufactured in the Continental U.S.A., and shipping over salt waterways will not be allowed.

2. The manufacturer shall be certified either under S.P.F.A. or ISO 9001 quality certification program for steel pipe and accessory manufacturing.
- B. Fabricate and supply miscellaneous steel pipe and fittings with nominal diameter of 24 inches and larger in accordance with AWWA C 200, C 207, C 208 and AWWA M 11 except as modified herein. Steel to be a minimum of ASTM A 36, ASTM A 1011 Grade 36, ASTM A 53 Grade B, ASTM A 135 Grade B, ASTM A 139 Grade B, or ASTM A 1018 Grade 36.
- C. Provide pipe sections in lengths no greater than 40 feet and no less than 10 feet except as required for special fittings or closure sections.
- D. Provide shop-coated and shop-lined steel pipe with self-priming polyamine-epoxy coating approved for use in potable water transmission lines on all exposed steel surfaces in accordance with manufacturer's recommendations
- E. Provide closure sections and short sections of steel pipe not less than 4 feet in length unless indicated on Drawings or specifically permitted by Owner's Representative.
- F. If applicable, square flanges with pipe with bolt holes straddling both horizontal and vertical axis. Provide ½ -inch gap between pipe ends to be coupled with sleeve coupling unless otherwise indicated on Drawings.
  1. Provide standard ring or hub type flanges, conforming to AWWA C207, Class D.
  2. Apply Densco petroleum-based tape or approved equal to exposed portions of nuts and bolts.
- G. Pipe Design Conditions:
  1. Design: Design pipe and fittings to withstand most critical simultaneous application of external loads and internal pressures. Base design on minimum of AASHTO HS-20 loading or AREMA E-80 loads and depths of bury as applicable and where indicated on Drawings. Design pipes with Marston's earth loads for transition width trench for all heights of cover.
  2. Groundwater Level: Design for most critical ground water level condition, groundwater levels are provided in the Geotechnical Report No. G134-15 by Aviles Engineering dated September 2015.
  3. Working pressure = 100 psi.
  4. Hydrostatic field test pressure = 10 psi.
  5. Maximum pressure due to surge = 10 psi.

6. Minimum pressure due to surge = -5 psi.
7. Modulus of elasticity (E) = 30,000,000 psi.
8. Maximum deflection from specified diameter: 2 percent for mortar coating; 3 percent for flexible coatings and three percent for mortar lining.
9. Design stress due to working pressure to be no greater than 50 percent of minimum yield, and stress not to exceed 16,500 psi for mortar coated pipe.
10. Design stress due to maximum hydraulic surge pressure to be no greater than 75 percent of minimum yield, and stress not to exceed 24,750 psi for mortar coated pipe.
11. Modulus of soil reaction (E) < 1,000 psi.
12. Unit weight of fill ( $w > 120$  pcf).
13. Deflection lag factor (D1) = 1.2.
14. Bedding constant (K) = 0.1.
15. Fully saturated soil conditions:  $hw = h$  = depth of cover above top of pipe.
16. Do not allow diameter (D) over thickness (t) ratio to be greater than 240.
  - a. Design pipe and joints to carry loads including overburden and lateral earth pressures, subsurface soil and water loads, grouting, other conditions of service, thrust of jacks, and stresses anticipated during handling and construction loads during installation of pipe.

Nominal Allowable Steel-Wall Thickness for Water Lines shall be no less than 0.25 inches. Net internal diameter (including inside linings) to be no less than net inside diameter listed. Contractor to consider installation conditions (i.e. jacking loads) which may be more extreme than those indicated by this specification and design accordingly. If, in opinion of Owner's Representative, proposed pipe wall thicknesses appear inadequate for indicated loading conditions, submittal of design calculations will be required for review.

- H. Fittings: Fabricate in accordance with AWWA M11, and AWWA C208.
1. Wall Thickness: Equal to or greater than pipe to which fitting is to be welded.
  2. Elbows: As shown on Drawings, in accordance with AWWA M11.
  3. Radius: Minimum radius of two and one-half times pipe diameter unless otherwise shown on drawings.
  4. Butt Straps for Closure Piece: Minimum 12-inch-wide split butt strap;

minimum plate thickness equal to thinnest member being joined; fabricated from material equal in chemical and physical properties to thinnest member being joined. Provide minimum lap of 4 inches between member being joined and edge of butt strap, welded on both inside and outside, unless otherwise approved by Owner's Representative. Provide minimum 6-inch welded outlet for inspecting each closure section, unless access manway is within 40 feet of closure section.

- I. Pipe Ends: Pipe ends shall be lap welded slip joint or butt strap joint.
  1. Lap Welded Slip Joint:
    - a. Lap welded slip joint shall be provided in all locations for pipe larger than 60 inches and where joints are welded for thrust restraint. Ends of pipe, fittings, and specials for field welded joints shall be prepared with one end expanded in order to receive a plain end making a bell and plain end type of joint. Clearance between the surfaces of lap joints shall not exceed 1/8 inch at any point around the periphery.
    - b. In addition to the provisions for a minimum lap of 1-1/2 inches as specified in AWWA C200, the depth of bell shall be such as to provide for a minimum distance of 1 inch between the weld and the nearest tangent of the bell radius when welds are to be located on the inside of the pipe.
    - c. Lap welded slip joints shall be welded from the inside for pipe diameters 42 inches and larger. All other sizes may be welded from either the inside or outside.
  - J. Butt Strap Closure Joints: Where necessary to make closure to pipe previously laid, closure joints shall be installed using butt strap joints in accordance with AWWA C206 and applicable provisions of this Section.
  - K. Perform x-ray, ultrasonic, or magnetic particle testing of manual welds on special pipe and fittings.
  - L. Make curves and bends by deflecting joints, or by using beveled joints, or by combination of two methods, unless otherwise indicated on Drawings or permitted by Owner's Representative. Do not exceed deflection angle at joint as recommended by pipe manufacturer. Make penetration of spigot into bell at all points of circumference at least equal to minimum required penetration shown on Drawings. Beveled pipe sections used in curved alignment to be of standard length except when shorter sections are required to limit radius of curvature, in which case all sections throughout curve are to be of equal length. Do not allow bevel to exceed 5 degrees.

## **2.2 INTERNAL LINING SYSTEMS FOR STEEL PIPE, ALL INSTALLATIONS**

- A. Supply steel pipe with epoxy lining capable of conveying water at

temperatures not greater than 140°F. Provide linings conforming to American National Standards Institute/National Sanitation Foundation (ANSI/NFS) Standard 61, and certification to be from organization accredited by ANSI. Unless otherwise noted, coat all exposed (wetted) steel parts of flanges, blind flanges, bolts, access manhole covers, with epoxy lining, as specified.

**B. Epoxy Lining:**

1. AWWA C210, color White, or approved equal for shop and field joint applied, except as modified in this Section. Provide materials from same manufacturer.
2. Protect interior surface with liquid two-part chemically cured epoxy primer specified for interior surfaces.

Surface Preparation	SSPC-SP5 White Metal Blast Cleaning 2.0 to 3.0 mils surface profile.
Prime Coat 4.0 to 6.0 mils DFT	NSF Certified Epoxy – Carboline 891 VOC, or approved equal
Finish Coat 4.0 to 6.0 mils DFT	NSF Certified Epoxy – Carboline 891 VOC, or approved equal

3. Total allowable dry film thickness for system:
  - a. Minimum: 12.0 mils
  - b. Maximum: 18.0 mils
4. Provide dry film thicknesses for approved alternate products in accordance with product’s manufacturer recommendations.
5. Lining system may consist of two or more coats of same approved alternate epoxy lining without use of separate primer.
6. Perform adhesion test on pipe 48 inches in diameter and larger in accordance with ASTM D4541. Minimum field adhesion: 700 psi. Perform test on pipe for project at frequency of one for every 1,000 square feet of epoxy lining. Perform cure test in accordance with ASTM D4752 (solvent rub test) and ASTM D3363 (pencil hardness) for each section of pipe. Repair tested areas with approved procedures.

**2.3 EXTERNAL COATING SYSTEM FOR STEEL PIPE INSTALLED ABOVEGROUND AND IN VAULTS (EXPOSED) (NOT USED)**

**2.4 EXTERNAL COATING SYSTEMS FOR STEEL PIPE**

**A. Epoxy Coating:**

Protect exterior pipe surfaces with coal tar epoxy such as Carboline Bitumastic 300 M, or approved equal. Product shall comply with AWWA

C210. Product shall be applied according to manufacturer instructions.

1. Total allowable dry film thickness for system:
  - a. Minimum: 16 mils
  - b. Maximum: 24 mils
2. Provide dry film thicknesses for approved alternate products in accordance with product's manufacturer recommendations.
3. Lining system may consist of three or more coats of same approved alternate epoxy lining without use of separate primer.
4. Perform adhesion test on pipe 48 inches in diameter and larger in accordance with ASTM D4541. Minimum field adhesion: 700 psi. Perform test on pipe for project at frequency of one for every 1,000 square feet of epoxy lining. Perform cure test in accordance with ASTM D4752 (solvent rub test) and ASTM D3363 (pencil hardness) for each section of pipe. Repair tested areas with approved procedures.

## **2.5 EXTERNAL COATING SYSTEM FOR STEEL PIPE IN TUNNEL, CASING (NOT USED)**

## **2.6 GROUT FOR JOINTS AND SPECIAL APPLICATIONS (NOT USED)**

## **2.7 CATHODIC PROTECTION (NOT USED)**

# **PART 3 - EXECUTION**

## **3.1 PIPING INSTALLATION**

1. Conform to Specification Section 33 05 23.19 Microtunneling and Pipe-Jacked Tunnels for sections of pipe to be installed via trenchless methods.
  2. Conform to Specification section 31 21 33 Trenching, Backfilling, and Compacting for Utilities for sections of pipe to be installed via open excavation methods.
- B. Comply with following:
1. Make available services of manufacturer's representative when deemed necessary by Owner's Representative. Representative to advise in aspects of installation, including, but not limited to handling and storing, cleaning and inspecting, coating and lining repair, and general construction methods as applicable to pipe.
  2. Install stulls prior to placement of pipe, bends, and fittings to prevent deflection during installation. Provide stulls (minimum of three) with end blocks shaped to fit curvature of interior surface of pipe or other appropriate configuration and material. Firmly edge and secure stulls

to blocks so that they will remain intact position during handling and installation. Provide stulls adequate to resist loads encountered without structural failure to stull members or damage to pipe. Where applicable, place stulls at such lengths so as to elongate vertical diameter of pipe as required to suit trench conditions encountered.

3. Handling and Storage: Install padded struts or stulls prior to shipping, horizontally and vertically at 10-foot intervals, or as proposed by manufacturer and approved by Owner's Representative. Spiders: Installed in joint ends of fittings. Stulls to remain in place, horizontally and vertically positioned under following conditions:
  - a. During storage and shipping.
  - b. Until welding is complete.
4. Reject and remove immediately from site pipe that arrives at site with defects in lining, including sand pockets, voids, and oversanded areas.
5. Bedding and Backfilling:
  - a. Conform to requirements of Section 31 21 33 – Trenching, Backfilling, and Compacting for Utilities.
  - b. Align pipe at proper grade prior to joint connection and do not shift after jointing operation has been completed.
  - c. Take necessary precautions during bedding and backfilling operations to prevent deformation or deflection of cylindrical shape of pipe by more than allowable pipe deflection. Do not move trench support system (trench safety system) once bedding material is compacted.
  - d. Excavate outside specified trench section for bell holes, and for spaces sufficient to permit removal of slings. Provide bell holes at proper locations for unrestricted access to joint. Form bell holes large enough to facilitate joint wrapping and to permit visual examination of process. Enlargement of bell holes as required or directed by Owner's Representative. Subsequent backfilling thereof will not be considered as authorized additional excavation and backfill. Backfill bell holes and spaces to satisfaction of Owner's Representative.
  - e. Blocking may be removed 24 hours after placing backfill to top of pavement or natural ground level.
6. Pipe Deflection: After backfill is complete, test pipe for excessive deflection by measuring actual inside vertical diameter. For maximum deflection allowable, see Section 2.1.
  - a. Deflection may be measured by Owner's Representative at location along pipe. Arithmetical averages of deflection are not

- acceptable.
- b. If deflection exceeds that specified, do one of the following:
    - 1) Remove backfill and side support. Reround the pipe and properly replace compacted backfill and side support.
    - 2) Remove entire portion of deflected pipe section and install new pipe as directed by Owner's Representative at no additional cost to Owner.
  7. Move pipe in such manner not to damage pipe or coating. Do not roll pipe nor drag on ground. Inspect and repair coating abrasions before pipe is lowered into trench.
  8. Use of dogs, clips, lugs, or equivalent devices welded to steel pipe for purpose of forcing it into position will not be permitted unless approved by Owner's Representative. Remove foreign matter and protective material from surfaces that are to be in contact at joints. Leave surfaces of joint areas thoroughly clean for metal-to-metal contact of field joints.
- C. Induced AC:
1. Where welded steel water pipelines are strung along the right-of-way of an overhead AC transmission system, induced AC current may occur. If this potential hazard exists, prepare a safety plan to be implemented during construction.
  2. Properly ground steel pipeline during construction as necessary to prevent build-up of static electricity.
  3. Electrically test where required after installation of pipeline is complete.
- D. Deviation of installed pipe in one pipe section from line and grade shown on approved shop drawing layout will not exceed 2 inches from grade and 3 inches from line. No deviation from line and grade at contract interfaces are allowed.
- E. Use adequate surveying methods, procedures, and employ competent surveying personnel to ensure pipe sections are laid to line and grade and within stipulated tolerances. Measure and record, in form approved by Owner's Representative and submit copy of data to Owner's Representative at end of that day. Survey data to include unique pipe number, deflection angle at pipe joint and whether beveled ends were used, invert elevation at pipe joint, deviation of joint from project line, deviation of joint from project grade, inside pipe joint lap measured at top, bottom, and at springline (each side).
- F. Any time that laying of additional pipe is stopped for more than 8 hours, plug ends of installed pipe and take proper precautions against flotation of pipe segments.

**3.2 EXTERNAL COATING SYSTEM FOR STEEL PIPE INSTALLED ABOVE GROUND AND IN VAULTS (EXPOSED) AND EPOXY INTERNAL LINING SYSTEM (NOT USED)**

**3.3 INTERNAL LINING AND EXTERNAL COATING SYSTEM FOR STEEL PIPE**

- A. Safety: Paints, coatings, and linings specified in this Section are hazardous materials. Vapors may be toxic or explosive. Protective equipment, approved by appropriate regulatory agency, is mandatory for personnel involved in painting, coating, and lining operations.
- B. Workmanship:
1. Application: By qualified and experienced workers who are knowledgeable in surface preparation and application of high-performance industrial coatings.
  2. Paint Application Procedures: SSPC Painting Manual, Volume 1 Good Painting Practices.
- C. Surface Preparation:
1. Use abrasive blasting to prepare surfaces to SSPC-SP10.
  2. Schedule cleaning and painting so that detrimental amounts of dust or other contaminants do not fall on wet, newly-painted surfaces. Protect surfaces not intended to be painted from effects of cleaning and painting operations.
  3. Prior to blasting, clean surfaces to be coated or lined of grease, oil and dirt by steaming or detergent cleaning in accordance with SSPC SP 1.
  4. Metal and Weld Preparation: Remove surface defects such as gouges, pits, welding and torch-cut slag, welding flux and spatter by grinding to ¼-inch minimum radius.
  5. Abrasive Material:
    - a. Blast only as much steel as can be coated within same day of blasting.
    - b. Use sharp, angular, properly graded abrasive capable of producing depth of profile specified herein. Transport abrasive to jobsite in moisture-proof bags or airtight bulk containers. Copper slag abrasives are not acceptable.
    - c. After abrasive blast cleaning, verify surface profile with replica tape such as Tes-Text Coarse or Extra Coarse Press-O-Film Tape, or approved equal. Furnish tapes to Owner's Representative.
    - d. Do not blast if metal surface may become wet before priming commences, or when metal surface is less than 5°F above



dewpoint.

6. Evaluate degree of cleanliness for surface preparation with use of SSPC Pictorial Surface Preparation Standards for Painting Steel Surfaces, SSPC-Vis 1.
7. Remove dust and abrasive residue from freshly blasted surfaces by brushing or blowing with clean, dry air. Test cleanliness by placing  $\frac{3}{4}$ -inch by 4-inch piece of clear Scotch-type tape on blasted surface, then removing and placing tape on 3 x 5 white index card. Reclean areas exhibiting dust or residue.

D. Coating and Lining Application:

1. Environmental Conditions: Do not apply when metal temperature is less than 50°F; when ambient temperature is less than 5°F above dewpoint; when expected weather conditions are such that ambient temperature will drop below 40°F within 6 hours after application; or when relative humidity is above 85 percent. Measure relative humidity and dewpoint by use of sling psychrometer in conjunction with U.S. Department of Commerce Weather Bureau Psychrometric Tables. Provide dehumidifiers for field-applied coatings and linings to maintain proper humidity levels.
2. Application Procedures:
  - a. Apply in accordance with manufacturer's recommendations and requirements of this Section. Provide finish free of runs, sags, curtains, pinholes, orange peel, fish eyes, excessive over spray, or delaminations.
  - b. Thin materials only with manufacturer's recommended thinners. Thin only amount required to adjust viscosity for temperature variations, proper atomization and flow-out. Mix material components using mechanical mixers.
  - c. Discard catalyzed materials remaining at end of day.
3. Thoroughly dry pipe before coating. Apply coating immediately after cleaning surface. Apply succeeding coats before contamination of undersurface occurs.
4. Cure minimum of 24 hours at 77°F before successive coats are applied. During curing process, provide force air ventilation in volume sufficient to maintain solvent vapor levels below published threshold limit value. Apply successive coats within recoat threshold time as recommended by coating or lining manufacturer on printed technical data sheets or through written communications. Brush blast joints of pipe which have been shop primed and are to receive intermediate and finish coats in field prior to application of additional coats. After interior coats are applied, provide forced-air ventilation in sufficient volume and for sufficient length of time to ensure proper curing before

filling pipe with water.

### **3.4 JOINTS AND JOINTING**

#### **A. Welded Joints:**

1. Field weld to be lap field joints or full penetration butt welded joints for steel pipe and encasement sleeves for entire circumference.
2. Employ independent certified testing laboratory, approved by Owner's Representative, to perform weld acceptance tests on welded joints. Include cost of such testing in contract unit price bid for water line. Furnish copies of all test reports to Owner's Representative for review. Test by magnetic particle test method for lap welds and fillet welds or by X-ray methods for butt welds, for 100 percent of all joint welds. Owner's Representative has final decision as to suitability of welds tested.
3. Repair epoxy coating damaged by welding operations in accordance with coating manufacturer recommendations.

### **3.5 INSPECTION (EXCEPT MORTAR COATED PIPE) (NOT USED)**

### **3.6 COATINGS AND LININGS INSPECTION RESPONSIBILITIES**

- #### **A. Contractor is responsible for quality control of coatings and linings applications and testing and inspection stipulated in this Section. Owner's Representative is responsible for quality assurance and reserves right to inspect or acquire services of independent third-party inspector who is fully knowledgeable and qualified to inspect surface preparation and application of high-performance coatings at phases of coatings and linings, field- or shop-applied. Contractor is responsible for proper application and performance of coatings and linings whether or not Owner's Representative provides such inspection.**

### **3.7 FIELD REPAIR PROCEDURES AND SPECIAL FITTINGS APPLICATION FOR CEMENT MORTAR LINING (NOT USED)**

### **3.8 OWNER TRAINING (NOT USED)**

**END OF SECTION**

## **SECTION 33 11 15**

### **HIGH DENSITY POLYETHYLENE (HDPE) SOLID AND PROFILE WALL PIPE**

#### **PART 1 - GENERAL**

##### **1.1 SUMMARY**

A. Section Includes:

1. High density polyethylene (HDPE) pipe for rehabilitation and extension of existing reinforced concrete pipe (RCP).

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

1. Division 00 – Proposing Requirements, Contract Forms, and Conditions of the Contract.
2. Division 01 – General Requirements.
3. Specification Sections:
  - a. Specification Section 31 21 33 – Trenching, Backfilling, and Compacting For Utilities.
  - b. Specification Section 31 71 02.02 – Tunnel and Casing Grout

##### **1.2 MEASUREMENT AND PAYMENT**

- A. Stipulated Price (Lump Sum). If Contract is a Stipulated Price Contract, payment for Work in this Section is included in total Stipulated Price.

##### **1.3 QUALITY ASSURANCE**

A. Referenced Standards:

1. American Water Works Association (AWWA):
  - a. C906 – Polyethylene (PE) pressure Pipe & Fittings, 4 inch through 63 inch for water
2. ASTM International (ASTM):
  - a. D 618 – Standard Practice for Conditioning Plastics for Testing.
  - b. D 1248 – Standard Specification for Polyethylene Plastics Extrusion Materials for Wire and Cable.
  - c. D 2239 – Standard Specification for Polyethylene (PE) Plastic Pipe (SIDR-PR) Based on Controlled Inside Diameter
  - d. D 2321 – Standard Recommended Practice for Underground Installation of Flexible Thermoplastic Pipe.
  - e. D 2657 – Standard Practice for Heat Fusion Joining Polyolefin Pipe and Fittings.
  - f. D 2774 – Standard Practice for Underground Installation of Thermoplastic Pressure Piping

- g. D 2837 – Standard Test Method for Obtaining Hydrostatic Design Basis for Thermoplastic Pipe Materials.
- h. D 3035 – Standard Specification for Polyethylene (PE) Plastic Pipe (DR-PR) Based on Controlled Outside Diameter.
- i. D 3212 – Standard Specification for Joints for Drain and Sewer Plastic Pipes Using Flexible Elastomeric Seals.
- j. D 3350 – Standard Specification for Polyethylene Plastics Pipe and Fittings Materials.
- k. F 477 – Standard Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe.
- l. F 714 – Standard Specification for Polyethylene Plastic (PE) Pipe (SDR-PR) Based on Outside Diameter.
- m. F 894 – Standard Specification for Polyethylene (PE) Large-Diameter Profile Wall Sewer and Drain Pipe.
- n. F 2487 – Standard Practice for Infiltration and Exfiltration Acceptance Testing of Installed Corrugated High Density Polyethylene Pipelines.

#### **1.4 SUBMITTALS**

- A. Conform to requirements of Specification Section 01 33 00 – Submittals.
- B. Provide manufacturer's certificate of conformance to Specifications.
- C. Submit shop drawings showing design of pipe and fittings including specials fittings required to achieve alignment and grade as shown on the Drawings, pipe section lengths, fabrication, fittings, flanges, gasket material, and special details.
- D. Submit details of Pipe Joints and jointing procedure for HDPE pipe.
- E. Submit pipe technical data.
- F. Submit details of sliplining procedure.

#### **1.5 QUALITY CONTROL**

- A. Furnish pipe and fittings that are homogeneous throughout and free from visible cracks, holes, foreign inclusions, or other injurious defects. Provide pipe as uniform as commercially practical in color, opacity, density, and other physical properties.
- B. Owner's Representative reserves right to inspect pipes or witness pipe manufacturing. Inspection shall in no way relieve manufacturer of responsibilities to provide products that comply with applicable standards and these Specifications.
  - 1. Manufacturer's Notification: Should Owner's Representative wish to witness manufacture of specific pipes, manufacturer shall provide Owner's Representative with minimum three weeks notice of when and where production of those specific pipes will take place.

2. Failure to Inspect. Approval of products or tests is not implied by Owner's Representative's decision not to inspect manufacturing, testing, or finished pipes.
- C. Pipe manufacturer to provide services of experienced, competent, and authorized representative to visit site to advise and consult Contractor during jointing and installation of pipe if requested by the Owner.

## **1.6 QUALIFICATIONS**

- A. Manufacturer: Company specializing in manufacturing the products specified in this section with documented experience of minimum 5 years of pipe installations that have been in successful, continuous service for same type of service as proposed Work.

## **1.7 WARRANTY (NOT USED)**

- A. The pipe shall be warranted one year by the pipe supplier.
- B. The fusion services (if applicable) shall be warranted for one year by the fusion service provider.

## **PART 2 - PRODUCTS**

### **2.1 GENERAL**

- A. Provide solid wall and profile wall HDPE pipe based on the intended service as described herein and as shown on the Drawings.
- B. Mark each standard and random length of pipe in compliance with these Specifications with following information:
  1. Pipe size.
  2. Pipe class.
  3. Production code.
  4. Material designation.

### **2.2 MATERIALS**

- A. HDPE pipe shall be "DRISCOPLEX Series" as manufactured by Performance Pipe, or approved equal.
- B. Furnish solid wall pipe with plain end construction for heat joining (butt fusion) conforming to ASTM D 2657 for pressure applications. Utilize controlled temperatures and pressures for joining to produce fused leak-free joint.
- C. Furnish solid wall pipe with minimum working pressure rating of 63 psi, and with inside diameter equal to or greater than 48 inches.
- D. All piping system components shall be the products of one manufacturer and shall conform to the latest edition of ASTM D 1248, ASTM D 3350, ASTM F 714, and AWWA C 906.
- E. Piping and bends shall be extruded from a polyethylene compound and shall conform to the following requirements:

1. The polyethylene resin shall meet or exceed the requirements of ASTM D 3350 for PE 3408 material with a cell classification of 335434C, or better.
  2. The polyethylene compound shall be suitably protected against degradation by ultraviolet light by means of carbon black, well dispersed by pre-compounding in a concentration of not less than 2 percent.
  3. The maximum allowable hoop stress shall be 800 psi at 73.4 degrees F.
  4. The pipe manufacturer shall be listed with the Plastic Pipe Institute as meeting the recipe and mixing requirements of the resin manufacturer for the resin used to manufacture the pipe in this project.
  5. The pipe and bends shall have a minimum standard dimension ratio (SDR) wall thickness of SDR 32.5 and a minimum working pressure of 63 psi.
  6. Joining shall be performed by thermal butt-fusion in accordance with the manufacturer's recommendations.
- F. Each HDPE pipe section for water service shall also be marked with:
1. Dimension ratio or standard dimension ratio.
  2. AWWA pressure class.
  3. AWWA standard designation number.
  4. NSF-61 mark verifying suitability for potable water service.
  5. Extrusion production record code.
  6. Trademark or trade name.
  7. Cell classification of HDPE material code.

G. Connections and fittings for pressure application

### **2.3 MATERIALS FOR GRAVITY SANITARY SEWERS (NOT USED)**

### **2.4 MATERIALS FOR FORCE MAIN SANITARY SEWERS (NOT USED)**

### **2.5 MATERIALS FOR GRAVITY STORM SEWERS AND STORM SEWER CULVERTS (NOT USED)**

## **PART 3 - EXECUTION**

### **3.1 TRANSPORTATION AND STORAGE**

- A. All of the pipe supplier's guidelines shall be followed for transportation and storage of the pipe.
- B. Care shall be taken during transportation of the pipe to ensure that it is not cut, kinked, or otherwise damaged.
- C. Pipes shall be stored on level ground free of sharp objects which could damage the pipe.

- D. Stacking of the pipe shall be limited to a height that will not cause excessive deformation of the bottom layers of pipes under anticipated temperature condition.
- E. Where necessary due to ground conditions, the pipe shall be stored on wooden sleepers, spaced suitably and of such widths as not to allow deformation of the pipe at the point of contact with the sleeper or between supports.
- F. Any pipe damage during transportation or storage shall be replaced by the contractor at the contractor's expense.

### **3.2 INSTALLATION**

- A. Install pipe in accordance with the manufacturers recommended installation procedures and ASTM D 2774.
- B. Bedding and backfill: Conform to requirements of Section 31 21 33 – Trenching, Backfilling, and Compacting for Utilities.
- C. Use only workmen trained in the installation of HDPE Pipe.
- D. Do not store pipe uncovered direct in direct sunlight. Allow pipe temperature to approach ground temperature before each individual pipe section is terminally connected.
- E. Fusion joints: Meet minimum requirements of manufacturer for cool down time and other fusing requirements. Socket fusion and extrusion welding or hot gas welding will not be accepted. Join sections of HDPE pipe into continuous lengths above ground by thermal butt fusion method in accordance with AWWA C906 and pipe manufacturer's recommendations for specified service.
- F. Cutting pipe: Comply with pipe manufacturer's recommendations. After cutting, leave end pipe in accordance with manufacturer's recommendations.
- G. Sliplining pipe: do not exceed the maximum pulling force as specified in Chapter 11 of the Plastic Pipe Institute Handbook of PE pipe.

### **3.3 OWNER TRAINING (NOT USED)**

**END OF SECTION**

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**SECTION 33 11 16**  
**GEOPOLYMER LINING SYSTEM**

**PART 1 - GENERAL**

**1.1 SUMMARY**

A. Section Includes:

1. Geopolymer liner system for existing 60-inch RCP bypass pipe.

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

1. Division 00 – Proposal Requirements, Contract Forms and Conditions of the Contract
2. Division 01 – General Requirements

**1.2 MEASUREMENT AND PAYMENT**

A. Stipulated Price (Lump Sum). If Contract is a Stipulated Price Contract, payment for Work in this Section is included in total Stipulated Price.

**1.3 QUALITY ASSURANCE**

A. Reference Standards – 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.

1. American Association of State Highway and Transportation Officials (AASHTO).
2. ASTM International (ASTM):
  - a. C33, Standard Specification for Concrete Aggregates
  - b. C39/C109 , Compressive Strength Hydraulic Cement Mortars
  - c. C78/C293/C348, Flexural Strength of Concrete
  - d. C138/C642, Standard Test Method for Density
  - e. C267, Chemical Resistance of Mortars, Grouts, and Monolithic Surfacing and Polymer Concretes
  - f. C469, Static Modulus of Elasticity & Poisson's Ratio of Concrete Compression
  - g. C496, Splitting Tensile Strength of Cylindrical Concrete Specimens
  - h. C666, Freeze Thaw Durability
  - i. C321/C882, Bond Strength of Epoxy-Resin Systems Used with Concrete by Slant Shear
  - j. C1090, Shrinkage Test
  - k. C1138, Standard Test Method for Abrasion Resistance of Concrete (Underwater Method)

- I. C1140-03A, Preparing and Testing Specimens from Shotcrete Test Panels
- m. C1202, Electrical Indication of Concrete's Ability to Resist Chloride Ion Penetration
- 3. American Concrete Institute (ACI):
  - a. 305R-99 Hot Weather Concreting
  - b. 306R-88 Cold Weather Concreting
  - c. ACI Certified Concrete Field Testing Technician, Level 1
- 4. International Organization for Standardization (ISO):
  - a. ISO 9000, Quality Management System - Fundamentals and Vocabulary.
- 5. Occupational Safety and Health Administration (OSHA).

#### **1.4 SUBMITTALS**

- A. See Specification Section 01 33 00 – Submittals for requirements for the mechanics and administration of the submittal process.
- B. Product Data:
  - 1. Geopolymer Liner:
    - a. Tabular summary by pipe segment noting required liner thickness per section
    - b. Manufacturer's recommended installation methods
- C. Shop Drawings:
  - 1. Provide calculations by Professional Engineer Registered in Texas to support Geopolymer Liner design thickness after curing.
  - 2. List the following criteria used for the calculations:
    - a. Assumed host pipe condition
    - b. Ground water table elevation
    - c. Depth of cover at deepest location
    - d. Modulus of soil stiffness
    - e. Long term modulus of elasticity
    - f. Live loading
    - g. Factor of safety against buckling
    - h. Assumed pipe ovality
- D. Certificates:

1. Furnish an affidavit certifying that all liner meets the provisions of this Specification Section and meets the requirements of above referenced ASTM standards.
2. Contractor shall submit a certified statement from the Manufacturer that he/she is a certified and/or licensed installer of the liner.
3. Submittal required from Manufacturer certifying that all materials have been approved for the installation conditions shown on the Drawings and as specified.
4. Submittals for Manufacturer's & Installer's warranty certificate and Installer's job history & reference certificate required.

E. Source Quality Control Submittals:

1. Manufacturer to provide third party test results supporting the long term performance and structural strength of the pipe being manufactured.

**1.5 QUALITY CONTROL**

A. Qualifications:

1. Manufacturing and Installation:

- a. Finished pipe shall be the product of one manufacturer.
- b. Liner manufacturing operations shall be performed at one location.
- c. The Manufacturer shall have performed a minimum of 5,000 LF of successful Geopolymer liner installation in the United States
- d. The Installer shall submit documentation and verifiable references that they have installed a minimum of 5,000 LF large diameter (>36 inch) horizontal pipe using the proposed lining system.

B. Certifications:

1. Manufacturing and Installation:

- a. Operate pipe manufacturing and installation under a quality management system certified by third party ISO 9000. Provide proof of certification upon request.
- b. If Installer is different company than Manufacturer, then installer must provide certification from the manufacturer that he/she is licensed and fully trained as an installer of the product upon request.
- c. Manufacturer shall submit a letter of certification that the product meets or exceeds all technical and packaging requirements
- d. Manufacturer shall submit original third-party verification of material formulation via XRF (X-ray Fluorescence) data.

**1.6 WARRANTY (NOT USED)**

## **PART 2 - PRODUCTS**

### **2.1 GENERAL**

#### A. Products:

1. All liner furnished and installed shall be in conformance with the ASTM standards referenced in this specification.
2. Subject to compliance with the Contract Documents, the following manufacturers/products are acceptable.
  - a. Ecocast, or approved equal.
3. Submit request for substitution in accordance with Specification Section 01 25 13 – Product Substitutions.

#### B. Performance / Design Criteria:

##### 1. Liner (tube):

- a. Design liner for a 50-year service life under continuous loading conditions.
- b. Base design on a fully deteriorated host pipe condition.
- c. Calculate wall thickness per Manufacturer's recommendation. Assume the following values for the design:
  - Safety Factor (N) = 2.0
  - Ovality (C) = 5 percent
  - Enhancement Factor (K) = 7.0
  - Groundwater Depth (Hw) = See 2015 Geotechnical Report
  - Soil Depth (H) = approximately 10, feet
  - Soil Modulus (E') = 1,000, psi
  - Soil Density (w) = 121-135 pounds per cubic foot
  - Live Load = ASSHTO HS 20

2. The minimum allowable liner thickness shall be 1.5-inches for all pipes with internal diameter of 54-inches or greater.

#### C. Materials:

##### 1. Liner:

- a. The liner shall be a micro-fiber reinforced ultra-dense Geopolymer.
- b. Construct liner to withstand installation pressures, have sufficient strength to bridge missing pipe and stretch to fit irregular pipe sections.
- c. The material shall provide a high strength fiber reinforced mortar specifically designed for ease of mechanical pumping, spraying and spin casting.
- d. Geopolymer mortar composition and strength shall be per Manufacturer's recommendation based on design as shown in Drawings.

- e. When finished, the Geopolymer liner shall have a homogenous and monolithic total wall thickness.
- f. The liner shall be compatible with the thermal and chemical conditions of the existing siphon structures.

## **PART 3 – EXECUTION**

### **3.1 INSTALLATION**

#### **A. Inspection**

1. Prior to installation, conduct an inspection of the existing pipe identified for rehabilitation along with the surrounding job site conditions.
2. Verify accessibility conditions and coordinate with Drawings and Owner regarding easement access and limitations.
3. Confirm full circumference of the host pipe prior to lining to ensure the pipe can be rehabilitated without compromising the geopolymer liner system.

#### **B. Host Pipe Preparation:**

1. Clean the pipe per material Manufacturer's requirements.
2. Inspect pipe as required by this Specification.

#### **C. Geopolymer Lining Material Preparation:**

1. Contractor shall mix geopolymer material for Manufacturer's recommended water cement ratio.
2. The mixing water temperature must be recorded in the daily operational log at multiple times throughout the day during the installation process. If water temperatures exceed 80°F, then the water should be chilled to 80°F or lower.
3. The Geopolymer lining material shall be mixed in a high shear mixer to ensure thorough and uniform mix of water with materials prior to pumping.
4. The mixing operation must be performed so that dust released into the surrounding environment is minimized.
5. Pumps must be equipped with multiple sensors that stop the pump if material either runs out or is overflowing.

#### **D. Safety:**

1. Carry out operation in accordance with all OSHA and manufacturer's safety requirements including, but not limited to, safety requirements involving confined space entry.

#### **E. Geopolymer Liner installation:**

1. The necessary equipment and application methods to apply the liner materials shall be only as approved by the material Manufacturer. Material shall be mixed in accordance with Manufacturer's specifications to proper consistency,

then the materials shall be pumped through a material plaster hose for delivery to the appropriate and/or selected application device.

2. The mortar delivery hose shall be coupled to a high-speed rotating applicator device. The rotating casting applicator shall then be positioned within the center, or positioned higher inside the pipe, as required by the diameter of the pipe.
3. The spin cast nozzle must be capable of bidirectional operation.
4. The high-speed rotating applicator shall then be initialized, and pumping of the material shall commence. As the material begins to be centrifugally cast evenly around the interior of the cavity the rotating applicator head shall uniformly travel back and forth at or near the center point of the pipe at a controlled frequency conducive to providing a uniform material thickness to the pipe walls. Controlled multiple passes shall then be made until the specified minimum finished thickness is attained.
5. If the procedure is interrupted for any reason, the operator shall arrest the retrieval of the applicator head until flows are recommenced.
6. Spraying shall be performed by starting at the pipe end-project location and progressing towards the entrance of the pipe. The geopolymer liner shall be applied to a specified minimum thickness and can be applied in multiple passes.
7. The geopolymer lining material shall be applied to a damp surface, with no flowing water.

C. Curing:

1. Follow Manufacturer's recommended cure schedule in curing of the geopolymer liner. The material must be allowed to cure a minimum of 2 hours or until the material has reached an initial set condition, whichever is longer prior to the release of bypass or flow through the pipe.
2. Proper steps shall be taken to ensure the material is cured in a moist and moderate climate. When situations or dry and/or hot conditions are present, the use of a wind barrier and fogging spray may be required.
3. The geopolymer liner should not be placed when the ambient temperature is 37°F and falling, or when the temperature is anticipated to fall below 32°F during the next 24 hours, unless specific precautions are employed.
4. Installation and curing are to be done in accordance with ACI 305R-99 "Hot Weather Concreting", and/or ACI 306R-88 "Cold Weather Concreting" when required.

### **3.2 FIELD QUALITY CONTROL**

A. Field Tests and Inspections:

1. Closed Circuit Television (CCTV) Inspection
  - a. Perform Post-CCTV Inspection.

2. The inspection must be completed and the quality of installation must be acceptable to the Owner prior to restoring services.
3. If the Geopolymer Lining is deemed unacceptable by the Owner, provide a method of repair or replacement for review and approval by the Owner.

**END OF SECTION**

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