CITY OF ENNIS, TEXAS

CONTRACT DOCUMENTS

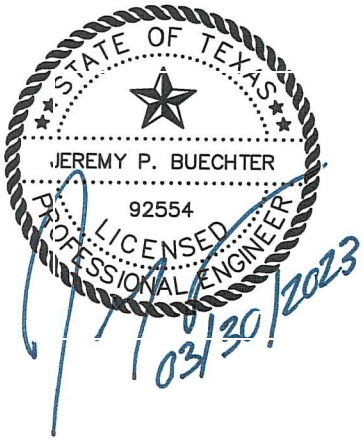
AND

TECHNICAL SPECIFICATIONS

FOR

WTP LAGOON UPGRADES

SCHAUMBURG & POLK, INC.
BEAUMONT | HOUSTON | RICHARDSON
KYLE | PORT ARTHUR | TERRELL | TYLER
320 S. Broadway Ave, Suite 200
Tyler, TX 75702
903.595.3913
Firm Registration No. F-520



SET NO.	JOB NO. 923239.00
	DATE 03/23

MARCH 2023

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BIDDING REQUIREMENTS

ADVERTISEMENT AND INVITATION FOR BIDS

The City of Ennis will receive bids for WTP Lagoon Upgrades. Bids will be received until 11:00 am on Thursday, May 4, 2023, at Ennis Public Works Facility, 500 Lake Bardwell Dr., Ennis, TX 75119. The bids will be publicly opened and read aloud at 11:00 am on Thursday, May 4, 2023, at Ennis Public Works Facility, 500 Lake Bardwell Dr., Ennis, TX 75119. Bids received after 11:00 am will be returned, unopened.

Bid/Contract Documents, including Drawings and Technical Specifications, are on file at Schaumburg & Polk, Inc., 320 S Broadway Ave, Suite 200, Tyler, TX 75702, and at Ennis Public Works Facility, 500 Lake Bardwell Dr., Ennis, TX 75119.

PLANS & SPECIFICATIONS may be examined without charge at Ennis Public Works Facility. Bid forms and plans may be examined or obtained at the office of Schaumburg & Polk, Inc., 320 S. Broadway Ave, Suite 200, Tyler, Texas 75702. One copy of each set of documents may be obtained from Schaumburg & Polk, Inc., upon payment of $60.00. No refunds will be made. Plans can also be found online at www.isqft.com or www.civcastusa.com.

A Bidder's Bond, Certified or Cashier's Check in an amount not less than (5%) of the total bid shall accompany each bid as a guarantee that, if awarded the contract, the bidder will promptly enter into a contract with the City of Ennis, Texas.

This project will include rehabilitation of existing lagoons, including reconstruction of banks and berms, rehabilitation of liners, reconstruction of outfall structures, piping upgrades, manholes, valves, and other miscellaneous items of construction.

The project is to be substantially complete within 90 calendar days from the notice to proceed and shall be fully complete within 120 calendar days from the notice to proceed. Liquidated damages of $300.00 per day shall be assessed for any days in which contract time is exceeded.

No bidder may withdraw his bid within ninety (90) days after the actual date of the opening thereof.

The City of Ennis reserves the right to reject any and all bids.

Adv. Dates: 04/02/2023
04/09/2023

City of Ennis
By: Angeline Juenemann
Title: Mayor

INSTRUCTIONS TO BIDDERS

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ARTICLE 1 – DEFINED TERMS

1.01 Terms used in these Instructions to Bidders have the meanings indicated in the General Conditions and Supplementary Conditions. Additional terms used in these Instructions to Bidders have the meanings indicated below:

A. *Issuing Office* – The office from which the Bidding Documents are to be issued.

ARTICLE 2 – COPIES OF BIDDING DOCUMENTS

2.01 Complete sets of the Bidding Documents may be obtained from the Issuing Office in the number and format stated in the advertisement or invitation to bid.

2.02 Complete sets of Bidding Documents shall be used in preparing Bids; neither Owner nor Engineer assumes any responsibility for errors or misinterpretations resulting from the use of incomplete sets of Bidding Documents.

2.03 Owner and Engineer, in making copies of Bidding Documents available on the above terms, do so only for the purpose of obtaining Bids for the Work and do not authorize or confer a license for any other use.

ARTICLE 3 – QUALIFICATIONS OF BIDDERS

3.01 To demonstrate Bidder's qualifications to perform the Work, after submitting its Bid and within [10] days of Owner's request, Bidder shall submit (a) written evidence establishing its qualifications such as financial data, previous experience, and present commitments, and (b) the following additional information:

A. [Evidence of Bidder's authority to do business in the state where the Project is located.]

B. [Bidder's state or other contractor license number, if applicable.]

C. [Subcontractor and Supplier qualification information; coordinate with provisions of Article 12 of these Instructions, "Subcontractors, Suppliers, and Others."]

D. [Other required information regarding qualifications]

3.02 A Bidder's failure to submit required qualification information within the times indicated may disqualify Bidder from receiving an award of the Contract.

3.03 No requirement in this Article 3 to submit information will prejudice the right of Owner to seek additional pertinent information regarding Bidder's qualifications.

3.04 Bidder is advised to carefully review those portions of the Bid Form requiring Bidder's representations and certifications.

ARTICLE 4 – SITE AND OTHER AREAS; EXISTING SITE CONDITIONS; EXAMINATION OF SITE; OWNER'S SAFETY PROGRAM; OTHER WORK AT THE SITE

4.01 *Site and Other Areas*

A. The Site is identified in the Bidding Documents. By definition, the Site includes rights-of-way, easements, and other lands furnished by Owner for the use of the Contractor. Any additional lands required for temporary construction facilities, construction equipment, or storage of materials and equipment, and any access needed for such additional lands, are to be obtained and paid for by Contractor.

4.02 *Existing Site Conditions*

A. Subsurface and Physical Conditions; Hazardous Environmental Conditions

1. The Supplementary Conditions identify:

a. those reports known to Owner of explorations and tests of subsurface conditions at or adjacent to the Site.

b. those drawings known to Owner of physical conditions relating to existing surface or subsurface structures at the Site (except Underground Facilities).

c. reports and drawings known to Owner relating to Hazardous Environmental Conditions that have been identified at or adjacent to the Site.

d. Technical Data contained in such reports and drawings.

2. Owner will make copies of reports and drawings referenced above available to any Bidder on request. These reports and drawings are not part of the Contract Documents, but the Technical Data contained therein upon whose accuracy Bidder is entitled to rely, as provided in the General Conditions, has been identified and established in the Supplementary Conditions. Bidder is responsible for any interpretation or conclusion Bidder draws from any Technical Data or any other data, interpretations, opinions, or information contained in such reports or shown or indicated in such drawings.

3. If the Supplementary Conditions do not identify Technical Data, the default definition of Technical Data set forth in Article 1 of the General Conditions will apply.

4. Geotechnical Baseline Report: The Bidding Documents contain a Geotechnical Baseline Report (GBR). The GBR describes certain select subsurface conditions that are anticipated to be encountered by Contractor during construction in specified locations ("Baseline Conditions"). The GBR is a Contract Document.

The Baseline Conditions in the GBR are intended to reduce uncertainty and the degree of contingency in submitted Bids. However, Bidders cannot rely solely on the Baseline Conditions. Bids should be based on a comprehensive approach that includes an independent review and analysis of the GBR, all other Contract Documents, Technical Data, other available information, and observable surface conditions. Not all potential subsurface conditions are baselined.

Nothing in the GBR is intended to relieve Bidders of the responsibility to make their own determinations regarding construction costs, bidding strategies, and Bid prices, nor of the responsibility to select and be responsible for the means, methods, techniques, sequences, and procedures of construction, and for safety precautions and programs incident thereto.

B. Underground Facilities: Information and data shown or indicated in the Bidding Documents with respect to existing Underground Facilities at or adjacent to the Site are set forth in the Contract Documents and are based upon information and data furnished to Owner and Engineer by owners of such Underground Facilities, including Owner, or others.

C. Adequacy of Data: Provisions concerning responsibilities for the adequacy of data furnished to prospective Bidders with respect to subsurface conditions, other physical conditions, and Underground Facilities, and possible changes in the Bidding Documents due to differing or unanticipated subsurface or physical conditions appear in Paragraphs 5.03, 5.04, and 5.05 of the General Conditions. Provisions concerning responsibilities for the adequacy of data

furnished to prospective Bidders with respect to a Hazardous Environmental Condition at the Site, if any, and possible changes in the Contract Documents due to any Hazardous Environmental Condition uncovered or revealed at the Site which was not shown or indicated in the Drawings or Specifications or identified in the Contract Documents to be within the scope of the Work, appear in Paragraph 5.06 of the General Conditions.

4.03 *Site Visit and Testing by Bidders*

A. Bidder shall conduct the required Site visit during normal working hours, and shall not disturb any ongoing operations at the Site.

B. Bidder is not required to conduct any subsurface testing, or exhaustive investigations of Site conditions.

C. On request, and to the extent Owner has control over the Site, and schedule permitting, the Owner will provide Bidder access to the Site to conduct such additional examinations, investigations, explorations, tests, and studies as Bidder deems necessary for preparing and submitting a successful Bid. Owner will not have any obligation to grant such access if doing so is not practical because of existing operations, security or safety concerns, or restraints on Owner's authority regarding the Site.

D. Bidder shall comply with all applicable Laws and Regulations regarding excavation and location of utilities, obtain all permits, and comply with all terms and conditions established by Owner or by property owners or other entities controlling the Site with respect to schedule, access, existing operations, security, liability insurance, and applicable safety programs.

E. Bidder shall fill all holes and clean up and restore the Site to its former condition upon completion of such explorations, investigations, tests, and studies.

4.04 *Owner's Safety Program*

A. Site visits and work at the Site may be governed by an Owner safety program. As the General Conditions indicate, if an Owner safety program exists, it will be noted in the Supplementary Conditions.

4.05 *Other Work at the Site*

A. Reference is made to Article 8 of the Supplementary Conditions for the identification of the general nature of other work of which Owner is aware (if any) that is to be performed at the Site by Owner or others (such as utilities and other prime contractors) and relates to the Work contemplated by these Bidding Documents. If Owner is party to a written contract for such other work, then on request, Owner will provide to each Bidder access to examine such contracts (other than portions thereof related to price and other confidential matters), if any.

ARTICLE 5 – BIDDER'S REPRESENTATIONS

5.01 It is the responsibility of each Bidder before submitting a Bid to:

A. examine and carefully study the Bidding Documents, and any data and reference items identified in the Bidding Documents;

B. visit the Site, conduct a thorough, alert visual examination of the Site and adjacent areas, and become familiar with and satisfy itself as to the general, local, and Site conditions that may affect cost, progress, and performance of the Work;

C. become familiar with and satisfy itself as to all Laws and Regulations that may affect cost, progress, and performance of the Work;

D. carefully study all: (1) reports of explorations and tests of subsurface conditions at or adjacent to the Site and all drawings of physical conditions relating to existing surface or subsurface structures at the Site that have been identified in the Supplementary Conditions, especially with respect to Technical Data in such reports and drawings, and (2) reports and drawings relating to Hazardous Environmental Conditions, if any, at or adjacent to the Site that have been identified in the Supplementary Conditions, especially with respect to Technical Data in such reports and drawings;

E. consider the information known to Bidder itself; information commonly known to contractors doing business in the locality of the Site; information and observations obtained from visits to the Site; the Bidding Documents; and the Site-related reports and drawings identified in the Bidding Documents, with respect to the effect of such information, observations, and documents on (1) the cost, progress, and performance of the Work; (2) the means, methods, techniques, sequences, and procedures of construction to be employed by Bidder; and (3) Bidder's safety precautions and programs;

F. agree, based on the information and observations referred to in the preceding paragraph, that at the time of submitting its Bid no further examinations, investigations, explorations, tests, studies, or data are necessary for the determination of its Bid for performance of the Work at the price bid and within the times required, and in accordance with the other terms and conditions of the Bidding Documents;

G. become aware of the general nature of the work to be performed by Owner and others at the Site that relates to the Work as indicated in the Bidding Documents;

H. promptly give Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Bidder discovers in the Bidding Documents and confirm that the written resolution thereof by Engineer is acceptable to Bidder;

I. determine that the Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for the performance and furnishing of the Work; and

J. agree that the submission of a Bid will constitute an incontrovertible representation by Bidder that Bidder has complied with every requirement of this Article, that without exception the Bid and all prices in the Bid are premised upon performing and furnishing the Work required by the Bidding Documents.

ARTICLE 6 – PRE-BID CONFERENCE

6.01 A pre-Bid conference will be held at the time and location stated in the invitation or advertisement to bid. Representatives of Owner and Engineer will be present to discuss the Project. Bidders are encouraged to attend and participate in the conference. Engineer will transmit to all prospective Bidders of record such Addenda as Engineer considers necessary in response to questions arising at the conference. Oral statements may not be relied upon and will not be binding or legally effective.

ARTICLE 7 – INTERPRETATIONS AND ADDENDA

7.01 All questions about the meaning or intent of the Bidding Documents are to be submitted to Engineer in writing. Interpretations or clarifications considered necessary by Engineer in

response to such questions will be issued by Addenda delivered to all parties recorded as having received the Bidding Documents. Questions received less than seven days prior to the date for opening of Bids may not be answered. Only questions answered by Addenda will be binding. Oral and other interpretations or clarifications will be without legal effect.

7.02 Addenda may be issued to clarify, correct, supplement, or change the Bidding Documents.

ARTICLE 8 – BID SECURITY

8.01 A Bid must be accompanied by Bid security made payable to Owner in an amount of [5] percent of Bidder's maximum Bid price (determined by adding the base bid and all alternates) and in the form of a certified check, bank money order, or a Bid bond (on the form included in the Bidding Documents) issued by a surety meeting the requirements of Paragraphs 6.01 and 6.02 of the General Conditions.

8.02 The Bid security of the apparent Successful Bidder will be retained until Owner awards the contract to such Bidder, and such Bidder has executed the Contract Documents, furnished the required contract security, and met the other conditions of the Notice of Award, whereupon the Bid security will be released. If the Successful Bidder fails to execute and deliver the Contract Documents and furnish the required contract security within 15 days after the Notice of Award, Owner may consider Bidder to be in default, annul the Notice of Award, and the Bid security of that Bidder will be forfeited. Such forfeiture shall be Owner's exclusive remedy if Bidder defaults.

8.03 The Bid security of other Bidders that Owner believes to have a reasonable chance of receiving the award may be retained by Owner until the earlier of seven days after the Effective Date of the Contract or 61 days after the Bid opening, whereupon Bid security furnished by such Bidders will be released.

8.04 Bid security of other Bidders that Owner believes do not have a reasonable chance of receiving the award will be released within seven days after the Bid opening.

ARTICLE 9 – CONTRACT TIMES

9.01 The number of days within which, or the dates by which the Work is to be substantially completed, and completed and ready for final payment, are set forth in the Agreement.

ARTICLE 10 – LIQUIDATED DAMAGES

10.01 Provisions for liquidated damages, if any, for failure to timely attain a Milestone, Substantial Completion, or completion of the Work in readiness for final payment, are set forth in the Agreement.

ARTICLE 11 – SUBSTITUTE AND "OR-EQUAL" ITEMS

11.01 The Contract for the Work, as awarded, will be on the basis of materials and equipment specified or described in the Bidding Documents without consideration during the bidding and Contract award process of possible substitute or "or-equal" items. In cases in which the Contract allows the Contractor to request that Engineer authorize the use of a substitute or "or-equal" item of material or equipment, application for such acceptance may not be made to and will not be considered by Engineer until after the Effective Date of the Contract.

ARTICLE 12 – SUBCONTRACTORS, SUPPLIERS, AND OTHERS

12.01 A Bidder shall be prepared to retain specific Subcontractors, Suppliers, or other individuals or entities for the performance of the Work if required by the Bidding Documents (most commonly in the Specifications) to do so. If a prospective Bidder objects to retaining any such Subcontractor, Supplier, or other individual or entity, and the concern is not relieved by an Addendum, then the prospective Bidder should refrain from submitting a Bid.

12.02 Subsequent to the submittal of the Bid, Owner may not require the Successful Bidder or Contractor to retain any Subcontractor, Supplier, or other individual or entity against which Contractor has reasonable objection.

12.03 The apparent Successful Bidder, and any other Bidder so requested, shall within five days after Bid opening, submit to Owner a list of the Subcontractors or Suppliers proposed for the following portions of the Work: ***[drafter should here list key categories of the Work; depending on the Project this might include electrical, fire protection, major equipment items, etc.]***.

If requested by Owner, 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, or other individual or entity. If Owner or Engineer, after due investigation, has reasonable objection to any proposed Subcontractor, Supplier, individual, or entity, Owner may, before the Notice of Award is given, request apparent Successful Bidder to submit an acceptable substitute, in which case apparent Successful Bidder shall submit a substitute, Bidder's Bid price will be increased (or decreased) by the difference in cost occasioned by such substitution, and Owner may consider such price adjustment in evaluating Bids and making the Contract award.

12.04 If apparent Successful Bidder declines to make any such substitution, Owner may award the Contract to the next lowest Bidder that proposes to use acceptable Subcontractors, Suppliers, or other individuals or entities. Declining to make requested substitutions will constitute grounds for forfeiture of the Bid security of any Bidder. Any Subcontractor, Supplier, individual, or entity so listed and against which Owner or Engineer makes no written objection prior to the giving of the Notice of Award will be deemed acceptable to Owner and Engineer subject to subsequent revocation of such acceptance as provided in Paragraph 7.06 of the General Conditions.

ARTICLE 13 – PREPARATION OF BID

13.01 The Bid Form is included with the Bidding Documents.

A. All blanks on the Bid Form shall be completed in ink and the Bid Form signed in ink. Erasures or alterations shall be initialed in ink by the person signing the Bid Form. A Bid price shall be indicated for each section, Bid item, alternate, adjustment unit price item, and unit price item listed therein.

B. If the Bid Form expressly indicates that submitting pricing on a specific alternate item is optional, and Bidder elects to not furnish pricing for such optional alternate item, then Bidder may enter the words "No Bid" or "Not Applicable."

13.02 A Bid by a corporation shall be executed in the corporate name by a corporate officer (whose title must appear under the signature), accompanied by evidence of authority to sign. The corporate address and state of incorporation shall be shown.

13.03 A Bid by a partnership shall be executed in the partnership name and signed by a partner (whose title must appear under the signature), accompanied by evidence of authority to sign. The partnership's address for receiving notices shall be shown.

13.04 A Bid by a limited liability company shall be executed in the name of the firm by a member or other authorized person and accompanied by evidence of authority to sign. The state of formation of the firm and the firm's address for receiving notices shall be shown.

13.05 A Bid by an individual shall show the Bidder's name and address for receiving notices.

13.06 A Bid by a joint venture shall be executed by an authorized representative of each joint venturer in the manner indicated on the Bid Form. The joint venture's address for receiving notices shall be shown.

13.07 All names shall be printed in ink below the signatures.

13.08 The Bid shall contain an acknowledgment of receipt of all Addenda, the numbers of which shall be filled in on the Bid Form.

13.09 Postal and e-mail addresses and telephone number for communications regarding the Bid shall be shown.

13.10 The Bid shall contain evidence of Bidder's authority and qualification to do business in the state where the Project is located, or Bidder shall covenant in writing to obtain such authority and qualification prior to award of the Contract and attach such covenant to the Bid. Bidder's state contractor license number, if any, shall also be shown on the Bid Form.

ARTICLE 14 – BASIS OF BID

14.01 Base Bid with Alternates

A. Bidders shall submit a Bid on a lump sum basis for the base Bid and include a separate price for each alternate described in the Bidding Documents and as provided for in the Bid Form. The price for each alternate will be the amount added to or deleted from the base Bid if Owner selects the alternate.

B. In the comparison of Bids, alternates will be applied in the same order of priority as listed in the Bid Form.

14.02 *Unit Price*

A. Bidders shall submit a Bid on a unit price basis for each item of Work listed in the unit price section of the Bid Form.

B. The "Bid Price" (sometimes referred to as the extended price) for each unit price Bid item will be the product of the "Estimated Quantity" (which Owner or its representative has set forth in the Bid Form) for the item and the corresponding "Bid Unit Price" offered by the Bidder. The total of all unit price Bid items will be the sum of these "Bid Prices"; such total will be used by Owner for Bid comparison purposes. The final quantities and Contract Price will be determined in accordance with Paragraph 13.03 of the General Conditions.

C. 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.

14.03 *Allowances*

A. For cash allowances the Bid price shall include such amounts as the Bidder deems proper for Contractor's overhead, costs, profit, and other expenses on account of cash allowances,

if any, named in the Contract Documents, in accordance with Paragraph 13.02.B of the General Conditions.

ARTICLE 15 – SUBMITTAL OF BID

15.01 With each copy of the Bidding Documents, a Bidder is furnished one separate unbound copy of the Bid Form, and, if required, the Bid Bond Form. The unbound copy of the Bid Form is to be completed and submitted with the Bid security and the other documents required to be submitted under the terms of Article 7 of the Bid Form.

15.02 A Bid shall be received no later than the date and time prescribed and at the place indicated in the advertisement or invitation to bid and shall be enclosed in a plainly marked package with the Project title (and, if applicable, the designated portion of the Project for which the Bid is submitted), the name and address of Bidder, and shall be accompanied by the Bid security and other required documents. If a Bid is sent by mail or other delivery system, the sealed envelope containing the Bid shall be enclosed in a separate package plainly marked on the outside with the notation "BID ENCLOSED." A mailed Bid shall be addressed to [Ennis Public Works Facility, 500 Lake Bardwell Dr., Ennis, TX 75119].

15.03 Bids received after the date and time prescribed for the opening of bids, or not submitted at the correct location or in the designated manner, will not be accepted and will be returned to the Bidder unopened.

ARTICLE 16 – MODIFICATION AND WITHDRAWAL OF BID

16.01 A Bid may be withdrawn by an appropriate document duly executed in the same manner that a Bid must be executed and delivered to the place where Bids are to be submitted prior to the date and time for the opening of Bids. Upon receipt of such notice, the unopened Bid will be returned to the Bidder.

16.02 If a Bidder wishes to modify its Bid prior to Bid opening, Bidder must withdraw its initial Bid in the manner specified in Paragraph 16.01 and submit a new Bid prior to the date and time for the opening of Bids.

16.03 If within 24 hours after Bids are opened any Bidder files a duly signed written notice with Owner and promptly thereafter demonstrates to the reasonable satisfaction of Owner that there was a material and substantial mistake in the preparation of its Bid, that Bidder may withdraw its Bid, and the Bid security will be returned. Thereafter, if the Work is rebid, that Bidder will be disqualified from further bidding on the Work.

ARTICLE 17 – OPENING OF BIDS

17.01 Bids will be opened at the time and place indicated in the advertisement or invitation to bid and, unless obviously non-responsive, read aloud publicly. An abstract of the amounts of the base Bids and major alternates, if any, will be made available to Bidders after the opening of Bids.

ARTICLE 18 – BIDS TO REMAIN SUBJECT TO ACCEPTANCE

18.01 All Bids will remain subject to acceptance for the period of time stated in the Bid Form, but Owner may, in its sole discretion, release any Bid and return the Bid security prior to the end of this period.

ARTICLE 19 – EVALUATION OF BIDS AND AWARD OF CONTRACT

19.01 Owner reserves the right to reject any or all Bids, including without limitation, nonconforming, nonresponsive, unbalanced, or conditional Bids. Owner will reject the Bid of any Bidder that Owner finds, after reasonable inquiry and evaluation, to not be responsible. If Bidder purports to add terms or conditions to its Bid, takes exception to any provision of the Bidding Documents, or attempts to alter the contents of the Contract Documents for purposes of the Bid, then the Owner will reject the Bid as nonresponsive; provided that Owner also reserves the right to waive all minor informalities not involving price, time, or changes in the Work.

19.02 If Owner awards the contract for the Work, such award shall be to the responsible Bidder submitting the lowest responsive Bid.

19.03 Evaluation of Bids

A. In evaluating Bids, Owner will consider whether or not the Bids comply with the prescribed requirements, and such alternates, unit prices, and other data, as may be requested in the Bid Form or prior to the Notice of Award.

B. In the comparison of Bids, alternates will be applied in the same order of priority as listed in the Bid Form. To determine the Bid prices for purposes of comparison, Owner shall announce to all bidders a "Base Bid plus alternates" budget after receiving all Bids, but prior to opening them. For comparison purposes alternates will be accepted, following the order of priority established in the Bid Form, until doing so would cause the budget to be exceeded. After determination of the Successful Bidder based on this comparative process and on the responsiveness, responsibility, and other factors set forth in these Instructions, the award may be made to said Successful Bidder on its base Bid and any combination of its additive alternate Bids for which Owner determines funds will be available at the time of award.

19.04 In evaluating whether a Bidder is responsible, Owner will consider the qualifications of the Bidder and may consider the qualifications and experience of Subcontractors and Suppliers proposed for those portions of the Work for which the identity of Subcontractors and Suppliers must be submitted as provided in the Bidding Documents.

19.05 Owner may conduct such investigations as Owner deems necessary to establish the responsibility, qualifications, and financial ability of Bidders and any proposed Subcontractors or Suppliers.

ARTICLE 20 – BONDS AND INSURANCE

20.01 Article 6 of the General Conditions, as may be modified by the Supplementary Conditions, sets forth Owner's requirements as to performance and payment bonds and insurance. When the Successful Bidder delivers the Agreement (executed by Successful Bidder) to Owner, it shall be accompanied by required bonds and insurance documentation.

ARTICLE 21 – SIGNING OF AGREEMENT

21.01 When Owner issues a Notice of Award to the Successful Bidder, it shall be accompanied by the unexecuted counterparts of the Agreement along with the other Contract Documents as identified in the Agreement. Within 15 days thereafter, Successful Bidder shall execute and deliver the required number of counterparts of the Agreement (and any bonds and insurance documentation required to be delivered by the Contract Documents) to Owner. Within ten days thereafter, Owner shall deliver one fully executed counterpart of the Agreement to Successful Bidder, together with printed and electronic copies of the Contract Documents as stated in Paragraph 2.02 of the General Conditions.

BID BOND

Any singular reference to Bidder, Surety, Owner or other party shall be considered plural where applicable.

BIDDER *(Name and Address)*:

SURETY *(Name, and Address of Principal Place of Business)*:

OWNER *(Name and Address)*:

BID

Bid Due Date:

Description *(Project Name— Include Location)*:

BOND

Bond Number:

Date:

Penal sum _____ $ _____

(Words) (Figures)

Surety and Bidder, intending to be legally bound hereby, subject to the terms set forth below, do each cause this Bid Bond to be duly executed by an authorized officer, agent, or representative.

BIDDER	**SURETY**
_____ (Seal)	_____ (Seal)
Bidder's Name and Corporate Seal	Surety's Name and Corporate Seal
By: _____	By: _____
Signature	Signature (Attach Power of Attorney)
_____	_____
Print Name	Print Name
_____	_____
Title	Title
Attest: _____	Attest: _____
Signature	Signature
Title	Title

Note: Addresses are to be used for giving any required notice.
Provide execution by any additional parties, such as joint venturers, if necessary.

1. Bidder and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to pay to Owner upon default of Bidder the penal sum set forth on the face of this Bond. Payment of the penal sum is the extent of Bidder's and Surety's liability. Recovery of such penal sum under the terms of this Bond shall be Owner's sole and exclusive remedy upon default of Bidder.

2. Default of Bidder shall occur upon the failure of Bidder to deliver within the time required by the Bidding Documents (or any extension thereof agreed to in writing by Owner) the executed Agreement required by the Bidding Documents and any performance and payment bonds required by the Bidding Documents.

3. This obligation shall be null and void if:

3.1 Owner accepts Bidder's Bid and Bidder delivers within the time required by the Bidding Documents (or any extension thereof agreed to in writing by Owner) the executed Agreement required by the Bidding Documents and any performance and payment bonds required by the Bidding Documents, or

3.2 All Bids are rejected by Owner, or

3.3 Owner fails to issue a Notice of Award to Bidder within the time specified in the Bidding Documents (or any extension thereof agreed to in writing by Bidder and, if applicable, consented to by Surety when required by Paragraph 5 hereof).

4. Payment under this Bond will be due and payable upon default of Bidder and within 30 calendar days after receipt by Bidder and Surety of written notice of default from Owner, which notice will be given with reasonable promptness, identifying this Bond and the Project and including a statement of the amount due.

5. Surety waives notice of any and all defenses based on or arising out of any time extension to issue Notice of Award agreed to in writing by Owner and Bidder, provided that the total time for issuing Notice of Award including extensions shall not in the aggregate exceed 120 days from the Bid due date without Surety's written consent.

6. No suit or action shall be commenced under this Bond prior to 30 calendar days after the notice of default required in Paragraph 4 above is received by Bidder and Surety and in no case later than two years after the Bid due date.

7. Any suit or action under this Bond shall be commenced only in a court of competent jurisdiction located in the state in which the Project is located.

8. Notices required hereunder shall be in writing and sent to Bidder and Surety at their respective addresses shown on the face of this Bond. Such notices may be sent by personal delivery, commercial courier, or by United States Registered or Certified Mail, return receipt requested, postage pre-paid, and shall be deemed to be effective upon receipt by the party concerned.

9. Surety shall cause to be attached to this Bond a current and effective Power of Attorney evidencing the authority of the officer, agent, or representative who executed this Bond on behalf of Surety to execute, seal, and deliver such Bond and bind the Surety thereby.

10. This Bond is intended to conform to all applicable statutory requirements. Any applicable requirement of any applicable statute that has been omitted from this Bond shall be deemed to be included herein as if set forth at length. If any provision of this Bond conflicts with any applicable statute, then the provision of said statute shall govern and the remainder of this Bond that is not in conflict therewith shall continue in full force and effect.

11. The term "Bid" as used herein includes a Bid, offer, or proposal as applicable.

BONDING COMPANY INFORMATION

The following person, firm, or corporation has agreed to execute the required payment and performance bonds in the event this contract is awarded to the bidder:

Name of Surety: _____

Mailing Address: _____

City, State, Zip: _____

Telephone Number: _____

Is surety authorized to operate in Texas? _____

Is surety aware of size of project? _____

Does surety have adequate authorization and resources to cover bonds for the amount of this contract? _____

Rating from Best's Key Rating Guide _____

Project:

Owner:

_____
Name of Bidder

BID FORM
CITY OF ENNIS
WTP LAGOON UPGRADES

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Page

ARTICLE 1 – BID RECIPIENT

1.01 This Bid is submitted to:

CITY OF ENNIS
500 LAKE BARDWELL DR.
ENNIS, TX 75119

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

ARTICLE 2 – BIDDER'S ACKNOWLEDGEMENTS

2.01 Bidder accepts all of the terms and conditions of the Instructions to Bidders, including without limitation those dealing with the disposition of Bid security. This Bid will remain subject to acceptance for 90 days after the Bid opening, or for such longer period of time that Bidder may agree to in writing upon request of Owner.

ARTICLE 3 – BIDDER'S REPRESENTATIONS

3.01 In submitting this Bid, Bidder represents that:

A. Bidder has examined and carefully studied the Bidding Documents, and any data and reference items identified in the Bidding Documents, and hereby acknowledges receipt of the following Addenda:

Addendum No.	**Addendum, Date**

B. Bidder has visited the Site, conducted a thorough, alert visual examination of the Site and adjacent areas, and become familiar with and satisfied itself as to the general, local, and Site conditions that may affect cost, progress, and performance of the Work.

C. Bidder is familiar with and has satisfied itself as to all Laws and Regulations that may affect cost, progress, and performance of the Work.

D. Bidder has carefully studied all: (1) reports of explorations and tests of subsurface conditions at or adjacent to the Site and all drawings of physical conditions relating to existing surface or subsurface structures at the Site that have been identified in the Supplementary Conditions, especially with respect to Technical Data in such reports and drawings, and (2) reports and drawings relating to Hazardous Environmental Conditions, if any, at or adjacent to the Site that have been identified in the Supplementary Conditions, especially with respect to Technical Data in such reports and drawings.

E. Bidder has considered the information known to Bidder itself; information commonly known to contractors doing business in the locality of the Site; information and observations obtained from visits to the Site; the Bidding Documents; and any Site-related reports and drawings identified in the Bidding Documents, with respect to the effect of

such information, observations, and documents on (1) the cost, progress, and performance of the Work; (2) the means, methods, techniques, sequences, and procedures of construction to be employed by Bidder; and (3) Bidder's safety precautions and programs.

F. Bidder agrees, based on the information and observations referred to in the preceding paragraph, that no further examinations, investigations, explorations, tests, studies, or data are necessary for the determination of this Bid for performance of the Work at the price bid and within the times required, and in accordance with the other terms and conditions of the Bidding Documents.

G. Bidder 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 Bidding Documents.

H. Bidder has given Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Bidder has discovered in the Bidding Documents, and confirms that the written resolution thereof by Engineer is acceptable to Bidder.

I. The Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for the performance and furnishing of the Work.

J. The submission of this Bid constitutes an incontrovertible representation by Bidder that Bidder has complied with every requirement of this Article, and that without exception the Bid and all prices in the Bid are premised upon performing and furnishing the Work required by the Bidding Documents.

ARTICLE 4 – BIDDER'S CERTIFICATION

4.01 Bidder certifies that:

A. This Bid is genuine and not made in the interest of or on behalf of any undisclosed individual or entity and is not submitted in conformity with any collusive agreement or rules of any group, association, organization, or corporation;

B. Bidder has not directly or indirectly induced or solicited any other Bidder to submit a false or sham Bid;

C. Bidder has not solicited or induced any individual or entity to refrain from bidding; and

D. Bidder has not engaged in corrupt, fraudulent, collusive, or coercive practices in competing for the Contract. For the purposes of this Paragraph 4.01.D:

1. "corrupt practice" means the offering, giving, receiving, or soliciting of any thing of value likely to influence the action of a public official in the bidding process;

2. "fraudulent practice" means an intentional misrepresentation of facts made (a) to influence the bidding process to the detriment of Owner, (b) to establish bid prices at artificial non-competitive 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 Bidders, with or without the knowledge of Owner, a purpose of which is to establish bid 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 bidding process or affect the e execution of the Contract.

ARTICLE 5 – BASIS OF BID

5.01 Bidder will complete the Work in accordance with the Contract Documents for the following price(s):

A. Bidder acknowledges that estimated quantities are not guaranteed, and are solely for the purpose of comparison of Bids, and final payment for all unit price Bid items will be based on actual quantities, determined as provided in the Contract Documents.

B. The 6 page bid proposal is attached at the end of this document.

ARTICLE 6 – TIME OF COMPLETION

6.01 Bidder agrees that the Work will be substantially complete within ninety (90) calendar days after the date when the Contract Times commence to run as provided in Paragraph 4.01 of the General Conditions, and will be completed and ready for final payment in accordance with Paragraph 15.06 of the General Conditions within one hundred and twenty (120) calendar days after the date when the Contract Times commence to run.

6.02 Bidder accepts the provisions of the Agreement as to liquidated damages.

ARTICLE 7 – ATTACHMENTS TO THIS BID

7.01 The following documents are submitted with and made a condition of this Bid:

A. Required Bid security;

B. List of Proposed Subcontractors;

C. List of Proposed Suppliers;

D. List of Project References;

E. Evidence of authority to do business in the state of the Project; or a written covenant to obtain such license within the time for acceptance of Bids;

F. Contractor's License No.: _____ **[or]** Evidence of Bidder's ability to obtain a State Contractor's License and a covenant by Bidder to obtain said license within the time for acceptance of Bids;

G. Required Bidder Qualification Statement with supporting data; and

ARTICLE 8 – DEFINED TERMS

8.01 The terms used in this Bid with initial capital letters have the meanings stated in the Instructions to Bidders, the General Conditions, and the Supplementary Conditions.

ARTICLE 9 – BID SUBMITTAL

BIDDER: *[Indicate correct name of bidding entity]*

_____

By:
[Signature] _____

[Printed name] _____
(If Bidder is a corporation, a limited liability company, a partnership, or a joint venture, attach evidence of authority to sign.)

Attest:
[Signature] _____

[Printed name] _____

Title: _____

Submittal Date: _____

Address for giving notices:

_____

_____

_____

Telephone Number: _____

Fax Number: _____

Contact Name and e-mail address: _____

_____

Bidder's License No.: _____
(where applicable)

NOTE TO USER: Use in those states or other jurisdictions where applicable or required.

ITEM	QUANTITY	UNIT	DESCRIPTION & UNIT PRICE (FILL IN UNIT PRICE IN SCRIPT & NUMBERS)	TOTAL PRICE

Base Bid Items

1. 1 LS **CONTRACTOR MOBILIZATION, BONDS AND INSURANCE** ALL IN ACCORDANCE WITH THE PLANS & SPECS, THE SUM OF

_____ DOLLARS &
_____ CENTS
Per Unit
($_____)

2. 1 LS **CONSTRUCTION STAKING** INCLUDING LOCATION, CONFIRMATION, AND TIE-IN OF PRE-ESTABLISHED BENCHMARKS, PROPERTY LINES, EASEMENTS, AND RIGHT OF WAYS, AS DESCRIBED IN PLANS, THE SUM OF

_____ DOLLARS &
_____ CENTS
Per Unit
($_____)

3. 1 LS **PREPARATION AND IMPLEMENTATION OF SWP3** INCLUDING SUBMISSION OF NOI AND NOT, INSTALLATION, INSPECTION, AND MAINTENANCE OF CONTROLS, ANY REQUIRED MODIFICATION OF SWP3 DOCUMENT TO MEET FIELD CONDITIONS GENERATED BY CHOSEN CONSTRUCTION METHODS AND SEQUENCING, THE SUM OF

_____ DOLLARS &
_____ CENTS
Per Unit
($_____)

4. 1 LS **PRE-CONSTRUCTION LOCATION & CONFIRMATION OF EXISTING UTITILIES** INCLUDING COORDINATION WITH TEXAS 811, FRANCHISE UTILITY COMPANIES, AND THE CITY OF ENNIS, LOCATION AND VERFICATION OF EXACT DEPTH, LOCATION, SIZE, AND MATERIALS OF ALL UTILITIES PRIOR TO COMMENCING CONSTRUCTION ACTVITIES, ALL EQUIPMENT, MATERIALS, LABOR & SUPERINTENDENCE, ALL IN ACCORDANCE WITH THE PLANS & SPECS, THE SUM OF

_____ DOLLARS &
_____ CENTS
Per Unit
($_____)

ITEM	QUANTITY	UNIT	DESCRIPTION & UNIT PRICE (FILL IN UNIT PRICE IN SCRIPT & NUMBERS)	TOTAL PRICE
5.	280	LF	**REMOVE & REPLACE HEADER PIPING AT LAGOONS 24" PVC**, FURNISHED & INSTALLED, COMPLETE IN PLACE, READY FOR SERVICE, INCLUDING ALL FITTINGS, EQUIPMENT, INCIDENTALS, THRUST BLOCKING, BACKFILLING, SURFACE RESTORATION, ALL MATERIALS, LABOR & SUPERINTENDENCE, AND TESTING ALL IN ACCORDANCE WITH THE PLANS & SPECS, THE SUM OF _____ DOLLARS & _____ CENTS Per Unit ($_____)	
6.	120	LF	**REMOVE & REPLACE INLET PIPING AT LAGOONS 16" PVC**, FURNISHED & INSTALLED, COMPLETE IN PLACE, READY FOR SERVICE, INCLUDING ALL FITTINGS, EQUIPMENT, INCIDENTALS, THRUST BLOCKING, CONCRETE PIPE SUPPORT STRUCTURES, BACKFILLING, SURFACE RESTORATION, ALL MATERIALS, LABOR & SUPERINTENDENCE, AND TESTING ALL IN ACCORDANCE WITH THE PLANS & SPECS, THE SUM OF _____ DOLLARS & _____ CENTS Per Unit ($_____)	
7.	4	EA	**REMOVE & REPLACE 4' DIA. MANHOLE,** FURNISHED AND INSTALLED, COMPLETE IN PLACE, READY FOR SERVICE, ALL FITTINGS, EQUIPMENT, INCIDENTALS, BACKFILLING, SURFACE RESTORATION, ALL MATERIALS, LABOR & SUPERINTENDENCE, AND TESTING ALL IN ACCORDANCE WITH THE PLANS & SPECS, THE SUM OF _____ DOLLARS & _____ CENTS Per Unit ($_____)	

ITEM	QUANTITY	UNIT	DESCRIPTION & UNIT PRICE (FILL IN UNIT PRICE IN SCRIPT & NUMBERS)	TOTAL PRICE
8.	214	LF	**INSTALL NEW 8" RESTRAINED JOINT DUCTILE IRON SLUDGE LINE**, FURNISHED & INSTALLED, COMPLETE IN PLACE, READY FOR SERVICE, INCLUDING ALL FITTINGS, EQUIPMENT, INCIDENTALS, THRUST BLOCKING, BACKFILLING, CONCRETE PIPE SUPPORT STRUCTURES, SURFACE RESTORATION, ALL MATERIALS, LABOR & SUPERINTENDENCE, AND TESTING ALL IN ACCORDANCE WITH THE PLANS & SPECS, THE SUM OF _____ DOLLARS & _____ CENTS Per Unit ($_____)	
9.	3	EA	**REPLACE AND REPLACE EXISTING 16" GATE VALVES AT LAGOONS**, FURNISHED & INSTALLED, COMPLETE IN PLACE, READY FOR SERVICE, TO INCLUDE EQUIPMENT, INCIDENTALS, ALL MATERIALS, LABOR & SUPERINTENDENCE, AND TESTING IN ACCORDANCE WITH THE PLANS & SPECS, THE SUM OF _____ DOLLARS & _____ CENTS Per Unit ($_____)	
10.	1	EA	**REMOVE EXISTING 12" PLUG VALVE AT POND 3**, FURNISHED & INSTALLED, COMPLETE IN PLACE, READY FOR SERVICE, TO INCLUDE EQUIPMENT, INCIDENTALS, ALL MATERIALS, LABOR & SUPERINTENDENCE, AND TESTING IN ACCORDANCE WITH THE PLANS & SPECS, THE SUM OF _____ DOLLARS & _____ CENTS Per Unit ($_____)	
11.	3	EA	**INSTALL NEW 12" GATE VALVES WITH RISING STEMS AT OUTFALL STRUCTURES**, FURNISHED & INSTALLED, COMPLETE IN PLACE, READY FOR SERVICE, TO INCLUDE EQUIPMENT, INCIDENTALS, ALL MATERIALS, LABOR & SUPERINTENDENCE, AND TESTING IN ACCORDANCE WITH THE PLANS & SPECS, THE SUM OF _____ DOLLARS & _____ CENTS Per Unit ($_____)	

ITEM	QUANTITY	UNIT	DESCRIPTION & UNIT PRICE (FILL IN UNIT PRICE IN SCRIPT & NUMBERS)	TOTAL PRICE
12.	3	EA	**INSTALL NEW 6" TELESCOPING VALVES AT OUTFALL STRUCTURES**, FURNISHED & INSTALLED, COMPLETE IN PLACE, READY FOR SERVICE, TO INCLUDE EQUIPMENT, INCIDENTALS, ALL MATERIALS, LABOR & SUPERINTENDENCE, AND TESTING IN ACCORDANCE WITH THE PLANS & SPECS, THE SUM OF _____ DOLLARS & _____ CENTS Per Unit ($_____)	
13.	3	EA	**RECONSTRUCT LAGOON OUTFALL STRUCTURE**, FURNISHED & INSTALLED, COMPLETE IN PLACE, READY FOR SERVICE, INCLUDING DEMOLISHING EXISTING WALKWAYS, ANCHORS, CLEANING OUT BOX IF NEEDED, RECONSTRUCTION OF REDWOOD BAFFLES, AND OTHER ITEMS SUBSIDIARY TO THE WORK ON THE OUTFALL BOX AND PIPING, ALL FITTINGS, EQUIPMENT, INCIDENTALS, BACKFILLING, SURFACE RESTORATION, ALL MATERIALS, LABOR & SUPERINTENDENCE, AND TESTING ALL IN ACCORDANCE WITH THE PLANS & SPECS, THE SUM OF _____ DOLLARS & _____ CENTS Per Unit ($_____)	
14.	250	CY	**HAUL IN GENERAL FILL AS NEEDED TO RECONSTRUCT BANKS AND BERMS AT LAGOONS**, ALL MATERIALS, LABOR & SUPERINTENDENCE, ALL IN ACCORDANCE WITH REQUIRED PERMITS, PLANS, & SPECS, THE SUM OF _____ DOLLARS & _____ CENTS Per Unit ($_____)	
15.	3	EA	**REPLACE 5' X 15' CATWALK STRUCTURE AT LAGOONS**, FURNISHED AND INSTALLED, COMPLETE IN PLACE, READY FOR SERVICE, ALL DEPTHS, INCLUDING , ALL MATERIALS, LABOR & SUPERINTENDENCE, ALL IN ACCORDANCE WITH REQUIRED PERMITS, PLANS, & SPECS, THE SUM OF _____ DOLLARS & _____ CENTS Per Unit ($_____)	

ITEM	QUANTITY	UNIT	DESCRIPTION & UNIT PRICE (FILL IN UNIT PRICE IN SCRIPT & NUMBERS)	TOTAL PRICE
16.	750	SY	**REHABILITATE LINERS AT LAGOONS**, HAULING AND INSTALLATION, LOCATIONS TO BE FIELD DETERMINED, ALL MATERIALS, LABOR & SUPERINTENDENCE, AND TESTING ALL IN ACCORDANCE WITH THE PLANS & SPECS, THE SUM OF _____ DOLLARS & _____ CENTS Per Unit ($_____)	
17.	1	LS	**GRADING AT EXISTING LAGOONS**, FURNISHED AND INSTALLED, COMPLETE IN PLACE, READY FOR SERVICE, INCLUDING INCIDENTALS, FOUNDATION, BACKFILLING, EMBEDMENT, SURFACE RESTORATION, ALL MATERIALS, LABOR & SUPERINTENDENCE, AND TESTING ALL IN ACCORDANCE WITH THE PLANS & SPECS, THE SUM OF _____ DOLLARS & _____ CENTS Per Unit ($_____)	
18.	3	EA	**NEW WASTING PUMP HEADER ASSEMBLY (8" SLUDGE LINE COUPLING DETAIL)**, FURNISHED AND INSTALLED, COMPLETE IN PLACE, READY FOR SERVICE, INCLUDING INCIDENTALS, FOUNDATION, BACKFILLING, EMBEDMENT, SURFACE RESTORATION, ALL MATERIALS, LABOR & SUPERINTENDENCE, AND TESTING ALL IN ACCORDANCE WITH THE PLANS & SPECS, THE SUM OF _____ DOLLARS & _____ CENTS Per Unit ($_____)	
19.	1	LS	**OWNER'S ALLOWANCE FOR MATERIALS TESTING**. CONTRACTOR SHALL PAY ALL NECESSARY LAB FEES, TO BE REIMBURSED THROUGH THIS BID ITEM. ONLY DIRECT INVOICES FROM THE LAB WILL BE REIMBURSED, THE SUM OF Fifty Thousand DOLLARS & Zero CENTS Per Unit ($ 50,000.00)	$50,000.00

ITEM	QUANTITY	UNIT	DESCRIPTION & UNIT PRICE (FILL IN UNIT PRICE IN SCRIPT & NUMBERS)	TOTAL PRICE
20.	1	LS	**OWNER'S ALLOWANCE FOR FIELD CHANGES** - TO BE DISBURSED ONLY WITH SPECIFIC WRITTEN APPROVAL OF OWNER, THE SUM OF Fifty Thousand DOLLARS & Zero CENTS Per Unit ($ 50,000.00)	$50,000.00
			Total Bid (Sum of Items 1-20)	

BID OPENING SHEET

CITY OF ENNIS
WTP LAGOON UPGRADES

Awarded project may include base bid, alternate bids, or any combination of individual projects therein.

Final bid pricing will be tabulated by the Engineer. Bidder will be notified of errors or discrepancies in final bid tabulation.

Fill out all bid pricing in both words and numbers as directed on the Bid Proposal Form.

Bid bond and completed Bid Form with attachments must be included with the bid.

Addenda Acknowledged (list numbers) _____

TOTAL BASE BID, GENERAL **$**_____

Name of Bidder: _____

Address: _____

_____

Phone: _____

Email: _____

Signature: _____

Statement of Bidder's Qualifications

All questions must be answered and the data given must be clear and comprehensive. This statement must be notarized. If necessary, questions may be answered on separate attached sheets. The Bidder may submit any additional information he desires.

Name of Bidder: _____

Address: _____

_____

_____

Date Organized: _____ Date Incorporated: _____

Number of Years in contracting business under present name: _____

CONTRACTS ON HAND:

Contracts	Dollar Amount	Completion Date

Type of work performed by your company: _____
Have you ever failed to complete any work awarded to you? _____
Have you ever defaulted on a contract? _____

List the projects most recently completed by your firm (include project of similar importance):

Project	Dollar Amount	Mo/Yr Completed

Major equipment available for this contract:

_____

_____

_____

Attach resume(s) for the principal member(s) of your organization, including the officers as well as the proposed superintendent for the project.

Credit available: $_____ Bank Reference: _____

The undersigned hereby authorizes and requests any person, firm, or corporation to furnish any information requested by the _____ in verification of the recitals compromising this Statement of Bidder's Qualifications.

Executed this _____ day of _____, 20 ___.

By: _____ _____
(Signature) (Title)

CONTRACT AGREEMENT AND FORMS

CERTIFICATE OF INTERESTED PARTIES

FORM 1295

Complete Nos. 1 - 4 and 6 if there are interested parties.
Complete Nos. 1, 2, 3, 5, and 6 if there are no interested parties.

OFFICE USE ONLY

1 Name of business entity filing form, and the city, state and country of the business entity's place of business.

2 Name of governmental entity or state agency that is a party to the contract for which the form is being filed.

3 Provide the identification number used by the governmental entity or state agency to track or identify the contract, and provide a description of the services, goods, or other property to be provided under the contract.

4 Name of Interested Party	City, State, Country (place of business)	Nature of Interest (check applicable)	
		Controlling	Intermediary

5 Check only if there is NO Interested Party. ☐

6 UNSWORN DECLARATION

My name is _____, and my date of birth is _____.

My address is _____, _____, _____, _____, _____.
(street) (city) (state) (zip code) (country)

I declare under penalty of perjury that the foregoing is true and correct.

Executed in _____ County, State of _____ , on the _____ day of _____, 20_____.
(month) (year)

_____
Signature of authorized agent of contracting business entity
(Declarant)

ADD ADDITIONAL PAGES AS NECESSARY

EJCDC
ENGINEERS JOINT CONTRACT DOCUMENTS COMMITTEE

NOTICE OF AWARD

Date of Issuance:

Owner:	City of Ennis	Owner's Contract No.:	
Engineer:	Schaumburg & Polk, Inc.	Engineer's Project No.:	923239.00
Project:	WTP Lagoon Upgrades	Contract Name:	WTP Lagoon Upgrades

Bidder:

Bidder's Address:

TO BIDDER:

You are notified that Owner has accepted your Bid dated [_____] for the above Contract, and that you are the Successful Bidder and are awarded a Contract for:

WTP Lagoon Upgrades _____ .

[describe Work, alternates, or sections of Work awarded]

The Contract Price of the awarded Contract is: $_____*[note if subject to unit prices, or cost-plus]*

[3] unexecuted counterparts of the Agreement accompany this Notice of Award, and one copy of the Contract Documents accompanies this Notice of Award, or has been transmitted or made available to Bidder electronically.

☐ a set of the Drawings will be delivered separately from the other Contract Documents.

You must comply with the following conditions precedent within 15 days of the date of this Notice of Award:

1. Deliver to Owner [____]counterparts of the Agreement, fully executed by Bidder.
2. Deliver with the executed Agreement(s) the Contract security *[e.g., performance and payment bonds]* and insurance documentation as specified in the Instructions to Bidders and General Conditions, Articles 2 and 6.
3. Other conditions precedent (if any):

Failure to comply with these conditions within the time specified will entitle Owner to consider you in default, annul this Notice of Award, and declare your Bid security forfeited.

Within ten days after you comply with the above conditions, Owner will return to you one fully executed counterpart of the Agreement, together with any additional copies of the Contract Documents as indicated in Paragraph 2.02 of the General Conditions.

Owner**:** City of Ennis

Authorized Signature

By:

Title:

Copy: Engineer

AGREEMENT
BETWEEN OWNER AND CONTRACTOR
FOR CONSTRUCTION CONTRACT (STIPULATED PRICE)

THIS AGREEMENT is by and between CITY OF ENNIS ("Owner") and

("Contractor").

Owner and Contractor hereby agree as follows:

ARTICLE 1 – WORK

1.01 Contractor shall complete all Work as specified or indicated in the Contract Documents. The Work is generally described as follows: *WTP Lagoon Upgrades*.

ARTICLE 2 – THE PROJECT

2.01 The Project, of which the Work under the Contract Documents is a part, is generally described as follows: *WTP Lagoon Upgrades*.

ARTICLE 3 – ENGINEER

3.01 The Owner has retained Schaumburg & Polk, Inc. ("Engineer") to act as Owner's representative, assume all duties and responsibilities, and have the rights and authority assigned to Engineer in the Contract Documents in connection with the completion of the Work in accordance with the Contract Documents.

ARTICLE 4 – CONTRACT TIMES

4.01 *Time of the Essence*

4.02 *Contract Times: Days*

A. The Work will be substantially completed within ninety (90) days after the date when the Contract Times commence to run as provided in Paragraph 4.01 of the General Conditions, and completed and ready for final payment in accordance with Paragraph 15.06 of the General Conditions within one hundred and twenty (120) days after the date when the Contract Times commence to run.

4.03 *Liquidated Damages*

A. Contractor and Owner recognize that time is of the essence as stated in Paragraph 4.01 above and that Owner will suffer financial and other losses if the Work is not completed and Milestones not achieved within the times specified in Paragraph 4.02 above, plus any extensions thereof allowed in accordance with the Contract. The parties also recognize the delays, expense, and difficulties involved in proving in a legal or arbitration proceeding 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):

1. Substantial Completion: Contractor shall pay Owner $300.00 for each day that expires after the time (as duly adjusted pursuant to the Contract) specified in Paragraph 4.02.A above for Substantial Completion until the Work is substantially complete.

2. Completion of Remaining Work: After Substantial Completion, if Contractor shall neglect, refuse, or fail to complete the remaining Work within the Contract Times (as duly adjusted pursuant to the Contract) for completion and readiness for final payment, Contractor shall pay Owner $300.00 for each day that expires after such time until the Work is completed and ready for final payment.

3. Liquidated damages for failing to timely attain Substantial Completion and final completion are not additive and will not be imposed concurrently.

4.04 *Special Damages*

A. In addition to the amount provided for liquidated damages, Contractor shall reimburse Owner (1) for any fines or penalties imposed on Owner as a direct result of the Contractor's failure to attain Substantial Completion according to the Contract Times, and (2) for the actual costs reasonably incurred by Owner for engineering, construction observation, inspection, and administrative services needed after the time specified in Paragraph 4.02 for Substantial Completion (as duly adjusted pursuant to the Contract), until the Work is substantially complete.

B. After Contractor achieves Substantial Completion, if Contractor shall neglect, refuse, or fail to complete the remaining Work within the Contract Times, Contractor shall reimburse Owner for the actual costs reasonably incurred by Owner for engineering, construction observation, inspection, and administrative services needed after the time specified in Paragraph 4.02 for Work to be completed and ready for final payment (as duly adjusted pursuant to the Contract), until the Work is completed and ready for final payment.

ARTICLE 5 – CONTRACT PRICE

5.01 Owner shall pay Contractor for completion of the Work in accordance with the Contract Documents the amounts that follow, subject to adjustment under the Contract:

A. For all Work, at the prices stated in Contractor's Bid, attached hereto as an exhibit.

1. and listed as a Contract Document in Article 9 below.

ARTICLE 6 – PAYMENT PROCEDURES

6.01 *Submittal and Processing of Payments*

A. Contractor shall submit Applications for Payment in accordance with Article 15 of the General Conditions. Applications for Payment will be processed by Engineer as provided in the General Conditions.

6.02 *Progress Payments; Retainage*

A. Owner shall make progress payments on account of the Contract Price on the basis of Contractor's Applications for Payment on or about the 1st day of each month during performance of the Work as provided in Paragraph 6.02.A.1 below, provided that such Applications for Payment have been submitted in a timely manner and otherwise meet the requirements of the Contract. All such payments will be measured by the Schedule of Values established as provided in the General Conditions (and in the case of Unit Price

Work based on the number of units completed) or, in the event there is no Schedule of Values, as provided elsewhere in the Contract.

1. Prior to Substantial Completion, progress payments will be made in an amount equal to the percentage indicated below but, in each case, less the aggregate of payments previously made and less such amounts as Owner may withhold, including but not limited to liquidated damages, in accordance with the Contract

    a. 95 percent of Work completed (with the balance being retainage).

    b. 95 percent of cost of materials and equipment not incorporated in the Work (with the balance being retainage).

6.03 *Final Payment*

A. Upon final completion and acceptance of the Work in accordance with Paragraph 15.06 of the General Conditions, Owner shall pay the remainder of the Contract Price as recommended by Engineer as provided in said Paragraph 15.06.

ARTICLE 7 – INTEREST

7.01 All amounts not paid when due shall bear interest at the rate of 1 percent per annum.

ARTICLE 8 – CONTRACTOR'S REPRESENTATIONS

8.01 In order to induce Owner to enter into this Contract, Contractor makes the following representations:

A. Contractor has examined and carefully studied the Contract Documents, and any data and reference items identified in the Contract Documents.

B. Contractor has visited the Site, conducted a thorough, alert visual examination of the Site and adjacent areas, and become familiar with and is satisfied as to the general, local, and Site conditions that may affect cost, progress, and performance of the Work.

C. Contractor is familiar with and is satisfied as to all Laws and Regulations that may affect cost, progress, and performance of the Work.

D. Contractor has carefully studied all: (1) reports of explorations and tests of subsurface conditions at or adjacent to the Site and all drawings of physical conditions relating to existing surface or subsurface structures at the Site that have been identified in the Supplementary Conditions, especially with respect to Technical Data in such reports and drawings, and (2) reports and drawings relating to Hazardous Environmental Conditions, if any, at or adjacent to the Site that have been identified in the Supplementary Conditions, especially with respect to Technical Data in such reports and drawings.

E. Contractor has considered the information known to Contractor itself; information commonly known to contractors doing business in the locality of the Site; information and observations obtained from visits to the Site; the Contract Documents; and the Site-related reports and drawings identified in the Contract Documents, with respect to the effect of such information, observations, and documents on (1) the cost, progress, and performance of the Work; (2) the means, methods, techniques, sequences, and procedures of construction to be employed by Contractor; and (3) Contractor's safety precautions and programs.

F. Based on the information and observations referred to in the preceding paragraph, Contractor agrees that no further examinations, investigations, explorations, tests, studies,

or data are necessary for the performance of the Work at the Contract Price, within the Contract Times, and in accordance with the other terms and conditions of the Contract.

G. 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.

H. Contractor has given Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Contractor has discovered in the Contract Documents, and the written resolution thereof by Engineer is acceptable to Contractor.

I. The Contract Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performance and furnishing of the Work.

J. Contractor's entry into this Contract constitutes an incontrovertible representation by Contractor that without exception all prices in the Agreement are premised upon performing and furnishing the Work required by the Contract Documents.

ARTICLE 9 – CONTRACT DOCUMENTS

9.01 *Contents*

A. The Contract Documents consist of the following:

1. This Agreement (pages 1 to 6, inclusive).
2. Performance bond (pages 1 to 3, inclusive).
3. Payment bond (pages 1 to 3, inclusive).
4. Other bonds.
    a. Maintenance Bond (pages 1 to 2, inclusive).
5. General Conditions (pages 1 to 65, inclusive).
6. Supplementary Conditions (pages 1 to 17, inclusive).
7. Specifications as listed in the table of contents of the Project Manual.
8. Drawings (not attached but incorporated by reference) consisting of 12 sheets.
9. Addenda (numbers ___ to ___, inclusive).
10. Exhibits to this Agreement (enumerated as follows):
    a. Contractor's Bid (pages 1 to 6, inclusive).
11. The following which may be delivered or issued on or after the Effective Date of the Contract and are not attached hereto:
    a. Notice to Proceed.
    b. Work Change Directives.
    c. Change Orders.
    d. Field Orders.

B. The documents listed in Paragraph 9.01.A are attached to this Agreement (except as expressly noted otherwise above).

C. There are no Contract Documents other than those listed above in this Article 9.

D. The Contract Documents may only be amended, modified, or supplemented as provided in the General Conditions.

ARTICLE 10 – MISCELLANEOUS

10.01 *Terms*

A. Terms used in this Agreement will have the meanings stated in the General Conditions and the Supplementary Conditions.

10.02 *Assignment of Contract*

A. Unless expressly agreed to elsewhere in the Contract, no assignment by a party hereto of any rights under 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, money that may become due and money that is 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 Documents.

10.03 *Successors and Assigns*

A. Owner and Contractor each binds itself, its successors, assigns, and legal representatives to the other party hereto, its successors, assigns, and legal representatives in respect to all covenants, agreements, and obligations contained in the Contract Documents.

10.04 *Severability*

A. Any provision or part of the Contract Documents held to be void or unenforceable under any Law or Regulation shall be deemed stricken, and all remaining provisions 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.

10.05 *Contractor's Certifications*

A. 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 Paragraph 10.05:

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 bidding process or in the Contract execution;

2. "fraudulent practice" means an intentional misrepresentation of facts made (a) to influence the bidding process or the execution of the Contract to the detriment of Owner, (b) to establish Bid or Contract prices at artificial non-competitive 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 Bidders, with or without the knowledge of Owner, a purpose of which is to establish Bid 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 bidding process or affect the execution of the Contract.

IN WITNESS WHEREOF, Owner and Contractor have signed this Agreement.

This Agreement will be effective on _____ (which is the Effective Date of the Contract).

OWNER: CITY OF ENNIS	CONTRACTOR:
_____	_____
By: _____	By: _____
Title: _____	Title: _____
	(If Contractor is a corporation, a partnership, or a joint venture, attach evidence of authority to sign.)
Attest: _____	Attest: _____
Title: _____	Title: _____
Address for giving notices:	Address for giving notices:
500 LAKE BARDWELL DR.	_____
ENNIS, TX 75119	_____
_____	_____
	License No.: _____ *(where applicable)*
(If Owner is a corporation, attach evidence of authority to sign. If Owner is a public body, attach evidence of authority to sign and resolution or other documents authorizing execution of this Agreement.)	*NOTE TO USER: Use in those states or other jurisdictions where applicable or required.*

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PERFORMANCE BOND

CONTRACTOR *(name and address)*:

SURETY *(name and address of principal place of business)*:

OWNER *(name and address)*:

CONSTRUCTION CONTRACT
Effective Date of the Agreement:
Amount:
Description *(name and location)*:

BOND
Bond Number:
Date *(not earlier than the Effective Date of the Agreement of the Construction Contract)*:
Amount:
Modifications to this Bond Form: ☐ None ☐ See Paragraph 16

Surety and Contractor, intending to be legally bound hereby, subject to the terms set forth below, do each cause this Performance Bond to be duly executed by an authorized officer, agent, or representative.

CONTRACTOR AS PRINCIPAL	**SURETY**
_____ *(seal)*	_____ *(seal)*
Contractor's Name and Corporate Seal	Surety's Name and Corporate Seal
By: _____	**By:** _____
Signature	Signature *(attach power of attorney)*
_____	_____
Print Name	Print Name
_____	_____
Title	Title
Attest: _____	**Attest:** _____
Signature	Signature
_____	_____
Title	Title

Notes: (1) Provide supplemental execution by any additional parties, such as joint venturers. (2) Any singular reference to Contractor, Surety, Owner, or other party shall be considered plural where applicable.

1. The Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to the Owner for the performance of the Construction Contract, which is incorporated herein by reference.

2. If the Contractor performs the Construction Contract, the Surety and the Contractor shall have no obligation under this Bond, except when applicable to participate in a conference as provided in Paragraph 3.

3. If there is no Owner Default under the Construction Contract, the Surety's obligation under this Bond shall arise after:

3.1 The Owner first provides notice to the Contractor and the Surety that the Owner is considering declaring a Contractor Default. Such notice shall indicate whether the Owner is requesting a conference among the Owner, Contractor, and Surety to discuss the Contractor's performance. If the Owner does not request a conference, the Surety may, within five (5) business days after receipt of the Owner's notice, request such a conference. If the Surety timely requests a conference, the Owner shall attend. Unless the Owner agrees otherwise, any conference requested under this Paragraph 3.1 shall be held within ten (10) business days of the Surety's receipt of the Owner's notice. If the Owner, the Contractor, and the Surety agree, the Contractor shall be allowed a reasonable time to perform the Construction Contract, but such an agreement shall not waive the Owner's right, if any, subsequently to declare a Contractor Default;

3.2 The Owner declares a Contractor Default, terminates the Construction Contract and notifies the Surety; and

3.3 The Owner has agreed to pay the Balance of the Contract Price in accordance with the terms of the Construction Contract to the Surety or to a contractor selected to perform the Construction Contract.

4. Failure on the part of the Owner to comply with the notice requirement in Paragraph 3.1 shall not constitute a failure to comply with a condition precedent to the Surety's obligations, or release the Surety from its obligations, except to the extent the Surety demonstrates actual prejudice.

5. When the Owner has satisfied the conditions of Paragraph 3, the Surety shall promptly and at the Surety's expense take one of the following actions:

5.1 Arrange for the Contractor, with the consent of the Owner, to perform and complete the Construction Contract;

5.2 Undertake to perform and complete the Construction Contract itself, through its agents or independent contractors;

5.3 Obtain bids or negotiated proposals from qualified contractors acceptable to the Owner for a contract for performance and completion of the Construction Contract, arrange for a contract to be prepared for execution by the Owner and a contractor selected with the Owners concurrence, to be secured with performance and payment bonds executed by a qualified surety equivalent to the bonds issued on the Construction Contract, and pay to the Owner the amount of damages as described in Paragraph 7 in excess of the Balance of the Contract Price incurred by the Owner as a result of the Contractor Default; or

5.4 Waive its right to perform and complete, arrange for completion, or obtain a new contractor, and with reasonable promptness under the circumstances:

5.4.1 After investigation, determine the amount for which it may be liable to the Owner and, as soon as practicable after the amount is determined, make payment to the Owner; or

5.4.2 Deny liability in whole or in part and notify the Owner, citing the reasons for denial.

6. If the Surety does not proceed as provided in Paragraph 5 with reasonable promptness, the Surety shall be deemed to be in default on this Bond seven days after receipt of an additional written notice from the Owner to the Surety demanding that the Surety perform its obligations under this Bond, and the Owner shall be entitled to enforce any remedy available to the Owner. If the Surety proceeds as provided in Paragraph 5.4, and the Owner refuses the payment or the Surety has denied liability, in whole or in part, without further notice the Owner shall be entitled to enforce any remedy available to the Owner.

7. If the Surety elects to act under Paragraph 5.1, 5.2, or 5.3, then the responsibilities of the Surety to the Owner shall not be greater than those of the Contractor under the Construction Contract, and the responsibilities of the Owner to the Surety shall not be greater than those of the Owner under the Construction Contract. Subject to the commitment by the Owner to pay the Balance of the Contract Price, the Surety is obligated, without duplication for:

7.1 the responsibilities of the Contractor for correction of defective work and completion of the Construction Contract;

7.2 additional legal, design professional, and delay costs resulting from the Contractor's Default, and resulting from the actions or failure to act of the Surety under Paragraph 5; and

7.3 liquidated damages, or if no liquidated damages are specified in the Construction Contract, actual damages caused by delayed performance or non-performance of the Contractor.

8. If the Surety elects to act under Paragraph 5.1, 5.3, or 5.4, the Surety's liability is limited to the amount of this Bond.

9. The Surety shall not be liable to the Owner or others for obligations of the Contractor that are unrelated to the Construction Contract, and the Balance of the Contract Price shall not be reduced or set off on account of any such unrelated obligations. No right of action shall accrue on this Bond to any person or entity other than the Owner or its heirs, executors, administrators, successors, and assigns.

10. The Surety hereby waives notice of any change, including changes of time, to the Construction Contract or to related subcontracts, purchase orders, and other obligations.

11. Any proceeding, legal or equitable, under this Bond may be instituted in any court of competent jurisdiction in the location in which the work or part of the work is located and shall be instituted within two years after a declaration of Contractor Default or within two years after the Contractor ceased working or within two years after the Surety refuses or fails to perform its obligations under this Bond, whichever occurs first. If the provisions of this paragraph are void or prohibited by law, the minimum periods of limitations available to sureties as a defense in the jurisdiction of the suit shall be applicable.

12. Notice to the Surety, the Owner, or the Contractor shall be mailed or delivered to the address shown on the page on which their signature appears.

13. When this Bond has been furnished to comply with a statutory or other legal requirement in the location where the construction was to be performed, any provision in this Bond conflicting with said statutory or legal requirement shall be deemed deleted herefrom and provisions conforming to such statutory or other legal requirement shall be deemed incorporated herein. When so furnished, the intent is that this Bond shall be construed as a statutory bond and not as a common law bond.

14. Definitions

14.1 Balance of the Contract Price: The total amount payable by the Owner to the Contractor under the Construction Contract after all proper adjustments have been made including allowance for the Contractor for any amounts received or to be received by the Owner in settlement of insurance or other claims for damages to which the Contractor is entitled, reduced by all valid and proper payments made to or on behalf of the Contractor under the Construction Contract.

14.2 Construction Contract: The agreement between the Owner and Contractor identified on the cover page, including all Contract Documents and changes made to the agreement and the Contract Documents.

14.3 Contractor Default: Failure of the Contractor, which has not been remedied or waived, to perform or otherwise to comply with a material term of the Construction Contract.

14.4 Owner Default: Failure of the Owner, which has not been remedied or waived, to pay the Contractor as required under the Construction Contract or to perform and complete or comply with the other material terms of the Construction Contract.

14.5 Contract Documents: All the documents that comprise the agreement between the Owner and Contractor.

15. If this Bond is issued for an agreement between a contractor and subcontractor, the term Contractor in this Bond shall be deemed to be Subcontractor and the term Owner shall be deemed to be Contractor.

16. Modifications to this Bond are as follows:

i. 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

ii. The performance bond shall be in a penal sum of not less than 100 percent of the contract price and remain in effect for two years beyond the date of approval by the Engineer of the political subdivision.

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PAYMENT BOND

CONTRACTOR *(name and address)*:

SURETY *(name and address of principal place of business)*:

OWNER *(name and address)*:

CONSTRUCTION CONTRACT

Effective Date of the Agreement:
Amount:
Description *(name and location)*:

BOND

Bond Number:
Date *(not earlier than the Effective Date of the Agreement of the Construction Contract)*:
Amount:
Modifications to this Bond Form: ☐ None ☐ See Paragraph 18

Surety and Contractor, intending to be legally bound hereby, subject to the terms set forth below, do each cause this Payment Bond to be duly executed by an authorized officer, agent, or representative.

CONTRACTOR AS PRINCIPAL

_____ *(seal)*
Contractor's Name and Corporate Seal

By: _____
Signature

_____
Print Name

_____
Title

Attest: _____
Signature

_____
Title

SURETY

_____ *(seal)*
Surety's Name and Corporate Seal

By: _____
Signature *(attach power of attorney)*

_____
Print Name

_____
Title

Attest: _____
Signature

_____
Title

Notes: (1) Provide supplemental execution by any additional parties, such as joint venturers. (2) Any singular reference to Contractor, Surety, Owner, or other party shall be considered plural where applicable.

1. The Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to the Owner to pay for labor, materials, and equipment furnished for use in the performance of the Construction Contract, which is incorporated herein by reference, subject to the following terms.

2. If the Contractor promptly makes payment of all sums due to Claimants, and defends, indemnifies, and holds harmless the Owner from claims, demands, liens, or suits by any person or entity seeking payment for labor, materials, or equipment furnished for use in the performance of the Construction Contract, then the Surety and the Contractor shall have no obligation under this Bond.

3. If there is no Owner Default under the Construction Contract, the Surety's obligation to the Owner under this Bond shall arise after the Owner has promptly notified the Contractor and the Surety (at the address described in Paragraph 13) of claims, demands, liens, or suits against the Owner or the Owner's property by any person or entity seeking payment for labor, materials, or equipment furnished for use in the performance of the Construction Contract, and tendered defense of such claims, demands, liens, or suits to the Contractor and the Surety.

4. When the Owner has satisfied the conditions in Paragraph 3, the Surety shall promptly and at the Surety's expense defend, indemnify, and hold harmless the Owner against a duly tendered claim, demand, lien, or suit.

5. The Surety's obligations to a Claimant under this Bond shall arise after the following:

   5.1 Claimants who do not have a direct contract with the Contractor,

      5.1.1 have furnished a written notice of non-payment to the Contractor, stating with substantial accuracy the amount claimed and the name of the party to whom the materials were, or equipment was, furnished or supplied or for whom the labor was done or performed, within ninety (90) days after having last performed labor or last furnished materials or equipment included in the Claim; and

      5.1.2 have sent a Claim to the Surety (at the address described in Paragraph 13).

   5.2 Claimants who are employed by or have a direct contract with the Contractor have sent a Claim to the Surety (at the address described in Paragraph 13).

6. If a notice of non-payment required by Paragraph 5.1.1 is given by the Owner to the Contractor, that is sufficient to satisfy a Claimant's obligation to furnish a written notice of non-payment under Paragraph 5.1.1.

7. When a Claimant has satisfied the conditions of Paragraph 5.1 or 5.2, whichever is applicable, the Surety shall promptly and at the Surety's expense take the following actions:

   7.1 Send an answer to the Claimant, with a copy to the Owner, within sixty (60) days after receipt of the Claim, stating the amounts that are undisputed and the basis for challenging any amounts that are disputed; and

   7.2 Pay or arrange for payment of any undisputed amounts.

   7.3 The Surety's failure to discharge its obligations under Paragraph 7.1 or 7.2 shall not be deemed to constitute a waiver of defenses the Surety or Contractor may have or acquire as to a Claim, except as to undisputed amounts for which the Surety and Claimant have reached agreement. If, however, the Surety fails to discharge its obligations under Paragraph 7.1 or 7.2, the Surety shall indemnify the Claimant for the reasonable attorney's fees the Claimant incurs thereafter to recover any sums found to be due and owing to the Claimant.

8. The Surety's total obligation shall not exceed the amount of this Bond, plus the amount of reasonable attorney's fees provided under Paragraph 7.3, and the amount of this Bond shall be credited for any payments made in good faith by the Surety.

9. Amounts owed by the Owner to the Contractor under the Construction Contract shall be used for the performance of the Construction Contract and to satisfy claims, if any, under any construction performance bond. By the Contractor furnishing and the Owner accepting this Bond, they agree that all funds earned by the Contractor in the performance of the Construction Contract are dedicated to satisfy obligations of the Contractor and Surety under this Bond, subject to the Owner's priority to use the funds for the completion of the work.

10. The Surety shall not be liable to the Owner, Claimants, or others for obligations of the Contractor that are unrelated to the Construction Contract. The Owner shall not be liable for the payment of any costs or expenses of any Claimant under this Bond, and shall have under this Bond no obligation to make payments to or give notice on behalf of Claimants, or otherwise have any obligations to Claimants under this Bond.

11. The Surety hereby waives notice of any change, including changes of time, to the Construction Contract or to related subcontracts, purchase orders, and other obligations.

12. No suit or action shall be commenced by a Claimant under this Bond other than in a court of competent jurisdiction in the state in which the project that is the subject of the Construction Contract is located or after the expiration of two years from the date (1) on which the Claimant sent a Claim to the Surety pursuant to Paragraph 5.1.2 or 5.2, or (2) on which the last labor or service was performed by anyone or the last materials or equipment were furnished by anyone under the Construction Contract, whichever of (1) or (2) first occurs. If the provisions of this paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit shall be applicable.

13. Notice and Claims to the Surety, the Owner, or the Contractor shall be mailed or delivered to the address shown on the page on which their signature appears. Actual receipt of notice or Claims, however accomplished, shall be sufficient compliance as of the date received.

14. When this Bond has been furnished to comply with a statutory or other legal requirement in the location where the construction was to be performed, any provision in this Bond conflicting with said statutory or legal requirement shall be deemed deleted herefrom and provisions conforming to such statutory or other legal requirement shall be deemed incorporated herein. When so furnished, the intent is that this Bond shall be construed as a statutory bond and not as a common law bond.

15. Upon requests by any person or entity appearing to be a potential beneficiary of this Bond, the Contractor and Owner shall promptly furnish a copy of this Bond or shall permit a copy to be made.

16. **Definitions**

    16.1 **Claim:** A written statement by the Claimant including at a minimum:

        1. The name of the Claimant;
        2. The name of the person for whom the labor was done, or materials or equipment furnished;
        3. A copy of the agreement or purchase order pursuant to which labor, materials, or equipment was furnished for use in the performance of the Construction Contract;
        4. A brief description of the labor, materials, or equipment furnished;
        5. The date on which the Claimant last performed labor or last furnished materials or equipment for use in the performance of the Construction Contract;
        6. The total amount earned by the Claimant for labor, materials, or equipment furnished as of the date of the Claim;
        7. The total amount of previous payments received by the Claimant; and
        8. The total amount due and unpaid to the Claimant for labor, materials, or equipment furnished as of the date of the Claim.

    16.2 **Claimant:** An individual or entity having a direct contract with the Contractor or with a subcontractor of the Contractor to furnish labor, materials, or equipment for use in the performance of the Construction Contract. The term Claimant also includes any individual or entity that has rightfully asserted a claim under an applicable mechanic's lien or similar statute against the real property upon which the Project is located. The intent of this Bond shall be to include without limitation in the terms of "labor, materials, or equipment" that part of the water, gas, power, light, heat, oil, gasoline, telephone service, or rental equipment used in the Construction Contract, architectural and engineering services required for performance of the work of the Contractor and the Contractor's subcontractors, and all other items for which a mechanic's lien may be asserted in the jurisdiction where the labor, materials, or equipment were furnished.

    16.3 **Construction Contract:** The agreement between the Owner and Contractor identified on the cover page, including all Contract Documents and all changes made to the agreement and the Contract Documents.

    16.4 **Owner Default**: Failure of the Owner, which has not been remedied or waived, to pay the Contractor as required under the Construction Contract or to perform and complete or comply with the other material terms of the Construction Contract.

    16.5 **Contract Documents:** All the documents that comprise the agreement between the Owner and Contractor.

17. If this Bond is issued for an agreement between a contractor and subcontractor, the term Contractor in this Bond shall be deemed to be Subcontractor and the term Owner shall be deemed to be Contractor.

18. Modifications to this Bond are as follows:

    i. The payment bond shall be in a penal sum of not less than 100 percent of the contract price and remain in effect for two years beyond the date of approval by the Engineer of the political subdivision.

MAINTENANCE BOND

STATE OF TEXAS §

COUNTY OF §

KNOW ALL MEN BY THESE PRESENTS: That _____ of the City of _____, County of _____, State of _____ _____, as principal, and _____ _____, authorized under the laws of the State of Texas to act as surety on bonds for principals, are held and firmly bound unto _____, a municipal corporation (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 _____ _____, dated the _____ day of _____, 20___, to _____ _____ _____ which contract is hereby referred to and made a part thereof as fully and to the same extent as if copied at length herein.

WHEREAS, under the plans, specifications and contract, it is provided that the contractor will maintain and keep in good repair the work herein contracted to be done for a period of two (2) years from the date of written acceptance of said work and to do all necessary repairing and/or reconstructing in whole or in part of said improvements that should be occasioned by settlement of foundation, defective workmanship or materials furnished in the construction of any part thereof, or any of the accessories thereto constructed by the Contractor. Be it understood that the purpose of this section is to cover all defective conditions arising by reason of this obligation, and the said contractor and surety herein shall be subject to the liquidation damages mentioned in said contract for each day's failure on its part to comply with the terms of said provisions of said contract.

NOW, THEREFORE, if the said contractor shall keep and perform it's said agreement to maintain said work and keep the same in repair for the said maintenance period of two (2) years, as provided, then these presents shall be null and void and have to further effect. If default shall be made by the said contractor in the performance of it's contract to so maintain and repair said work, then these presents shall have full force and effect and said Owner shall have and recover damages from the said contractor and it's principal and surety. It is further agreed that this obligation shall be continuing one against the principal and surety herein, and that successive recoveries may be had hereon for successive breaches until the full amount shall have been exhausted. It is further understood that the obligation herein to maintain said work shall continue throughout said maintenance period and the same shall not be changed, diminished or in any manner affected from any cause during said time.

PROVIDED, the aggregate liability of surety hereunder is limited to the penal sum of this bond.

IN WITNESS WHEREOF, the said principal and surety have signed and sealed this instrument this _____ day of _____, 20 _____.

_____	_____
Principal	Surety
By: _____	By: _____
Title _____	Title _____
Address _____	Address _____
_____	_____

The name and address of the resident agent of surety is:

_____

_____

NOTE: Date of Maintenance Bond must not be prior to date of contract.

CERTIFICATE OF INSURANCE

Date_____

Project No._____

_____
Owner

Type of _____

_____
Address

Project _____

THIS IS TO CERTIFY THAT_____
(Name and address of insured)

is, at the date of this certification, insured by this Company with respect to the business operations hereinafter described, for the types of Insurance and in accordance with the provisions of the standard policies used by this Company, and further hereinafter described. Exceptions to standard policy noted on reverse side hereof.

TYPE OF INSURANCE

	Policy No.	Effective Date	Expiration Date	Limits of Liability
Public Liability				1 Person $ _____ 1 Accident $_____
Contingent Liability				1 Person $ _____ 1 Accident $_____
Property Damage				
Builder's Risk				
Automobile				
Worker's Compensation				

The foregoing Policies (do) (do not) cover all sub-contractors.

Locations Covered: _____

Descriptions of Operations Covered:_____

The above policies either in the body thereof or by appropriate endorsement provide that they may not be changed or cancelled by the insurer in less than five days after the insured has received written notice of such change or cancellation.

When applicable local laws or regulations require more than five days actual notice of change or cancellation to the assured, the above policies contain such special requirements, either in the body thereof or by appropriate endorsement thereto attached.

_____
(Name of Insurer)

By_____

Title_____

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NOTICE TO PROCEED

Owner:	City of Ennis	Owner's Contract No.:	
Contractor:		Contractor's Project No.:	
Engineer:	Schaumburg & Polk, Inc.	Engineer's Project No.:	923239.00
Project:	WTP Lagoon Upgrades	Contract Name:	WTP Lagoon Upgrades
		Effective Date of Contract:	

TO CONTRACTOR:

Owner hereby notifies Contractor that the Contract Times under the above Contract will commence to run on _____, 20_____.

On that date, Contractor shall start performing its obligations under the Contract Documents. No Work shall be done at the Site prior to such date. In accordance with the Agreement, the date of Substantial Completion is _____, and the date of readiness for final payment is_____ _____ .

Before starting any Work at the Site, Contractor must comply with the following:
[Note any access limitations, security procedures, or other restrictions]

Owner**:** City of Ennis

Authorized Signature

By:

Title:

Date Issued:

Accepted

Contractor:

Authorized Signature

By:

Title:

Date:

Copy: Engineer

APPLICATION FOR PAYMENT

INSTRUCTIONS

A. GENERAL INFORMATION

This standard form is intended as a guide only. Many projects required a much more extensive form with space for numerous items, descriptions of Change Orders, identification of variable quantity adjustments, summary of materials and equipment stored at the site and other information. It is expected that a separate form will be developed by the Engineer or Contractor at the time Contractor's Schedule of Values is finalized. Note also that the format for retainage must be changed if the Agreement permits (or the Law provides), and Contractor elects, the deposit of securities in lieu of retainage. Refer to Article 14 of the General Conditions for provisions concerning payments to the Contractor.

B. COMPLETING THE FORM

The Schedule of Values, submitted and approved as provided in paragraphs 2.6.3 and 2.9 of the General Conditions, should be copied in the space indicated on the Application For Payment form. Note that the cost of materials and equipment is often listed separately from the cost of their installation. All Change Orders affecting the Contract Price should be identified and include such supplemental Schedules of Values as required for progress payments.

The form is suitable for use in the Final Application for Payment as well as for Progress Payments; however, the required accompanying documentation is usually more extensive for final payment. All accompanying documentation should be identified in the space provided on the form.

C. ENGINEER'S REVIEW

Engineer *must* review all Applications for Payment with care to avoid recommending any payments not yet earned by Contractor. All accompanying documentation of legal nature, such as lien waivers, should be reviewed by Owner's attorney, and Engineer should so advise owner.

EJCDC
ENGINEERS JOINT CONTRACT DOCUMENTS COMMITTEE

Contractor's Application for Payment No. _____

	Application Period:	Application Date:
To (Owner):	From (Contractor):	Via (Engineer):
Project:	Contract:	
Owner's Contract No.:	Contractor's Project No.:	Engineer's Project No.:

Application For Payment

Change Order Summary

Approved Change Orders		
Number	Additions	Deductions
TOTALS		
NET CHANGE BY CHANGE ORDERS		

1.	**ORIGINAL CONTRACT PRICE**		$ _____
2.	**Net change by Change Orders**		$ _____
3.	**Current Contract Price (Line 1 ± 2)**		$ _____
4.	**TOTAL COMPLETED AND STORED TO DATE**		
	(Column F total on Progress Estimates)		$ _____
5.	**RETAINAGE:**		
	a.	**X _____ Work Completed**	$ _____
	b.	**X _____ Stored Material**	$ _____
	c.	**Total Retainage (Line 5.a + Line 5.b)**	$ _____
6.	**AMOUNT ELIGIBLE TO DATE (Line 4 - Line 5.c)**		$ _____
7.	**LESS PREVIOUS PAYMENTS (Line 6 from prior Application)**		$ _____
8.	**AMOUNT DUE THIS APPLICATION**		$ _____
9.	**BALANCE TO FINISH, PLUS RETAINAGE**		
	(Column G total on Progress Estimates + Line 5.c above)		$ _____

Contractor's Certification

The undersigned Contractor certifies, to the best of its knowledge, the following:
(1) All previous progress payments received from Owner on account of Work done under the Contract have been applied on account to discharge Contractor's legitimate obligations incurred in connection with the Work covered by prior Applications for Payment;
(2) Title to all Work, materials and equipment incorporated in said Work, or otherwise listed in or covered by this Application for Payment, will pass to Owner at time of payment free and clear of all Liens, security interests, and encumbrances (except such as are covered by a bond acceptable to Owner indemnifying Owner against any such Liens, security interest, or encumbrances); and
(3) All the Work covered by this Application for Payment is in accordance with the Contract Documents and is not defective.

Contractor Signature

By:	Date:

Payment of: $ _____
(Line 8 or other - attach explanation of the other amount)

is recommended by: _____ _____
(Engineer) (Date)

Payment of: $ _____
(Line 8 or other - attach explanation of the other amount)

is approved by: _____ _____
(Owner) (Date)

Approved by: _____ _____
Funding or Financing Entity (if applicable) (Date)

Progress Estimate - Lump Sum Work

Contractor's Application

For (Contract):				Application Number:				
Application Period:				Application Date:				
			Work Completed		E	F		G
A		B	C	D	Materials Presently Stored (not in C or D)	Total Completed and Stored to Date (C + D + E)	% (F / B)	Balance to Finish (B - F)
Specification Section No.	Description	Scheduled Value ($)	From Previous Application (C+D)	This Period				
	Totals							

Progress Estimate - Unit Price Work

Contractor's Application

For (Contract):								Application Number:			
Application Period:								Application Date:			
A					B	C	D	E	F		
Item		Contract Information				Estimated Quantity Installed	Value of Work Installed to Date	Materials Presently Stored (not in C)	Total Completed and Stored to Date (D + E)	% (F / B)	Balance to Finish (B - F)
Bid Item No.	Description	Item Quantity	Units	Unit Price	Total Value of Item ($)						
	Totals										

Stored Material Summary

Contractor's Application

For (Contract):								Application Number:			
Application Period:								Application Date:			
A		B	C		D		E		F		G
Bid Item No.	Supplier Invoice No.	Submittal No. (with Specification Section No.)	Storage Location	Description of Materials or Equipment Stored	Stored Previously		Amount Stored this Month ($)	Subtotal Amount Completed and Stored to Date (D + E)	Incorporated in Work		Materials Remaining in Storage ($) (D + E - F)
					Date Placed into Storage (Month/Year)	Amount ($)			Date (Month/ Year)	Amount ($)	
				Totals							

No._____

RECOMMENDATION OF PAYMENT

Owner Project No. _____ ENGINEER's Project No._____

Project _____

CONTRACTOR _____

Contract For _____ Contract Date _____

Application Date _____ Application Amount _____

For Period Ending _____

To _____
OWNER

Attached hereto is the CONTRACTOR's Application for Payment for Work accomplished under the Contract through the date indicated above. The Application meets the requirements of the Contract Documents and includes the CONTRACTOR's Certificate stating that all previous payments to him under the Contract have been applied by him to discharge in full all of his obligations in connection with the Work covered by all prior Applications for Payments.

In accordance with the Contract the undersigned recommends payment to the CONTRACTOR of the amount due as shown below.

_____
ENGINEER

Dated _____, 20___ By _____

STATEMENT OF WORK

Original Contract Price	$_____	Work to Date	$_____
Net Change Orders	$_____	Amount Retained	$_____
Current Contract Price	$_____	Subtotal	$_____
Work to be Done	$_____	Previous Payments Recommended	$_____
		Amount Due this Payment	$_____

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CERTIFICATE OF SUBSTANTIAL COMPLETION

Owner:	Owner's Contract No.:
Contractor:	Contractor's Project No.:
Engineer: Schaumburg & Polk, Inc.	Engineer's Project No.:
Project:	Contract Name:

This [preliminary] [final] Certificate of Substantial Completion applies to:

☐ All Work ☐ The following specified portions of the Work:

Date of Substantial Completion

The Work to which this Certificate applies has been inspected by authorized representatives of Owner, Contractor, and Engineer, and found to be substantially complete. The Date of Substantial Completion of the Work or portion thereof designated above is hereby established, subject to the provisions of the Contract pertaining to Substantial Completion. The date of Substantial Completion in the final Certificate of Substantial Completion marks the commencement of the contractual correction period and applicable warranties required by the Contract.

A punch list of items to be completed or corrected is attached to this Certificate. This list may not be all-inclusive, and the failure to include any items on such list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract.

The responsibilities between Owner and Contractor for security, operation, safety, maintenance, heat, utilities, insurance, and warranties upon Owner's use or occupancy of the Work shall be as provided in the Contract, except as amended as follows: *[Note: Amendments of contractual responsibilities recorded in this Certificate should be the product of mutual agreement of Owner and Contractor; see Paragraph 15.03.D of the General Conditions.]*

Amendments to Owner's responsibilities: ☐ None ☐ As follows

Amendments to Contractor's responsibilities: ☐ None ☐ As follows:

The following documents are attached to and made a part of this Certificate: *[punch list; others]*

This Certificate does not constitute an acceptance of Work not in accordance with the Contract Documents, nor is it a release of Contractor's obligation to complete the Work in accordance with the Contract.

EXECUTED BY ENGINEER:	RECEIVED:	RECEIVED:
By: _____ (Authorized signature)	By: _____ Owner (Authorized Signature)	By: _____ Contractor (Authorized Signature)
Title: _____	Title: _____	Title: _____
Date: _____	Date: _____	Date: _____

GENERAL CONTRACT CONDITIONS

This document has important legal consequences; consultation with an attorney is encouraged with respect to its use or modification. This document should be adapted to the particular circumstances of the contemplated Project and the controlling Laws and Regulations.

STANDARD GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

Prepared by

EJCDC®
ENGINEERS JOINT CONTRACT DOCUMENTS COMMITTEE

Issued and Published Jointly by

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AMERICAN COUNCIL OF ENGINEERING COMPANIES

ASCE
AMERICAN SOCIETY OF CIVIL ENGINEERS

National Society of Professional Engineers®

These General Conditions have been prepared for use with the Agreement Between Owner and Contractor for Construction Contract (EJCDC® C-520, Stipulated Sum, or C-525, Cost-Plus, 2013 Editions). Their provisions are interrelated and a change in one may necessitate a change in the other.

To prepare supplementary conditions that are coordinated with the General Conditions, use EJCDC's Guide to the Preparation of Supplementary Conditions (EJCDC® C-800, 2013 Edition). The full EJCDC Construction series of documents is discussed in the Commentary on the 2013 EJCDC Construction Documents (EJCDC® C-001, 2013 Edition).

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STANDARD GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

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ARTICLE 1 – DEFINITIONS AND TERMINOLOGY

1.01 *Defined Terms*

A. Wherever used in the Bidding Requirements or Contract Documents, a term printed with initial capital letters, including the term's singular and plural forms, will have the meaning indicated in the definitions below. In addition to terms specifically defined, terms with initial capital letters in the Contract Documents include references to identified articles and paragraphs, and the titles of other documents or forms.

1. *Addenda*—Written or graphic instruments issued prior to the opening of Bids which clarify, correct, or change the Bidding Requirements or the proposed Contract Documents.

2. *Agreement*—The written instrument, executed by Owner and Contractor, that sets forth the Contract Price and Contract Times, identifies the parties and the Engineer, and designates the specific items that are Contract Documents.

3. *Application for Payment*—The form acceptable to Engineer which is to be used by Contractor during the course of the Work in requesting progress or final payments and which is to be accompanied by such supporting documentation as is required by the Contract Documents.

4. *Bid*—The offer of a Bidder submitted on the prescribed form setting forth the prices for the Work to be performed.

5. *Bidder*—An individual or entity that submits a Bid to Owner.

6. *Bidding Documents*—The Bidding Requirements, the proposed Contract Documents, and all Addenda.

7. *Bidding Requirements*—The advertisement or invitation to bid, Instructions to Bidders, Bid Bond or other Bid security, if any, the Bid Form, and the Bid with any attachments.

8. *Change Order*—A document which is signed by Contractor and Owner and authorizes an addition, deletion, or revision in the Work or an adjustment in the Contract Price or the Contract Times, or other revision to the Contract, issued on or after the Effective Date of the Contract.

9. *Change Proposal*—A written request by Contractor, duly submitted in compliance with the procedural requirements set forth herein, seeking an adjustment in Contract Price or Contract Times, or both; contesting an initial decision by Engineer concerning the requirements of the Contract Documents or the acceptability of Work under the Contract Documents; challenging a set-off against payments due; or seeking other relief with respect to the terms of the Contract.

10. *Claim*—(a) A demand or assertion by Owner directly to Contractor, duly submitted in compliance with the procedural requirements set forth herein: seeking an adjustment of Contract Price or Contract Times, or both; contesting an initial decision by Engineer concerning the requirements of the Contract Documents or the acceptability of Work under the Contract Documents; contesting Engineer's decision regarding a Change Proposal; seeking resolution of a contractual issue that Engineer has declined to address; or seeking other relief with respect to the terms of the Contract; or (b) a demand or assertion by Contractor directly to Owner, duly submitted in compliance with the procedural requirements set forth herein, contesting Engineer's decision regarding a Change Proposal; or seeking resolution of a contractual issue that Engineer

has declined to address. A demand for money or services by a third party is not a Claim.

11. *Constituent of Concern*—Asbestos, petroleum, radioactive materials, polychlorinated biphenyls (PCBs), hazardous waste, and any substance, product, waste, or other material of any nature whatsoever that is or becomes listed, regulated, or addressed pursuant to (a) the Comprehensive Environmental Response, Compensation and Liability Act, 42 U.S.C. §§9601 et seq. ("CERCLA"); (b) the Hazardous Materials Transportation Act, 49 U.S.C. §§5101 et seq.; (c) the Resource Conservation and Recovery Act, 42 U.S.C. §§6901 et seq. ("RCRA"); (d) the Toxic Substances Control Act, 15 U.S.C. §§2601 et seq.; (e) the Clean Water Act, 33 U.S.C. §§1251 et seq.; (f) the Clean Air Act, 42 U.S.C. §§7401 et seq.; or (g) any other federal, state, or local statute, law, rule, regulation, ordinance, resolution, code, order, or decree regulating, relating to, or imposing liability or standards of conduct concerning, any hazardous, toxic, or dangerous waste, substance, or material.

12. *Contract*—The entire and integrated written contract between the Owner and Contractor concerning the Work.

13. *Contract Documents*—Those items so designated in the Agreement, and which together comprise the Contract.

14. *Contract Price*—The money that Owner has agreed to pay Contractor for completion of the Work in accordance with the Contract Documents. .

15. *Contract Times*—The number of days or the dates by which Contractor shall: (a) achieve Milestones, if any; (b) achieve Substantial Completion; and (c) complete the Work.

16. *Contractor*—The individual or entity with which Owner has contracted for performance of the Work.

17. *Cost of the Work*—See Paragraph 13.01 for definition.

18. *Drawings*—The part of the Contract that graphically shows the scope, extent, and character of the Work to be performed by Contractor.

19. *Effective Date of the Contract*—The date, indicated in the Agreement, on which the Contract becomes effective.

20. *Engineer*—The individual or entity named as such in the Agreement.

21. *Field Order*—A written order issued by Engineer which requires minor changes in the Work but does not change the Contract Price or the Contract Times.

22. *Hazardous Environmental Condition*—The presence at the Site of Constituents of Concern in such quantities or circumstances that may present a danger to persons or property exposed thereto. The presence at the Site of materials that are necessary for the execution of the Work, or that are to be incorporated in the Work, and that are controlled and contained pursuant to industry practices, Laws and Regulations, and the requirements of the Contract, does not establish a Hazardous Environmental Condition.

23. *Laws and Regulations; Laws or Regulations*—Any and all applicable laws, statutes, rules, regulations, ordinances, codes, and orders of any and all governmental bodies, agencies, authorities, and courts having jurisdiction.

24. *Liens*—Charges, security interests, or encumbrances upon Contract-related funds, real property, or personal property.

25. *Milestone*—A principal event in the performance of the Work that the Contract requires Contractor to achieve by an intermediate completion date or by a time prior to Substantial Completion of all the Work.

26. *Notice of Award*—The written notice by Owner to a Bidder of Owner's acceptance of the Bid.

27. *Notice to Proceed*—A written notice by Owner to Contractor fixing the date on which the Contract Times will commence to run and on which Contractor shall start to perform the Work.

28. *Owner*—The individual or entity with which Contractor has contracted regarding the Work, and which has agreed to pay Contractor for the performance of the Work, pursuant to the terms of the Contract.

29. *Progress Schedule*—A schedule, prepared and maintained by Contractor, describing the sequence and duration of the activities comprising the Contractor's plan to accomplish the Work within the Contract Times.

30. *Project*—The total undertaking to be accomplished for Owner by engineers, contractors, and others, including planning, study, design, construction, testing, commissioning, and start-up, and of which the Work to be performed under the Contract Documents is a part.

31. *Project Manual*—The written documents prepared for, or made available for, procuring and constructing the Work, including but not limited to the Bidding Documents or other construction procurement documents, geotechnical and existing conditions information, the Agreement, bond forms, General Conditions, Supplementary Conditions, and Specifications. The contents of the Project Manual may be bound in one or more volumes.

32. *Resident Project Representative*—The authorized representative of Engineer assigned to assist Engineer at the Site. As used herein, the term Resident Project Representative or "RPR" includes any assistants or field staff of Resident Project Representative.

33. *Samples*—Physical examples of materials, equipment, or workmanship that are representative of some portion of the Work and that establish the standards by which such portion of the Work will be judged.

34. *Schedule of Submittals*—A schedule, prepared and maintained by Contractor, of required submittals and the time requirements for Engineer's review of the submittals and the performance of related construction activities.

35. *Schedule of Values*—A schedule, prepared and maintained by Contractor, allocating portions of the Contract Price to various portions of the Work and used as the basis for reviewing Contractor's Applications for Payment.

36. *Shop Drawings*—All drawings, diagrams, illustrations, schedules, and other data or information that are specifically prepared or assembled by or for Contractor and submitted by Contractor to illustrate some portion of the Work. Shop Drawings, whether approved or not, are not Drawings and are not Contract Documents.

37. *Site*—Lands or areas indicated in the Contract Documents as being furnished by Owner upon which the Work is to be performed, including rights-of-way and easements, and such other lands furnished by Owner which are designated for the use of Contractor.

38. *Specifications*—The part of the Contract that consists of written requirements for materials, equipment, systems, standards, and workmanship as applied to the Work, and certain administrative requirements and procedural matters applicable to the Work.

39. *Subcontractor*—An individual or entity having a direct contract with Contractor or with any other Subcontractor for the performance of a part of the Work.

40. *Substantial Completion*—The time at which the Work (or a specified part thereof) has progressed to the point where, in the opinion of Engineer, the Work (or a specified part thereof) is sufficiently complete, in accordance with the Contract Documents, so that the Work (or a specified part thereof) can be utilized for the purposes for which it is intended. The terms "substantially complete" and "substantially completed" as applied to all or part of the Work refer to Substantial Completion thereof.

41. *Successful Bidder*—The Bidder whose Bid the Owner accepts, and to which the Owner makes an award of contract, subject to stated conditions.

42. *Supplementary Conditions*—The part of the Contract that amends or supplements these General Conditions.

43. *Supplier*—A manufacturer, fabricator, supplier, distributor, materialman, or vendor having a direct contract with Contractor or with any Subcontractor to furnish materials or equipment to be incorporated in the Work by Contractor or a Subcontractor.

44. *Technical Data*—Those items expressly identified as Technical Data in the Supplementary Conditions, with respect to either (a) subsurface conditions at the Site, or physical conditions relating to existing surface or subsurface structures at the Site (except Underground Facilities) or (b) Hazardous Environmental Conditions at the Site. If no such express identifications of Technical Data have been made with respect to conditions at the Site, then the data contained in boring logs, recorded measurements of subsurface water levels, laboratory test results, and other factual, objective information regarding conditions at the Site that are set forth in any geotechnical or environmental report prepared for the Project and made available to Contractor are hereby defined as Technical Data with respect to conditions at the Site under Paragraphs 5.03, 5.04, and 5.06.

45. *Underground Facilities*—All underground pipelines, conduits, ducts, cables, wires, manholes, vaults, tanks, tunnels, or other such facilities or attachments, and any encasements containing such facilities, including but not limited to those that convey electricity, gases, steam, liquid petroleum products, telephone or other communications, fiber optic transmissions, cable television, water, wastewater, storm water, other liquids or chemicals, or traffic or other control systems.

46. *Unit Price Work*—Work to be paid for on the basis of unit prices.

47. *Work*—The entire construction or the various separately identifiable parts thereof required to be provided under the Contract Documents. Work includes and is the result of performing or providing all labor, services, and documentation necessary to produce such construction; furnishing, installing, and incorporating all materials and equipment into such construction; and may include related services such as testing, start-up, and commissioning, all as required by the Contract Documents.

48. *Work Change Directive*—A written directive to Contractor issued on or after the Effective Date of the Contract, signed by Owner and recommended by Engineer, ordering an addition, deletion, or revision in the Work.

1.02 *Terminology*

A. The words and terms discussed in the following paragraphs are not defined but, when used in the Bidding Requirements or Contract Documents, have the indicated meaning.

B. *Intent of Certain Terms or Adjectives*:

1. The Contract Documents include the terms "as allowed," "as approved," "as ordered," "as directed" or terms of like effect or import to authorize an exercise of professional judgment by Engineer. In addition, the adjectives "reasonable," "suitable," "acceptable," "proper," "satisfactory," or adjectives of like effect or import are used to describe an action or determination of Engineer as to the Work. It is intended that such exercise of professional judgment, action, or determination will be solely to evaluate, in general, the Work for compliance with the information in the Contract Documents and with the design concept of the Project as a functioning whole as shown or indicated in the Contract Documents (unless there is a specific statement indicating otherwise). The use of any such term or adjective is not intended to and shall not be effective to assign to Engineer any duty or authority to supervise or direct the performance of the Work, or any duty or authority to undertake responsibility contrary to the provisions of Article 10 or any other provision of the Contract Documents.

C. *Day*:

1. The word "day" means a calendar day of 24 hours measured from midnight to the next midnight.

D. *Defective*:

1. The word "defective," when modifying the word "Work," refers to Work that is unsatisfactory, faulty, or deficient in that it:

a. does not conform to the Contract Documents; or

b. does not meet the requirements of any applicable inspection, reference standard, test, or approval referred to in the Contract Documents; or

c. has been damaged prior to Engineer's recommendation of final payment (unless responsibility for the protection thereof has been assumed by Owner at Substantial Completion in accordance with Paragraph 15.03 or 15.04).

E. *Furnish, Install, Perform, Provide*:

1. The word "furnish," when used in connection with services, materials, or equipment, shall mean to supply and deliver said services, materials, or equipment to the Site (or some other specified location) ready for use or installation and in usable or operable condition.

2. The word "install," when used in connection with services, materials, or equipment, shall mean to put into use or place in final position said services, materials, or equipment complete and ready for intended use.

3. The words “perform” or “provide,” when used in connection with services, materials, or equipment, shall mean to furnish and install said services, materials, or equipment complete and ready for intended use.

4. If the Contract Documents establish an obligation of Contractor with respect to specific services, materials, or equipment, but do not expressly use any of the four words “furnish,” “install,” “perform,” or “provide,” then Contractor shall furnish and install said services, materials, or equipment complete and ready for intended use.

F. Unless stated otherwise in the Contract Documents, words or phrases that have a well-known technical or construction industry or trade meaning are used in the Contract Documents in accordance with such recognized meaning.

ARTICLE 2 – PRELIMINARY MATTERS

2.01 *Delivery of Bonds and Evidence of Insurance*

A. *Bonds*: When Contractor delivers the executed counterparts of the Agreement to Owner, Contractor shall also deliver to Owner such bonds as Contractor may be required to furnish.

B. *Evidence of Contractor’s Insurance*: When Contractor delivers the executed counterparts of the Agreement to Owner, Contractor shall also deliver to Owner, with copies to each named insured and additional insured (as identified in the Supplementary Conditions or elsewhere in the Contract), the certificates and other evidence of insurance required to be provided by Contractor in accordance with Article 6.

C. *Evidence of Owner’s Insurance*: After receipt of the executed counterparts of the Agreement and all required bonds and insurance documentation, Owner shall promptly deliver to Contractor, with copies to each named insured and additional insured (as identified in the Supplementary Conditions or otherwise), the certificates and other evidence of insurance required to be provided by Owner under Article 6.

2.02 *Copies of Documents*

A. Owner shall furnish to Contractor four printed copies of the Contract (including one fully executed counterpart of the Agreement), and one copy in electronic portable document format (PDF). Additional printed copies will be furnished upon request at the cost of reproduction.

B. Owner shall maintain and safeguard at least one original printed record version of the Contract, including Drawings and Specifications signed and sealed by Engineer and other design professionals. Owner shall make such original printed record version of the Contract available to Contractor for review. Owner may delegate the responsibilities under this provision to Engineer.

2.03 *Before Starting Construction*

A. *Preliminary Schedules*: Within 10 days after the Effective Date of the Contract (or as otherwise specifically required by the Contract Documents), Contractor shall submit to Engineer for timely review:

1. a preliminary Progress Schedule indicating the times (numbers of days or dates) for starting and completing the various stages of the Work, including any Milestones specified in the Contract;

2. a preliminary Schedule of Submittals; and

3. a preliminary Schedule of Values for all of the Work which includes quantities and prices of items which when added together equal the Contract Price and subdivides the Work into component parts in sufficient detail to serve as the basis for progress payments during performance of the Work. Such prices will include an appropriate amount of overhead and profit applicable to each item of Work.

2.04 *Preconstruction Conference; Designation of Authorized Representatives*

A. Before any Work at the Site is started, a conference attended by Owner, Contractor, Engineer, and others as appropriate will be held to establish a working understanding among the parties as to the Work and to discuss the schedules referred to in Paragraph 2.03.A, procedures for handling Shop Drawings, Samples, and other submittals, processing Applications for Payment, electronic or digital transmittals, and maintaining required records.

B. At this conference Owner and Contractor each shall designate, in writing, a specific individual to act as its authorized representative with respect to the services and responsibilities under the Contract. Such individuals shall have the authority to transmit and receive information, render decisions relative to the Contract, and otherwise act on behalf of each respective party.

2.05 *Initial Acceptance of Schedules*

A. At least 10 days before submission of the first Application for Payment a conference, attended by Contractor, Engineer, and others as appropriate, will be held to review for acceptability to Engineer as provided below the schedules submitted in accordance with Paragraph 2.03.A. Contractor shall have an additional 10 days to make corrections and adjustments and to complete and resubmit the schedules. No progress payment shall be made to Contractor until acceptable schedules are submitted to Engineer.

1. The Progress Schedule will be acceptable to Engineer if it provides an orderly progression of the Work to completion within the Contract Times. Such acceptance will not impose on Engineer responsibility for the Progress Schedule, for sequencing, scheduling, or progress of the Work, nor interfere with or relieve Contractor from Contractor's full responsibility therefor.

2. Contractor's Schedule of Submittals will be acceptable to Engineer if it provides a workable arrangement for reviewing and processing the required submittals.

3. Contractor's Schedule of Values will be acceptable to Engineer as to form and substance if it provides a reasonable allocation of the Contract Price to the component parts of the Work.

2.06 *Electronic Transmittals*

A. Except as otherwise stated elsewhere in the Contract, the Owner, Engineer, and Contractor may transmit, and shall accept, Project-related correspondence, text, data, documents, drawings, information, and graphics, including but not limited to Shop Drawings and other submittals, in electronic media or digital format, either directly, or through access to a secure Project website.

B. If the Contract does not establish protocols for electronic or digital transmittals, then Owner, Engineer, and Contractor shall jointly develop such protocols.

C. When transmitting items in electronic media or digital format, the transmitting party makes no representations as to long term compatibility, usability, or readability of the items resulting from the recipient's use of software application packages, operating systems, or

computer hardware differing from those used in the drafting or transmittal of the items, or from those established in applicable transmittal protocols.

ARTICLE 3 – DOCUMENTS: INTENT, REQUIREMENTS, REUSE

3.01 *Intent*

A. The Contract Documents are complementary; what is required by one is as binding as if required by all.

B. It is the intent of the Contract Documents to describe a functionally complete project (or part thereof) to be constructed in accordance with the Contract Documents.

C. Unless otherwise stated in the Contract Documents, if there is a discrepancy between the electronic or digital versions of the Contract Documents (including any printed copies derived from such electronic or digital versions) and the printed record version, the printed record version shall govern.

D. The Contract supersedes prior negotiations, representations, and agreements, whether written or oral.

E. Engineer will issue clarifications and interpretations of the Contract Documents as provided herein.

3.02 *Reference Standards*

A. Standards Specifications, Codes, Laws and Regulations

1. Reference in the Contract Documents to standard specifications, manuals, reference standards, or codes of any technical society, organization, or association, or to Laws or Regulations, whether such reference be specific or by implication, shall mean the standard specification, manual, reference standard, code, or Laws or Regulations in effect at the time of opening of Bids (or on the Effective Date of the Contract if there were no Bids), except as may be otherwise specifically stated in the Contract Documents.

2. No provision of any such standard specification, manual, reference standard, 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 part of the Contract Documents prepared by or for Engineer. No such provision or instruction shall be effective to assign to Owner, Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, any duty or authority to supervise or direct the performance of the Work or any duty or authority to undertake responsibility inconsistent with the provisions of the part of the Contract Documents prepared by or for Engineer.

3.03 *Reporting and Resolving Discrepancies*

A. *Reporting Discrepancies*:

1. *Contractor's Verification of Figures and Field Measurements*: Before undertaking each part of the Work, Contractor shall carefully study the Contract Documents, and check and verify pertinent figures and dimensions therein, particularly with respect to applicable field measurements. Contractor shall promptly report in writing to Engineer any conflict, error, ambiguity, or discrepancy that Contractor discovers, or has actual knowledge of, and shall not proceed with any Work affected thereby until the conflict,

error, ambiguity, or discrepancy is resolved, by a clarification or interpretation by Engineer, or by an amendment or supplement to the Contract Documents issued pursuant to Paragraph 11.01.

2. *Contractor's Review of Contract Documents*: If, before or during the performance of the Work, Contractor discovers any conflict, error, ambiguity, or discrepancy within the Contract Documents, or between the Contract Documents and (a) any applicable Law or Regulation, (b) actual field conditions, (c) any standard specification, manual, reference standard, or code, or (d) any instruction of any Supplier, then Contractor shall promptly report it to Engineer in writing. Contractor shall not proceed with the Work affected thereby (except in an emergency as required by Paragraph 7.15) until the conflict, error, ambiguity, or discrepancy is resolved, by a clarification or interpretation by Engineer, or by an amendment or supplement to the Contract Documents issued pursuant to Paragraph 11.01.

3. Contractor shall not be liable to Owner or Engineer for failure to report any conflict, error, ambiguity, or discrepancy in the Contract Documents unless Contractor had actual knowledge thereof.

B. *Resolving Discrepancies*:

1. Except as may be otherwise specifically stated in the Contract Documents, the provisions of the part of the Contract Documents prepared by or for Engineer shall take precedence in resolving any conflict, error, ambiguity, or discrepancy between such provisions of the Contract Documents and:

a. the provisions of any standard specification, manual, reference standard, or code, or the instruction of any Supplier (whether or not specifically incorporated by reference as a Contract Document); or

b. the provisions of any Laws or Regulations applicable to the performance of the Work (unless such an interpretation of the provisions of the Contract Documents would result in violation of such Law or Regulation).

3.04 *Requirements of the Contract Documents*

A. During the performance of the Work and until final payment, Contractor and Owner shall submit to the Engineer all matters in question concerning the requirements of the Contract Documents (sometimes referred to as requests for information or interpretation—RFIs), or relating to the acceptability of the Work under the Contract Documents, as soon as possible after such matters arise. Engineer will be the initial interpreter of the requirements of the Contract Documents, and judge of the acceptability of the Work thereunder.

B. Engineer will, with reasonable promptness, render a written clarification, interpretation, or decision on the issue submitted, or initiate an amendment or supplement to the Contract Documents. Engineer's written clarification, interpretation, or decision will be final and binding on Contractor, unless it appeals by submitting a Change Proposal, and on Owner, unless it appeals by filing a Claim.

C. If a submitted matter in question concerns terms and conditions of the Contract Documents that do not involve (1) the performance or acceptability of the Work under the Contract Documents, (2) the design (as set forth in the Drawings, Specifications, or otherwise), or (3) other engineering or technical matters, then Engineer will promptly give written notice to Owner and Contractor that Engineer is unable to provide a decision or interpretation. If Owner and Contractor are unable to agree on resolution of such a matter in question, either party may pursue resolution as provided in Article 12.

3.05 *Reuse of Documents*

A. Contractor and its Subcontractors and Suppliers shall not:

1. 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 Engineer or its consultants, including electronic media editions, or reuse any such Drawings, Specifications, other documents, or copies thereof on extensions of the Project or any other project without written consent of Owner and Engineer and specific written verification or adaptation by Engineer; or

2. have or acquire any title or ownership rights in any other Contract Documents, reuse any such Contract Documents for any purpose without Owner's express written consent, or violate any copyrights pertaining to such Contract Documents.

B. The prohibitions of this Paragraph 3.05 will survive final payment, or termination of the Contract. Nothing herein shall preclude Contractor from retaining copies of the Contract Documents for record purposes.

ARTICLE 4 – COMMENCEMENT AND PROGRESS OF THE WORK

4.01 *Commencement of Contract Times; Notice to Proceed*

A. The Contract Times will commence to run on the thirtieth day after the Effective Date of the Contract or, if a Notice to Proceed is given, on the day indicated in the Notice to Proceed. A Notice to Proceed may be given at any time within 30 days after the Effective Date of the Contract. In no event will the Contract Times commence to run later than the sixtieth day after the day of Bid opening or the thirtieth day after the Effective Date of the Contract, whichever date is earlier.

4.02 *Starting the Work*

A. Contractor shall start to perform the Work on the date when the Contract Times commence to run. No Work shall be done at the Site prior to such date.

4.03 *Reference Points*

A. Owner shall provide engineering surveys to establish reference points for construction which in Engineer's judgment are necessary to enable Contractor to proceed with the Work. Contractor shall be responsible for laying out the Work, shall protect and preserve the established reference points and property monuments, and shall make no changes or relocations without the prior written approval of Owner. Contractor shall report to Engineer whenever any reference point or property monument is lost or destroyed or requires relocation because of necessary changes in grades or locations, and shall be responsible for the accurate replacement or relocation of such reference points or property monuments by professionally qualified personnel.

4.04 *Progress Schedule*

A. Contractor shall adhere to the Progress Schedule established in accordance with Paragraph 2.05 as it may be adjusted from time to time as provided below.

1. Contractor shall submit to Engineer for acceptance (to the extent indicated in Paragraph 2.05) proposed adjustments in the Progress Schedule that will not result in changing the Contract Times.

2. Proposed adjustments in the Progress Schedule that will change the Contract Times shall be submitted in accordance with the requirements of Article 11.

B. Contractor shall carry on the Work and adhere to the Progress Schedule during all disputes or disagreements with Owner. No Work shall be delayed or postponed pending resolution of any disputes or disagreements, or during any appeal process, except as permitted by Paragraph 16.04, or as Owner and Contractor may otherwise agree in writing.

4.05 *Delays in Contractor's Progress*

A. If Owner, Engineer, or anyone for whom Owner is responsible, delays, disrupts, or interferes with the performance or progress of the Work, then Contractor shall be entitled to an equitable adjustment in the Contract Times and Contract Price. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times.

B. Contractor shall not be entitled to an adjustment in Contract Price or Contract Times for delay, disruption, or interference caused by or within the control of Contractor. Delay, disruption, and interference attributable to and within the control of a Subcontractor or Supplier shall be deemed to be within the control of Contractor.

C. If Contractor's performance or progress is delayed, disrupted, or interfered with by unanticipated causes not the fault of and beyond the control of Owner, Contractor, and those for which they are responsible, then Contractor shall be entitled to an equitable adjustment in Contract Times. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times. Such an adjustment shall be Contractor's sole and exclusive remedy for the delays, disruption, and interference described in this paragraph. Causes of delay, disruption, or interference that may give rise to an adjustment in Contract Times under this paragraph include but are not limited to the following:

1. severe and unavoidable natural catastrophes such as fires, floods, epidemics, and earthquakes;

2. abnormal weather conditions;

3. acts or failures to act of utility owners (other than those performing other work at or adjacent to the Site by arrangement with the Owner, as contemplated in Article 8); and

4. acts of war or terrorism.

D. Delays, disruption, and interference to the performance or progress of the Work resulting from the existence of a differing subsurface or physical condition, an Underground Facility that was not shown or indicated by the Contract Documents, or not shown or indicated with reasonable accuracy, and those resulting from Hazardous Environmental Conditions, are governed by Article 5.

E. Paragraph 8.03 governs delays, disruption, and interference to the performance or progress of the Work resulting from the performance of certain other work at or adjacent to the Site.

F. Contractor shall not be entitled to an adjustment in Contract Price or Contract Times for any delay, disruption, or interference if such delay is concurrent with a delay, disruption, or interference caused by or within the control of Contractor.

G. Contractor must submit any Change Proposal seeking an adjustment in Contract Price or Contract Times under this paragraph within 30 days of the commencement of the delaying, disrupting, or interfering event.

ARTICLE 5 – AVAILABILITY OF LANDS; SUBSURFACE AND PHYSICAL CONDITIONS; HAZARDOUS ENVIRONMENTAL CONDITIONS

5.01 *Availability of Lands*

A. Owner shall furnish the Site. Owner shall notify Contractor of any encumbrances or restrictions not of general application but specifically related to use of the Site with which Contractor must comply in performing the Work.

B. Upon reasonable written request, Owner shall furnish Contractor with a current statement of record legal title and legal description of the lands upon which permanent improvements are to be made and Owner's interest therein as necessary for giving notice of or filing a mechanic's or construction lien against such lands in accordance with applicable Laws and Regulations.

C. Contractor shall provide for all additional lands and access thereto that may be required for temporary construction facilities or storage of materials and equipment.

5.02 *Use of Site and Other Areas*

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

1. Contractor shall confine construction equipment, temporary construction facilities, the storage of materials and equipment, and the operations of workers to the Site, adjacent areas that Contractor has arranged to use through construction easements or otherwise, and other adjacent areas permitted by Laws and Regulations, and shall not unreasonably encumber the Site and such other adjacent areas with construction equipment or other materials or equipment. Contractor shall assume full responsibility for (a) damage to the Site; (b) damage to any such other adjacent areas used for Contractor's operations; (c) damage to any other adjacent land or areas; and (d) for injuries and losses sustained by the owners or occupants of any such land or areas; provided that such damage or injuries result from the performance of the Work or from other actions or conduct of the Contractor or those for which Contractor is responsible.

2. If a damage or injury claim is made by the owner or occupant of any such land or area because of the performance of the Work, or because of other actions or conduct of the Contractor or those for which Contractor is responsible, Contractor shall (a) take immediate corrective or remedial action as required by Paragraph 7.12, or otherwise; (b) promptly attempt to settle the claim as to all parties through negotiations with such owner or occupant, or otherwise resolve the claim by arbitration or other dispute resolution proceeding, or at law; and (c) to the fullest extent permitted by Laws and Regulations, indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against any such claim, and against all costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any claim or action, legal or equitable, brought by any such owner or occupant against Owner, Engineer, or any other party indemnified hereunder to the extent caused directly or indirectly, in whole or in part

by, or based upon, Contractor's performance of the Work, or because of other actions or conduct of the Contractor or those for which Contractor is responsible.

B. *Removal of Debris During Performance of the Work*: During the progress of the Work the Contractor shall keep the Site and other adjacent areas free from accumulations of waste materials, rubbish, and other debris. Removal and disposal of such waste materials, rubbish, and other debris shall conform to applicable Laws and Regulations.

C. *Cleaning*: Prior to Substantial Completion of the Work Contractor shall clean the Site and the Work and make it ready for utilization by Owner. At the completion of the Work Contractor shall remove from the Site and adjacent areas all tools, appliances, construction equipment and machinery, and surplus materials and shall restore to original condition all property not designated for alteration by the Contract Documents.

D. *Loading of Structures*: Contractor shall not load nor permit any part of any structure to be loaded in any manner that will endanger the structure, nor shall Contractor subject any part of the Work or adjacent structures or land to stresses or pressures that will endanger them.

5.03 *Subsurface and Physical Conditions*

A. *Reports and Drawings*: The Supplementary Conditions identify:

1. those reports known to Owner of explorations and tests of subsurface conditions at or adjacent to the Site;

2. those drawings known to Owner of physical conditions relating to existing surface or subsurface structures at the Site (except Underground Facilities); and

3. Technical Data contained in such reports and drawings.

B. *Reliance by Contractor on Technical Data Authorized*: Contractor may rely upon the accuracy of the Technical Data expressly identified in the Supplementary Conditions with respect to such reports and drawings, but such reports and drawings are not Contract Documents. If no such express identification has been made, then Contractor may rely upon the accuracy of the Technical Data (as defined in Article 1) contained in any geotechnical or environmental report prepared for the Project and made available to Contractor. Except for such reliance on Technical Data, Contractor may not rely upon or make any claim against Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, with respect to:

1. the completeness of such reports and drawings for Contractor's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences, and procedures of construction to be employed by Contractor, and safety precautions and programs incident thereto; or

2. other data, interpretations, opinions, and information contained in such reports or shown or indicated in such drawings; or

3. any Contractor interpretation of or conclusion drawn from any Technical Data or any such other data, interpretations, opinions, or information.

5.04 *Differing Subsurface or Physical Conditions*

A. *Notice by Contractor*: If Contractor believes that any subsurface or physical condition that is uncovered or revealed at the Site either:

1. is of such a nature as to establish that any Technical Data on which Contractor is entitled to rely as provided in Paragraph 5.03 is materially inaccurate; or

2. is of such a nature as to require a change in the Drawings or Specifications; or

3. differs materially from that shown or indicated in the Contract Documents; or

4. is of an unusual nature, and differs materially from conditions ordinarily encountered and generally recognized as inherent in work of the character provided for in the Contract Documents;

then Contractor shall, promptly after becoming aware thereof and before further disturbing the subsurface or physical conditions or performing any Work in connection therewith (except in an emergency as required by Paragraph 7.15), notify Owner and Engineer in writing about such condition. Contractor shall not further disturb such condition or perform any Work in connection therewith (except with respect to an emergency) until receipt of a written statement permitting Contractor to do so.

B. *Engineer's Review*: After receipt of written notice as required by the preceding paragraph, Engineer will promptly review the subsurface or physical condition in question; determine the necessity of Owner's obtaining additional exploration or tests with respect to the condition; conclude whether the condition falls within any one or more of the differing site condition categories in Paragraph 5.04.A above; obtain any pertinent cost or schedule information from Contractor; prepare recommendations to Owner regarding the Contractor's resumption of Work in connection with the subsurface or physical condition in question and the need for any change in the Drawings or Specifications; and advise Owner in writing of Engineer's findings, conclusions, and recommendations.

C. *Owner's Statement to Contractor Regarding Site Condition*: After receipt of Engineer's written findings, conclusions, and recommendations, Owner shall issue a written statement to Contractor (with a copy to Engineer) regarding the subsurface or physical condition in question, addressing the resumption of Work in connection with such condition, indicating whether any change in the Drawings or Specifications will be made, and adopting or rejecting Engineer's written findings, conclusions, and recommendations, in whole or in part.

D. *Possible Price and Times Adjustments*:

1. Contractor shall be entitled to an equitable adjustment in Contract Price or Contract Times, or both, to the extent that the existence of a differing subsurface or physical condition, or any related delay, disruption, or interference, causes an increase or decrease in Contractor's cost of, or time required for, performance of the Work; subject, however, to the following:

a. such condition must fall within any one or more of the categories described in Paragraph 5.04.A;

b. with respect to Work that is paid for on a unit price basis, any adjustment in Contract Price will be subject to the provisions of Paragraph 13.03; and,

c. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times.

2. Contractor shall not be entitled to any adjustment in the Contract Price or Contract Times with respect to a subsurface or physical condition if:

a. Contractor knew of the existence of such condition at the time Contractor made a commitment to Owner with respect to Contract Price and Contract Times by the submission of a Bid or becoming bound under a negotiated contract, or otherwise; or

b. the existence of such condition reasonably could have been discovered or revealed as a result of any examination, investigation, exploration, test, or study of the Site and contiguous areas expressly required by the Bidding Requirements or Contract Documents to be conducted by or for Contractor prior to Contractor's making such commitment; or

c. Contractor failed to give the written notice as required by Paragraph 5.04.A.

3. If Owner and Contractor agree regarding Contractor's entitlement to and the amount or extent of any adjustment in the Contract Price or Contract Times, or both, then any such adjustment shall be set forth in a Change Order.

4. Contractor may submit a Change Proposal regarding its entitlement to or the amount or extent of any adjustment in the Contract Price or Contract Times, or both, no later than 30 days after Owner's issuance of the Owner's written statement to Contractor regarding the subsurface or physical condition in question.

5.05 *Underground Facilities*

A. *Contractor's Responsibilities*: The information and data shown or indicated in the Contract Documents with respect to existing Underground Facilities at or adjacent to the Site is based on information and data furnished to Owner or Engineer by the owners of such Underground Facilities, including Owner, or by others. Unless it is otherwise expressly provided in the Supplementary Conditions:

1. Owner and Engineer do not warrant or guarantee the accuracy or completeness of any such information or data provided by others; and

2. the cost of all of the following will be included in the Contract Price, and Contractor shall have full responsibility for:

a. reviewing and checking all information and data regarding existing Underground Facilities at the Site;

b. locating all Underground Facilities shown or indicated in the Contract Documents as being at the Site;

c. coordination of the Work with the owners (including Owner) of such Underground Facilities, during construction; and

d. the safety and protection of all existing Underground Facilities at the Site, and repairing any damage thereto resulting from the Work.

B. *Notice by Contractor*: If Contractor believes that an Underground Facility that is uncovered or revealed at the Site was not shown or indicated in the Contract Documents, or was not shown or indicated with reasonable accuracy, then Contractor shall, promptly after

becoming aware thereof and before further disturbing conditions affected thereby or performing any Work in connection therewith (except in an emergency as required by Paragraph 7.15), identify the owner of such Underground Facility and give written notice to that owner and to Owner and Engineer.

C. *Engineer's Review*: Engineer will promptly review the Underground Facility and conclude whether such Underground Facility was not shown or indicated in the Contract Documents, or was not shown or indicated with reasonable accuracy; obtain any pertinent cost or schedule information from Contractor; prepare recommendations to Owner regarding the Contractor's resumption of Work in connection with the Underground Facility in question; determine the extent, if any, to which a change is required in the Drawings or Specifications to reflect and document the consequences of the existence or location of the Underground Facility; and advise Owner in writing of Engineer's findings, conclusions, and recommendations. During such time, Contractor shall be responsible for the safety and protection of such Underground Facility.

D. *Owner's Statement to Contractor Regarding Underground Facility*: After receipt of Engineer's written findings, conclusions, and recommendations, Owner shall issue a written statement to Contractor (with a copy to Engineer) regarding the Underground Facility in question, addressing the resumption of Work in connection with such Underground Facility, indicating whether any change in the Drawings or Specifications will be made, and adopting or rejecting Engineer's written findings, conclusions, and recommendations in whole or in part.

E. *Possible Price and Times Adjustments*:

1. Contractor shall be entitled to an equitable adjustment in the Contract Price or Contract Times, or both, to the extent that any existing Underground Facility at the Site that was not shown or indicated in the Contract Documents, or was not shown or indicated with reasonable accuracy, or any related delay, disruption, or interference, causes an increase or decrease in Contractor's cost of, or time required for, performance of the Work; subject, however, to the following:

    a. Contractor did not know of and could not reasonably have been expected to be aware of or to have anticipated the existence or actual location of the Underground Facility in question;

    b. With respect to Work that is paid for on a unit price basis, any adjustment in Contract Price will be subject to the provisions of Paragraph 13.03;

    c. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times; and

    d. Contractor gave the notice required in Paragraph 5.05.B.

2. If Owner and Contractor agree regarding Contractor's entitlement to and the amount or extent of any adjustment in the Contract Price or Contract Times, or both, then any such adjustment shall be set forth in a Change Order.

3. Contractor may submit a Change Proposal regarding its entitlement to or the amount or extent of any adjustment in the Contract Price or Contract Times, or both, no later than 30 days after Owner's issuance of the Owner's written statement to Contractor regarding the Underground Facility in question.

5.06 *Hazardous Environmental Conditions at Site*

A. *Reports and Drawings*: The Supplementary Conditions identify:

1. those reports and drawings known to Owner relating to Hazardous Environmental Conditions that have been identified at or adjacent to the Site; and

2. Technical Data contained in such reports and drawings.

B. *Reliance by Contractor on Technical Data Authorized*: Contractor may rely upon the accuracy of the Technical Data expressly identified in the Supplementary Conditions with respect to such reports and drawings, but such reports and drawings are not Contract Documents. If no such express identification has been made, then Contractor may rely on the accuracy of the Technical Data (as defined in Article 1) contained in any geotechnical or environmental report prepared for the Project and made available to Contractor. Except for such reliance on Technical Data, Contractor may not rely upon or make any claim against Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors with respect to:

1. the completeness of such reports and drawings for Contractor's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences and procedures of construction to be employed by Contractor and safety precautions and programs incident thereto; or

2. other data, interpretations, opinions and information contained in such reports or shown or indicated in such drawings; or

3. any Contractor interpretation of or conclusion drawn from any Technical Data or any such other data, interpretations, opinions or information.

C. Contractor shall not be responsible for removing or remediating any Hazardous Environmental Condition encountered, uncovered, or revealed at the Site unless such removal or remediation is expressly identified in the Contract Documents to be within the scope of the Work.

D. Contractor shall be responsible for controlling, containing, and duly removing all Constituents of Concern brought to the Site by Contractor, Subcontractors, Suppliers, or anyone else for whom Contractor is responsible, and for any associated costs; and for the costs of removing and remediating any Hazardous Environmental Condition created by the presence of any such Constituents of Concern.

E. If Contractor encounters, uncovers, or reveals a Hazardous Environmental Condition whose removal or remediation is not expressly identified in the Contract Documents as being within the scope of the Work, or if Contractor or anyone for whom Contractor is responsible creates a Hazardous Environmental Condition, then Contractor shall immediately: (1) secure or otherwise isolate such condition; (2) stop all Work in connection with such condition and in any area affected thereby (except in an emergency as required by Paragraph 7.15); and (3) notify Owner and Engineer (and promptly thereafter confirm such notice in writing). Owner shall promptly consult with Engineer concerning the necessity for Owner to retain a qualified expert to evaluate such condition or take corrective action, if any. Promptly after consulting with Engineer, Owner shall take such actions as are necessary to permit Owner to timely obtain required permits and provide Contractor the written notice required by Paragraph 5.06.F. If Contractor or anyone for whom Contractor is responsible created the Hazardous Environmental Condition in question, then Owner may remove and remediate the Hazardous Environmental Condition, and impose a set-off against payments to account for the associated costs.

F. Contractor shall not resume Work in connection with such Hazardous Environmental Condition or in any affected area until after Owner has obtained any required permits related thereto, and delivered written notice to Contractor either (1) specifying that such condition and any affected area is or has been rendered safe for the resumption of Work, or (2) specifying any special conditions under which such Work may be resumed safely.

G. If Owner and Contractor cannot agree as to entitlement to or on the amount or extent, if any, of any adjustment in Contract Price or Contract Times, or both, as a result of such Work stoppage or such special conditions under which Work is agreed to be resumed by Contractor, then within 30 days of Owner's written notice regarding the resumption of Work, Contractor may submit a Change Proposal, or Owner may impose a set-off.

H. If after receipt of such written notice Contractor does not agree to resume such Work based on a reasonable belief it is unsafe, or does not agree to resume such Work under such special conditions, then Owner may order the portion of the Work that is in the area affected by such condition to be deleted from the Work, following the contractual change procedures in Article 11. Owner may have such deleted portion of the Work performed by Owner's own forces or others in accordance with Article 8.

I. To the fullest extent permitted by Laws and Regulations, Owner shall indemnify and hold harmless Contractor, Subcontractors, and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to a Hazardous Environmental Condition, provided that such Hazardous Environmental Condition (1) was not shown or indicated in the Drawings, Specifications, or other Contract Documents, identified as Technical Data entitled to limited reliance pursuant to Paragraph 5.06.B, or identified in the Contract Documents to be included within the scope of the Work, and (2) was not created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 5.06.I shall obligate Owner to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.

J. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to the failure to control, contain, or remove a Constituent of Concern brought to the Site by Contractor or by anyone for whom Contractor is responsible, or to a Hazardous Environmental Condition created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 5.06.J shall obligate Contractor to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.

K. The provisions of Paragraphs 5.03, 5.04, and 5.05 do not apply to the presence of Constituents of Concern or to a Hazardous Environmental Condition uncovered or revealed at the Site.

ARTICLE 6 – BONDS AND INSURANCE

6.01 *Performance, Payment, and Other Bonds*

A. Contractor shall furnish a performance bond and a payment bond, each in an amount at least equal to the Contract Price, as security for the faithful performance and payment of all of Contractor's obligations under the Contract. These bonds shall remain in effect until two years after the date when final payment becomes due or until completion of the correction period specified in Paragraph 15.08, whichever is later, except as provided otherwise by Laws or Regulations, the Supplementary Conditions, or other specific provisions of the Contract. Contractor shall also furnish such other bonds as are required by the Supplementary Conditions or other specific provisions of the Contract.

B. All bonds shall be in the form prescribed by the Contract except as provided otherwise by Laws or Regulations, and shall be executed by such sureties as are named in "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies" as published in Circular 570 (as amended and supplemented) by the Financial Management Service, Surety Bond Branch, U.S. Department of the Treasury. A bond signed by an agent or attorney-in-fact must be accompanied by a certified copy of that individual's authority to bind the surety. The evidence of authority shall show that it is effective on the date the agent or attorney-in-fact signed the accompanying bond.

C. Contractor shall obtain the required bonds from surety companies that are duly licensed or authorized in the jurisdiction in which the Project is located to issue bonds in the required amounts.

D. If the surety on a bond furnished by Contractor is declared bankrupt or becomes insolvent, or its right to do business is terminated in any state or jurisdiction where any part of the Project is located, or the surety ceases to meet the requirements above, then Contractor shall promptly notify Owner and Engineer and shall, within 20 days after the event giving rise to such notification, provide another bond and surety, both of which shall comply with the bond and surety requirements above.

E. If Contractor has failed to obtain a required bond, Owner may exclude the Contractor from the Site and exercise Owner's termination rights under Article 16.

F. Upon request, Owner shall provide a copy of the payment bond to any Subcontractor, Supplier, or other person or entity claiming to have furnished labor or materials used in the performance of the Work.

6.02 *Insurance—General Provisions*

A. Owner and Contractor shall obtain and maintain insurance as required in this Article and in the Supplementary Conditions.

B. All insurance required by the Contract to be purchased and maintained by Owner or Contractor shall be obtained from insurance companies that are duly licensed or authorized, in the state or jurisdiction in which the Project is located, to issue insurance policies for the required limits and coverages. Unless a different standard is indicated in the Supplementary Conditions, all companies that provide insurance policies required under this Contract shall have an A.M. Best rating of A-VII or better.

C. Contractor shall deliver to Owner, with copies to each named insured and additional insured (as identified in this Article, in the Supplementary Conditions, or elsewhere in the Contract), certificates of insurance establishing that Contractor has obtained and is

maintaining the policies, coverages, and endorsements required by the Contract. Upon request by Owner or any other insured, Contractor shall also furnish other evidence of such required insurance, including but not limited to copies of policies and endorsements, and documentation of applicable self-insured retentions and deductibles. Contractor may block out (redact) any confidential premium or pricing information contained in any policy or endorsement furnished under this provision.

D. Owner shall deliver to Contractor, with copies to each named insured and additional insured (as identified in this Article, the Supplementary Conditions, or elsewhere in the Contract), certificates of insurance establishing that Owner has obtained and is maintaining the policies, coverages, and endorsements required of Owner by the Contract (if any). Upon request by Contractor or any other insured, Owner shall also provide other evidence of such required insurance (if any), including but not limited to copies of policies and endorsements, and documentation of applicable self-insured retentions and deductibles. Owner may block out (redact) any confidential premium or pricing information contained in any policy or endorsement furnished under this provision.

E. Failure of Owner or Contractor to demand such certificates or other evidence of the other party's full compliance with these insurance requirements, or failure of Owner or Contractor to identify a deficiency in compliance from the evidence provided, shall not be construed as a waiver of the other party's obligation to obtain and maintain such insurance.

F. If either party does not purchase or maintain all of the insurance required of such party by the Contract, such party shall notify the other party in writing of such failure to purchase prior to the start of the Work, or of such failure to maintain prior to any change in the required coverage.

G. If Contractor has failed to obtain and maintain required insurance, Owner may exclude the Contractor from the Site, impose an appropriate set-off against payment, and exercise Owner's termination rights under Article 16.

H. Without prejudice to any other right or remedy, if a party has failed to obtain required insurance, the other party may elect to obtain equivalent insurance to protect such other party's interests at the expense of the party who was required to provide such coverage, and the Contract Price shall be adjusted accordingly.

I. Owner does not represent that insurance coverage and limits established in this Contract necessarily will be adequate to protect Contractor or Contractor's interests.

J. The insurance and insurance limits required herein shall not be deemed as a limitation on Contractor's liability under the indemnities granted to Owner and other individuals and entities in the Contract.

6.03 *Contractor's Insurance*

A. *Workers' Compensation*: Contractor shall purchase and maintain workers' compensation and employer's liability insurance for:

1. claims under workers' compensation, disability benefits, and other similar employee benefit acts.

2. United States Longshoreman and Harbor Workers' Compensation Act and Jones Act coverage (if applicable).

3. claims for damages because of bodily injury, occupational sickness or disease, or death of Contractor's employees (by stop-gap endorsement in monopolist worker's compensation states).

4. Foreign voluntary worker compensation (if applicable).

B. *Commercial General Liability—Claims Covered*: Contractor shall purchase and maintain commercial general liability insurance, covering all operations by or on behalf of Contractor, on an occurrence basis, against:

1. claims for damages because of bodily injury, sickness or disease, or death of any person other than Contractor's employees.

2. claims for damages insured by reasonably available personal injury liability coverage.

3. claims for damages, other than to the Work itself, because of injury to or destruction of tangible property wherever located, including loss of use resulting therefrom.

C. *Commercial General Liability—Form and Content*: Contractor's commercial liability policy shall be written on a 1996 (or later) ISO commercial general liability form (occurrence form) and include the following coverages and endorsements:

1. Products and completed operations coverage:

a. Such insurance shall be maintained for three years after final payment.

b. Contractor shall furnish Owner and each other additional insured (as identified in the Supplementary Conditions or elsewhere in the Contract) evidence of continuation of such insurance at final payment and three years thereafter.

2. Blanket contractual liability coverage, to the extent permitted by law, including but not limited to coverage of Contractor's contractual indemnity obligations in Paragraph 7.18.

3. Broad form property damage coverage.

4. Severability of interest.

5. Underground, explosion, and collapse coverage.

6. Personal injury coverage.

7. Additional insured endorsements that include both ongoing operations and products and completed operations coverage through ISO Endorsements CG 20 10 10 01 and CG 20 37 10 01 (together); or CG 20 10 07 04 and CG 20 37 07 04 (together); or their equivalent.

8. For design professional additional insureds, ISO Endorsement CG 20 32 07 04, "Additional Insured—Engineers, Architects or Surveyors Not Engaged by the Named Insured" or its equivalent.

D. *Automobile liability*: Contractor shall purchase and maintain automobile liability insurance against claims for damages because of bodily injury or death of any person or property damage arising out of the ownership, maintenance, or use of any motor vehicle. The automobile liability policy shall be written on an occurrence basis.

E. *Umbrella or excess liability*: Contractor shall purchase and maintain umbrella or excess liability insurance written over the underlying employer's liability, commercial general liability, and automobile liability insurance described in the paragraphs above. Subject to industry-standard exclusions, the coverage afforded shall follow form as to each and every one of the underlying policies.

F. *Contractor's pollution liability insurance*: Contractor shall purchase and maintain a policy covering third-party injury and property damage claims, including clean-up costs, as a result

of pollution conditions arising from Contractor's operations and completed operations. This insurance shall be maintained for no less than three years after final completion.

G. *Additional insureds*: The Contractor's commercial general liability, automobile liability, umbrella or excess, and pollution liability policies shall include and list as additional insureds Owner and Engineer, and any individuals or entities identified in the Supplementary Conditions; include coverage for the respective officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of all such additional insureds; and the insurance afforded to these additional insureds shall provide primary coverage for all claims covered thereby (including as applicable those arising from both ongoing and completed operations) on a non-contributory basis. Contractor shall obtain all necessary endorsements to support these requirements.

H. *Contractor's professional liability insurance*: If Contractor will provide or furnish professional services under this Contract, through a delegation of professional design services or otherwise, then Contractor shall be responsible for purchasing and maintaining applicable professional liability insurance. This insurance shall provide protection against claims arising out of performance of professional design or related services, and caused by a negligent error, omission, or act for which the insured party is legally liable. It shall be maintained throughout the duration of the Contract and for a minimum of two years after Substantial Completion. If such professional design services are performed by a Subcontractor, and not by Contractor itself, then the requirements of this paragraph may be satisfied through the purchasing and maintenance of such insurance by such Subcontractor.

I. *General provisions*: The policies of insurance required by this Paragraph 6.03 shall:

1. include at least the specific coverages provided in this Article.

2. be written for not less than the limits of liability provided in this Article and in the Supplementary Conditions, or required by Laws or Regulations, whichever is greater.

3. contain a provision or endorsement that the coverage afforded will not be canceled, materially changed, or renewal refused until at least 10 days prior written notice has been given to Contractor. Within three days of receipt of any such written notice, Contractor shall provide a copy of the notice to Owner, Engineer, and each other insured under the policy.

4. remain in effect at least until final payment (and longer if expressly required in this Article) and at all times thereafter when Contractor may be correcting, removing, or replacing defective Work as a warranty or correction obligation, or otherwise, or returning to the Site to conduct other tasks arising from the Contract Documents.

5. be appropriate for the Work being performed and provide protection from claims that may arise out of or result from Contractor's performance of the Work and Contractor's other obligations under the Contract Documents, whether it is to be performed by Contractor, any Subcontractor or Supplier, or by anyone directly or indirectly employed by any of them to perform any of the Work, or by anyone for whose acts any of them may be liable.

J. The coverage requirements for specific policies of insurance must be met by such policies, and not by reference to excess or umbrella insurance provided in other policies.

6.04 *Owner's Liability Insurance*

A. In addition to the insurance required to be provided by Contractor under Paragraph 6.03, Owner, at Owner's option, may purchase and maintain at Owner's expense Owner's own liability insurance as will protect Owner against claims which may arise from operations under the Contract Documents.

B. Owner's liability policies, if any, operate separately and independently from policies required to be provided by Contractor, and Contractor cannot rely upon Owner's liability policies for any of Contractor's obligations to the Owner, Engineer, or third parties.

6.05 *Property Insurance*

A. *Builder's Risk*: Unless otherwise provided in the Supplementary Conditions, Contractor shall purchase and maintain builder's risk insurance upon the Work on a completed value basis, in the amount of the full insurable replacement cost thereof (subject to such deductible amounts as may be provided in the Supplementary Conditions or required by Laws and Regulations). This insurance shall:

1. include the Owner and Contractor as named insureds, and all Subcontractors, and any individuals or entities required by the Supplementary Conditions to be insured under such builder's risk policy, as insureds or named insureds. For purposes of the remainder of this Paragraph 6.05, Paragraphs 6.06 and 6.07, and any corresponding Supplementary Conditions, the parties required to be insured shall collectively be referred to as "insureds."

2. be written on a builder's risk "all risk" policy form that shall at least include insurance for physical loss or damage to the Work, temporary buildings, falsework, and materials and equipment in transit, and shall insure against at least the following perils or causes of loss: fire; lightning; windstorm; riot; civil commotion; terrorism; vehicle impact; aircraft; smoke; theft; vandalism and malicious mischief; mechanical breakdown, boiler explosion, and artificially generated electric current; earthquake; volcanic activity, and other earth movement; flood; collapse; explosion; debris removal; demolition occasioned by enforcement of Laws and Regulations; water damage (other than that caused by flood); and such other perils or causes of loss as may be specifically required by the Supplementary Conditions. If insurance against mechanical breakdown, boiler explosion, and artificially generated electric current; earthquake; volcanic activity, and other earth movement; or flood, are not commercially available under builder's risk policies, by endorsement or otherwise, such insurance may be provided through other insurance policies acceptable to Owner and Contractor.

3. cover, as insured property, at least the following: (a) the Work and all materials, supplies, machinery, apparatus, equipment, fixtures, and other property of a similar nature that are to be incorporated into or used in the preparation, fabrication, construction, erection, or completion of the Work, including Owner-furnished or assigned property; (b) spare parts inventory required within the scope of the Contract; and (c) temporary works which are not intended to form part of the permanent constructed Work but which are intended to provide working access to the Site, or to the Work under construction, or which are intended to provide temporary support for the Work under construction, including scaffolding, form work, fences, shoring, falsework, and temporary structures.

4. cover expenses incurred in the repair or replacement of any insured property (including but not limited to fees and charges of engineers and architects).

5. extend to cover damage or loss to insured property while in temporary storage at the Site or in a storage location outside the Site (but not including property stored at the premises of a manufacturer or Supplier).

6. extend to cover damage or loss to insured property while in transit.

7. allow for partial occupation or use of the Work by Owner, such that those portions of the Work that are not yet occupied or used by Owner shall remain covered by the builder's risk insurance.

8. allow for the waiver of the insurer's subrogation rights, as set forth below.

9. provide primary coverage for all losses and damages caused by the perils or causes of loss covered.

10. not include a co-insurance clause.

11. include an exception for ensuing losses from physical damage or loss with respect to any defective workmanship, design, or materials exclusions.

12. include performance/hot testing and start-up.

13. be maintained in effect, subject to the provisions herein regarding Substantial Completion and partial occupancy or use of the Work by Owner, until the Work is complete.

B. *Notice of Cancellation or Change*: All the policies of insurance (and the certificates or other evidence thereof) required to be purchased and maintained in accordance with this Paragraph 6.05 will contain a provision or endorsement that the coverage afforded will not be canceled or materially changed or renewal refused until at least 10 days prior written notice has been given to the purchasing policyholder. Within three days of receipt of any such written notice, the purchasing policyholder shall provide a copy of the notice to each other insured.

C. *Deductibles*: The purchaser of any required builder's risk or property insurance shall pay for costs not covered because of the application of a policy deductible.

D. *Partial Occupancy or Use by Owner*: If Owner will occupy or use a portion or portions of the Work prior to Substantial Completion of all the Work as provided in Paragraph 15.04, then Owner (directly, if it is the purchaser of the builder's risk policy, or through Contractor) will provide notice of such occupancy or use to the builder's risk insurer. The builder's risk insurance shall not be canceled or permitted to lapse on account of any such partial use or occupancy; rather, those portions of the Work that are occupied or used by Owner may come off the builder's risk policy, while those portions of the Work not yet occupied or used by Owner shall remain covered by the builder's risk insurance.

E. *Additional Insurance*: If Contractor elects to obtain other special insurance to be included in or supplement the builder's risk or property insurance policies provided under this Paragraph 6.05, it may do so at Contractor's expense.

F. *Insurance of Other Property*: If the express insurance provisions of the Contract do not require or address the insurance of a property item or interest, such as tools, construction equipment, or other personal property owned by Contractor, a Subcontractor, or an employee of Contractor or a Subcontractor, then the entity or individual owning such property item will be responsible for deciding whether to insure it, and if so in what amount.

6.06 *Waiver of Rights*

A. All policies purchased in accordance with Paragraph 6.05, expressly including the builder's risk policy, 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 insureds thereunder, or against Engineer or its consultants, or their officers, directors, members, partners, employees, agents, consultants, or subcontractors. Owner and Contractor waive all rights against each other and the respective officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, for all 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, in addition, waive all such rights against Engineer, its consultants, all Subcontractors, all individuals or entities identified in the Supplementary Conditions as insureds, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, under such policies for losses and damages so caused. 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 or Contractor as trustee or fiduciary, or otherwise payable under any policy so issued.

B. Owner waives all rights against Contractor, Subcontractors, and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them, for:

1. loss due to business interruption, loss of use, or other consequential loss extending beyond direct physical loss or damage to Owner's property or the Work caused by, arising out of, or resulting from fire or other perils whether or not insured by Owner; and

2. loss or damage to the completed Project or part thereof caused by, arising out of, or resulting from fire or other insured peril or cause of loss covered by any property insurance maintained on the completed Project or part thereof by Owner during partial occupancy or use pursuant to Paragraph 15.04, after Substantial Completion pursuant to Paragraph 15.03, or after final payment pursuant to Paragraph 15.06.

C. Any insurance policy maintained by Owner covering any loss, damage or consequential loss referred to in Paragraph 6.06.B shall contain provisions to the effect that in the event of payment of any such loss, damage, or consequential loss, the insurers will have no rights of recovery against Contractor, Subcontractors, or Engineer, or the officers, directors, members, partners, employees, agents, consultants, or subcontractors of each and any of them.

D. Contractor shall be responsible for assuring that the agreement under which a Subcontractor performs a portion of the Work contains provisions whereby the Subcontractor waives all rights against Owner, Contractor, all individuals or entities identified in the Supplementary Conditions as insureds, the Engineer and its consultants, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, for all losses and damages caused by, arising out of, relating to, or resulting from any of the perils or causes of loss covered by builder's risk insurance and any other property insurance applicable to the Work.

6.07 *Receipt and Application of Property Insurance Proceeds*

A. Any insured loss under the builder's risk and other policies of insurance required by Paragraph 6.05 will be adjusted and settled with the named insured that purchased the

policy. Such named insured shall act as fiduciary for the other insureds, and give notice to such other insureds that adjustment and settlement of a claim is in progress. Any other insured may state its position regarding a claim for insured loss in writing within 15 days after notice of such claim.

B. Proceeds for such insured losses may be made payable by the insurer either jointly to multiple insureds, or to the named insured that purchased the policy in its own right and as fiduciary for other insureds, subject to the requirements of any applicable mortgage clause. A named insured receiving insurance proceeds under the builder's risk and other policies of insurance required by Paragraph 6.05 shall distribute such proceeds in accordance with such agreement as the parties in interest may reach, or as otherwise required under the dispute resolution provisions of this Contract or applicable Laws and Regulations.

C. If no other special agreement is reached, the damaged Work shall be repaired or replaced, the money so received applied on account thereof, and the Work and the cost thereof covered by Change Order, if needed.

ARTICLE 7 – CONTRACTOR'S RESPONSIBILITIES

7.01 *Supervision and Superintendence*

A. Contractor shall supervise, inspect, and direct the Work competently and efficiently, devoting such attention thereto and applying such skills and expertise as may be necessary to perform the Work in accordance with the Contract Documents. Contractor shall be solely responsible for the means, methods, techniques, sequences, and procedures of construction.

B. At all times during the progress of the Work, Contractor shall assign a competent resident superintendent who shall not be replaced without written notice to Owner and Engineer except under extraordinary circumstances.

7.02 *Labor; Working Hours*

A. Contractor shall provide competent, suitably qualified personnel to survey and lay out the Work and perform construction as required by the Contract Documents. Contractor shall at all times maintain good discipline and order at the Site.

B. Except as otherwise required for the safety or protection of persons or the Work or property at the Site or adjacent thereto, and except as otherwise stated in the Contract Documents, all Work at the Site shall be performed during regular working hours, Monday through Friday. Contractor will not perform Work on a Saturday, Sunday, or any legal holiday. Contractor may perform Work outside regular working hours or on Saturdays, Sundays, or legal holidays only with Owner's written consent, which will not be unreasonably withheld.

7.03 *Services, Materials, and Equipment*

A. Unless otherwise specified in the Contract Documents, Contractor shall provide and assume full responsibility for all services, materials, equipment, labor, transportation, construction equipment and machinery, tools, appliances, fuel, power, light, heat, telephone, water, sanitary facilities, temporary facilities, and all other facilities and incidentals necessary for the performance, testing, start up, and completion of the Work, whether or not such items are specifically called for in the Contract Documents.

B. All materials and equipment incorporated into the Work shall be of good quality and new, except as otherwise provided in the Contract Documents. All special warranties and

guarantees required by the Specifications shall expressly run to the benefit of Owner. If required by Engineer, Contractor shall furnish satisfactory evidence (including reports of required tests) as to the source, kind, and quality of materials and equipment.

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

7.04 *"Or Equals"*

A. Whenever an item of material or equipment is specified or described in the Contract Documents by using the name of a proprietary item or the name of a particular Supplier, the Contract Price has been based upon Contractor furnishing such item as specified. The specification or description of such an item is intended to establish the type, function, appearance, and quality required. Unless the specification or description contains or is followed by words reading that no like, equivalent, or "or equal" item is permitted, Contractor may request that Engineer authorize the use of other items of material or equipment, or items from other proposed suppliers under the circumstances described below.

1. If Engineer in its sole discretion determines that an item of material or equipment proposed by Contractor is functionally equal to that named and sufficiently similar so that no change in related Work will be required, Engineer shall deem it an "or equal" item. For the purposes of this paragraph, a proposed item of material or equipment will be considered functionally equal to an item so named if:

a. in the exercise of reasonable judgment Engineer determines that:

1) it is at least equal in materials of construction, quality, durability, appearance, strength, and design characteristics;

2) it will reliably perform at least equally well the function and achieve the results imposed by the design concept of the completed Project as a functioning whole;

3) it has a proven record of performance and availability of responsive service; and

4) it is not objectionable to Owner.

b. Contractor certifies that, if approved and incorporated into the Work:

1) there will be no increase in cost to the Owner or increase in Contract Times; and

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

B. *Contractor's Expense*: Contractor shall provide all data in support of any proposed "or equal" item at Contractor's expense.

C. *Engineer's Evaluation and Determination*: Engineer will be allowed a reasonable time to evaluate each "or-equal" request. Engineer may require Contractor to furnish additional data about the proposed "or-equal" item. Engineer will be the sole judge of acceptability. No "or-equal" item will be ordered, furnished, installed, or utilized until Engineer's review is complete and Engineer determines that the proposed item is an "or-equal", which will be evidenced by an approved Shop Drawing or other written communication. Engineer will advise Contractor in writing of any negative determination.

D. *Effect of Engineer's Determination*: Neither approval nor denial of an "or-equal" request shall result in any change in Contract Price. The Engineer's denial of an "or-equal" request shall be final and binding, and may not be reversed through an appeal under any provision of the Contract Documents.

E. *Treatment as a Substitution Request*: If Engineer determines that an item of material or equipment proposed by Contractor does not qualify as an "or-equal" item, Contractor may request that Engineer considered the proposed item as a substitute pursuant to Paragraph 7.05.

7.05 *Substitutes*

A. Unless the specification or description of an item of material or equipment required to be furnished under the Contract Documents contains or is followed by words reading that no substitution is permitted, Contractor may request that Engineer authorize the use of other items of material or equipment under the circumstances described below. To the extent possible such requests shall be made before commencement of related construction at the Site.

1. Contractor shall submit sufficient information as provided below to allow Engineer to determine if the item of material or equipment proposed is functionally equivalent to that named and an acceptable substitute therefor. Engineer will not accept requests for review of proposed substitute items of material or equipment from anyone other than Contractor.

2. The requirements for review by Engineer will be as set forth in Paragraph 7.05.B, as supplemented by the Specifications, and as Engineer may decide is appropriate under the circumstances.

3. Contractor shall make written application to Engineer for review of a proposed substitute item of material or equipment that Contractor seeks to furnish or use. The application:

a. shall certify that the proposed substitute item will:

1) perform adequately the functions and achieve the results called for by the general design,

2) be similar in substance to that specified, and

3) be suited to the same use as that specified.

b. will state:

1) the extent, if any, to which the use of the proposed substitute item will necessitate a change in Contract Times,

2) whether use of the proposed substitute item in the Work will require a change in any of the Contract Documents (or in the provisions of any other direct contract with Owner for other work on the Project) to adapt the design to the proposed substitute item, and

3) whether incorporation or use of the proposed substitute item in connection with the Work is subject to payment of any license fee or royalty.

c. will identify:

1) all variations of the proposed substitute item from that specified, and

2) available engineering, sales, maintenance, repair, and replacement services.

d. shall contain an itemized estimate of all costs or credits that will result directly or indirectly from use of such substitute item, including but not limited to changes in Contract Price, shared savings, costs of redesign, and claims of other contractors affected by any resulting change.

B. *Engineer's Evaluation and Determination*: Engineer will be allowed a reasonable time to evaluate each substitute request, and to obtain comments and direction from Owner. Engineer may require Contractor to furnish additional data about the proposed substitute item. Engineer will be the sole judge of acceptability. No substitute will be ordered, furnished, installed, or utilized until Engineer's review is complete and Engineer determines that the proposed item is an acceptable substitute. Engineer's determination will be evidenced by a Field Order or a proposed Change Order accounting for the substitution itself and all related impacts, including changes in Contract Price or Contract Times. Engineer will advise Contractor in writing of any negative determination.

C. *Special Guarantee*: Owner may require Contractor to furnish at Contractor's expense a special performance guarantee or other surety with respect to any substitute.

D. *Reimbursement of Engineer's Cost*: Engineer will record Engineer's costs in evaluating a substitute proposed or submitted by Contractor. Whether or not Engineer approves a substitute so proposed or submitted by Contractor, Contractor shall reimburse Owner for the reasonable charges of Engineer for evaluating each such proposed substitute. Contractor shall also reimburse Owner for the reasonable charges of Engineer for making changes in the Contract Documents (or in the provisions of any other direct contract with Owner) resulting from the acceptance of each proposed substitute.

E. *Contractor's Expense*: Contractor shall provide all data in support of any proposed substitute at Contractor's expense.

F. *Effect of Engineer's Determination*: If Engineer approves the substitution request, Contractor shall execute the proposed Change Order and proceed with the substitution. The Engineer's denial of a substitution request shall be final and binding, and may not be reversed through an appeal under any provision of the Contract Documents. Contractor may challenge the scope of reimbursement costs imposed under Paragraph 7.05.D, by timely submittal of a Change Proposal.

7.06 *Concerning Subcontractors, Suppliers, and Others*

A. Contractor may retain Subcontractors and Suppliers for the performance of parts of the Work. Such Subcontractors and Suppliers must be acceptable to Owner.

B. Contractor shall retain specific Subcontractors, Suppliers, or other individuals or entities for the performance of designated parts of the Work if required by the Contract to do so.

C. Subsequent to the submittal of Contractor's Bid or final negotiation of the terms of the Contract, Owner may not require Contractor to retain any Subcontractor, Supplier, or other individual or entity to furnish or perform any of the Work against which Contractor has reasonable objection.

D. Prior to entry into any binding subcontract or purchase order, Contractor shall submit to Owner the identity of the proposed Subcontractor or Supplier (unless Owner has already deemed such proposed Subcontractor or Supplier acceptable, during the bidding process or otherwise). Such proposed Subcontractor or Supplier shall be deemed acceptable to Owner unless Owner raises a substantive, reasonable objection within five days.

E. Owner may require the replacement of any Subcontractor, Supplier, or other individual or entity retained by Contractor to perform any part of the Work. Owner also may require Contractor to retain specific replacements; provided, however, that Owner may not require a replacement to which Contractor has a reasonable objection. If Contractor has submitted the identity of certain Subcontractors, Suppliers, or other individuals or entities for acceptance by Owner, and Owner has accepted it (either in writing or by failing to make written objection thereto), then Owner may subsequently revoke the acceptance of any such Subcontractor, Supplier, or other individual or entity so identified solely on the basis of substantive, reasonable objection after due investigation. Contractor shall submit an acceptable replacement for the rejected Subcontractor, Supplier, or other individual or entity.

F. If Owner requires the replacement of any Subcontractor, Supplier, or other individual or entity retained by Contractor to perform any part of the Work, then Contractor shall be entitled to an adjustment in Contract Price or Contract Times, or both, with respect to the replacement; and Contractor shall initiate a Change Proposal for such adjustment within 30 days of Owner's requirement of replacement.

G. No acceptance by Owner of any such Subcontractor, Supplier, or other individual or entity, whether initially or as a replacement, shall constitute a waiver of the right of Owner to the completion of the Work in accordance with the Contract Documents.

H. On a monthly basis Contractor shall submit to Engineer a complete list of all Subcontractors and Suppliers having a direct contract with Contractor, and of all other Subcontractors and Suppliers known to Contractor at the time of submittal.

I. Contractor shall be fully responsible to Owner and Engineer for all acts and omissions of the Subcontractors, Suppliers, and other individuals or entities performing or furnishing any of the Work just as Contractor is responsible for Contractor's own acts and omissions.

J. Contractor shall be solely responsible for scheduling and coordinating the work of Subcontractors, Suppliers, and all other individuals or entities performing or furnishing any of the Work.

K. Contractor shall restrict all Subcontractors, Suppliers, and such other individuals or entities performing or furnishing any of the Work from communicating with Engineer or Owner, except through Contractor or in case of an emergency, or as otherwise expressly allowed herein.

L. The divisions and sections of the Specifications and the identifications of any Drawings shall not control Contractor in dividing the Work among Subcontractors or Suppliers or delineating the Work to be performed by any specific trade.

M. All Work performed for Contractor by a Subcontractor or Supplier shall be pursuant to an appropriate contractual agreement that specifically binds the Subcontractor or Supplier to the applicable terms and conditions of the Contract Documents for the benefit of Owner and Engineer.

N. Owner may furnish to any Subcontractor or Supplier, to the extent practicable, information about amounts paid to Contractor on account of Work performed for Contractor by the particular Subcontractor or Supplier.

O. Nothing in the Contract Documents:

1. shall create for the benefit of any such Subcontractor, Supplier, or other individual or entity any contractual relationship between Owner or Engineer and any such Subcontractor, Supplier, or other individual or entity; nor

2. shall create any obligation on the part of Owner or Engineer to pay or to see to the payment of any money due any such Subcontractor, Supplier, or other individual or entity except as may otherwise be required by Laws and Regulations.

7.07 *Patent Fees and Royalties*

A. Contractor shall pay all license fees and royalties and assume all costs incident to the use in the performance of the Work or the incorporation in the Work of any invention, design, process, product, or device which is the subject of patent rights or copyrights held by others. If a particular invention, design, process, product, or device is specified in the Contract Documents for use in the performance of the Work and if, to the actual knowledge of Owner or Engineer, its use is subject to patent rights or copyrights calling for the payment of any license fee or royalty to others, the existence of such rights shall be disclosed by Owner in the Contract Documents.

B. To the fullest extent permitted by Laws and Regulations, Owner shall indemnify and hold harmless Contractor, and its officers, directors, members, partners, employees, agents, consultants, and subcontractors from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals, and all court or arbitration or other dispute resolution costs) arising out of or relating to any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product, or device specified in the Contract Documents, but not identified as being subject to payment of any license fee or royalty to others required by patent rights or copyrights.

C. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product, or device not specified in the Contract Documents.

7.08 *Permits*

A. Unless otherwise provided in the Contract Documents, Contractor shall obtain and pay for all construction permits and licenses. Owner shall assist Contractor, when necessary, in obtaining such permits and licenses. Contractor shall pay all governmental charges and inspection fees necessary for the prosecution of the Work which are applicable at the time of the submission of Contractor's Bid (or when Contractor became bound under a negotiated contract). Owner shall pay all charges of utility owners for connections for providing permanent service to the Work

7.09 *Taxes*

A. Contractor shall pay all sales, consumer, use, and other similar taxes required to be paid by Contractor in accordance with the Laws and Regulations of the place of the Project which are applicable during the performance of the Work.

7.10 *Laws and Regulations*

A. Contractor shall give all notices required by and shall comply with all Laws and Regulations applicable to the performance of the Work. Except where otherwise expressly required by applicable Laws and Regulations, neither Owner nor Engineer shall be responsible for monitoring Contractor's compliance with any Laws or Regulations.

B. If Contractor performs any Work or takes any other action knowing or having reason to know that it is contrary to Laws or Regulations, Contractor shall bear all resulting costs and losses, and shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such Work or other action. It shall not be Contractor's responsibility to make certain that the Work described in the Contract Documents is in accordance with Laws and Regulations, but this shall not relieve Contractor of Contractor's obligations under Paragraph 3.03.

C. Owner or Contractor may give notice to the other party of any changes after the submission of Contractor's Bid (or after the date when Contractor became bound under a negotiated contract) in Laws or Regulations having an effect on the cost or time of performance of the Work, including but not limited to changes in Laws or Regulations having an effect on procuring permits and on sales, use, value-added, consumption, and other similar taxes. If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in Contract Price or Contract Times resulting from such changes, then within 30 days of such notice Contractor may submit a Change Proposal, or Owner may initiate a Claim.

7.11 *Record Documents*

A. Contractor shall maintain in a safe place at the Site one printed record copy of all Drawings, Specifications, Addenda, Change Orders, Work Change Directives, Field Orders, written interpretations and clarifications, and approved Shop Drawings. Contractor shall keep such record documents in good order and annotate them to show changes made during construction. These record documents, together with all approved Samples, will be available to Engineer for reference. Upon completion of the Work, Contractor shall deliver these record documents to Engineer.

7.12 *Safety and Protection*

A. Contractor shall be solely responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the Work. Such responsibility does not relieve Subcontractors of their responsibility for the safety of persons or property in the performance of their work, nor for compliance with applicable safety Laws and Regulations. Contractor shall take all necessary precautions for the safety of, and shall provide the necessary protection to prevent damage, injury, or loss to:

1. all persons on the Site or who may be affected by the Work;

2. all the Work and materials and equipment to be incorporated therein, whether in storage on or off the Site; and

3. other property at the Site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures, other work in progress, utilities, and Underground Facilities not designated for removal, relocation, or replacement in the course of construction.

B. Contractor shall comply with all applicable Laws and Regulations relating to the safety of persons or property, or to the protection of persons or property from damage, injury, or loss; and shall erect and maintain all necessary safeguards for such safety and protection. Contractor shall notify Owner; the owners of adjacent property, Underground Facilities, and other utilities; and other contractors and utility owners performing work at or adjacent to the Site, when prosecution of the Work may affect them, and shall cooperate with them in the protection, removal, relocation, and replacement of their property or work in progress.

C. Contractor shall comply with the applicable requirements of Owner's safety programs, if any. The Supplementary Conditions identify any Owner's safety programs that are applicable to the Work.

D. Contractor shall inform Owner and Engineer of the specific requirements of Contractor's safety program with which Owner's and Engineer's employees and representatives must comply while at the Site.

E. All damage, injury, or loss to any property referred to in Paragraph 7.12.A.2 or 7.12.A.3 caused, directly or indirectly, in whole or in part, by Contractor, any Subcontractor, Supplier, or any other individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, shall be remedied by Contractor at its expense (except damage or loss attributable to the fault of Drawings or Specifications or to the acts or omissions of Owner or Engineer or anyone employed by any of them, or anyone for whose acts any of them may be liable, and not attributable, directly or indirectly, in whole or in part, to the fault or negligence of Contractor or any Subcontractor, Supplier, or other individual or entity directly or indirectly employed by any of them).

F. Contractor's duties and responsibilities for safety and protection shall continue until such time as all the Work is completed and Engineer has issued a notice to Owner and Contractor in accordance with Paragraph 15.06.B that the Work is acceptable (except as otherwise expressly provided in connection with Substantial Completion).

G. Contractor's duties and responsibilities for safety and protection shall resume whenever Contractor or any Subcontractor or Supplier returns to the Site to fulfill warranty or correction obligations, or to conduct other tasks arising from the Contract Documents.

7.13 *Safety Representative*

A. Contractor shall designate a qualified and experienced safety representative at the Site whose duties and responsibilities shall be the prevention of accidents and the maintaining and supervising of safety precautions and programs.

7.14 *Hazard Communication Programs*

A. 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 Laws or Regulations.

7.15 *Emergencies*

A. In emergencies affecting the safety or protection of persons or the Work or property at the Site or adjacent thereto, Contractor is obligated to act to prevent threatened damage, injury, or loss. Contractor shall give Engineer prompt written notice if Contractor believes that any significant changes in the Work or variations from the Contract Documents have been caused thereby or are required as a result thereof. If Engineer determines that a change in the Contract Documents is required because of the action taken by Contractor in response to such an emergency, a Work Change Directive or Change Order will be issued.

7.16 *Shop Drawings, Samples, and Other Submittals*

A. *Shop Drawing and Sample Submittal Requirements*:

1. Before submitting a Shop Drawing or Sample, Contractor shall have:

a. reviewed and coordinated the Shop Drawing or Sample with other Shop Drawings and Samples and with the requirements of the Work and the Contract Documents;

b. determined and verified all field measurements, quantities, dimensions, specified performance and design criteria, installation requirements, materials, catalog numbers, and similar information with respect thereto;

c. determined and verified the suitability of all materials and equipment offered with respect to the indicated application, fabrication, shipping, handling, storage, assembly, and installation pertaining to the performance of the Work; and

d. 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.

2. 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 review of that submittal, and that Contractor approves the submittal.

3. With each submittal, Contractor shall give 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 set forth in a written communication separate from the Shop Drawings or Sample submittal; and, in addition, in the case of Shop Drawings by a specific notation made on each Shop Drawing submitted to Engineer for review and approval of each such variation.

B. *Submittal Procedures for Shop Drawings and Samples*: Contractor shall submit Shop Drawings and Samples to Engineer for review and approval in accordance with the accepted Schedule of Submittals. Each submittal will be identified as Engineer may require.

1. *Shop Drawings*:

a. Contractor shall submit the number of copies required in the Specifications.

b. Data shown on the Shop Drawings will be complete with respect to quantities, dimensions, specified performance and design criteria, materials, and similar data to show Engineer the services, materials, and equipment Contractor proposes to

provide and to enable Engineer to review the information for the limited purposes required by Paragraph 7.16.D.

2. *Samples*:

   a. Contractor shall submit the number of Samples required in the Specifications.

   b. Contractor shall clearly identify each Sample as to material, Supplier, pertinent data such as catalog numbers, the use for which intended and other data as Engineer may require to enable Engineer to review the submittal for the limited purposes required by Paragraph 7.16.D.

3. Where a Shop Drawing or Sample is required by the Contract Documents or the Schedule of Submittals, any related Work performed prior to Engineer's review and approval of the pertinent submittal will be at the sole expense and responsibility of Contractor.

C. *Other Submittals*: Contractor shall submit other submittals to Engineer in accordance with the accepted Schedule of Submittals, and pursuant to the applicable terms of the Specifications.

D. *Engineer's Review*:

1. Engineer will provide timely review of Shop Drawings and Samples in accordance with the Schedule of Submittals acceptable to Engineer. Engineer's review and approval will be only to determine if the items covered by the submittals will, after installation or incorporation in the Work, conform to the information given in the Contract Documents and be compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents.

2. Engineer's review and approval will not extend to means, methods, techniques, sequences, or procedures of construction or to safety precautions or programs incident thereto.

3. Engineer's review and approval of a separate item as such will not indicate approval of the assembly in which the item functions.

4. Engineer's review and approval of a Shop Drawing or Sample shall not relieve Contractor from responsibility for any variation from the requirements of the Contract Documents unless Contractor has complied with the requirements of Paragraph 7.16.A.3 and Engineer has given written approval of each such variation by specific written notation thereof incorporated in or accompanying the Shop Drawing or Sample. Engineer will document any such approved variation from the requirements of the Contract Documents in a Field Order.

5. Engineer's review and approval of a Shop Drawing or Sample shall not relieve Contractor from responsibility for complying with the requirements of Paragraph 7.16.A and B.

6. Engineer's review and approval of a Shop Drawing or Sample, or of a variation from the requirements of the Contract Documents, shall not, under any circumstances, change the Contract Times or Contract Price, unless such changes are included in a Change Order.

7. Neither Engineer's receipt, review, acceptance or approval of a Shop Drawing, Sample, or other submittal shall result in such item becoming a Contract Document.

8. Contractor shall perform the Work in compliance with the requirements and commitments set forth in approved Shop Drawings and Samples, subject to the provisions of Paragraph 7.16.D.4.

E. *Resubmittal Procedures*:

1. Contractor shall make corrections required by 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 Engineer on previous submittals.

2. Contractor shall furnish required submittals with sufficient information and accuracy to obtain required approval of an item with no more than three submittals. Engineer will record Engineer's time for reviewing a fourth or subsequent submittal of a Shop Drawings, sample, or other item requiring approval, and Contractor shall be responsible for Engineer's charges to Owner for such time. Owner may impose a set-off against payments due to Contractor to secure reimbursement for such charges.

3. If Contractor requests a change of a previously approved submittal item, Contractor shall be responsible for Engineer's charges to Owner for its review time, and Owner may impose a set-off against payments due to Contractor to secure reimbursement for such charges, unless the need for such change is beyond the control of Contractor.

7.17 *Contractor's General Warranty and Guarantee*

A. Contractor warrants and guarantees to Owner that all Work will be in accordance with the Contract Documents and will not be defective. Engineer and its officers, directors, members, partners, employees, agents, consultants, and subcontractors shall be entitled to rely on Contractor's warranty and guarantee.

B. Contractor's warranty and guarantee hereunder excludes defects or damage caused by:

1. abuse, modification, or improper maintenance or operation by persons other than Contractor, Subcontractors, Suppliers, or any other individual or entity for whom Contractor is responsible; or

2. normal wear and tear under normal usage.

C. Contractor's obligation to perform and complete the Work in accordance with the Contract Documents shall be absolute. None of the following will constitute an acceptance of Work that is not in accordance with the Contract Documents or a release of Contractor's obligation to perform the Work in accordance with the Contract Documents:

1. observations by Engineer;

2. recommendation by Engineer or payment by Owner of any progress or final payment;

3. the issuance of a certificate of Substantial Completion by Engineer or any payment related thereto by Owner;

4. use or occupancy of the Work or any part thereof by Owner;

5. any review and approval of a Shop Drawing or Sample submittal;

6. the issuance of a notice of acceptability by Engineer;

7. any inspection, test, or approval by others; or

8. any correction of defective Work by Owner.

D. If the Contract requires the Contractor to accept the assignment of a contract entered into by Owner, then the specific warranties, guarantees, and correction obligations contained in the assigned contract shall govern with respect to Contractor's performance obligations to Owner for the Work described in the assigned contract.

7.18 *Indemnification*

A. To the fullest extent permitted by Laws and Regulations, and in addition to any other obligations of Contractor under the Contract or otherwise, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to the performance of the Work, provided that any such claim, cost, loss, or damage 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 but only to the extent caused by any negligent act or omission of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work or anyone for whose acts any of them may be liable.

B. In any and all claims against Owner or Engineer or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors by any employee (or the survivor or personal representative of such employee) of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, the indemnification obligation under Paragraph 7.18.A shall not be limited in any way by any limitation on the amount or type of damages, compensation, or benefits payable by or for Contractor or any such Subcontractor, Supplier, or other individual or entity under workers' compensation acts, disability benefit acts, or other employee benefit acts.

C. The indemnification obligations of Contractor under Paragraph 7.18.A shall not extend to the liability of Engineer and Engineer's officers, directors, members, partners, employees, agents, consultants and subcontractors arising out of:

1. the preparation or approval of, or the failure to prepare or approve maps, Drawings, opinions, reports, surveys, Change Orders, designs, or Specifications; or

2. giving directions or instructions, or failing to give them, if that is the primary cause of the injury or damage.

7.19 *Delegation of Professional Design Services*

A. Contractor will not be required to provide professional design services unless such services are specifically required by the Contract Documents for a portion of the Work or unless such services are required to carry out Contractor's responsibilities for construction means, methods, techniques, sequences and procedures. Contractor shall not be required to provide professional services in violation of applicable Laws and Regulations.

B. If professional design services or certifications by a design professional related to systems, materials, or equipment are specifically required of Contractor by the Contract Documents, Owner and Engineer will specify all performance and design criteria that such services must satisfy. Contractor shall cause such services or certifications to be provided by a properly licensed professional, whose signature and seal shall appear on all drawings, calculations, specifications, certifications, and other submittals prepared by such professional. Shop

Drawings and other submittals related to the Work designed or certified by such professional, if prepared by others, shall bear such professional's written approval when submitted to Engineer.

C. Owner and Engineer shall be entitled to rely upon the adequacy, accuracy, and completeness of the services, certifications, or approvals performed by such design professionals, provided Owner and Engineer have specified to Contractor all performance and design criteria that such services must satisfy.

D. Pursuant to this paragraph, Engineer's review and approval of design calculations and design drawings will be only for the limited purpose of checking for conformance with performance and design criteria given and the design concept expressed in the Contract Documents. Engineer's review and approval of Shop Drawings and other submittals (except design calculations and design drawings) will be only for the purpose stated in Paragraph 7.16.D.1.

E. Contractor shall not be responsible for the adequacy of the performance or design criteria specified by Owner or Engineer.

ARTICLE 8 – OTHER WORK AT THE SITE

8.01 *Other Work*

A. In addition to and apart from the Work under the Contract Documents, the Owner may perform other work at or adjacent to the Site. Such other work may be performed by Owner's employees, or through contracts between the Owner and third parties. Owner may also arrange to have third-party utility owners perform work on their utilities and facilities at or adjacent to the Site.

B. If Owner performs other work at or adjacent to the Site with Owner's employees, or through contracts for such other work, then Owner shall give Contractor written notice thereof prior to starting any such other work. If Owner has advance information regarding the start of any utility work at or adjacent to the Site, Owner shall provide such information to Contractor.

C. Contractor shall afford each other contractor that performs such other work, each utility owner performing other work, and Owner, if Owner is performing other work with Owner's employees, proper and safe access to the Site, and provide a reasonable opportunity for the introduction and storage of materials and equipment and the execution of such other work. Contractor shall do all cutting, fitting, and patching of the Work that may be required to properly connect or otherwise make its several parts come together and properly integrate with such other work. Contractor shall not endanger any work of others by cutting, excavating, or otherwise altering such work; provided, however, that Contractor may cut or alter others' work with the written consent of Engineer and the others whose work will be affected.

D. If the proper execution or results of any part of Contractor's Work depends upon work performed by others under this Article 8, Contractor shall inspect such other work and promptly report to Engineer in writing any delays, defects, or deficiencies in such other work that render it unavailable or unsuitable for the proper execution and results of Contractor's Work. Contractor's failure to so report will constitute an acceptance of such other work as fit and proper for integration with Contractor's Work except for latent defects and deficiencies in such other work.

8.02 *Coordination*

A. If Owner intends to contract with others for the performance of other work at or adjacent to the Site, to perform other work at or adjacent to the Site with Owner's employees, or to arrange to have utility owners perform work at or adjacent to the Site, the following will be set forth in the Supplementary Conditions or provided to Contractor prior to the start of any such other work:

1. the identity of the individual or entity that will have authority and responsibility for coordination of the activities among the various contractors;

2. an itemization of the specific matters to be covered by such authority and responsibility; and

3. the extent of such authority and responsibilities.

B. Unless otherwise provided in the Supplementary Conditions, Owner shall have sole authority and responsibility for such coordination.

8.03 *Legal Relationships*

A. If, in the course of performing other work at or adjacent to the Site for Owner, the Owner's employees, any other contractor working for Owner, or any utility owner for whom the Owner is responsible causes damage to the Work or to the property of Contractor or its Subcontractors, or delays, disrupts, interferes with, or increases the scope or cost of the performance of the Work, through actions or inaction, then Contractor shall be entitled to an equitable adjustment in the Contract Price or the Contract Times, or both. Contractor must submit any Change Proposal seeking an equitable adjustment in the Contract Price or the Contract Times under this paragraph within 30 days of the damaging, delaying, disrupting, or interfering event. The entitlement to, and extent of, any such equitable adjustment shall take into account information (if any) regarding such other work that was provided to Contractor in the Contract Documents prior to the submittal of the Bid or the final negotiation of the terms of the Contract. When applicable, any such equitable adjustment in Contract Price shall be conditioned on Contractor assigning to Owner all Contractor's rights against such other contractor or utility owner with respect to the damage, delay, disruption, or interference that is the subject of the adjustment. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times.

B. Contractor shall take reasonable and customary measures to avoid damaging, delaying, disrupting, or interfering with the work of Owner, any other contractor, or any utility owner performing other work at or adjacent to the Site. If Contractor fails to take such measures and as a result damages, delays, disrupts, or interferes with the work of any such other contractor or utility owner, then Owner may impose a set-off against payments due to Contractor, and assign to such other contractor or utility owner the Owner's contractual rights against Contractor with respect to the breach of the obligations set forth in this paragraph.

C. When Owner is performing other work at or adjacent to the Site with Owner's employees, Contractor shall be liable to Owner for damage to such other work, and for the reasonable direct delay, disruption, and interference costs incurred by Owner as a result of Contractor's failure to take reasonable and customary measures with respect to Owner's other work. In response to such damage, delay, disruption, or interference, Owner may impose a set-off against payments due to Contractor.

D. If Contractor damages, delays, disrupts, or interferes with the work of any other contractor, or any utility owner performing other work at or adjacent to the Site, through Contractor's failure to take reasonable and customary measures to avoid such impacts, or if any claim arising out of Contractor's actions, inactions, or negligence in performance of the Work at or adjacent to the Site is made by any such other contractor or utility owner against Contractor, Owner, or Engineer, then Contractor shall (1) promptly attempt to settle the claim as to all parties through negotiations with such other contractor or utility owner, or otherwise resolve the claim by arbitration or other dispute resolution proceeding or at law, and (2) indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against any such claims, and against all costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such damage, delay, disruption, or interference.

ARTICLE 9 – OWNER'S RESPONSIBILITIES

9.01 *Communications to Contractor*

A. Except as otherwise provided in these General Conditions, Owner shall issue all communications to Contractor through Engineer.

9.02 *Replacement of Engineer*

A. Owner may at its discretion appoint an engineer to replace Engineer, provided Contractor makes no reasonable objection to the replacement engineer. The replacement engineer's status under the Contract Documents shall be that of the former Engineer.

9.03 *Furnish Data*

A. Owner shall promptly furnish the data required of Owner under the Contract Documents.

9.04 *Pay When Due*

A. Owner shall make payments to Contractor when they are due as provided in the Agreement.

9.05 *Lands and Easements; Reports, Tests, and Drawings*

A. Owner's duties with respect to providing lands and easements are set forth in Paragraph 5.01.

B. Owner's duties with respect to providing engineering surveys to establish reference points are set forth in Paragraph 4.03.

C. Article 5 refers to Owner's identifying and making available to Contractor copies of reports of explorations and tests of conditions at the Site, and drawings of physical conditions relating to existing surface or subsurface structures at the Site.

9.06 *Insurance*

A. Owner's responsibilities, if any, with respect to purchasing and maintaining liability and property insurance are set forth in Article 6.

9.07 *Change Orders*

A. Owner's responsibilities with respect to Change Orders are set forth in Article 11.

9.08 *Inspections, Tests, and Approvals*

A. Owner's responsibility with respect to certain inspections, tests, and approvals is set forth in Paragraph 14.02.B.

9.09 *Limitations on Owner's Responsibilities*

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

9.10 *Undisclosed Hazardous Environmental Condition*

A. Owner's responsibility in respect to an undisclosed Hazardous Environmental Condition is set forth in Paragraph 5.06.

9.11 *Evidence of Financial Arrangements*

A. Upon request of Contractor, Owner shall furnish Contractor reasonable evidence that financial arrangements have been made to satisfy Owner's obligations under the Contract Documents (including obligations under proposed changes in the Work).

9.12 *Safety Programs*

A. While at the Site, Owner's employees and representatives shall comply with the specific applicable requirements of Contractor's safety programs of which Owner has been informed.

B. Owner shall furnish copies of any applicable Owner safety programs to Contractor.

ARTICLE 10 – ENGINEER'S STATUS DURING CONSTRUCTION

10.01 *Owner's Representative*

A. Engineer will be Owner's representative during the construction period. The duties and responsibilities and the limitations of authority of Engineer as Owner's representative during construction are set forth in the Contract.

10.02 *Visits to Site*

A. Engineer will make visits to the Site at intervals appropriate to the various stages of construction as 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, Engineer, for the benefit of Owner, will determine, in general, if the Work is proceeding in accordance with the Contract Documents. Engineer will not be required to make exhaustive or continuous inspections on the Site to check the quality or quantity of the Work. 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 observations, Engineer will keep Owner informed of the progress of the Work and will endeavor to guard Owner against defective Work.

B. Engineer's visits and observations are subject to all the limitations on Engineer's authority and responsibility set forth in Paragraph 10.08. Particularly, but without limitation, during

or as a result of Engineer's visits or observations of Contractor's Work, 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, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work.

10.03 *Project Representative*

A. If Owner and Engineer have agreed that Engineer will furnish a Resident Project Representative to represent Engineer at the Site and assist Engineer in observing the progress and quality of the Work, then the authority and responsibilities of any such Resident Project Representative will be as provided in the Supplementary Conditions, and limitations on the responsibilities thereof will be as provided in Paragraph 10.08. If Owner designates another representative or agent to represent Owner at the Site who is not Engineer's consultant, agent, or employee, the responsibilities and authority and limitations thereon of such other individual or entity will be as provided in the Supplementary Conditions.

10.04 *Rejecting Defective Work*

A. Engineer has the authority to reject Work in accordance with Article 14.

10.05 *Shop Drawings, Change Orders and Payments*

A. Engineer's authority, and limitations thereof, as to Shop Drawings and Samples, are set forth in Paragraph 7.16.

B. Engineer's authority, and limitations thereof, as to design calculations and design drawings submitted in response to a delegation of professional design services, if any, are set forth in Paragraph 7.19.

C. Engineer's authority as to Change Orders is set forth in Article 11.

D. Engineer's authority as to Applications for Payment is set forth in Article 15.

10.06 *Determinations for Unit Price Work*

A. Engineer will determine the actual quantities and classifications of Unit Price Work performed by Contractor as set forth in Paragraph 13.03.

10.07 *Decisions on Requirements of Contract Documents and Acceptability of Work*

A. Engineer will render decisions regarding the requirements of the Contract Documents, and judge the acceptability of the Work, pursuant to the specific procedures set forth herein for initial interpretations, Change Proposals, and acceptance of the Work. In rendering such decisions and judgments, Engineer will not show partiality to Owner or Contractor, and will not be liable to Owner, Contractor, or others in connection with any proceedings, interpretations, decisions, or judgments conducted or rendered in good faith.

10.08 *Limitations on Engineer's Authority and Responsibilities*

A. Neither Engineer's authority or responsibility under this Article 10 or under any other provision of the Contract, nor any decision made by Engineer in good faith either to exercise or not exercise such authority or responsibility or the undertaking, exercise, or performance of any authority or responsibility by Engineer, shall create, impose, or give rise to any duty in contract, tort, or otherwise owed by Engineer to Contractor, any Subcontractor, any Supplier, any other individual or entity, or to any surety for or employee or agent of any of them.

B. 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, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work. Engineer will not be responsible for Contractor's failure to perform the Work in accordance with the Contract Documents.

C. Engineer will not be responsible for the acts or omissions of Contractor or of any Subcontractor, any Supplier, or of any other individual or entity performing any of the Work.

D. Engineer's review of the final Application for Payment and accompanying documentation and all maintenance and operating instructions, schedules, guarantees, bonds, certificates of inspection, tests and approvals, and other documentation required to be delivered by Paragraph 15.06.A will only be to determine generally that their content complies 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.

E. The limitations upon authority and responsibility set forth in this Paragraph 10.08 shall also apply to the Resident Project Representative, if any.

10.09 *Compliance with Safety Program*

A. While at the Site, Engineer's employees and representatives will comply with the specific applicable requirements of Owner's and Contractor's safety programs (if any) of which Engineer has been informed.

ARTICLE 11 – AMENDING THE CONTRACT DOCUMENTS; CHANGES IN THE WORK

11.01 *Amending and Supplementing Contract Documents*

A. The Contract Documents may be amended or supplemented by a Change Order, a Work Change Directive, or a Field Order.

1. *Change Orders*:

a. If an amendment or supplement to the Contract Documents includes a change in the Contract Price or the Contract Times, such amendment or supplement must be set forth in a Change Order. A Change Order also may be used to establish amendments and supplements of the Contract Documents that do not affect the Contract Price or Contract Times.

b. Owner and Contractor may amend those terms and conditions of the Contract Documents that do not involve (1) the performance or acceptability of the Work, (2) the design (as set forth in the Drawings, Specifications, or otherwise), or (3) other engineering or technical matters, without the recommendation of the Engineer. Such an amendment shall be set forth in a Change Order.

2. *Work Change Directives*: A Work Change Directive will not change the Contract Price or the Contract Times but is evidence that the parties expect that the modification ordered or documented by a Work Change Directive will be incorporated in a subsequently issued Change Order, following negotiations by the parties as to the Work Change Directive's effect, if any, on the Contract Price and Contract Times; or, if negotiations are unsuccessful, by a determination under the terms of the Contract Documents governing adjustments, expressly including Paragraph 11.04 regarding change of Contract Price. Contractor must submit any Change Proposal seeking an

adjustment of the Contract Price or the Contract Times, or both, no later than 30 days after the completion of the Work set out in the Work Change Directive. Owner must submit any Claim seeking an adjustment of the Contract Price or the Contract Times, or both, no later than 60 days after issuance of the Work Change Directive.

3. *Field Orders*: Engineer may authorize minor changes in the Work if the changes do not involve an adjustment in the Contract Price or the Contract Times and are compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. Such changes will be accomplished by a Field Order and will be binding on Owner and also on Contractor, which shall perform the Work involved promptly. If Contractor believes that a Field Order justifies an adjustment in the Contract Price or Contract Times, or both, then before proceeding with the Work at issue, Contractor shall submit a Change Proposal as provided herein.

11.02 *Owner-Authorized Changes in the Work*

A. Without invalidating the Contract and without notice to any surety, Owner may, at any time or from time to time, order additions, deletions, or revisions in the Work. Such changes shall be supported by Engineer's recommendation, to the extent the change involves the design (as set forth in the Drawings, Specifications, or otherwise), or other engineering or technical matters. Such changes may be accomplished by a Change Order, if Owner and Contractor have agreed as to the effect, if any, of the changes on Contract Times or Contract Price; or by a Work Change Directive. Upon receipt of any such document, Contractor shall promptly proceed with the Work involved; or, in the case of a deletion in the Work, promptly cease construction activities with respect to such deleted Work. Added or revised Work shall be performed under the applicable conditions of the Contract Documents. Nothing in this paragraph shall obligate Contractor to undertake work that Contractor reasonably concludes cannot be performed in a manner consistent with Contractor's safety obligations under the Contract Documents or Laws and Regulations.

11.03 *Unauthorized Changes in the Work*

A. Contractor shall not be entitled to an increase in the Contract Price or an extension of the Contract Times with respect to any work performed that is not required by the Contract Documents, as amended, modified, or supplemented, except in the case of an emergency as provided in Paragraph 7.15 or in the case of uncovering Work as provided in Paragraph 14.05.

11.04 *Change of Contract Price*

A. The Contract Price may only be changed by a Change Order. Any Change Proposal for an adjustment in the Contract Price shall comply with the provisions of Paragraph 11.06. Any Claim for an adjustment of Contract Price shall comply with the provisions of Article 12.

B. An adjustment in the Contract Price will be determined as follows:

1. where the Work involved is covered by unit prices contained in the Contract Documents, then by application of such unit prices to the quantities of the items involved (subject to the provisions of Paragraph 13.03); or

2. where the Work involved is not covered by unit prices contained in the Contract Documents, then by a mutually agreed lump sum (which may include an allowance for overhead and profit not necessarily in accordance with Paragraph 11.04.C.2); or

3. where the Work involved is not covered by unit prices contained in the Contract Documents and the parties do not reach mutual agreement to a lump sum, then on

the basis of the Cost of the Work (determined as provided in Paragraph 13.01) plus a Contractor's fee for overhead and profit (determined as provided in Paragraph 11.04.C).

C. *Contractor's Fee*: When applicable, the Contractor's fee for overhead and profit shall be determined as follows:

1. a mutually acceptable fixed fee; or

2. if a fixed fee is not agreed upon, then a fee based on the following percentages of the various portions of the Cost of the Work:

a. for costs incurred under Paragraphs 13.01.B.1 and 13.01.B.2, the Contractor's fee shall be 15 percent;

b. for costs incurred under Paragraph 13.01.B.3, the Contractor's fee shall be five percent;

c. where one or more tiers of subcontracts are on the basis of Cost of the Work plus a fee and no fixed fee is agreed upon, the intent of Paragraphs 11.04.C.2.a and 11.04.C.2.b is that the Contractor's fee shall be based on: (1) a fee of 15 percent of the costs incurred under Paragraphs 13.01.A.1 and 13.01.A.2 by the Subcontractor that actually performs the Work, at whatever tier, and (2) with respect to Contractor itself and to any Subcontractors of a tier higher than that of the Subcontractor that actually performs the Work, a fee of five percent of the amount (fee plus underlying costs incurred) attributable to the next lower tier Subcontractor; provided, however, that for any such subcontracted work the maximum total fee to be paid by Owner shall be no greater than 27 percent of the costs incurred by the Subcontractor that actually performs the work;

d. no fee shall be payable on the basis of costs itemized under Paragraphs 13.01.B.4, 13.01.B.5, and 13.01.C;

e. the amount of credit to be allowed by Contractor to Owner for any change which results in a net decrease in cost will be the amount of the actual net decrease in cost plus a deduction in Contractor's fee by an amount equal to five percent of such net decrease; and

f. when both additions and credits are involved in any one change, the adjustment in Contractor's fee shall be computed on the basis of the net change in accordance with Paragraphs 11.04.C.2.a through 11.04.C.2.e, inclusive.

11.05 *Change of Contract Times*

A. The Contract Times may only be changed by a Change Order. Any Change Proposal for an adjustment in the Contract Times shall comply with the provisions of Paragraph 11.06. Any Claim for an adjustment in the Contract Times shall comply with the provisions of Article 12.

B. An adjustment of the Contract Times shall be subject to the limitations set forth in Paragraph 4.05, concerning delays in Contractor's progress.

11.06 *Change Proposals*

A. Contractor shall submit a Change Proposal to Engineer to request an adjustment in the Contract Times or Contract Price; appeal an initial decision by Engineer concerning the requirements of the Contract Documents or relating to the acceptability of the Work under the Contract Documents; contest a set-off against payment due; or seek other relief under

the Contract. The Change Proposal shall specify any proposed change in Contract Times or Contract Price, or both, or other proposed relief, and explain the reason for the proposed change, with citations to any governing or applicable provisions of the Contract Documents.

1. *Procedures*: Contractor shall submit each Change Proposal to Engineer promptly (but in no event later than 30 days) after the start of the event giving rise thereto, or after such initial decision. The Contractor shall submit supporting data, including the proposed change in Contract Price or Contract Time (if any), to the Engineer and Owner within 15 days after the submittal of the Change Proposal. The supporting data shall be accompanied by a written statement that the supporting data are accurate and complete, and that any requested time or price adjustment is the entire adjustment to which Contractor believes it is entitled as a result of said event. Engineer will advise Owner regarding the Change Proposal, and consider any comments or response from Owner regarding the Change Proposal.

2. *Engineer's Action*: Engineer will review each Change Proposal and, within 30 days after receipt of the Contractor's supporting data, either deny the Change Proposal in whole, approve it in whole, or deny it in part and approve it in part. Such actions shall be in writing, with a copy provided to Owner and Contractor. If Engineer does not take action on the Change Proposal within 30 days, then either Owner or Contractor may at any time thereafter submit a letter to the other party indicating that as a result of Engineer's inaction the Change Proposal is deemed denied, thereby commencing the time for appeal of the denial under Article 12.

3. *Binding Decision*: Engineer's decision will be final and binding upon Owner and Contractor, unless Owner or Contractor appeals the decision by filing a Claim under Article 12.

B. *Resolution of Certain Change Proposals*: If the Change Proposal does not involve the design (as set forth in the Drawings, Specifications, or otherwise), the acceptability of the Work, or other engineering or technical matters, then Engineer will notify the parties that the Engineer is unable to resolve the Change Proposal. For purposes of further resolution of such a Change Proposal, such notice shall be deemed a denial, and Contractor may choose to seek resolution under the terms of Article 12.

11.07 *Execution of Change Orders*

A. Owner and Contractor shall execute appropriate Change Orders covering:

1. changes in the Contract Price or Contract Times which are agreed to by the parties, including any undisputed sum or amount of time for Work actually performed in accordance with a Work Change Directive;

2. changes in Contract Price resulting from an Owner set-off, unless Contractor has duly contested such set-off;

3. changes in the Work which are: (a) ordered by Owner pursuant to Paragraph 11.02, (b) required because of Owner's acceptance of defective Work under Paragraph 14.04 or Owner's correction of defective Work under Paragraph 14.07, or (c) agreed to by the parties, subject to the need for Engineer's recommendation if the change in the Work involves the design (as set forth in the Drawings, Specifications, or otherwise), or other engineering or technical matters; and

4. changes in the Contract Price or Contract Times, or other changes, which embody the substance of any final and binding results under Paragraph 11.06, or Article 12.

B. If Owner or Contractor refuses to execute a Change Order that is required to be executed under the terms of this Paragraph 11.07, it shall be deemed to be of full force and effect, as if fully executed.

11.08 *Notification to Surety*

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

ARTICLE 12 – CLAIMS

12.01 *Claims*

A. *Claims Process*: The following disputes between Owner and Contractor shall be submitted to the Claims process set forth in this Article:

1. Appeals by Owner or Contractor of Engineer's decisions regarding Change Proposals;

2. Owner demands for adjustments in the Contract Price or Contract Times, or other relief under the Contract Documents; and

3. Disputes that Engineer has been unable to address because they do not involve the design (as set forth in the Drawings, Specifications, or otherwise), the acceptability of the Work, or other engineering or technical matters.

B. *Submittal of Claim*: The party submitting a Claim shall deliver it directly to the other party to the Contract promptly (but in no event later than 30 days) after the start of the event giving rise thereto; in the case of appeals regarding Change Proposals within 30 days of the decision under appeal. The party submitting the Claim shall also furnish a copy to the Engineer, for its information only. The responsibility to substantiate a Claim shall rest with the party making the Claim. In the case of a Claim by Contractor seeking an increase in the Contract Times or Contract Price, or both, Contractor shall certify that the Claim is made in good faith, that the supporting data are accurate and complete, and that to the best of Contractor's knowledge and belief the amount of time or money requested accurately reflects the full amount to which Contractor is entitled.

C. *Review and Resolution*: The party receiving a Claim shall review it thoroughly, giving full consideration to its merits. The two parties shall seek to resolve the Claim through the exchange of information and direct negotiations. The parties may extend the time for resolving the Claim by mutual agreement. All actions taken on a Claim shall be stated in writing and submitted to the other party, with a copy to Engineer.

D. *Mediation*:

1. At any time after initiation of a Claim, Owner and Contractor may mutually agree to mediation of the underlying dispute. The agreement to mediate shall stay the Claim submittal and response process.

2. If Owner and Contractor agree to mediation, then after 60 days from such agreement, either Owner or Contractor may unilaterally terminate the mediation process, and the Claim submittal and decision process shall resume as of the date of the termination. If the mediation proceeds but is unsuccessful in resolving the dispute, the Claim

submittal and decision process shall resume as of the date of the conclusion of the mediation, as determined by the mediator.

3. Owner and Contractor shall each pay one-half of the mediator's fees and costs.

E. *Partial Approval*: If the party receiving a Claim approves the Claim in part and denies it in part, such action shall be final and binding unless within 30 days of such action the other party invokes the procedure set forth in Article 17 for final resolution of disputes.

F. *Denial of Claim*: If efforts to resolve a Claim are not successful, the party receiving the Claim may deny it by giving written notice of denial to the other party. If the receiving party does not take action on the Claim within 90 days, then either Owner or Contractor may at any time thereafter submit a letter to the other party indicating that as a result of the inaction, the Claim is deemed denied, thereby commencing the time for appeal of the denial. A denial of the Claim shall be final and binding unless within 30 days of the denial the other party invokes the procedure set forth in Article 17 for the final resolution of disputes.

G. *Final and Binding Results*: If the parties reach a mutual agreement regarding a Claim, whether through approval of the Claim, direct negotiations, mediation, or otherwise; or if a Claim is approved in part and denied in part, or denied in full, and such actions become final and binding; then the results of the agreement or action on the Claim shall be incorporated in a Change Order to the extent they affect the Contract, including the Work, the Contract Times, or the Contract Price.

ARTICLE 13 – COST OF THE WORK; ALLOWANCES; UNIT PRICE WORK

13.01 *Cost of the Work*

A. *Purposes for Determination of Cost of the Work*: The term Cost of the Work means the sum of all costs necessary for the proper performance of the Work at issue, as further defined below. The provisions of this Paragraph 13.01 are used for two distinct purposes:

1. To determine Cost of the Work when Cost of the Work is a component of the Contract Price, under cost-plus-fee, time-and-materials, or other cost-based terms; or

2. To determine the value of a Change Order, Change Proposal, Claim, set-off, or other adjustment in Contract Price. When the value of any such adjustment is determined on the basis of Cost of the Work, Contractor is entitled only to those additional or incremental costs required because of the change in the Work or because of the event giving rise to the adjustment.

B. *Costs Included*: Except as otherwise may be agreed to in writing by Owner, costs included in the Cost of the Work shall be in amounts no higher than those prevailing in the locality of the Project, shall not include any of the costs itemized in Paragraph 13.01.C, and shall include only the following items:

1. Payroll costs for employees in the direct employ of Contractor in the performance of the Work under schedules of job classifications agreed upon by Owner and Contractor. Such employees shall include, without limitation, superintendents, foremen, and other personnel employed full time on the Work. Payroll costs for employees not employed full time on the Work shall be apportioned on the basis of their time spent on the Work. Payroll costs shall include, but not be limited to, salaries and wages plus the cost of fringe benefits, which shall include social security contributions, unemployment, excise, and payroll taxes, workers' compensation, health and retirement benefits, bonuses, sick leave, and vacation and holiday pay applicable

thereto. The expenses of performing Work outside of regular working hours, on Saturday, Sunday, or legal holidays, shall be included in the above to the extent authorized by Owner.

2. Cost of all materials and equipment furnished and incorporated in the Work, including costs of transportation and storage thereof, and Suppliers' field services required in connection therewith. All cash discounts shall accrue to Contractor unless Owner deposits funds with Contractor with which to make payments, in which case the cash discounts shall accrue to Owner. All trade discounts, rebates, and refunds and returns from sale of surplus materials and equipment shall accrue to Owner, and Contractor shall make provisions so that they may be obtained.

3. Payments made by Contractor to Subcontractors for Work performed by Subcontractors. If required by Owner, Contractor shall obtain competitive bids from subcontractors acceptable to Owner and Contractor and shall deliver such bids to Owner, who will then determine, with the advice of Engineer, which bids, if any, will be acceptable. If any subcontract provides that the Subcontractor is to be paid on the basis of Cost of the Work plus a fee, the Subcontractor's Cost of the Work and fee shall be determined in the same manner as Contractor's Cost of the Work and fee as provided in this Paragraph 13.01.

4. Costs of special consultants (including but not limited to engineers, architects, testing laboratories, surveyors, attorneys, and accountants) employed for services specifically related to the Work.

5. Supplemental costs including the following:

    a. The proportion of necessary transportation, travel, and subsistence expenses of Contractor's employees incurred in discharge of duties connected with the Work.

    b. Cost, including transportation and maintenance, of all materials, supplies, equipment, machinery, appliances, office, and temporary facilities at the Site, and hand tools not owned by the workers, which are consumed in the performance of the Work, and cost, less market value, of such items used but not consumed which remain the property of Contractor.

    c. Rentals of all construction equipment and machinery, and the parts thereof, whether rented from Contractor or others in accordance with rental agreements approved by Owner with the advice of Engineer, and the costs of transportation, loading, unloading, assembly, dismantling, and removal thereof. All such costs shall be in accordance with the terms of said rental agreements. The rental of any such equipment, machinery, or parts shall cease when the use thereof is no longer necessary for the Work.

    d. Sales, consumer, use, and other similar taxes related to the Work, and for which Contractor is liable, as imposed by Laws and Regulations.

    e. Deposits lost for causes other than negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, and royalty payments and fees for permits and licenses.

    f. Losses and damages (and related expenses) caused by damage to the Work, not compensated by insurance or otherwise, sustained by Contractor in connection with the performance of the Work (except losses and damages within the deductible amounts of property insurance established in accordance with Paragraph 6.05), provided such losses and damages have resulted from causes

other than the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable. Such losses shall include settlements made with the written consent and approval of Owner. No such losses, damages, and expenses shall be included in the Cost of the Work for the purpose of determining Contractor's fee.

g. The cost of utilities, fuel, and sanitary facilities at the Site.

h. Minor expenses such as communication service at the Site, express and courier services, and similar petty cash items in connection with the Work.

i. The costs of premiums for all bonds and insurance that Contractor is required by the Contract Documents to purchase and maintain.

C. *Costs Excluded*: The term Cost of the Work shall not include any of the following items:

1. Payroll costs and other compensation of Contractor's officers, executives, principals (of partnerships and sole proprietorships), general managers, safety managers, engineers, architects, estimators, attorneys, auditors, accountants, purchasing and contracting agents, expediters, timekeepers, clerks, and other personnel employed by Contractor, whether at the Site or in Contractor's principal or branch office for general administration of the Work and not specifically included in the agreed upon schedule of job classifications referred to in Paragraph 13.01.B.1 or specifically covered by Paragraph 13.01.B.4. The payroll costs and other compensation excluded here are to be considered administrative costs covered by the Contractor's fee.

2. Expenses of Contractor's principal and branch offices other than Contractor's office at the Site.

3. Any part of Contractor's capital expenses, including interest on Contractor's capital employed for the Work and charges against Contractor for delinquent payments.

4. Costs due to the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, including but not limited to, the correction of defective Work, disposal of materials or equipment wrongly supplied, and making good any damage to property.

5. Other overhead or general expense costs of any kind and the costs of any item not specifically and expressly included in Paragraph 13.01.B.

D. *Contractor's Fee*: When the Work as a whole is performed on the basis of cost-plus, Contractor's fee shall be determined as set forth in the Agreement. When the value of any Work covered by a Change Order, Change Proposal, Claim, set-off, or other adjustment in Contract Price is determined on the basis of Cost of the Work, Contractor's fee shall be determined as set forth in Paragraph 11.04.C.

E. *Documentation*: Whenever the Cost of the Work for any purpose is to be determined pursuant to this Article 13, Contractor will establish and maintain records thereof in accordance with generally accepted accounting practices and submit in a form acceptable to Engineer an itemized cost breakdown together with supporting data.

13.02 *Allowances*

A. It is understood that Contractor has included in the Contract Price all allowances so named in the Contract Documents and shall cause the Work so covered to be performed for such sums and by such persons or entities as may be acceptable to Owner and Engineer.

B. *Cash Allowances*: Contractor agrees that:

1. the cash allowances include the cost to Contractor (less any applicable trade discounts) of materials and equipment required by the allowances to be delivered at the Site, and all applicable taxes; and

2. Contractor's costs for unloading and handling on the Site, labor, installation, overhead, profit, and other expenses contemplated for the cash allowances have been included in the Contract Price and not in the allowances, and no demand for additional payment on account of any of the foregoing will be valid.

C. *Contingency Allowance*: Contractor agrees that a contingency allowance, if any, is for the sole use of Owner to cover unanticipated costs.

D. Prior to final payment, an appropriate Change Order will be issued as recommended by Engineer to reflect actual amounts due Contractor on account of Work covered by allowances, and the Contract Price shall be correspondingly adjusted.

13.03 *Unit Price Work*

A. Where the Contract Documents provide that all or part of the Work is to be Unit Price Work, initially the Contract Price will be deemed to include for all Unit Price Work an amount equal to the sum of the unit price for each separately identified item of Unit Price Work times the estimated quantity of each item as indicated in the Agreement.

B. The estimated quantities of items of Unit Price Work are not guaranteed and are solely for the purpose of comparison of Bids and determining an initial Contract Price. Payments to Contractor for Unit Price Work will be based on actual quantities.

C. Each unit price will be deemed to include an amount considered by Contractor to be adequate to cover Contractor's overhead and profit for each separately identified item.

D. Engineer will determine the actual quantities and classifications of Unit Price Work performed by Contractor. Engineer will review with Contractor the Engineer's preliminary determinations on such matters before rendering a written decision thereon (by recommendation of an Application for Payment or otherwise). Engineer's written decision thereon will be final and binding (except as modified by Engineer to reflect changed factual conditions or more accurate data) upon Owner and Contractor, subject to the provisions of the following paragraph.

E. Within 30 days of Engineer's written decision under the preceding paragraph, Contractor may submit a Change Proposal, or Owner may file a Claim, seeking an adjustment in the Contract Price if:

1. the quantity of any item of Unit Price Work performed by Contractor differs materially and significantly from the estimated quantity of such item indicated in the Agreement;

2. there is no corresponding adjustment with respect to any other item of Work; and

3. Contractor believes that it is entitled to an increase in Contract Price as a result of having incurred additional expense or Owner believes that Owner is entitled to a decrease in Contract Price, and the parties are unable to agree as to the amount of any such increase or decrease.

ARTICLE 14 – TESTS AND INSPECTIONS; CORRECTION, REMOVAL OR ACCEPTANCE OF DEFECTIVE WORK

14.01 *Access to Work*

A. Owner, Engineer, their consultants and other representatives and personnel of Owner, independent testing laboratories, and authorities having jurisdiction will have access to the Site and the Work at reasonable times for their observation, inspection, and testing. Contractor shall provide them proper and safe conditions for such access and advise them of Contractor's safety procedures and programs so that they may comply therewith as applicable.

14.02 *Tests, Inspections, and Approvals*

A. Contractor shall give Engineer timely notice of readiness of the Work (or specific parts thereof) for all required inspections and tests, and shall cooperate with inspection and testing personnel to facilitate required inspections and tests.

B. Owner shall retain and pay for the services of an independent inspector, testing laboratory, or other qualified individual or entity to perform all inspections and tests expressly required by the Contract Documents to be furnished and paid for by Owner, except that costs incurred in connection with tests or inspections of covered Work shall be governed by the provisions of Paragraph 14.05.

C. If Laws or Regulations of any public body having jurisdiction require any Work (or part thereof) specifically to be inspected, tested, or approved by an employee or other representative of such public body, Contractor shall assume full responsibility for arranging and obtaining such inspections, tests, or approvals, pay all costs in connection therewith, and furnish Engineer the required certificates of inspection or approval.

D. Contractor shall be responsible for arranging, obtaining, and paying for all inspections and tests required:

1. by the Contract Documents, unless the Contract Documents expressly allocate responsibility for a specific inspection or test to Owner;

2. to attain Owner's and Engineer's acceptance of materials or equipment to be incorporated in the Work;

3. by manufacturers of equipment furnished under the Contract Documents;

4. for testing, adjusting, and balancing of mechanical, electrical, and other equipment to be incorporated into the Work; and

5. for acceptance of materials, mix designs, or equipment submitted for approval prior to Contractor's purchase thereof for incorporation in the Work.

Such inspections and tests shall be performed by independent inspectors, testing laboratories, or other qualified individuals or entities acceptable to Owner and Engineer.

E. If the Contract Documents require the Work (or part thereof) to be approved by Owner, Engineer, or another designated individual or entity, then Contractor shall assume full responsibility for arranging and obtaining such approvals.

F. If any Work (or the work of others) that is to be inspected, tested, or approved is covered by Contractor without written concurrence of Engineer, Contractor shall, if requested by Engineer, uncover such Work for observation. Such uncovering shall be at Contractor's expense unless Contractor had given Engineer timely notice of Contractor's intention to

cover the same and Engineer had not acted with reasonable promptness in response to such notice.

14.03 *Defective Work*

A. *Contractor's Obligation*: It is Contractor's obligation to assure that the Work is not defective.

B. *Engineer's Authority*: Engineer has the authority to determine whether Work is defective, and to reject defective Work.

C. *Notice of Defects*: Prompt notice of all defective Work of which Owner or Engineer has actual knowledge will be given to Contractor.

D. *Correction, or Removal and Replacement*: Promptly after receipt of written notice of defective Work, Contractor shall correct all such defective Work, whether or not fabricated, installed, or completed, or, if Engineer has rejected the defective Work, remove it from the Project and replace it with Work that is not defective.

E. *Preservation of Warranties*: When correcting defective Work, Contractor shall take no action that would void or otherwise impair Owner's special warranty and guarantee, if any, on said Work.

F. *Costs and Damages*: In addition to its correction, removal, and replacement obligations with respect to defective Work, Contractor shall pay all claims, costs, losses, and damages arising out of or relating to defective Work, including but not limited to the cost of the inspection, testing, correction, removal, replacement, or reconstruction of such defective Work, fines levied against Owner by governmental authorities because the Work is defective, and the costs of repair or replacement of work of others resulting from defective Work. Prior to final payment, if Owner and Contractor are unable to agree as to the measure of such claims, costs, losses, and damages resulting from defective Work, then Owner may impose a reasonable set-off against payments due under Article 15.

14.04 *Acceptance of Defective Work*

A. If, instead of requiring correction or removal and replacement of defective Work, Owner prefers to accept it, Owner may do so (subject, if such acceptance occurs prior to final payment, to Engineer's confirmation that such acceptance is in general accord with the design intent and applicable engineering principles, and will not endanger public safety). Contractor shall pay all claims, costs, losses, and damages attributable to Owner's evaluation of and determination to accept such defective Work (such costs to be approved by Engineer as to reasonableness), and for the diminished value of the Work to the extent not otherwise paid by Contractor. If any such acceptance occurs prior to final payment, the necessary revisions in the Contract Documents with respect to the Work shall be incorporated in a Change Order. If the parties are unable to agree as to the decrease in the Contract Price, reflecting the diminished value of Work so accepted, then Owner may impose a reasonable set-off against payments due under Article 15. If the acceptance of defective Work occurs after final payment, Contractor shall pay an appropriate amount to Owner.

14.05 *Uncovering Work*

A. Engineer has the authority to require additional inspection or testing of the Work, whether or not the Work is fabricated, installed, or completed.

B. If any Work is covered contrary to the written request of Engineer, then Contractor shall, if requested by Engineer, uncover such Work for Engineer's observation, and then replace the covering, all at Contractor's expense.

C. If Engineer considers it necessary or advisable that covered Work be observed by Engineer or inspected or tested by others, then Contractor, at Engineer's request, shall uncover, expose, or otherwise make available for observation, inspection, or testing as Engineer may require, that portion of the Work in question, and provide all necessary labor, material, and equipment.

1. If it is found that the uncovered Work is defective, Contractor shall be responsible for all claims, costs, losses, and damages arising out of or relating to such uncovering, exposure, observation, inspection, and testing, and of satisfactory replacement or reconstruction (including but not limited to all costs of repair or replacement of work of others); and pending Contractor's full discharge of this responsibility the Owner shall be entitled to impose a reasonable set-off against payments due under Article 15.

2. If the uncovered Work is not found to be defective, Contractor shall be allowed an increase in the Contract Price or an extension of the Contract Times, or both, directly attributable to such uncovering, exposure, observation, inspection, testing, replacement, and reconstruction. If the parties are unable to agree as to the amount or extent thereof, then Contractor may submit a Change Proposal within 30 days of the determination that the Work is not defective.

14.06 *Owner May Stop the Work*

A. If the Work is defective, or Contractor fails to supply sufficient skilled workers or suitable materials or equipment, or fails to perform the Work in such a way that the completed Work will conform to the Contract Documents, then 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 on the part of Owner to exercise this right for the benefit of Contractor, any Subcontractor, any Supplier, any other individual or entity, or any surety for, or employee or agent of any of them.

14.07 *Owner May Correct Defective Work*

A. If Contractor fails within a reasonable time after written notice from Engineer to correct defective Work, or to remove and replace rejected Work as required by Engineer, 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, then Owner may, after seven days written notice to Contractor, correct or remedy any such deficiency.

B. In exercising the rights and remedies under this Paragraph 14.07, Owner shall 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, Owner's representatives, agents and employees, Owner's other contractors, and Engineer and Engineer's consultants access to the Site to enable Owner to exercise the rights and remedies under this paragraph.

C. All claims, costs, losses, and damages incurred or sustained by Owner in exercising the rights and remedies under this Paragraph 14.07 will be charged against Contractor as set-offs against payments due under Article 15. 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.

D. Contractor shall not be allowed an extension of the Contract Times because of any delay in the performance of the Work attributable to the exercise by Owner of Owner's rights and remedies under this Paragraph 14.07.

ARTICLE 15 – PAYMENTS TO CONTRACTOR; SET-OFFS; COMPLETION; CORRECTION PERIOD

15.01 *Progress Payments*

A. *Basis for Progress Payments*: The Schedule of Values established as provided in Article 2 will serve as the basis for progress payments and will be incorporated into a form of Application for Payment acceptable to Engineer. Progress payments on account of Unit Price Work will be based on the number of units completed during the pay period, as determined under the provisions of Paragraph 13.03. Progress payments for cost-based Work will be based on Cost of the Work completed by Contractor during the pay period.

B. *Applications for Payments*:

1. At least 20 days before the date established in the Agreement for each progress payment (but not more often than once a month), Contractor shall submit to Engineer for review an Application for Payment filled out and signed by Contractor covering the Work completed as of the date of the Application and accompanied by such supporting documentation as is required by the Contract Documents. If payment is requested on the basis of materials and equipment not incorporated in the Work but delivered and suitably stored at the Site or at another location agreed to in writing, the Application for Payment shall also be accompanied by a bill of sale, invoice, or other documentation warranting that Owner has received the materials and equipment free and clear of all Liens, and evidence that the materials and equipment are covered by appropriate property insurance, a warehouse bond, or other arrangements to protect Owner's interest therein, all of which must be satisfactory to Owner.

2. Beginning with the second Application for Payment, each Application shall include an affidavit of Contractor stating that all previous progress payments received on account of the Work have been applied on account to discharge Contractor's legitimate obligations associated with prior Applications for Payment.

3. The amount of retainage with respect to progress payments will be as stipulated in the Agreement.

C. *Review of Applications*:

1. Engineer will, within 10 days after receipt of each Application for Payment, including each resubmittal, either indicate in writing a recommendation of payment and present the Application to Owner, or return the Application to Contractor indicating in writing Engineer's reasons for refusing to recommend payment. In the latter case, Contractor may make the necessary corrections and resubmit the Application.

2. Engineer's recommendation of any payment requested in an Application for Payment will constitute a representation by Engineer to Owner, based on Engineer's observations of the executed Work as an experienced and qualified design professional, and on Engineer's review of the Application for Payment and the accompanying data and schedules, that to the best of Engineer's knowledge, information and belief:

a. the Work has progressed to the point indicated;

b. 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, the results of any subsequent tests called for in the Contract Documents, a final determination of quantities and classifications for Unit Price Work under Paragraph 13.03, and any other qualifications stated in the recommendation); and

c. the conditions precedent to Contractor's being entitled to such payment appear to have been fulfilled in so far as it is Engineer's responsibility to observe the Work.

3. By recommending any such payment Engineer will not thereby be deemed to have represented that:

a. inspections made to check the quality or the quantity of the Work as it has been performed have been exhaustive, extended to every aspect of the Work in progress, or involved detailed inspections of the Work beyond the responsibilities specifically assigned to Engineer in the Contract; or

b. 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 to Contractor.

4. Neither Engineer's review of Contractor's Work for the purposes of recommending payments nor Engineer's recommendation of any payment, including final payment, will impose responsibility on Engineer:

a. to supervise, direct, or control the Work, or

b. for the means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or

c. for Contractor's failure to comply with Laws and Regulations applicable to Contractor's performance of the Work, or

d. to make any examination to ascertain how or for what purposes Contractor has used the money paid on account of the Contract Price, or

e. to determine that title to any of the Work, materials, or equipment has passed to Owner free and clear of any Liens.

5. Engineer may refuse to recommend the whole or any part of any payment if, in Engineer's opinion, it would be incorrect to make the representations to Owner stated in Paragraph 15.01.C.2.

6. Engineer will recommend reductions in payment (set-offs) necessary in Engineer's opinion to protect Owner from loss because:

a. the Work is defective, requiring correction or replacement;

b. the Contract Price has been reduced by Change Orders;

c. Owner has been required to correct defective Work in accordance with Paragraph 14.07, or has accepted defective Work pursuant to Paragraph 14.04;

d. Owner has been required to remove or remediate a Hazardous Environmental Condition for which Contractor is responsible; or

e. Engineer has actual knowledge of the occurrence of any of the events that would constitute a default by Contractor and therefore justify termination for cause under the Contract Documents.

D. *Payment Becomes Due*:

1. Ten days after presentation of the Application for Payment to Owner with Engineer's recommendation, the amount recommended (subject to any Owner set-offs) will become due, and when due will be paid by Owner to Contractor.

E. *Reductions in Payment by Owner*:

1. In addition to any reductions in payment (set-offs) recommended by Engineer, Owner is entitled to impose a set-off against payment based on any of the following:

a. claims have been made against Owner on account of Contractor's conduct in the performance or furnishing of the Work, or Owner has incurred costs, losses, or damages on account of Contractor's conduct in the performance or furnishing of the Work, including but not limited to claims, costs, losses, or damages from workplace injuries, adjacent property damage, non-compliance with Laws and Regulations, and patent infringement;

b. Contractor has failed to take reasonable and customary measures to avoid damage, delay, disruption, and interference with other work at or adjacent to the Site;

c. Contractor has failed to provide and maintain required bonds or insurance;

d. Owner has been required to remove or remediate a Hazardous Environmental Condition for which Contractor is responsible;

e. Owner has incurred extra charges or engineering costs related to submittal reviews, evaluations of proposed substitutes, tests and inspections, or return visits to manufacturing or assembly facilities;

f. the Work is defective, requiring correction or replacement;

g. Owner has been required to correct defective Work in accordance with Paragraph 14.07, or has accepted defective Work pursuant to Paragraph 14.04;

h. the Contract Price has been reduced by Change Orders;

i. an event that would constitute a default by Contractor and therefore justify a termination for cause has occurred;

j. liquidated damages have accrued as a result of Contractor's failure to achieve Milestones, Substantial Completion, or final completion of the Work;

k. Liens have been filed in connection with the Work, except where Contractor has delivered a specific bond satisfactory to Owner to secure the satisfaction and discharge of such Liens;

l. there are other items entitling Owner to a set off against the amount recommended.

2. If Owner imposes any set-off against payment, whether based on its own knowledge or on the written recommendations of Engineer, Owner will give Contractor immediate written notice (with a copy to Engineer) stating the reasons for such action and the specific amount of the reduction, and promptly pay Contractor any amount

remaining after deduction of the amount so withheld. Owner shall promptly pay Contractor the amount so withheld, or any adjustment thereto agreed to by Owner and Contractor, if Contractor remedies the reasons for such action. The reduction imposed shall be binding on Contractor unless it duly submits a Change Proposal contesting the reduction.

3. Upon a subsequent determination that Owner's refusal of payment was not justified, the amount wrongfully withheld shall be treated as an amount due as determined by Paragraph 15.01.C.1 and subject to interest as provided in the Agreement.

15.02 *Contractor's Warranty of Title*

A. Contractor warrants and guarantees that title to all Work, materials, and equipment furnished under the Contract will pass to Owner free and clear of (1) all Liens and other title defects, and (2) all patent, licensing, copyright, or royalty obligations, no later than seven days after the time of payment by Owner.

15.03 *Substantial Completion*

A. When Contractor considers the entire Work ready for its intended use Contractor shall notify Owner and Engineer in writing that the entire Work is substantially complete and request that Engineer issue a certificate of Substantial Completion. Contractor shall at the same time submit to Owner and Engineer an initial draft of punch list items to be completed or corrected before final payment.

B. Promptly after Contractor's notification, Owner, Contractor, and Engineer shall make an inspection of the Work to determine the status of completion. If Engineer does not consider the Work substantially complete, Engineer will notify Contractor in writing giving the reasons therefor.

C. If Engineer considers the Work substantially complete, Engineer will deliver to Owner a preliminary certificate of Substantial Completion which shall fix the date of Substantial Completion. Engineer shall attach to the certificate a punch list of items to be completed or corrected before final payment. Owner shall have seven days after receipt of the preliminary certificate during which to make written objection to Engineer as to any provisions of the certificate or attached punch list. If, after considering the objections to the provisions of the preliminary certificate, Engineer concludes that the Work is not substantially complete, Engineer will, within 14 days after submission of the preliminary certificate to Owner, notify Contractor in writing that the Work is not substantially complete, stating the reasons therefor. If Owner does not object to the provisions of the certificate, or if despite consideration of Owner's objections Engineer concludes that the Work is substantially complete, then Engineer will, within said 14 days, execute and deliver to Owner and Contractor a final certificate of Substantial Completion (with a revised punch list of items to be completed or corrected) reflecting such changes from the preliminary certificate as Engineer believes justified after consideration of any objections from Owner.

D. At the time of receipt of the preliminary certificate of Substantial Completion, Owner and Contractor will confer regarding Owner's use or occupancy of the Work following Substantial Completion, review the builder's risk insurance policy with respect to the end of the builder's risk coverage, and confirm the transition to coverage of the Work under a permanent property insurance policy held by Owner. Unless Owner and Contractor agree otherwise in writing, Owner shall bear responsibility for security, operation, protection of the Work, property insurance, maintenance, heat, and utilities upon Owner's use or occupancy of the Work.

E. After Substantial Completion the Contractor shall promptly begin work on the punch list of items to be completed or corrected prior to final payment. In appropriate cases Contractor may submit monthly Applications for Payment for completed punch list items, following the progress payment procedures set forth above.

F. Owner shall have the right to exclude Contractor from the Site after the date of Substantial Completion subject to allowing Contractor reasonable access to remove its property and complete or correct items on the punch list.

15.04 *Partial Use or Occupancy*

A. Prior to Substantial Completion of all the Work, Owner may use or occupy any substantially completed part of the Work which has specifically been identified in the Contract Documents, or which Owner, Engineer, 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, subject to the following conditions:

1. At any time Owner may request in writing that Contractor permit Owner to use or occupy any such part of the Work that Owner believes to be substantially complete. If and when Contractor agrees that such part of the Work is substantially complete, Contractor, Owner, and Engineer will follow the procedures of Paragraph 15.03.A through E for that part of the Work.

2. At any time Contractor may notify Owner and Engineer in writing that Contractor considers any such part of the Work substantially complete and request Engineer to issue a certificate of Substantial Completion for that part of the Work.

3. Within a reasonable time after either such request, Owner, Contractor, and Engineer shall make an inspection of that part of the Work to determine its status of completion. If Engineer does not consider that part of the Work to be substantially complete, Engineer will notify Owner and Contractor in writing giving the reasons therefor. If Engineer considers that part of the Work to be substantially complete, the provisions of Paragraph 15.03 will apply with respect to certification of Substantial Completion of that part of the Work and the division of responsibility in respect thereof and access thereto.

4. No use or occupancy or separate operation of part of the Work may occur prior to compliance with the requirements of Paragraph 6.05 regarding builder's risk or other property insurance.

15.05 *Final Inspection*

A. Upon written notice from Contractor that the entire Work or an agreed portion thereof is complete, Engineer will promptly make a final inspection with Owner and Contractor and will notify Contractor in writing of all particulars in which this inspection reveals that the Work, or agreed portion thereof, is incomplete or defective. Contractor shall immediately take such measures as are necessary to complete such Work or remedy such deficiencies.

15.06 *Final Payment*

A. *Application for Payment*:

1. After Contractor has, in the opinion of Engineer, satisfactorily completed all corrections identified during the final inspection and has delivered, in accordance with the Contract Documents, all maintenance and operating instructions, schedules, guarantees, bonds, certificates or other evidence of insurance, certificates of

inspection, annotated record documents (as provided in Paragraph 7.11), and other documents, Contractor may make application for final payment.

2. The final Application for Payment shall be accompanied (except as previously delivered) by:

   a. all documentation called for in the Contract Documents;

   b. consent of the surety, if any, to final payment;

   c. satisfactory evidence that all title issues have been resolved such that title to all Work, materials, and equipment has passed to Owner free and clear of any Liens or other title defects, or will so pass upon final payment.

   d. a list of all disputes that Contractor believes are unsettled; and

   e. complete and legally effective releases or waivers (satisfactory to Owner) of all Lien rights arising out of the Work, and of Liens filed in connection with the Work.

3. In lieu of the releases or waivers of Liens specified in Paragraph 15.06.A.2 and as approved by Owner, Contractor may furnish receipts or releases in full and an affidavit of Contractor that: (a) the releases and receipts include all labor, services, material, and equipment for which a Lien could be filed; and (b) all payrolls, material and equipment bills, and other indebtedness connected with the Work for which Owner might in any way be responsible, or which might in any way result in liens or other burdens on Owner's property, have been paid or otherwise satisfied. If any Subcontractor or Supplier fails to furnish such a release or receipt in full, Contractor may furnish a bond or other collateral satisfactory to Owner to indemnify Owner against any Lien, or Owner at its option may issue joint checks payable to Contractor and specified Subcontractors and Suppliers.

B. *Engineer's Review of Application and Acceptance*:

1. If, on the basis of Engineer's observation of the Work during construction and final inspection, and Engineer's review of the final Application for Payment and accompanying documentation as required by the Contract Documents, Engineer is satisfied that the Work has been completed and Contractor's other obligations under the Contract have been fulfilled, Engineer will, within ten days after receipt of the final Application for Payment, indicate in writing Engineer's recommendation of final payment and present the Application for Payment to Owner for payment. Such recommendation shall account for any set-offs against payment that are necessary in Engineer's opinion to protect Owner from loss for the reasons stated above with respect to progress payments. At the same time Engineer will also give written notice to Owner and Contractor that the Work is acceptable, subject to the provisions of Paragraph 15.07. Otherwise, Engineer will return the Application for Payment to Contractor, indicating in writing the reasons for refusing to recommend final payment, in which case Contractor shall make the necessary corrections and resubmit the Application for Payment.

C. *Completion of Work*: The Work is complete (subject to surviving obligations) when it is ready for final payment as established by the Engineer's written recommendation of final payment.

D. *Payment Becomes Due*: Thirty days after the presentation to Owner of the final Application for Payment and accompanying documentation, the amount recommended by Engineer (less any further sum Owner is entitled to set off against Engineer's recommendation,

including but not limited to set-offs for liquidated damages and set-offs allowed under the provisions above with respect to progress payments) will become due and shall be paid by Owner to Contractor.

15.07 *Waiver of Claims*

A. The making of final payment will not constitute a waiver by Owner of claims or rights against Contractor. Owner expressly reserves claims and rights arising from unsettled Liens, from defective Work appearing after final inspection pursuant to Paragraph 15.05, from Contractor's failure to comply with the Contract Documents or the terms of any special guarantees specified therein, from outstanding Claims by Owner, or from Contractor's continuing obligations under the Contract Documents.

B. The acceptance of final payment by Contractor will constitute a waiver by Contractor of all claims and rights against Owner other than those pending matters that have been duly submitted or appealed under the provisions of Article 17.

15.08 *Correction Period*

A. If within two years after the date of Substantial Completion (or such longer period of time as may be prescribed by the terms of any applicable special guarantee required by the Contract Documents, or by any specific provision of the Contract Documents), any Work is found to be defective, or if the repair of any damages to the Site, adjacent areas that Contractor has arranged to use through construction easements or otherwise, and other adjacent areas used by Contractor as permitted by Laws and Regulations, is found to be defective, then Contractor shall promptly, without cost to Owner and in accordance with Owner's written instructions:

1. correct the defective repairs to the Site or such other adjacent areas;

2. correct such defective Work;

3. if the defective Work has been rejected by Owner, remove it from the Project and replace it with Work that is not defective, and

4. satisfactorily correct or repair or remove and replace any damage to other Work, to the work of others, or to other land or areas resulting therefrom.

B. If Contractor does not promptly comply with the terms of Owner's written instructions, or in an emergency where delay would cause serious risk of loss or damage, Owner may have the defective Work corrected or repaired or may have the rejected Work removed and replaced. Contractor shall pay all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such correction or repair or such removal and replacement (including but not limited to all costs of repair or replacement of work of others).

C. In special circumstances where a particular item of equipment is placed in continuous service before Substantial Completion of all the Work, the correction period for that item may start to run from an earlier date if so provided in the Specifications.

D. Where defective Work (and damage to other Work resulting therefrom) has been corrected or removed and replaced under this paragraph, the correction period hereunder with respect to such Work will be extended for an additional period of two years after such correction or removal and replacement has been satisfactorily completed.

E. Contractor's obligations under this paragraph are in addition to all other obligations and warranties. The provisions of this paragraph shall not be construed as a substitute for, or a waiver of, the provisions of any applicable statute of limitation or repose.

ARTICLE 16 – SUSPENSION OF WORK AND TERMINATION

16.01 *Owner May Suspend Work*

A. At any time and without cause, Owner may suspend the Work or any portion thereof for a period of not more than 90 consecutive days by written notice to Contractor and Engineer. Such notice will fix the date on which Work will be resumed. Contractor shall resume the Work on the date so fixed. Contractor shall be entitled to an adjustment in the Contract Price or an extension of the Contract Times, or both, directly attributable to any such suspension. Any Change Proposal seeking such adjustments shall be submitted no later than 30 days after the date fixed for resumption of Work.

16.02 *Owner May Terminate for Cause*

A. The occurrence of any one or more of the following events will constitute a default by Contractor and justify termination for cause:

1. Contractor's persistent failure to perform the Work in accordance with the Contract Documents (including, but not limited to, failure to supply sufficient skilled workers or suitable materials or equipment or failure to adhere to the Progress Schedule);

2. Failure of Contractor to perform or otherwise to comply with a material term of the Contract Documents;

3. Contractor's disregard of Laws or Regulations of any public body having jurisdiction; or

4. Contractor's repeated disregard of the authority of Owner or Engineer.

B. If one or more of the events identified in Paragraph 16.02.A occurs, then after giving Contractor (and any surety) ten days written notice that Owner is considering a declaration that Contractor is in default and termination of the contract, Owner may proceed to:

1. declare Contractor to be in default, and give Contractor (and any surety) notice that the Contract is terminated; and

2. enforce the rights available to Owner under any applicable performance bond.

C. Subject to the terms and operation of any applicable performance bond, if Owner has terminated the Contract for cause, Owner may exclude Contractor from the Site, take possession of the Work, 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 complete the Work as Owner may deem expedient.

D. Owner may not proceed with termination of the Contract under Paragraph 16.02.B if Contractor within seven days of receipt of notice of intent to terminate begins to correct its failure to perform and proceeds diligently to cure such failure.

E. If Owner proceeds as provided in Paragraph 16.02.B, Contractor shall not be entitled to receive any further payment until the Work is completed. If the unpaid balance of the Contract Price exceeds the cost to complete the Work, including all related claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals) sustained by Owner, such excess will be paid to Contractor. If the cost to complete the Work including such related claims, costs, losses,

and damages exceeds such unpaid balance, Contractor shall pay the difference to Owner. Such claims, costs, losses, and damages incurred by Owner will be reviewed by Engineer as to their reasonableness and, when so approved by Engineer, incorporated in a Change Order. When exercising any rights or remedies under this paragraph, Owner shall not be required to obtain the lowest price for the Work performed.

F. Where Contractor's services have been so terminated by Owner, the termination will not affect any rights or remedies of Owner against Contractor then existing or which may thereafter accrue, or any rights or remedies of Owner against Contractor or any surety under any payment bond or performance bond. Any retention or payment of money due Contractor by Owner will not release Contractor from liability.

G. If and to the extent that Contractor has provided a performance bond under the provisions of Paragraph 6.01.A, the provisions of that bond shall govern over any inconsistent provisions of Paragraphs 16.02.B and 16.02.D.

16.03 *Owner May Terminate For Convenience*

A. Upon seven days written notice to Contractor and Engineer, Owner may, without cause and without prejudice to any other right or remedy of Owner, terminate the Contract. In such case, Contractor shall be paid for (without duplication of any items):

1. completed and acceptable Work executed in accordance with the Contract Documents prior to the effective date of termination, including fair and reasonable sums for overhead and profit on such Work;

2. expenses sustained prior to the effective date of termination in performing services and furnishing labor, materials, or equipment as required by the Contract Documents in connection with uncompleted Work, plus fair and reasonable sums for overhead and profit on such expenses; and

3. other reasonable expenses directly attributable to termination, including costs incurred to prepare a termination for convenience cost proposal.

B. Contractor shall not be paid on account of loss of anticipated overhead, profits, or revenue, or other economic loss arising out of or resulting from such termination.

16.04 *Contractor May Stop Work or Terminate*

A. If, through no act or fault of Contractor, (1) the Work is suspended for more than 90 consecutive days by Owner or under an order of court or other public authority, or (2) Engineer fails to act on any Application for Payment within 30 days after it is submitted, or (3) Owner fails for 30 days to pay Contractor any sum finally determined to be due, then Contractor may, upon seven days written notice to Owner and Engineer, and provided Owner or Engineer do not remedy such suspension or failure within that time, terminate the contract and recover from Owner payment on the same terms as provided in Paragraph 16.03.

B. In lieu of terminating the Contract and without prejudice to any other right or remedy, if Engineer has failed to act on an Application for Payment within 30 days after it is submitted, or Owner has failed for 30 days to pay Contractor any sum finally determined to be due, Contractor may, seven days after written notice to Owner and Engineer, stop the Work until payment is made of all such amounts due Contractor, including interest thereon. The provisions of this paragraph are not intended to preclude Contractor from submitting a Change Proposal for an adjustment in Contract Price or Contract Times or otherwise for

expenses or damage directly attributable to Contractor's stopping the Work as permitted by this paragraph.

ARTICLE 17 – FINAL RESOLUTION OF DISPUTES

17.01 *Methods and Procedures*

A. *Disputes Subject to Final Resolution*: The following disputed matters are subject to final resolution under the provisions of this Article:

1. A timely appeal of an approval in part and denial in part of a Claim, or of a denial in full; and

2. Disputes between Owner and Contractor concerning the Work or obligations under the Contract Documents, and arising after final payment has been made.

B. *Final Resolution of Disputes*: For any dispute subject to resolution under this Article, Owner or Contractor may:

1. elect in writing to invoke the dispute resolution process provided for in the Supplementary Conditions; or

2. agree with the other party to submit the dispute to another dispute resolution process; or

3. if no dispute resolution process is provided for in the Supplementary Conditions or mutually agreed to, give written notice to the other party of the intent to submit the dispute to a court of competent jurisdiction.

ARTICLE 18 – MISCELLANEOUS

18.01 *Giving Notice*

A. Whenever any provision of the Contract Documents requires the giving of written notice, it will be deemed to have been validly given if:

1. delivered in person, by a commercial courier service or otherwise, to the individual or to a member of the firm or to an officer of the corporation for which it is intended; or

2. delivered at or sent by registered or certified mail, postage prepaid, to the last business address known to the sender of the notice.

18.02 *Computation of Times*

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

18.03 *Cumulative Remedies*

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

18.04 *Limitation of Damages*

A. With respect to any and all Change Proposals, Claims, disputes subject to final resolution, and other matters at issue, neither Owner nor Engineer, nor any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, shall be liable to Contractor for any claims, costs, losses, or damages sustained by Contractor on or in connection with any other project or anticipated project.

18.05 *No Waiver*

A. A party's non-enforcement of any provision shall not constitute a waiver of that provision, nor shall it affect the enforceability of that provision or of the remainder of this Contract.

18.06 *Survival of Obligations*

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

18.07 *Controlling Law*

A. This Contract is to be governed by the law of the state in which the Project is located.

18.08 *Headings*

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

SUPPLEMENTAL CONDITIONS OF THE AGREEMENT

1. GENERAL

The provisions of this Section of the specifications shall govern in the event of any conflict between them and the "General Conditions of Agreement".

2. OWNER

The word "Owner" in these specifications shall be understood as referring to the **CITY OF ENNIS, 500 LAKE BARDWELL DR., ENNIS, TX 75119.**

3. ENGINEER

The word "Engineer" in these specifications shall be understood as referring to **Schaumburg & Polk, Inc.**, 320 S. Broadway Ave, Suite 200, Tyler, Texas 75702, Engineer of the Owner, or such other Engineer, as may be authorized by said Owner to act in any particular position.

4. CONTRACTOR

The word "Contractor" in these specifications shall be understood as denoting the General Contractor signing this contract.

5. SUBLETTING

The Contractor will not be permitted to assign, sell, transfer or otherwise dispose of the contract or any portion thereof, or his rights, title or interest therein without the approval of the Owner. The Contractor will not be permitted to sublet any portion of the contract without the approval of the Owner and the Engineer. No sub-contract will, in any case, relieve the Contractor of his responsibility under the contract and bond.

The Contractor shall perform with his own organization and with the assistance of workmen under his immediate superintendence, work of a value not less than 50 percent of all work embraced in the contract exclusive of items not commonly found in contracts for similar work, or which require highly specialized knowledge, craftsmanship and/or equipment not ordinarily available in the organization of Contractors performing work of the character embraced in the contract.

6. TRADE NAMES

Except as specifically specified otherwise, wherever in the specifications an article or class of material is designated by a trade name, or by the name or catalog number of any maker, patentee, manufacturer, or dealer, such designation shall be taken as intending to mean and specify the articles described or another equal thereto in quality, finish, and serviceability for the purpose intended as may be determined and judged by the Engineer in his sole discretion.

7. MATERIALS AND WORKMANSHIP

Unless otherwise specified, all materials shall be new. No material which has been used by the Contractor for any temporary purpose whatever is to be incorporated in the permanent structure without written consent of the Engineer.

Where material or equipment are specified by a trade or brand name, it is not the intention of the Owner to discriminate against an equivalent product of another manufacturer, but rather to set a

definite standard of equality or performance and to establish an equitable basis for the evaluation of bids. Where the words "equivalent", "proper" or "equal to" are use, they shall be understood to mean that the object referred to shall be proper, the equivalent of, or equal to some other object, in the opinion or judgment of the Engineer.

Unless otherwise specified, all materials shall be the best of their respective kinds and shall be in all cases fully equivalent to approved samples. Notwithstanding that the words "or equal to" or other such expressions may be used in the specifications in connection with material, manufactured article, or process, the material, article, or process specifically designated shall be used, unless a substitute shall be approved in writing by the Engineer, and the Engineer shall have the right to require the use of such specifically designated material, article or process.

8. CASUALTY INSURANCE

The Contractor shall within one week after signing the contract, and before any work shall start, furnish the Owner with certificates of insurance satisfactory to the Owner indicating the existence of the following coverages:

1. Statutory Worker's Compensation Insurance.

2. Commercial General Liability (XCU and completed operations coverage must be included).

   a. Combined Single Limit $500,000

   b. General Aggregate $1,000,000

3. Commercial Automobile Liability (Owned, hired and non-owned vehicles)

4. Contractual Liability Insurance covering the indemnity provision of this Contract in same amount and coverage as provided for Commercial General Liability Policy, specifically referring to this Contract by date, job number, and location;

5. Owner's Protective Liability naming (OWNER), ENNIS, Texas, its offices, agents, and employees, and the Engineer as insured in the same amount and coverage as provided for in the Commercial General Liability Policy; and

   Contractor’s Public Liability and Property Damage Insurance and Vehicle Liability Insurance: The Contractor shall procure and shall maintain during the life of this contract Contractor’s Public Liability Insurance, Contractor’s Property Damage Insurance and Vehicle Liability Insurance in the following amounts: ($500,000, $1,000,000, $100,000)

6. All-Risks Builder's Risk

These certificates shall contain a provision that the Owner shall be notified thirty (30) days before the cancellation of the insurance.

The Contractor shall maintain such insurance in force during the life of the contract and no modification or change of insurance coverage and provision shall be made without thirty (30) days written advance notice to the Owner.

9. INDEMNIFICATION

The Contractor shall indemnify and hold harmless the (OWNER), the **CITY OF ENNIS, TEXAS** and the Engineer from any and all claims, causes of actions, and damages of every kind, for injury to or death of any person and damages to property arising out of the construction of said improvements or the operations embraced by this contract or the use of the premises upon which the improvements under this contract are to be constructed, and including acts or omissions of the Owner or the Engineer in connection with said construction.

10. PERFORMANCE OF WORK

The Contractor shall commence work within ten (10) days after order to proceed and shall perform the work systematically and energetically so that all of his work will be completed within the contract time.

The work shall be done at such point and in such sequence as the Engineer may direct and in accordance with special provisions of working specifications.

The Engineer, on reasonable notice in writing to the Contractor may stop any portion of the work, if in his judgment, the weather or other conditions, such as labor troubles, poor materials, improper construction methods, noncompliance with plans and specifications, prevent the work from being properly done.

For delays occasioned by any act, neglect or default of the Owner, the Owner shall not be held liable for damages on account thereof, but an extension of time shall be granted to the Contractor for the completion of this contract, equivalent to the delays so caused.

Additional time shall be allowed the Contractor for the following causes:

Rises in streams, bad weather, delay of material in transit and proportionate for increased quantities of work or for other causes beyond reasonable control of the Contractor, which in the opinion of the Engineer, necessarily prevent work. Claims for additional time shall be presented to the Engineer at the end of each month covering delays during that month. Claims not so presented will not be considered.

11. LIQUIDATED DAMAGES FOR DELAYS

It is understood and agreed between the parties hereto that time is of the essence of this contract, and in case the Contractor shall fail to fully, entirely, and in conformity with the provisions of this contract, perform and complete said work within the time stated in the proposal with such allowances as herein before provided or within such further time as he may be allowed by the Owner, the Engineer shall compute the number of days of delinquency in said final and entire completion. It is hereby acknowledged by the Contractor that such delinquency caused additional overhead costs and expense to the Owner and costly inconveniences to the public by reason of interruption of traffic and/or services from the incomplete work, and that the said delinquency is a damage to the Owner caused through the fault of the Contractor.

It is hereby agreed between both parties to this contract that the amount of said damages are hereby ascertained and liquidated at the greater of **three hundred ($300.00) per day** of delay, or the actual measurable damages to the Owner including penalties, or other fees which may be charged to the Owner for failure to meet the time requirements. At a minimum, the Contractor agrees to pay the documented cost to the Owner for additional Resident Project Representative and Contract Administration services performed by the Engineer as a direct result of the delinquency.

The Contractor hereby agrees to pay the stated sum to the Owner for each and every day of delinquency until final acceptance of the project.

12. RESPONSIBILITIES

The Contractor shall be responsible for all materials delivered to him for all parts of the work, including that which has been partially paid for, until final acceptance of the entire work, and shall be liable for all losses or damages thereto which may occur during the progress of construction and before final acceptance. The Contractor shall be required to make good at his own cost any loss, injury or damage which the said materials or work may sustain from any source or cause whatsoever before final acceptance thereof.

The Contractor is required to replace or repair, if necessary, any portion of pavement or other street improvements adjoining his work which may have suffered through his operations, and all adjacent paving or other structures shall be left in a satisfactory and workmanlike condition, at least equal to that existing before the Contractor hereunder started his work.

13. CONNECTING WITH OLD WORK

The Contractor shall do all work that may be necessary to connect the new work with existing improvements in a proper and workmanlike manner. Only such portion of existing improvements shall be removed for new construction as shall be ordered by the Engineer. Any other damage to existing improvements shall be repaired by the Contractor at his own expense.

14. PARTIAL PAYMENTS BY THE OWNER

a. Progress Payment. Partial payment for the amount of work completed each month is specified in the General Conditions of the Agreement. Checks for partial payments will be issued by the Owner based on work performed under each proposal.

It is expressly understood, however, that such estimates and payments shall only be made when the work progresses as rapidly as may be required by the Engineer, and in accordance with the provisions of this contract, and furthermore, with the understanding that such partial payment on account shall not be construed as an acceptance of any part of the work.

The Contractor shall prepare his 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 his review. 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%) of the total amount, as a retainage; (2) any back-charges assessed in accordance with the contract documents; (3) any special withholding according to sub-item "b" below; and (4) the amount of all previous payments.

The total value of work completed to date shall be abased on the estimated quantities of work completed and on the unit prices contained in the agreement (or cost breakdown submitted and approved using the form contained in these specifications) 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.

For purposes of partial payment, the quantity of materials on hand may not exceed the quantity of materials reasonably necessary to complete the project. Payment for materials

on hand (prior to deduction for retainage) may not exceed the bid price or bid breakdown price for the work in which such materials will be incorporated. No payment will be made for materials not meeting specifications.

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.

The five percent (5%) retainage of the progress payments otherwise due to the Contractor may not be reduced until the building of the project is substantially complete.

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 he 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 acclaims or disputes between the Contractor and his subcontractors or material dealers, or to withhold any moneys for their protection unless the Owner elects to do so. The failure or refusal of the Owner to withhold any moneys from the Contractor shall in no way impair the obligations of any surety or sureties under any bond or bonds furnished under this Contract.

The Owner may withhold liquidated damages for violation of overtime requirements.

At any time upon request of the Engineer, the Contractor shall submit evidence showing payment of his bills for labor, materials, freight, or other expenses on account of the work, and if it should be evident that the Contractor is not making prompt and full payment of his obligations, the Engineer may withhold the issuance of estimates until such unpaid wages and/or related liquidated damages are remedied.

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 him and his subcontractors within these contract documents, and by other general and special conditions elsewhere in these contract documents.

15. SALES TAX

A. Tax Exempt Items

The Contractor performing construction under this contract may purchase materials, supplies, equipment, and other tangible property for either of the following purposes:

1. Incorporation of these items into the work being performed for the Owner.

2. Furnishing these items to the Owner uninstalled as specified by these contract documents.

B. Exemption Requirements - General

The Contractor is responsible for furnishing his suppliers with the required resale certificates in accordance with State Law. The Owner will furnish the Contractor with any necessary exemption certificates which are required from the Owner by the

State Comptroller for sales tax exemption purposes, in accordance with State Law.

In order for the above described sales tax exemption to apply, this contract between the Owner and the Contractor must be a separated contract as defined by the State Comptroller (in which the Contractor's charges to the Owner for incorporated/furnished materials are stated separately from installation costs, consumable materials, etc.).

The Contractor shall submit to the Engineer a completed Separation of Materials Form prior to contract execution, in order to make this document a part of the executed contract.

Separation of material prices will also be reflected in any change orders which are executed during (or before) construction, including final change orders if necessary. Each change order will include a total Contractor's price (to the Owner) for sales tax exempt materials, if applicable. This requirement applies to deducts for deleted items as well as to extra work.

Failure of the Contractor to provide the required material separation, either for the contract or for change orders, may result in disallowance by the State Comptroller of all or part of his sales tax exemption for incorporated/furnished materials for this project. In such cases, the Owner shall not bear any liability for such losses, even to the extent that they may be caused by increased as-built quantities.

In the event that the Comptroller should require any information or documentation regarding the Contractor's separated material prices, the Contractor shall be responsible for providing these items except for any documentation which may required of the Owner by the Comptroller. The Owner shall not bear any liability for any disallowed sales tax exemptions as a result of action by the Comptroller.

No sales tax exemption is allowable for the following items:

1. Any materials, supplies, or incidentals, including motor fuel, used or consumed in the performance of this contract and not incorporated into the completed work.

2. Purchase, rental, or maintenance of any equipment used by the Contractor in the performance of the work.

C. Special Requirements-Items Furnished Uninstalled

One additional requirement applies to materials and equipment which are being furnished to the Owner uninstalled. These items must be purchased by the Contractor and furnished directly to the Owner without first being used by the Contractor. These items shall, if possible, be labelled by the supplier (prior to entering the custody of the Contractor) as belonging to the Owner.

The Contractor may make subsequent use of these items in performing the contract only under the following conditions:

1. Such use is specifically provided in the plans and specifications or by other written directives of the Owner.

2. Such use occurs only after the Owner takes title to and possession of the items.

These provisions shall not be construed to prevent the Contractor from any necessary assembly, modification, testing, or transportation of the items to be furnished uninstalled.

These provisions apply also to (a) materials which are incorporated into an item to be fabricated by the Contractor and furnished uninstalled, and (b) to items which are being purchased in a used condition by the Contractor and furnished uninstalled to the Owner in accordance with plans and specifications.

16. USE OF UTILITY SYSTEM WATER

The Owner will furnish the Contractor, free of charge, all water required for construction including testing of water, and sewer lines. The Contractor shall not use this water wastefully.

The Contractor shall furnish and install all temporary piping, fittings, valves, and pumping as necessary to perform the testing as specified in this Contract.

The Owner will designate during construction the fire hydrants or other taps which the Contractor may use for this purpose. No person shall be allowed to open, turn off, interfere with, attach any pipe or hose to, or connect anything with, any fire hydrant, stop valve, or stop cock belonging to the Owner unless duly authorized by the (OWNER).

17. EQUAL EMPLOYMENT OPPORTUNITY POLICY

a. The Contractor shall not discriminate against any employee or applicant for employment because of race, color, religion, sex or national origin. The Contractor shall take affirmative action to ensure that applicants are employed, and that the employees are treated during employment, without regard to their race, color, religion, sex or national origin. Such actions shall include, but not be limited to the following: Employment, upgrading, demotion or transfer, or recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The Contractor will be required to post in conspicuous places, available to employees and applicants for employment, notices to be provided setting forth the provisions of this non-discrimination clause.

b. The Contractor shall, in all solicitations or advertisements for employees place by or on behalf of the Contractor, state that all qualified applicants will receive considerations for employment without regard to race, color, religion, sex, age, handicap, or national origin.

c. The Contractor shall send to each labor union or representative of workers with which he has a collective bargaining agreement or other contract or understanding, a notice to be provided advising the said labor union or workers' representatives of the Contractor's commitments under this section, and shall post copies of the notice in conspicuous places available to employees and applicants for employment.

d. The Contractor shall comply with all provisions of Executive Order 11246 of September 24, 1965, the Age Discrimination in Employment Act of 1967, 29 U.S.C.A. 621 (1985), Executive Order 12250 of November 2, 1980, the Rehabilitation Act of 1973, 29 U.S.C.A. 701 et seq. (1985), and of the rules, regulations, and relevant orders of the Secretary of Labor.

e. The Contractor shall furnish all information and reports required by Executive Order 11246 of September 24, 1965, and by rules, regulations, and orders of the Secretary of Labor, or pursuant thereto, and will permit access to his books, records, and accounts by the administering agency and the Secretary of Labor for purposes of investigation to ascertain compliance with such rules, regulations, and orders.

f. In the event of the Contractor's noncompliance with the nondiscrimination clauses of this contract or with any of the said rules, regulations, or orders, this contract may be canceled, terminated, or suspend in whole or in part and the Contractor may be declared ineligible for further Government contracts or federally assisted construction contracts in accordance with procedures authorized in Executive Order 11246 of September 24, 1965, and such other sanctions may be imposed and remedies invoked as provided in Executive Order 11246 of September 24, 1965, or by rule, regulation, or order of the Secretary of Labor, or as otherwise provided by law.

g. The Contractor shall include all provisions of this item regarding Equal Employment Opportunity in every subcontract or purchase order unless exempted by rules, regulations, or orders of the Secretary of Labor issued pursuant to section 204 of Executive Order 11246 of September 24, 1965, so that such provisions will be binding upon each subcontractor or vendor.

The Contractor shall take such action with respect to any subcontract or purchase order as the administering agency may detect as a means of enforcing such provisions, including sanctions for noncompliance: PROVIDED, HOWEVER, that in the event a Contractor becomes involved in, or is threatened with, litigation with a subcontractor or vendor as a result of such direction by the administering agency the Contractor may request the United States to enter into such litigation to protect the interest of the United States.

18. USE OF STREETS

The Contractor shall obtain a permit to utilize the portions of public streets, or other public property adjacent to the structures for storage of materials and equipment which will immediately be used for the orderly prosecution of the work subject to such regulations as may be designated by the Engineer, or as stated in the detailed specifications, and provided that the following regulations are observed in connection therewith:

a. The Contractor, at all times, shall conduct the work so as to insure the least practicable inconvenience to traffic in accordance with the special provisions of the Detailed Specifications. No street or part of street shall be closed to the public as a result of construction traffic.

b. The Contractor shall provide and maintain suitable warning signals, flagmen, barricades, and night lights for night where necessary, to direct and protect traffic, and shall carry out any orders thereon which may be given by the Engineer. No street or part of street shall be closed to the public until such barricades and warning signals for day and night have been provided and placed by the Contractor. The failure of the Engineer to issue orders on this subject, or the inadequacy of orders which may be issued by him, shall not release the Contractor from any of his responsibilities.

c. The Contractor shall provide temporary outlets for any surface water, the flow of which is blocked by his work, to the extent necessary to prevent damage to private property or hindrance to the public.

d. The Contractor must obtain a street cut permit and any applicable barricading permits from the City prior to any of the following operations:

(1) removal of pavement, base, sidewalks, or curb and gutter within street right-of-way.

(2) Excavation, boring, or tunneling within street right-of-way.

(3) Any operations outside street right-of-way causing excavated material to be placed within street right-of-way even temporarily.

Work shall be in conformance with such permits, and a copy of the permit shall be kept at the job site during construction. Separate permit applications will normally be required for various segments of the project. See Item 27, PERMITS, of these Special Conditions for details.

The Contractor shall provide storage space for materials which are not to be immediately used in the work.

All other permits for securing materials, storage space for materials, plant sites, material yards, camp sites, right to pass upon private property and all such other permits and licenses as he shall desire, or which are necessary for the proper executing of the work, must be secured by the Contractor at his expense, except as noted in Item 27, PERMITS.

19. REMOVAL OF CONDEMNED WORK

In the construction of the work contemplated in this contract and under these plans and specifications, the best workmanship, materials and equipment of the grade and make specified shall be used and installed, and to that end, judged by these standards. If any work, equipment or material is found to be imperfect or not in substantial compliance with the provisions of this contract, as interpreted by the Engineer, at any time prior to the acceptance of the entire work done under this contract, notwithstanding that it may have been passed, overlooked, or previously accepted by the Engineering Assistants, the Contractor shall, at his own cost and expense, remove it from the premises of the Owner, otherwise dispose of it as directed by the Engineer.

When such condemned work, material or equipment has been removed or disposed of, it shall be replaced by the Contractor at his own cost and expense, in accordance with the plans and specifications to the entire satisfaction of the Engineer. The Owner shall not be compelled nor be under any obligation to retain said condemned work, material or equipment nor any part thereof, nor pay the Contractor even the reasonable value of same.

In case the Contractor shall neglect or refuse to remove or replace any condemned work, material or equipment after written notice, within the time designated by the Engineer, such condemned work, material or equipment may be removed or replaced by the Owner and the Contractor hereby agrees to pay the cost of work so done, or material or equipment so purchased by the Owner.

20. BARRICADES, SIGNS AND HANDLING OF TRAFFIC

Public buildings, facilities, centers, constructed with funds provided under this contract shall have permanent signage placed in a prominent visible public area. The formatting of such signage will be at local discretion to best fit the architectural design of the facility constructed but should be legible from at least three feet.

Other construction projects, e.g., water transmission lines, sewer collection lines, drainage, roadways, housing rehabilitation, etc. utilizing funds provided under this contract shall have temporary signage erected in a prominent location at the construction project site or along a major thoroughfare within the locality as directed by the owner.

21. CONTRACTORS GENERAL WARRANTY AND GUARANTY

"Contractor warrants and guaranties to Owner, Engineer and Engineer's consultants that all work will be in accordance with the Contract Documents and will not be defective. If any work is found to be defective, the Contractor shall promptly, without cost to Owner and in accordance with Owner's written instructions, either correct such defective work, or, if it has been rejected by Owner, remove it from the site and replace with non-defective work to the satisfaction of the Owner and Engineer"

If the Contractor does not promptly comply with the terms of such instructions, or in an emergency where delay would cause serious risk of loss or damage, Owner may have the defective work corrected or the rejected work removed and replaced, an all direct, indirect and consequential costs of such removal and replacement, including but not limited to fees and charges of architects, engineers, attorneys and other professionals, shall be paid by the Contractor. In special circumstances where a particular item of equipment is placed in continuous service before Substantial Completion of all work, the correction period for that item shall start at the commencement of continuous service.

22. SUBMITTALS, OPERATION AND MAINTENANCE INFORMATION

Submittal, and operation and maintenance information for all equipment to be supplied in this project shall meet the requirements of the Technical Specifications.

23. MEASUREMENT

For lump sum priced contracts, the Contractor, before ordering any material or doing any work, shall verify all measurements of any existing and new work and shall be responsible for their correctness. Any differences which may be found shall be submitted to the Engineer for consideration before proceeding with the work. No extra compensation will be allowed because of differences between actual dimensions and measurements indicated on the working drawings. For unit price contracts, measurement shall be made of the actual installed quantities and Contractor's compensation shall be based on same.

24. AS-BUILT DIMENSIONS, DRAWINGS, AND DATA

The Contractor shall make appropriate daily measurements of constructed facilities and shall keep accurate records of locations (horizontal and vertical) of all facilities. In cases of underground facilities, the Contractor shall also give the Engineer an opportunity to measure locations before backfilling, and/or shall place temporary reference markers as directed by the Engineer, adequately protected pending future use by Engineer.

Such location measurements shall be reported according to the reference line used by the Engineer for the facility under construction, or in such a manner that the locations can easily be tied into the reference line.

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:

a. Horizontal and vertical locations or work.

b. Changes in equipment and dimensions due to substitutions.

c. Nameplate data on all installed equipment.

d. Deletions, additions, and changes to scope of work.

e. Any other changes made.

25. SUBSURFACE INFORMATION

Prior to bidding, bidders may make their own subsurface investigations under time schedule and arrangements approved in advance by the Owner or the Engineer. The Contractor shall determine to his satisfaction the subsoil conditions and their effect on the required construction and shall complete the work as required without additional cost to the owner.

26. CONSTRUCTION STAKES

The Owner will establish such general reference points as in his judgment will enable the Contractor to proceed with the work. The Contractor will be responsible for the layout of the work from these stakes and will protect and preserve the established reference points and will make no changes or relocations without prior written approval of the Owner. He will report to the Engineer whenever any reference point is lost or destroyed or requires relocation because of necessary changes in grades or locations. The Contractor will replace and accurately relocate all reference points so lost, destroyed, or moved.

27. PERMITS

The Owner will acquire any permits and/or easements required for crossing or paralleling county roads, drainage ditches, canals, power line easements, pipelines, and various private property. Street cut and barricade permits will be issued at no charge to the Contractor, should they be applicable. All other permits, fees and licenses necessary for the pursuit of the work shall be obtained and paid for by the Contractor.

Permit applications for street cuts and/or barricading shall be made on forms provided by the County. These forms may be obtained from the County Engineer. The application shall include or be accompanied by any necessary drawings showing the location of the proposed street cuts and proposed barricades.

The Contractor shall submit to the Engineer at least six (6) copies of his plans for barricading and traffic control for all portions of the project, at least two (2) business days before the preconstruction conference. Applications for street cuts and barricading for specific locations shall be submitted to the Engineer not less than five (5) business days prior to the proposed work.

The Texas Department of Transportation (TxDOT) may require revisions to barricading plans submitted with an application if, in their opinion, such revisions are necessary to serve the best interest of TxDOT.

In some cases the scope of street cut and/or barricading requirements may be increased, as when the need for utility relocation is discovered during piping construction. In such cases the Contractor shall immediately apply for permit revisions as necessary.

28. MAINTENANCE OF SITE AND CLEANUP

The work site shall be kept reasonably clean at all times. Surplus materials shall be disposed of by the Contractor. In final clean-up operations all equipment, scrap materials and temporary structures shall be removed and the site left clean.

29. PROTECTION AND REPLACEMENT OF PROPERTY

Public or private property that is damaged, destroyed or removed by the Contractor during the construction shall be replaced to its original condition or better by the Contractor, at no additional cost to the Owner.

30. PROTECTION OF TREES, PLANTS AND SHRUBS

Care shall be exercised to prevent damage to trees, plants and shrubs along the work site. No tree, plant or shrub shall be removed unless it is designated for removal or interferes unduly with the construction work. Permission for such removal must first be obtained from the Owner. Provisions of the Technical Specifications shall govern in matters of this nature.

In the event that rare or endangered plant species are encountered during construction, the Contractor shall notify the Engineer immediately and shall immediately cease construction in the affected area. The Engineer will immediately consult with appropriate wildlife management agencies and/or a professional biologist to determine appropriate measures.

The Contractor shall take care to locate and identify before clearing operation those plant species, along with surrounding vegetation, which are designated for preservation.

31. LOCATION OF AND DAMAGE TO EXISTING UTILITIES

The Contractor is responsible for locating underground obstacles. It is not represented that the drawings show all underground obstacles.

The Contractor shall exercise caution to prevent damage to existing facilities during the progress of the construction work, taking care to locate same, where possible, in advance of the actual work. The Engineer will render all assistance possible to the Contractor in the matter of determining the location of existing utilities by making available such maps, records, and other information as may be accessible to him, when requested to do so, but the accuracy of such information will not be guaranteed. The Contractor shall make good all damage to existing utilities and/or pipelines resulting from his operations. Should the Contractor, in the layout of his work, encounter any pipe, underground utility, or structure, the location of which has not been furnished to him by the Engineer, he shall bring such conditions to the attention of the Engineer for his determination of the method to be used to remove or bypass such obstructions.

In cases where owners of existing pipelines or underground utilities provide services for locating their facilities, the Contractor shall coordinate the location marking and be responsible for preserving all stakes and markers set for this purpose. The Contractor's responsibility for these markers shall be similar to his responsibility for construction stakes (Item 25 above). The Contractor shall save harmless the Owner and the Engineer for any expenses for restoring damaged markers.

32. OBSERVATION OF THE WORK

It is agreed by the Contractor that the Engineer shall be and is hereby authorized to appoint from

time to time such representatives as the said Owner may deem proper to observe the material furnished and the work done under this contract and to see that the said material is furnished and said work is done in accordance with the specifications therefore.

The Contractor shall furnish all reasonable aid and assistance required by these representatives for the proper observation of the work and all parts of the work. Except as hereinbefore provided, the authority of subordinate representatives shall be limited to the rejection of unsatisfactory work and materials until the questions of acceptability can be referred to the Engineer.

Representatives of various facilities being crossed or paralleled by the project shall have similar rights when their facilities are involved.

33. ACCESS TO THE WORK

Representatives of the Occupational Safety Health Administration shall have access to the work whenever it is in preparation or progress. The Contractor shall provide proper facilities for such access and inspection.

34. REVIEW BY OWNER

The Owner, authorized representatives and agents of the Owner, 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. However, all instructions and approval with respect tot he work will be given to the Contractor only by the Owner through authorized representatives or agents.

35. CONSTRUCTION SCHEDULE

The Contractor shall within one week after signing the contract, and before any work shall start, furnish the Engineer with a Construction Schedule for approval. The Schedule shall indicate the orderly progress of work.

36. ON-SITE AND MATERIAL TESTING

If the Owner desires testing to be performed, other than items as specified for materials furnished by the Contractor the following procedure will be used:

1. Owner will select the laboratory and authorize the tests.
2. The Owner will pay the cost of each initial test.
3. In those cases where the item being tested fails to meet the specification requirements, the cost of retesting shall be charged to the Contractor.

All costs to furnish and perform the infiltration, exfiltration, hydrostatic pressure, low air pressure, and deflection testing, as specified, shall be borne by the Contractor, except for the free use of water.

37. CLAIMS

In the event of a claim or disagreement, the Contractor shall make all bid related documents (including but not limited to bid spread sheet, breakdowns, and quantity take-offs) available to Owner within one week of the date that the claim is filed, to assist in determining validity of dispute.

38. CHANGE ORDERS

Contractor acknowledges and agrees that the adjustments in contract price and/or contract time stipulated in Change Orders for this Contract represent full compensation for all increases or decreases in the cost of, or the time required to perform the entire work under the Contract, arising directly or indirectly from such Change Orders. Acceptance of this waiver constitutes an agreement between Owner and Contractor that each Change Order represents an all inclusive, mutually agreed on adjustment to the Contract, and the Contractor will waive all rights to file a claim on Change Orders after they are properly executed.

39. FINAL ACCEPTANCE AND PAYMENT

Upon the issuance by the Engineer of the Certificate of Completion following final inspection, the Engineer shall proceed to make final measurements and prepare a final statement of the value of all work performed and material furnished under the terms of the Contract. This statement shall be based on the carefully measured or computed quantity of each item of work at the applicable unit prices in the Bid Proposal, the Bid Breakdown for lump sum items, and/or approved change orders. The Engineer shall certify this statement to the Owner within ten days after the date of such Certificate of Completion. The total amount of the final balance due the Contractor shall be the amount computed in the statement less all previous payments and less any liquidated damages, back-charges, and/or other deductions provided under this contract.

The Owner shall pay the Contractor the balance due the Contractor under the terms of the Contract, provided the Contractor has fully performed his contractual obligations under the terms of the Contract; said payment shall become due in any event upon said performance by the Contractor. Final payment to the Contractor shall be made subject to his furnishing the Owner with a release in satisfactory form of all claims against the Owner arising under and by virtue of his contract, other than such claims, if any, as may be specifically excepted by the Contractor from the operation of the release as provided under general and special conditions elsewhere in this contract.

The Owner, before paying the final estimate, may require the Contractor to furnish releases or receipts from all subcontractors having performed any work and all persons having supplied materials, equipment (installed on the Project or furnished to the Owner), and services to the Contractor, if the Owner deems the same necessary in order to protect the Owner's interests. The Owner, however, may if it deems such action advisable make payment in part or in full to the Contractor without requiring the furnishing of such releases or receipts and any payments so made shall in no way impair the obligations of any surety or sureties furnished under this Contract.

Withholding of any amount due the Owner, under general and/or special conditions regarding "Liquidated Damages," shall be deducted from the final payment due the Contractor, unless such deduction has been made earlier in the project in accordance with the agreement.

If the Owner should issue the Certificate of Acceptance following the issuance by the Engineer of the Certificate of Substantial Completion, the Engineer shall thereupon proceed to make final measurements and prepare a final statement of the value of all work performed and materials furnished under the terms of the Contract, less a retention of the Engineer's estimated cost of completing the incomplete or unsatisfactory items of work with specified amounts for each incomplete or defective item of work.

40. PROJECT SITE

The Project Site is located **within the CITY OF ENNIS, Texas** as shown on the Contract Plans designated as **Drawing No.(s) 1 - 12.**

41. TIME FOR COMPLETION

The work which the Contractor is required to perform under this Contract shall be commenced at the time stipulated by the Owner in the Notice to Proceed to the Contractor and shall be fully completed within **one hundred and twenty (120) consecutive calendar days** thereafter.

42. COMMUNICATIONS

a. All notices, demands, requests, instructions, approvals, proposals and claims must be in writing. Only written communications will be considered as binding.

b. Any notice to or demand upon the Contractor shall be delivered to the location stated on the signature page of the Agreement (or at such other office as the Contractor may from time to time designate in writing to the Owner), or if deposited in the United States mail in a sealed, postage-prepaid envelope, or delivered with charges prepaid to any telegraph company for transmission, in each case addressed to such office.

c. All papers required to be delivered to the Owner shall, unless otherwise specified in writing to the Contractor, be delivered to
City of Ennis
500 Lake Bardwell Dr.
Ennis, TX 75119

Any notice to or demand upon the Owner shall be sufficiently given if so delivered, or if deposited in the United States mail in a sealed, postage-prepaid envelope, or delivered with charges prepaid to any telegraph company for transmission to said Owner or to such other address as the Owner may subsequently specify in writing to the Contractor for such purposes.

d. Any such notice shall be deemed to have been given as of the time of actual delivery or (in the case of mailing) when the same should have been received in due course of post, or (in the case of telegrams) at the time of actual receipt, as the case may be.

e. In the case of conflicts, acceptability of materials or workmanship, interpretations of contract documents, or changes which significantly affect the cost of the work, only written communication from the Engineer will be considered binding.

f. The Engineer will issue directions, field orders, interpretations and written orders orally and in writing to the Contractor. No other communications whether written or oral, whether from Engineer to subcontractor or from Owner to Contractor or from Owner to subcontractors, will be official and enforceable.

43. CONTRACT DOCUMENTS AND DRAWINGS

The Owner will furnish the Contractor without charge 3 (three) copies of the Contract Documents, including Technical Specifications and Drawings. Additional copies requested by the Contractor will be furnished at cost.

44. EXISTING STRUCTURES

The Owner assumes no responsibility for failure to show the location of any or all of the existing surface and subsurface structures on the plans, or to show them in their exact location. It is mutually agreed that such failure shall not be considered sufficient basis for claims for additional compensation for extra work or for increasing the pay quantities in any manner whatsoever, unless the obstruction encountered is such as to necessitate the building of special work, provisions for which are not made in the plans and proposal, in which case the provisions in these specifications for extra work shall apply.

45. DISPOSAL OF WASTE AND SURPLUS EXCAVATION

All trees, stumps, slashings, brush or other debris removed from the job site as a preliminary to the construction of the work or its appurtenances shall be removed from the property and disposed of in a manner approved by the Engineer.

46. OWNER'S RIGHT TO DO WORK

If the Contractor should neglect to prosecute the work properly or fail to perform any provision of this contract, the Owner, after ten (10) days written notice to the Contractor, may, without prejudice to any other remedy the Owner may have, make good such deficiency and may deduct the cost thereof from the payment then or thereafter due the Contractor. Any money due the Owner after such deduction shall be paid by the Contractor of his sureties who hereby agree to these provisions.

47. DEWATERING EXCAVATION

The prospective bidders shall make sufficient subsurface explorations to determine the location of ground-water which might be encountered. The Contractor shall at his own expense, utilize a pumping system in order to place materials in de-watered excavations.

48. REMOVAL AND REPLACEMENT OF EXISTING PIPE CULVERTS

Existing pipe culverts in conflict with the proposed construction shall be unearthed carefully, disjointed and stockpiled adjacent to the right-of-way. The pipe culverts shall be cleaned and replaced immediately after the construction is clear so as to cause no serious inconveniences to the property owners and to allow access to their property as quickly as possible. Pipe culverts shall be backfilled and mechanically tamped to a density such that settlement will not occur. Where existing rubble or concrete headwalls are cut, damaged or removed, they shall be replaced in an equal or better condition as determined by the Engineer.

Removal and replacement of exiting pipe culverts will not be measured and paid for. No separate payments will be made for removing and replacing headwalls on culverts and all costs in connection therewith shall be included in other items listed in the Proposal.

49. VERIFICATION NO BOYCOTT ISRAEL

As required by Chapter 2270, Government Code, the Firm hereby verifies that it does not boycott Israel and will not boycott Israel through the term of this Agreement. For purposes of this verification, “boycott Israel” 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.

50. FOR CONTRACTS $100,000 AND OVER

Firearm Entities and Trade Association Discrimination CONTACTOR verifies that: (1) it does not, and will not for the duration of the contract, have a practice, policy, guidance, or directive that discriminates against a firearm entity or firearm trade association or (2) the verification required by Section 2274.002 of the Texas Government Code does not apply to the contract. If circumstances relevant to this provision change during the course of the contract, Respondent shall promptly notify Agency.

51. FOREIGN TERRORIST ORGANIZATIONS

Pursuant to Chapter 2252, Texas Government Code, the Firm represents and certifies that, at the time of execution of this Agreement neither the Firm, nor any wholly owned subsidiary, majority-owned subsidiary, parent company or affiliate of the same (i) engages in business with Iran, Sudan, or any foreign terrorist organization as described in Chapters 806 or 807 of the Texas Government Code, or Subchapter F of Chapter 2252 of the Texas Government Code, or (ii) is a company listed by the Texas Comptroller of Public Accounts under Sections 806.051, 807.051, or 2252.153 of the Texas Government Code. The term "foreign terrorist organization" in this paragraph has the meaning assigned to such term in Section 2252.151 of the Texas Government Code.

TECHNICAL SPECIFICATIONS

SCHAUMBURG & POLK, INC.
ENGINEERING A BETTER FUTURE

TECHNICAL SPECIFICATIONS
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SPECIFICATIONS GROUP

Facility Construction Subgroup

Site and Infrastructure Subgroup

Process Equipment Subgroup

SECTION 03 10 00 – CONCRETE FORMING & ACCESSORIES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Formwork for cast-in place concrete.
2. Shoring, bracing, and anchorage.
3. Form accessories.
4. Form stripping.

1.2 UNIT PRICE - MEASUREMENT AND PAYMENT

A. All items including but not limited to materials, equipment, overhead, coordination, testing, labor, and supervision required for a complete and operable project shall be included in the bid for the project. All measurement and payment shall be based on the items of work that are specifically listed in the Bid Proposal. Any items not specifically listed in the Bid Proposal shall be considered subsidiary to unit cost items within the Bid Proposal and no additional payment shall be made for subsidiary items.

1.3 REFERENCES

A. American Concrete Institute:

1. ACI 117 - Standard Specifications for Tolerances for Concrete Construction and Materials.
2. ACI 301 - Specifications for Structural Concrete.
3. ACI 318 - Building Code Requirements for Structural Concrete.
4. ACI 347 - Guide to Formwork for Concrete.

B. American Forest and Paper Association:

1. AF&PA - National Design Specifications for Wood Construction.

C. The Engineered Wood Association:

1. APA/EWA PS 1 - Voluntary Product Standard for Construction and Industrial Plywood.

D. American Society of Mechanical Engineers:

1. ASME A17.1 - Safety Code for Elevators and Escalators.

E. ASTM International:

1. ASTM D1751 - Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types).
2. ASTM E96/E96M - Standard Test Methods for Water Vapor Transmission of Materials.

F. West Coast Lumber Inspection Bureau:

1. WCLIB - Standard Grading Rules for West Coast Lumber.

1.4 DESIGN REQUIREMENTS

A. Design, engineer and construct formwork, shoring and bracing in accordance with the ACI to conform to design requirements to achieve concrete shape, line and dimension as indicated in the plan Drawings.

1.5 SUBMITTALS

A. Section 01 33 00 - Submittal Procedures: Requirements for submittals.

B. If a releasing agent is used, provide a product data and application method submittal.

C. Only provide the following formwork submittals when structures exceed 20’ in length or when noted in the Plan Drawings.

1. Shop Drawings Signed and sealed by professional engineer.

a. Submit formwork, shoring, and reshoring shop drawings.
b. Indicate the following:

1) Pertinent dimensions, openings, methods of construction, types of connections, materials, joint arrangement and details, ties and shores, location of framing, studding and bracing, and temporary supports.
2) Means of leakage prevention for concrete exposed to view in finished construction.
3) Sequence and timing of erection and stripping assumed compressive strength at time of stripping, height of lift and height of drop during placement.
4) Vertical, horizontal and special loads in accordance with ACI 347, Section 2.2 and camber diagrams, when applicable.
5) Notes to formwork erector showing size and location of conduits and piping embedded in concrete in accordance with ACI 318, Section 6.3.
6) Procedure and schedule for removal of shores and installation and removal of reshores.

2. Product Data: Submit data on void form materials and installation requirements.

3. Design Data: Signed and sealed by professional engineer.

a. Indicate design data for any required formwork, shoring, and reshores.
b. Indicate loads transferred to structure during process of concreting, shoring and reshoring.
c. Include structural calculations to support design.

1.6 QUALITY ASSURANCE

A. Perform Work in accordance with the ACI.

B. For wood products furnished for work of this Section, comply with AF&PA.

C. Perform Work in accordance with all local and state standard specifications.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Deliver void forms and installation instructions in manufacturer's packaging.

B. Store off ground in ventilated and protected manner to prevent deterioration from moisture.

1.8 COORDINATION

A. Coordinate this Section with other sections of work, requiring attachment of components to formwork.

PART 2 - PRODUCTS

2.1 WOOD FORM MATERIALS

A. Form Materials: At discretion of Contractor.

1. Forms shall be of suitable material and of a type, size, shape, quality and strength to insure construction as designed.
2. Wood products for use in forming concrete shall conform to ACI Standard SP-4 Formwork for Concrete.
3. The forms shall be true to line and grade, mortar tight and sufficiently rigid to resist deflection during placing of the concrete. The responsibilities for adequacy shall rest with the CONTRACTOR.
4. All dirt, chips, sawdust, nails and other foreign matter shall be completely removed from forms before any concrete is deposited therein. The surfaces of forms shall be smooth and free from irregularities, dents, sags and holes that would deface the finished surfaces. Forms previously used shall be thoroughly cleaned of all dirt, mortar and foreign matter before being reused.

2.2 PREFABRICATED FORMS

A. Furnish and install materials in accordance with state, local, and manufacturer’s specifications & standards.

B. Preformed Steel Forms: Minimum 16gage matched, tight fitting, stiffened to support weight of concrete without deflection detrimental to tolerances and appearance of finished surfaces.

C. Glass Fiber Fabric Reinforced Plastic Forms: Matched, tight fitting, stiffened to support weight of concrete without deflection detrimental to tolerances and appearance of finished concrete surfaces.

D. Pan Type: Steel or Glass fiber of size and profile required.

E. Tubular Column Type: Round, spirally wound laminated fiber, wood, or glass fiber material, surface treated with release agent, non-reusable, sizes as indicated in drawings.

F. Void Forms: Moisture resistant treated paper faces, biodegradable, structurally sufficient to support weight of wet concrete mix until initial set; min 2inches thick.

G. Steel Forms: Sheet steel, suitably reinforced, and designed for particular use indicated on Drawings.

H. Form Liners: Smooth, durable, grainless and non-staining hardboard, unless otherwise indicated on Drawings.

I. Framing, Studding and Bracing: Stud or No. 3 structural light framing grade.

2.3 FORMWORK ACCESSORIES

A. Form Ties: Metal form ties of an approved type or an approved substitute shall be used to hold forms in place. All metal ties or other appliances used inside the forms to hold them in correct alignment shall be removed to a depth of at least ½-inches from the surface of the concrete. Burning off of rods, bolts or ties shall not be permitted. The cavities produced shall be carefully cleaned and completely filled with retempered sand-cement mortar mixed in proportions of 1-to-3 and the concrete shall be left smooth and even.

B. Spreaders: Standard, non-corrosive metal form clamp assembly, of type acting as spreaders and leaving no metal within 1 inch of concrete face. Wire ties, wood spreaders, through bolts or pipe spreaders are not permitted.

C. Form Anchors and Hangers:

1. Do not use anchors and hangers exposed concrete leaving exposed metal at concrete surface.
2. Symmetrically arrange hangers supporting forms from structural steel members to minimize twisting or rotation of member.
3. Penetration of structural steel members is not permitted.

D. Form Release Agent: The contractor is allowed, but not required to use form release agents. Colorless mineral oil that will not stain concrete, or absorb moisture, or impair natural bonding or color characteristics of coating intended for use on concrete. Care shall be exercised that no releasing agent is deposited on previously placed concrete, reinforcement or embedded metal items.

E. Vapor Retarder: Where indicated on Drawings, 8 mil thick polyethylene sheet.

F. Bituminous Joint Filler: ASTM D1751.

G. Nails, Spikes, Lag Bolts, Through Bolts, Anchorages: Size, strength and character to maintain formwork in place while placing concrete.

H. Water Stops: Type & size as indicated in drawings. Minimum requirements: Rubber/PVC, minimum 1,750 psi tensile strength, minimum 50 degrees F to plus 175 degrees F working temperature range, min 6 inch wide, maximum possible lengths, ribbed profile, preformed corner sections, heat welded jointing. Water stops are not required where walls act strictly as baffles. Water stops must be cast in to concrete on both sides formed into keyways. Not to be inserted into concrete after concrete is poured.

2.4 COATINGS

A. Coatings for Aluminum: Polyamide epoxy finish coat with paint manufacturer's recommended primer for aluminum substrate. Apply one coat primer and one coat finish

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify lines, levels, and centers before proceeding with formwork. Verify dimensions agree with Drawings.

B. When formwork is placed after reinforcement resulting in insufficient concrete cover over reinforcement before proceeding, request instructions from Engineer.

3.2 INSTALLATION

A. Earth Forms: Earth forms are not permitted unless contractor receives written approval from engineer. When approved, the following shall apply:

1. Trench earth forms neatly, accurately, and at least 2 inches wider than footing widths indicated on Drawings.
2. Trim sides and bottom of earth forms.
3. Construct wood edge strips at top of each side of trench to secure reinforcing and prevent trench from sloughing.
4. Form sides of footings where earth sloughs.
5. Tamp earth forms firm and clean forms of debris and loose material before depositing concrete.

B. Formwork - General:

1. Provide top form for sloped surfaces steeper than 1.5 horizontal to 1 vertical to hold shape of concrete during placement, unless it can be demonstrated that top forms can be omitted.
2. Construct forms to correct shape and dimensions, mortar-tight, braced, and of sufficient strength to maintain shape and position under imposed loads from construction operations.
3. Camber forms where necessary to produce level finished soffits unless otherwise shown on Drawings.
4. Carefully verify horizontal and vertical positions of forms. Correct misaligned or misplaced forms before placing concrete.
5. Complete wedging and bracing before placing concrete.

C. Forms for Smooth Finish Concrete:

1. Smooth finish concrete is required for all surfaces that shall not be completely enclosed or hidden below the permanent surface of the ground.
2. Use steel, plywood or lined board forms.
3. Use clean and smooth plywood and form liners, uniform in size, and free from surface and edge damage capable of affecting resulting concrete finish.
4. Install form lining with close-fitting square joints between separate sheets without springing into place.
5. Use full size sheets of form lines and plywood wherever possible.
6. Tape joints to prevent protrusions in concrete.
7. Use care in forming and stripping wood forms to protect corners and edges.
8. Level and continue horizontal joints.
9. Keep wood forms wet until stripped.
10. Any lumber or material which becomes badly checked or warped prior to placing concrete shall not be used.

D. Architectural Form Liners:

1. Erect architectural side of formwork first.
2. Attach form liner to forms before installing form ties.
3. Install form liners square, with joints and pattern aligned.
4. Seal form liner joints to prevent grout leaks.
5. Dress joints and edges to match form liner pattern and texture.

E. Forms for Surfaces to Receive Membrane Waterproofing: Use plywood or steel forms. After erection of forms, tape form joints to prevent protrusions in concrete.

F. Framing, Studding and Bracing:

1. Space studs at 16 inches on center maximum for boards and 12 inches on center maximum for plywood.
2. Size framing, bracing, centering, and supporting members with sufficient strength to maintain shape and position under imposed loads from construction operations.
3. Construct beam soffits of material minimum of 2 inches thick.
4. Distribute bracing loads over base area on which bracing is erected.
5. When placed on ground, protect against undermining, settlement or accidental impact.

G. Erect formwork, shoring, and bracing to achieve design requirements, in accordance with requirements of ACI 301 and ACI 318.

H. Arrange and assemble formwork to permit dismantling and stripping. Do not damage concrete during stripping. Permit removal of remaining principal shores.

I. Obtain Architect/Engineer’s approval before framing openings in structural members not indicated on Drawings.

J. Install fillet and chamfer strips on external corners of beams, joists and, columns

K. Install void forms in accordance with manufacturer's recommendations.

L. Do not reuse wood formwork more than 3 times for concrete surfaces to be exposed to view. Do not patch formwork.

3.3 APPLICATION - FORM RELEASE AGENT

A. Apply form release agent on formwork in accordance with manufacturer's recommendations.

B. Apply PRIOR to placement of reinforcing steel, anchoring devices, and embedded items. Care shall be exercised that no releasing agent is deposited on previously placed concrete, reinforcement or embedded metal items.

C. Do not apply form release agent where concrete surfaces are indicated to receive special finishes or applied coverings that are affected by agent. Soak inside surfaces of untreated forms with clean water. Keep surfaces coated prior to placement of concrete.

D. Reuse and Coating of Forms: Thoroughly clean forms and reapply form coating before each reuse. For exposed work, do not reuse forms with damaged faces or edges. Apply form coating to forms in accordance with manufacturer’s specifications. Do not coat forms for concrete indicated to receive “scored finish”. Apply form coatings before placing reinforcing steel.

3.4 INSTALLATION - INSERTS, EMBEDDED PARTS, AND OPENINGS

A. Install formed openings for items to be embedded in or passing through concrete work.

B. Locate and set in place items required to be cast directly into concrete.

C. Coordinate with Work of other sections & plan drawings in forming and placing openings, slots, reglets, recesses, sleeves, bolts, anchors, other inserts, and components of other Work.

D. Install accessories straight, level, and plumb. Ensure items are not disturbed during concrete placement.

E. Install water stops continuous without displacing reinforcement. Heat seal joints watertight

F. Provide temporary ports or openings in formwork where required to facilitate cleaning and inspection. Locate openings at bottom of forms to allow flushing water to drain.

G. Close temporary openings with tight fitting panels, flush with inside face of forms, and neatly fitted so joints will not be apparent in exposed concrete surfaces.

H. Form Ties:

1. Use sufficient strength and sufficient quantity to prevent spreading of forms.
2. Place ties at least 1 inch away from finished surface of concrete.
3. Leave inner rods in concrete when forms are stripped.
4. Space form ties equidistant, symmetrical and aligned vertically and horizontally unless otherwise shown on Drawings.

I. Arrangement: Arrange formwork to allow proper erection sequence and to permit form removal without damage to concrete.

J. Construction Joints:

1. Install surfaced pouring strip where construction joints intersect exposed surfaces to provide straight line at joints.
2. Just prior to subsequent concrete placement, remove strip and tighten forms to conceal shrinkage.
3. Show no overlapping of construction joints. Construct joints to present same appearance as butted plywood joints.
4. Arrange joints in continuous line straight, true and sharp.

K. Embedded Items:

1. Make provisions for pipes, sleeves, anchors, inserts, reglets, anchor slots, nailers, water stops, and other features.
2. Do not embed wood or uncoated aluminum in concrete.
3. Obtain installation and setting information for embedded items furnished under other Specification sections.
4. Securely anchor embedded items in correct location and alignment prior to placing concrete.
5. Verify conduits and pipes, including those made of coated aluminum, meet requirements of ACI 318 for size and location limitations.

L. Openings for Items Passing Through Concrete:

1. Frame openings in concrete where indicated on Drawings. Establish exact locations, sizes, and other conditions required for openings and attachment of work specified under other sections.
2. Coordinate work to avoid cutting and patching of concrete after placement.
3. Perform cutting and repairing of concrete required as result of failure to provide required openings.

M. Screeds:

1. Set screeds and establish levels for tops of concrete slabs and levels for finish on slabs.
2. Slope slabs to drain where required or as shown on Drawings.
3. Before depositing concrete, remove debris from space to be occupied by concrete and thoroughly wet forms. Remove freestanding water.

N. Screed Supports:

1. For concrete over waterproof membranes and vapor retarder membranes, use cradle, pad or base type screed supports which will not puncture membrane.
2. Staking through membrane is not be permitted.

O. Cleanouts and Access Panels:

1. Provide removable cleanout sections or access panels at bottoms of forms to permit inspection and effective cleaning of loose dirt, debris and waste material.
2. Clean forms and surfaces against which concrete is to be placed. Remove chips, saw dust and other debris. Thoroughly blow out forms with compressed air just before concrete is placed.

3.5 FORM CLEANING

A. Clean forms as erection proceeds, to remove foreign matter within forms.

B. Clean formed cavities of debris prior to placing concrete.

C. Flush with water or use compressed air to remove remaining foreign matter. Ensure that water and debris drain to exterior through clean-out ports.

D. During cold weather, remove ice and snow from within forms. Do not use de-icing salts. Do not use water to clean out forms, unless formwork and concrete construction proceed within heated enclosure. Use compressed air or other means to remove foreign matter.

3.6 FORM REMOVAL

A. Do not remove forms or bracing until concrete has gained sufficient strength to carry its own weight and imposed loads and removal has been approved by Architect/Engineer.

B. Loosen forms carefully. Do not wedge pry bars, hammers, or tools against finish concrete surfaces scheduled for exposure to view. Do not jar the formwork during the initial set.

C. Store removed forms in manner that surfaces to be in contact with fresh concrete will not be damaged. Discard damaged forms.

D. Leave forms in place for minimum number of days as specified in ACI 347.

3.7 ERECTION TOLERANCES

A. Construct formwork to maintain tolerances required by ACI 301 and ACI 318.

3.8 FIELD QUALITY CONTROL

A. Inspect erected formwork, shoring, and bracing to ensure that work is in accordance with formwork design, and that supports, fastenings, wedges, ties, and items are secure.

B. Notify Architect/Engineer after placement of reinforcing steel in forms, but prior to placing concrete. Contractor shall five the owner & engineer a minimum 24 hours notice before beginning placement of concrete to permit the inspection of forms & rebar

C. Schedule concrete placement to permit formwork inspection before placing concrete.

END OF SECTION

SECTION 03 20 00 - CONCRETE REINFORCING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Reinforcing bars.
2. Welded wire fabric.
3. Reinforcement accessories.

1.2 UNIT PRICE - MEASUREMENT AND PAYMENT

A. All items including but not limited to materials, equipment, overhead, coordination, testing, labor, and supervision required for a complete and operable project shall be included in the bid for the project. All measurement and payment shall be based on the items of work that are specifically listed in the Bid Proposal. Any items not specifically listed in the Bid Proposal shall be considered subsidiary to unit cost items within the Bid Proposal and no additional payment shall be made for subsidiary items.

1.3 REFERENCES

A. American Concrete Institute:

1. ACI 301 - Specifications for Structural Concrete.
2. ACI 318 - Building Code Requirements for Structural Concrete.
3. ACI 530.1 - Specifications for Masonry Structures.
4. ACI SP-66 - ACI Detailing Manual.

B. ASTM International:

1. ASTM A82/A82M - Standard Specification for Steel Wire, Plain, for Concrete Reinforcement.
2. ASTM A184/A184M - Standard Specification for Fabricated Deformed Steel Bar Mats for Concrete Reinforcement.
3. A185/A185M-07 Standard Specification for Steel Welded Wire Reinforcement, Plain, for Concrete.
4. ASTM A496/A496M - Standard Specification for Steel Wire, Deformed, for Concrete Reinforcement.
5. ASTM A497/A497M - Standard Specification for Steel Welded Wire Fabric, Deformed, for Concrete Reinforcement.
6. ASTM A615/A615M - Standard Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement.
7. ASTM A704/A704M - Standard Specification for Welded Steel Plain Bar or Rod Mats for Concrete Reinforcement.
8. ASTM A706/A706M - Standard Specification for Low-Alloy Steel Deformed and Plain Bars for Concrete Reinforcement.
9. ASTM A767/A767M - Standard Specification for Zinc-Coated (Galvanized) Steel Bars for Concrete Reinforcement.
10. ASTM A775/A775M - Standard Specification for Epoxy-Coated Steel Reinforcing Bars.

11. ASTM A884/A884M - Standard Specification for Epoxy-Coated Steel Wire and Welded Wire Reinforcement.
12. ASTM A934/A934M - Standard Specification for Epoxy-Coated Prefabricated Steel Reinforcing Bars.
13. ASTM A996/A996M - Standard Specification for Rail-Steel and Axle-Steel Deformed Bars for Concrete Reinforcement.

C. American Welding Society:

1. AWS D1.4 - Structural Welding Code - Reinforcing Steel.

D. Concrete Reinforcing Steel Institute:

1. CRSI - Manual of Standard Practice.
2. CRSI - Placing Reinforcing Bars.

1.4 SUBMITTALS

A. Shop Drawings: Indicate bar sizes, spacing's, locations, and quantities of reinforcing steel and welded wire fabric, bending and cutting schedules, and supporting and spacing devices

B. Certificates: Submit AWS qualification certificate for welders employed on the Work.

C. Manufacturer's Certificate: Certify Products meet or exceed specified requirements.

1. Submit certified copies of mill test report of reinforcement materials analysis.

1.5 QUALITY ASSURANCE

A. Perform Work in accordance with ACI 301 and ACI 318

B. Prepare shop drawings in accordance with ACI SP-66.

C. Perform Work in accordance with state and local standard specifications.

1.6 QUALIFICATIONS

A. Welders: AWS qualified within previous 12 months.

PART 2 - PRODUCTS

2.1 REINFORCEMENT

A. Reinforcing Steel: ASTM A615/A615M,60 ksi yield grade, deformed billet bars, uncoated finish.

B. Deformed Reinforcement: ASTM A996/A996M; 60 ksi yield strength, Type R steel bars, unfinished.

C. Welded Deformed Wire Fabric: ASTM A497/A497M; in flat sheets; unfinished.

D. Structural steel shall be A-36 unless otherwise noted on plans.

2.2 ACCESSORY MATERIALS

A. Tie Wire: Minimum 16 gage annealed type.

B. Chairs, Bolsters, Bar Supports, Spacers: Sized and shaped for strength and support of reinforcement during concrete placement conditions including load bearing pad on bottom to prevent vapor retarder puncture.

C. Special Chairs, Bolsters, Bar Supports, Spacers Adjacent to Weather Exposed Concrete Surfaces: Plastic-coated steel type; size and shape to meet Project conditions.

2.3 FABRICATION

A. Fabricate concrete reinforcement in accordance with CRSI Manual of Practice ACI 318.

B. Form standard hooks for 180 degree bends, 90 degree bend, stirrup and tie hooks, as indicated on Drawings.

C. Form reinforcement bends with minimum diameters in accordance with ACI 318.

D. Fabricate column reinforcement with offset bends at reinforcement splices.

E. Form spiral column reinforcement from minimum 3/8 inch diameter continuous deformed bar or wire.

F. Form ties and stirrups from the following:

1. For bars No. 10 and Smaller: No. 3 deformed bars.
2. For bars No. 11 and Larger: No. 4 deformed bars.

G. Weld reinforcement in accordance with AWS D1.4.

H. Locate reinforcement splices not indicated on Drawings, at point of minimum stress.

PART 3 - EXECUTION

3.1 PLACEMENT

A. Place, support and secure reinforcement against displacement. Do not deviate from required position beyond specified tolerance.

1. Do not weld crossing reinforcement bars for assembly except as permitted by Engineer.

B. Do not displace or damage vapor retarder.

C. Accommodate placement of formed openings.

D. Space reinforcement bars with minimum clear spacing in accordance with ACI 318.

1. Where bars are indicated in multiple layers, place upper bars directly above lower bars.

E. Maintain concrete cover around reinforcement in accordance with ACI 318 as follows:

Reinforcement Location		Minimum Concrete Cover
Footings and Concrete Formed Against Earth		3 inches
Concrete exposed to earth or weather	No. 6 bars and larger	2 inches
	No. 5 bars and smaller	1-1/2 inches
Supported Slabs, Walls, and Joists	No. 14 bars and larger	1-1/2 inches
	No. 11 bars and smaller	3/4 inches
Beams and Columns		1-1/2 inches
Shell and Folded Plate Members	No. 6 bars and larger	3/4 inches
	No. 5 bars and smaller	1/2 inches

F. If applicable, bond and ground reinforcement in accordance with the requirements outlined in the electrical plans.

3.2 ERECTION TOLERANCES

A. Install reinforcement within the following tolerances for flexural members, walls, and compression members:

Reinforcement Depth	Depth Tolerance	Concrete Cover Tolerance
Greater than 8 inches	plus or minus 3/8 inch	minus 3/8 inch
Less than 8 inches	plus or minus 1/2 inch	minus 1/2 inch

B. Install reinforcement within the tolerances specified in ACI 530.1 for foundation walls.

3.3 FIELD QUALITY CONTROL

A. Perform field inspection and testing in accordance with ACI 318.

B. Provide free access to Work and cooperate with appointed firm.

C. Reinforcement Inspection:

1. Placement Acceptance: Specified and ACI 318 material requirements and specified placement tolerances.
2. Welding: Inspect welds in accordance with AWS D1.1.
3. Periodic Placement Inspection: Inspect for correct materials, fabrication, sizes, locations, spacing, concrete cover, and splicing.
4. Weldability Inspection: Inspect for reinforcement weldability when formed from steel other than ASTM A706/A706M.
5. Continuous Weld Inspection: Inspect reinforcement as required by ACI 318.
6. Periodic Weld Inspection: Other welded connections.

END OF SECTION

SECTION 03 30 00 - CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes Cast-in-Place Concrete for Following Items:

1. Building frame members.
2. Beams, lintels, and columns.
3. Shear walls.
4. Retaining walls.
5. Foundation walls.
6. Footings.
7. Supported slabs.
8. Slabs on grade.
9. Control, expansion, and contraction joint devices.
10. Equipment pads.
11. Light pole base.
12. Flagpole base.
13. Thrust blocks.
14. Manholes.

1.2 UNIT PRICE - MEASUREMENT AND PAYMENT

A. All items including but not limited to materials, equipment, overhead, coordination, testing, labor, and supervision required for a complete and operable project shall be included in the bid for the project. All measurement and payment shall be based on the items of work that are specifically listed in the Bid Proposal. Any items not specifically listed in the Bid Proposal shall be considered subsidiary to unit cost items within the Bid Proposal and no additional payment shall be made for subsidiary items.

1.3 REFERENCE STANDARDS

A. American Concrete Institute:

1. ACI 301 - Specifications for Structural Concrete.
2. ACI 305R - Guide to Hot Weather Concreting.
3. ACI 306.1 - Standard Specification for Cold Weather Concreting.
4. ACI 308.1 - Specification for Curing Concrete.
5. ACI 318 - Building Code Requirements for Structural Concrete.

B. ASTM International:

1. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.
2. ASTM C31 - Standard Practice for Making and Curing Concrete Test Specimens in the Field.
3. ASTM C33 - Standard Specification for Concrete Aggregates.
4. ASTM C39 - Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens.

5. ASTM C42 - Standard Test Method for Obtaining and Testing Drilled Cores and Sawed Beams of Concrete.
6. ASTM C94 - Standard Specification for Ready-Mixed Concrete.
7. ASTM C143 - Standard Test Method for Slump of Hydraulic-Cement Concrete.
8. ASTM C150 - Standard Specification for Portland Cement.
9. ASTM C172 - Standard Practice for Sampling Freshly Mixed Concrete.
10. ASTM C173 - Standard Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method.
11. ASTM C231 - Standard Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method.
12. ASTM C260 - Standard Specification for Air-Entraining Admixtures for Concrete.
13. ASTM C330 - Standard Specification for Lightweight Aggregates for Structural Concrete.
14. ASTM C494 - Standard Specification for Chemical Admixtures for Concrete.
15. ASTM C595 - Standard Specification for Blended Hydraulic Cements.
16. ASTM C618 - Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete.
17. ASTM C685 - Standard Specification for Concrete Made by Volumetric Batching and Continuous Mixing.
18. ASTM C845 - Standard Specification for Expansive Hydraulic Cement.
19. ASTM C989 - Standard Specification for Slag Cement for Use in Concrete and Mortars.
20. ASTM C1017 - Standard Specification for Chemical Admixtures for Use in Producing Flowing Concrete.
21. ASTM C1064 - Standard Test Method for Temperature of Freshly Mixed Hydraulic-Cement Concrete.
22. ASTM C1107 - Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Nonshrink).
23. ASTM C1116 - Standard Specification for Fiber-Reinforced Concrete.
24. ASTM C1157 - Standard Performance Specification for Hydraulic Cement.
25. ASTM C1218 - Standard Test Method for Water-Soluble Chloride in Mortar and Concrete.
26. ASTM C1240 - Standard Specification for Silica Fume Used in Cementitious Mixtures.
27. ASTM D994 - Standard Specification for Preformed Expansion Joint Filler for Concrete (Bituminous Type).
28. ASTM D1751 - Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types).
29. ASTM D1752 - Standard Specification for Preformed Sponge Rubber Cork and Recycled PVC Expansion Joint Fillers for Concrete Paving and Structural Construction.
30. ASTM D6690 - Standard Specification for Joint and Crack Sealants, Hot Applied, for Concrete and Asphalt Pavements.
31. ASTM E96 - Standard Test Methods for Water Vapor Transmission of Materials.
32. ASTM E119 - Standard Test Methods for Fire Tests of Building Construction and Materials.
33. ASTM E1643 - Standard Practice for Selection, Design, Installation, and Inspection of Water Vapor Retarders Used in Contact with Earth or Granular Fill Under Concrete Slabs.
34. ASTM E1745 - Standard Specification for Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill under Concrete Slabs.

1.4 COORDINATION

A. Coordinate placement of joint devices with erection of concrete formwork and placement of form accessories.

1.5 SUBMITTALS

A. Product Data: Submit data on joint devices and attachment accessories.

B. Design Data:

1. Submit concrete mix design for each concrete strength.
2. Submit separate mix designs if admixtures are required for following:

a. Hot and cold weather concrete Work.
b. Air entrained concrete Work.

3. Identify mix ingredients and proportions, including admixtures.
4. Identify chloride content of admixtures and whether or not chlorides were added during manufacture.

C. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

D. Manufacturer Instructions: Submit installation procedures and interfacing required with adjacent Work.

E. Field Quality-Control Submittals: Indicate results of Contractor-furnished tests and inspections.

1.6 CLOSEOUT SUBMITTALS

A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for submittals.

B. Project Record Documents: Record actual locations of embedded utilities and components concealed from view in finished construction.

1.7 QUALITY ASSURANCE

A. Concrete mixing plant shall conform to TxDOT standards and be certified in the state of Texas.

B. Perform Work according to ACI 318.

C. Comply with ACI 305R when pouring concrete during hot weather.

D. Comply with ACI 306.1 when pouring concrete during cold weather.

E. Acquire cement and aggregate from one source for Work.

F. Perform Work according to city standards.

1.8 AMBIENT CONDITIONS

A. Maintain concrete temperature after installation at minimum 50 degrees F for minimum seven days.

B. Maintain high-early strength concrete temperature after installation at minimum 50 degrees F for minimum three days.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Concrete:

1. Cement:

   a. Comply with ASTM C150
   b. Type: Portland.

2. Blended Cement:

   a. Comply with ASTM C595.

3. Hydraulic Cement:

   a. Comply with ASTM C1157.

4. Normal Weight Aggregates:

   a. Comply with ASTM C33.
   b. Coarse Aggregate Maximum Size: According to ACI 318.

5. Lightweight Aggregate:

   a. Comply with ASTM C330.
   b. Coarse Aggregate Maximum Size: According to ACI 318.

6. Water:

   a. Comply with ACI 318.
   b. Potable, without deleterious amounts of chloride ions.
   c. Furnish materials according to city standards.

7. Air Entrainment: Comply with ASTM C260.
8. Chemical:

   a. Comply with ASTM C494.

9. Fly Ash Calcined Pozzolan: Comply with ASTM C618, Class C.
10. Silica Fume: Comply with ASTM C1240.
11. Slag:

    a. Description: Ground-granulated blast-furnace slag.
    b. Comply with ASTM C989.
    c. Grade 100.

12. Plasticizing:

    a. Comply with ASTM C1017.
    b. Type I, plasticizing.

B. Joint Devices and Filler:

1. Joint Filler, Type A:

   a. Description: Asphalt-impregnated fiberboard or felt.
   b. Comply with ASTM D1751 D994.
   c. Thickness: 1/4 inch.
   d. Profile: Tongue-and-groove.

2. Joint Filler, Type B:

   a. Description: Recycled PVC.
   b. Comply with ASTM D1752.
   c. Thickness: 1/4 inch.

3. Joint Filler, Type C:

   a. Description: Premolded sponge rubber.
   b. Comply with ASTM D1752.
   c. Thickness: 1/4 inch.

4. Construction Joint Devices:

   a. Material: Integral extruded plastic.
   b. Thickness: 1/2 inch.
   c. Profile: Tongue-and-groove with removable top strip exposing sealant trough and knockout holes spaced at 6 inches o.c.

5. Expansion and Contraction Joint Devices:

   a. Comply with ASTM B221.
   b. Material: Extruded aluminum.
   c. Filler Strip: Resilient neoprene with Shore A hardness of 35 to permit plus or minus 25 percent joint movement with full recovery.
   d. Cover Plate: Extruded aluminum, of longest manufactured length at each location, and recessed mounted.
   e. Color: As selected.

6. Sealant:

   a. Description: two-part liquid neoprene.

2.2 CONCRETE MIX

A. Select proportions for concrete according to ACI 318 field test data.

B. Performance and Design Criteria:

Class of Concrete [1]	Minimum Cementitious Lb./CY	28 Day Min. Compressive Strength [2] psi	28 Day Min. Beam Strength [2,3] psi	Maximum Water/ Cementitious Ratio	Coarse Aggregate Maximum Size [4]

A	470	3000	500	0.58	1.5”
B	376	2000	330	0.71	1.5”
C	564	3600	600	0.53	1.5”
D	282	1500	250	0.97	1.5”
E	564	3000	500	0.62	1.5”
F	611	4200	700	0.49	1.5”
S	564	3600	600	0.44	1.5”
H[5]	611	See Plans	N/A	0.49	1”
M	As directed	As directed	As Directed	As Directed	As Directed

(1) All exposed horizontal concrete shall have entrained air
(2) Min strength required by owner
(3) ASTM C78 (Third Point); Reduced by 10% when Typ II Cement used
(4) Smaller nominal max size aggregate may be used if strength satisfied
(5) Prestressed concrete

C. Admixtures:

1. Include admixture types and quantities indicated in concrete mix designs only if approved by Architect/Engineer.
2. Do not use calcium chloride or admixtures containing calcium chloride.
3. Add air entrainment admixture to concrete mix for Work exposed to freezing and thawing.
4. For concrete exposed to deicing chemicals, limit fly ash, pozzolans, silica fumes, and slag content as required by applicable code.

D. Average Compressive Strength Reduction: Permitted according to ACI 318.

E. Ready-Mixed Concrete: Mix and deliver concrete according to ASTM C94 & C685.

F. Site-Mixed Concrete: Mix concrete according to ACI 318.

2.3 ACCESSORIES

A. Vapor Retarder:

1. Description: Clear polyethylene film.
2. Comply with ASTM E1745, Class A B C.
3. Thickness: 6 mils.
4. Type: As recommended for below-grade application.
5. Joint Tape: As recommended by manufacturer.

B. Non-shrink Grout:

1. Description: Premixed compound consisting of non-metallic aggregate, cement, and water-reducing and plasticizing agents.
2. Comply with ASTM C1107.
3. Minimum Compressive Strength: 2,400 psi in 48 hours and 7,000 psi in 28 days.

C. Concrete Reinforcing Fibers:

1. Description: High-strength industrial-grade fibers specifically engineered for secondary reinforcement of concrete.
2. Comply with ASTM C1116.
3. Tensile Strength: 130 ksi.
4. Toughness: 15 ksi.
5. Fiber Length: 3/4 inch.
6. Fiber Count: 34 million/lb.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for installation examination.

B. Verify requirements for concrete cover over reinforcement.

C. Verify that anchors, seats, plates, reinforcement, and other items to be cast into concrete are accurately placed, positioned securely, and will not interfere with placing concrete.

3.2 PREPARATION

A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for installation preparation.

B. Previously Placed Concrete:

1. Prepare previously placed concrete by cleaning with steel brush and applying bonding agent.
2. Remove laitance, coatings, and unsound materials.

C. In locations where new concrete is doweled to existing work, drill holes in existing concrete, blow/clean all holes thoroughly, insert steel dowels, and pack solid with non-shrink grout or epoxy.

D. Remove debris and ice from formwork, reinforcement, and concrete substrates.

E. Remove water from areas receiving concrete before concrete is placed.

3.3 INSTALLATION

A. Placing Concrete:

1. Place concrete according to ACI 318.

2. Notify testing laboratory and Engineer minimum 24 hours prior to commencement of operations.
3. Ensure that reinforcement, inserts, embedded parts, formed expansion and contraction joints, not disturbed during concrete placement.
4. Install vapor retarder under interior slabs on grade according to ASTM E1643.
5. Lap joints minimum 6 inches and seal watertight by taping edges and ends.
6. Repairs:

    a. Repair vapor retarder damaged during placement of concrete reinforcement.
    b. Using vapor retarder material, lap over damaged areas minimum6 inches and seal watertight.

7. Joint Filler:

    a. Separate slabs on grade from vertical surfaces with 1/4-inch-thick joint filler.
    b. Place joint filler in floor slab pattern placement sequence; set top to required elevations; secure to resist movement by wet concrete.
    c. Extend joint filler from bottom of slab to within 1/2 inch of finished slab surface.

8. Joint Devices:

    a. Coordination: Install construction joint devices in coordination with floor slab pattern placement sequence; set top to required elevations; secure to resist movement by wet concrete.
    b. Install joint device anchors, maintaining correct position to allow joint cover to be flush with floor and wall finish.
    c. Install joint covers in longest practical length when adjacent construction activity is complete.

9. Deposit concrete at final position, preventing segregation of mix.
10. Place concrete in continuous operation for each panel or section as determined by predetermined joints.
11. Consolidate concrete.
12. Maintain records of concrete placement, including date, location, quantity, air temperature, and test samples taken.
13. Place concrete continuously between predetermined expansion, control, and construction joints.
14. Place floor slabs in indicated checkerboard or saw-cut pattern.
15. Saw-Cut Joints:

    a. Saw-cut joints within 12 hours after placing.
    b. Use 3/16 inch thick blade.
    c. Cut into 1/4 depth of slab thickness.

16. Screeding:

    a. Screed floors and slabs on grade level.
    b. Surface Flatness: maximum 1/4 inch in 10 feet.

B. Concrete Finishing:

1. Provide formed concrete surfaces to be left exposed with smooth-rubbed finish.
2. Finish concrete floor surfaces as specified in Section 03 35 00 - Concrete Finishing and ACI 318.
3. Steel trowel all floor or slab surfaces.

4. In areas with floor drains, maintain floor elevation at walls and pitch surfaces uniformly to drains at 1/8 inch per foot nominal or as indicated on Drawings.

C. Curing and Protection:

1. Immediately after placement, protect concrete from premature drying, excessively hot or cold temperatures, and mechanical injury.
2. Protect concrete footings from freezing for minimum of 7 days.
3. Maintain concrete with minimal moisture loss at relatively constant temperature for period as necessary for hydration of cement and hardening of concrete.
4. Cure floor surfaces according to ACI 318.

3.4 FIELD QUALITY CONTROL

A. Perform inspection and testing according to ACI 318.

B. Submit proposed mix design of each class of concrete to inspection and testing firm for review prior to commencement of Work.

C. Field verify locations of all surrounding structures and piping prior to soil disturbing activities or placement of concrete formwork.

D. Concrete Inspections:

1. Continuous Placement Inspection: Inspect for proper installation procedures.
2. Periodic Curing Inspection: Inspect for specified curing temperature and procedures.

E. Strength Test Samples:

1. Sampling Procedures: Comply with ASTM C172.
2. Cylinder Molding and Curing Procedures:

    a. Comply with ASTM C31.
    b. Cylinder Specimens: Field cured.

3. Test cylinders shall be prepared by the contractor for owner's use in quality assurance. A minimum of one set of concrete cylinders shall be prepared for each structure, for each day's pour, and for each 50 CY of concrete poured. Each test set shall consist of at least 4 cylinders. The contractor may at his option elect to prepare additional cylinders for his own use.
4. Sample concrete and make one set of three cylinders for every 75 cu. yd. or less of each class of concrete placed each day, and for every 5,000 sq. ft. of surface area for slabs and walls.
5. If volume of concrete for a class of concrete would provide less than five sets of cylinders, take samples from five randomly selected batches, or from every batch if less than five batches are used.
6. Make one additional cylinder during cold weather concreting and field cure.

F. Field Testing:

1. Slump Test Method: Comply with ASTM C143.
2. Air Content Test Method: Comply with ASTM C173 C231.
3. Temperature Test Method: Comply with ASTM C1064.
4. Compressive Strength Concrete:

a. Measure slump and temperature for each sample.
b. Measure air content in air-entrained concrete for each sample.

G. Cylinder Compressive Strength Testing:

1. Test Method: Comply with ASTM C39.
2. Test Acceptance: According to ACI 318.
3. Test one cylinder at seven days.
4. Test one cylinder at 28 days.
5. Retain one cylinder for 90 days for testing when requested by Engineer.
6. Dispose of remaining cylinders if testing is not required.

H. Core Compressive Strength Testing:

1. Sampling and Testing Procedures: Comply with ASTM C42.
2. Test Acceptance: According to ACI 318.
3. Drill three cores for each failed strength test from failed concrete.

I. Water-Soluble Chloride Ion Concentration Test Method:

1. Comply with ASTM C1218.
2. Test at 28 days.
3. Maximum Chloride Ion Concentration: As permitted by applicable code.

J. Patching:

1. Allow Architect/Engineer to inspect concrete surfaces immediately upon removal of forms.
2. Honeycombing or Embedded Debris in Concrete:

a. Not acceptable.
b. Notify Architect/Engineer upon discovery.

3. Patch imperfections according to ACI 318.

K. Defective Concrete:

1. Description: Concrete not conforming to required lines, details, dimensions, tolerances, or specified requirements.
2. Repair or replacement of defective concrete will be determined by Architect/Engineer.
3. Do not patch, fill, touch up, repair, or replace exposed concrete except upon express direction of Architect/Engineer for each individual area.

3.5 ATTACHMENTS

A. Schedule - Concrete Strengths unless otherwise noted on plan drawings:

1. Sidewalks & Driveways = 3,600 psi @ 28 days.
2. Foundations and slabs on grade = 3,600 psi @ 28 days.
3. Structures = 4,200 psi @ 28 days.
4. Roadway = 4,200 psi @ 28 days.

END OF SECTION

SECTION 03 39 00 - CONCRETE CURING

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes initial and final curing of horizontal and vertical concrete surfaces.

1.2 REFERENCES

A. American Concrete Institute:

1. ACI 301 - Specifications for Structural Concrete.
2. ACI 302.1 - Guide for Concrete Floor and Slab Construction.
3. ACI 308.1 - Standard Specification for Curing Concrete.
4. ACI 318 - Building Code Requirements for Structural Concrete.

B. ASTM International:

1. ASTM C171 - Standard Specification for Sheet Materials for Curing Concrete.
2. ASTM C309 - Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete.
3. ASTM C1315 - Standard Specification for Liquid Membrane-Forming Compounds Having Special Properties for Curing and Sealing Concrete.
4. ASTM D2103 - Standard Specification for Polyethylene Film and Sheeting.

1.3 SUBMITTALS

A. Section 01 33 00 - Submittal Procedures: Submittal procedures.

B. Product Data: Submit data on all curing compounds compatibilities, and limitations.

1.4 QUALITY ASSURANCE

A. Perform Work in accordance with ACI 318.

B. Perform Work in accordance with state and local standard specifications.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver curing materials in manufacturer's packaging including application instructions.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Membrane Curing Compound: ASTM C309, Type 1D, Class A.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify substrate surfaces are ready to be cured.

3.2 INSTALLATION – HORIZONTAL AND VERTICAL SURFACES

A. Cure concrete in accordance with ACI 308.1 using membrane curing method.

B. Membrane Curing Compound: Apply curing compound in two coats with second coat applied at right angles to first.

3.3 PROTECTION OF FINISHED WORK

A. Section 01 70 00 - Execution and Closeout Requirements: Protecting finished Work.

B. Do not permit traffic over unprotected floor surface.

END OF SECTION

SECTION 03 60 00 - GROUTING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Portland cement grout.
2. Rapid curing epoxy grout.
3. Non-shrink cementitious grout.

1.2 UNIT PRICE - MEASUREMENT AND PAYMENT

A. All items including but not limited to materials, equipment, overhead, coordination, testing, labor, and supervision required for a complete and operable project shall be included in the bid for the project. All measurement and payment shall be based on the items of work that are specifically listed in the Bid Proposal. Any items not specifically listed in the Bid Proposal shall be considered subsidiary to unit cost items within the Bid Proposal and no additional payment shall be made for subsidiary items.

1.3 REFERENCES

A. American Concrete Institute:

1. ACI 301 - Specifications for Structural Concrete.
2. ACI 318 - Building Code Requirements for Structural Concrete.

B. American Society of Testing and Materials:

1. ASTM C33 - Standard Specification for Concrete Aggregates.
2. ASTM C40 - Test Method for Organic Impurities in Fine Aggregates for Concrete.
3. ASTM C150 - Standard Specification for Portland Cement.
4. ASTM C191 - Test Method for Time of Setting of Hydraulic Cement by Vicat Needle.
5. ASTM C307 - Test Method for Tensile Strength of Chemical-Resistant Mortar, Grouts, and Monolithic Surfacings.
6. ASTM C531 - Test Method for Linear Shrinkage and Coefficient of Thermal Expansion of Chemical-Resistant Mortars, Grouts, Monolithic Surfacings, and Polymer Concretes.
7. ASTM C579 - Test Method for Compressive Strength of Chemical-Resistant Mortars, Grouts, monolithic Surfacings and Polymer Concretes.
8. ASTM C827 - Test Method for Change in Height at Early Ages of Cylindrical Specimens from Cementitious Mixtures.

C. U. S. Army Corps of Engineers Concrete Research Division (CRD):

1. CRD C621 - Non-Shrink Grout.

1.4 SUBMITTALS

A. Section 01 33 00 - Submittal Procedures: Requirements for submittals.

B. Product Data: Submit product data on grout.

C. Manufacturer's Installation Instructions: Submit manufacturer’s instructions for mixing, handling, surface preparation and placing epoxy type and non-shrink type grouts.

D. Manufacturer's Certificate: Certify Products meet or exceed specified requirements.

1.5 QUALITY ASSURANCE

A. Perform Work in accordance with state and local standard specifications

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver grout in manufacturer's unopened containers with proper labels intact.

B. Store grout in a dry shelter, protect from moisture.

1.7 ENVIRONMENTAL REQUIREMENTS

A. Do not perform grouting if temperatures exceed 95 degrees F.

B. Maintain minimum temperature of 40 degrees F before, during, and after grouting, until grout has set.

PART 2 - PRODUCTS

2.1 PORTLAND CEMENT GROUT MATERIALS

A. Portland Cement: ASTM C150, Type I and II.

B. Water:

1. Potable; containing no impurities, suspended particles, algae or dissolved natural salts in quantities capable of causing:

a. Corrosion of steel.
b. Volume change increasing shrinkage cracking.
c. Efflorescence.
d. Excess air entraining.

C. Fine Aggregate:

1. Washed natural sand.

2. Gradation in accordance with ASTM C33 and represented by smooth granulometric curve within required limits.
3. Free from injurious amounts of organic impurities as determined by ASTM C40.

D. Mix:

1. Portland cement, sand and water. Do not use ferrous aggregate or staining ingredients in grout mixes.

2.2 RAPID CURING EPOXY GROUT

A. Furnish materials in accordance with state and local standard specifications.

B. Rapid Curing Epoxy Grout: High strength, three component epoxy grout formulated with thermosetting resins and inert fillers. Rapid-curing, high adhesion, and resistant to ordinary chemicals, acids and alkalies.

Property	Test	Result
Compressive Strength	ASTM C579	12,000 psi at 7 days
Tensile Strength	ASTM C307	2,000 psi minimum
Coefficient of Expansion	ASTM C531	30x10-6 in per degree F
Shrinkage	ASTM C827	None

2.3 NON-SHRINK CEMENTITIOUS GROUT

A. Furnish materials in accordance with state and local standard specifications.

B. Non-shrink Cementitious Grout: Pre-mixed ready for use formulation requiring only addition of water; non-shrink, non-corrosive, non-metallic, non-gas forming, no chlorides.

C. Properties: Certified to maintain initial placement volume or expand after set and meet the following minimum properties when tested in accordance with CRD-C621, for Type D non-shrink grout:

Property	Test	Time	Result
Setting Time	ASTM C191	Initial	2 hours (Approx)
		Final	3 hours (Approx)
Expansion			0.10% - 0.4% Maximum
Compressive Strength	CRD-C621	1 day	4,000 psi
		7 days	7,000 psi
		28 days	10,000 psi to 10,800 psi

2.4 FORMWORK

A. Refer to Section 03 10 00 for formwork requirements.

2.5 CURING

A. Prevent rapid loss of water from grout during first 48 hours by use of approved membrane curing compound or with use of wet burlap method.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify areas to receive grout.

3.2 PREPARATION

A. Remove defective concrete, laitance, dirt, oil, grease and other foreign material from concrete surfaces by brushing, hammering, chipping or other similar means until sound, clean concrete surface is achieved.

B. Rough concrete lightly, but not enough to interfere with placement of grout.

C. Remove foreign materials from metal surfaces in contact with grout.

D. Align, level and maintain final positioning of components to be grouted.

E. Saturate concrete surfaces with clean water; remove excess water, leave none standing.

3.3 INSTALLATION - FORMWORK

A. Construct leakproof forms anchored and shored to withstand grout pressures.

B. Install formwork with clearances to permit proper placement of grout.

3.4 MIXING

A. Mix and prepare rapid curing epoxy grout in accordance with manufacturer's instructions.

1. Capable of developing minimum compressive strength of 2400 psi in 48 hours and 7000 psi in 28 days.

3.5 PLACING GROUT

A. Place grout material quickly and continuously.

B. Do not use pneumatic-pressure or dry-packing methods.

C. Apply grout from one side only to avoid entrapping air.

D. Do not vibrate placed grout mixture, or permit placement when area is being vibrated by nearby equipment.

E. Thoroughly compact final installation and eliminate air pockets.

F. Do not remove leveling shims for at least 48 hours after grout has been placed.

3.6 CURING

A. Immediately after placement, protect grout from premature drying, excessively hot or cold temperatures, and mechanical injury.

B. After grout has attained its initial set, keep damp for minimum of 3 days.

3.7 FIELD QUALITY CONTROL

A. Field inspection and testing will be performed in accordance with ACI 301 and ACI 318.

B. Submit proposed mix design of each class of grout to inspection and testing firm for review prior to commencement of Work.

C. Tests of grout components may be performed to ensure conformance with specified requirements.

END OF SECTION

SECTION 05 51 00.00 - LADDERS, STAIRWAYS, AND HANDRAILS

PART 1 - GENERAL

1.1 – SUMMARY

A. Section Includes:
   1. Ladders and Stairways
   2. Handrails

1.2 – UNIT PRICE – MEASUREMENT AND PAYMENT

The Contractor shall supply all labor, material, and equipment to install all ladders, stairways, and handrails. Approved shop drawings are required by the Engineer before the work proceeds.

1.3 - REFERENCES

A. ASTM INTERNATIONAL
   1. ASTM - 36

1.4 - SUBMITTALS

A. The Contractor, immediately following the award of the Contract, shall prepare shop drawings, based on the design drawings, for the approval of the Engineer.

B. Shop drawings shall give all necessary information for the fabrication, erection, field connections, anchor bolt size and locations, and painting or galvanizing of the structure.

C. Three sets of finally approved drawings shall be furnished to the Engineer. No fabrication shall be conducted until approved drawings are in the hands of the shop inspector.

PART 2 - PRODUCTS

2.1 - MATERIAL

A. Ladders and Stairways.
   1. Ladders and stairways that are to be fabricated shall be made from structural steel conforming to ASTM A-36, and shall be hot-dip galvanized after fabricating.
   2. Stair treads shall be of 14 gauge hot-dip galvanized steel with an abrasive nosing and serrated grating.

B. Handrails.
   1. All handrail systems shall meet all applicable OSHA requirements.
   2. Handrail systems shall include, as a minimum, a top rail at 42" above the walkway, a mid rail at 21" above the walkway, and a 4" toe board all continuous as shown on the plans stair handrails to be 34 inches high.
   3. Support posts shall be installed at five (5') feet center to center maximum or as recommended by the manufacturer.
   4. Handrails shall be 1□" diameter hot dipped galvanized schedule 40 steel or 1.90" diameter extruded aluminum alloy pipe with 1/4" wall thickness.

5. Aluminum component handrail systems shall be Connectorial □Systems by Juluis Blum & Company, or prior approved equivalent.
6. Aluminum handrail system shall be constructed with tubular rivets and SEMS screws and through bolts.
7. Hot dipped galvanized component handrail systems shall be as manufactured by Kee Klamp or prior approved equivalent. Component handrail systems shall be subject to approval by the Engineer.

2.2 - DISSIMILAR MATERIALS

A. Where dissimilar metals contact each other, they shall be coated with zinc chromate (or bituminous) protective coating or installed with vinyl isolation gasket as applicable.

2.3 - OTHER SPECIFICATIONS

A. When ladders, stairways, and/or handrails are covered in specifications for equipment or treatment units which they will serve, the requirements of those specifications shall govern over this item in event of any conflict.

PART 3 - EXECUTION

3.1 - WORKMANSHIP

A. Handrails and post ends shall be cut accurately and square, and free of burrs, nicks, or other irregularities.

B. All holes drilled to receive one-piece tubular inserts and stainless-steel fasteners shall be proper size, tapped as required for positive connection, and countersunk.

C. Posts shall be plumb and rails parallel whether in horizontal or rake application.

D. Top handrails shall be smooth and continuous in accordance with OSHA standards. All handrails shall meet OSHA loading requirements.

DIVISION 11 – WATER CONTROL DEVICES

SECTION 11288 - STAINLESS STEEL SLIDE & WEIR GATES

PART 1 – GENERAL

1.1 SUMMARY

A. The Contractor shall provide all labor, materials, equipment, and incidentals required to furnish and install slide gates, operating stems, and operating floor stands, complete and operational with all necessary accessories as shown on the Contract Drawings, as specified herein, or as required for complete operation.

B. The Contractor shall obtain all equipment specified in this Section from one manufacturer to ensure proper coordination and functionality. The manufacturer shall have responsibility for performance and compatibility of the entire system. This does in no way relieve the Contractor for ultimate responsibility under this Contract for equipment, coordination, installation, operation and guarantee.

C. The Contract Drawings are for purpose of guidance and to show functional features and required external connections. They do not necessarily show all components necessary to accomplish the desired results nor do they necessarily show all components required to interface with the equipment. The Contractor shall provide all parts, equipment, and devices necessary to meet the functional requirements of the system.

1.2 REFERENCES

A. Comply with applicable provisions and recommendations of the following, except as otherwise shown or specified:

1. American Water Works Association (AWWA C561)
2. American National Standards Institute (ANSI)
3. American Society for Testing and Materials (ASTM)

1.3 SYSTEM DESCRIPTION

A. Design Requirements:

1. The slide gates shall be manufactured in accordance with the latest version of AWWA C561, shall be constructed of stainless steel (ASTM 304L or 316L).

2. Liberal safety factors will be used in the design of all equipment. Gate, frame, and yoke design shall be such that the flexural stress does not exceed 18,750 psi or that the minimum safety factor is 4-to-1 based on the ultimate strength of the material used.

1.4 SUBMITTALS

A. For approval: Submit the following shop drawings for approval:

1. Manufacturer’s information, specifications, and data showing dimensions, materials of construction, and weight of all major items of equipment.

2. Installation diagrams showing location, arrangement, and size of all fasteners required for the equipment.

3. Setting drawings, templates, and instructions for installation of frames, thimbles, etc.

4. Certification that all components were designed based upon the maximum seating and unseating heads described herein.

B. Upon completion of installation, submit three (3) copies of the Operation and Maintenance Manual for this equipment. A final copy of this manual shall be approved by the Engineer prior to distribution and as a minimum shall contain the following:

1. Operational and maintenance manuals shall include all approved shop drawings associated with this Section, complete instructions for installation, and parts list for all components.

2. Include a list and frequency of specific maintenance activities.

PART 2 – PRODUCTS

2.1 MANUFACTURERS

A. Provide slide gates as manufactured by the following:

1. Hydro Gate
2. Waterman
3. Whipps
4. Approved equal.

2.2 EQUIPMENT MATERIALS

A. All slide gates shown on the plans and listed in the specifications shall conform in all respects to the latest version of AWWA C561, with the noted changes and additions: Materials used in construction of slide gates and appurtenances will be best suited for the application and will conform to the following specifications:

1. Frame, Slide, Yoke, and Reinforcing: Stainless Steel, ASTM A240/A240M, Type 304L, or ASTM A240/A240M, Type 316L

2. Stainless Steel for stems: ASTM A-276, Type 304.

5. Stainless Steel for fasteners: F-593/F-594, Alloy Group 1, 2 (SS304, SS316)

6. Invert seals and compression load pad: Neopreone, ASTM D2000, 60 Durometer, with a stainless steel ASTM A276, Type 304L, or Type 316L retainer bar.

7. Side Seal: Ultra High Molecular Weight (UHMW) Polymer, ASTM D4040

8. Top Wedges: Type 316 Stainless Steel ASTM A351-CF8M

B. Gate frame shall be flat back, embedded, or channel mount as shown in the “Gate Schedule.” Spigot-back frames are not acceptable. The frame shall be an integral unit of brake form and structural shapes, rigidly assembled to form the waterway openings. Holes shall be provided for mounting on anchor bolts. The head channels shall be welded or bolted to the gate frame. The channels are to be sufficiently spaced to allow removal of the gate slide. The primary slot of the frame extrusion shall contain polymer guide liner retained in grooves, to prevent metal-to-metal contact between slide and frame.

C. Gate slide shall conform to the safety factors stated under “General”, but shall, in no case, be less than ¼-in. thickness. Deflection under full head shall be limited to 1/720 of the span. The stem connector clips or stem block pocket shall be welded to the slide. Gates over 24” wide shall have adjustable top wedges in order to prevent deflection in the slide resulting from over closure.

D. Flush Bottom: Slide gates shall incorporate a flush-bottom seal that is mechanically fastened to the bottom frame invert member. The seal shall be of the materials shown in “Materials of Construction.” Seals attached to the slide or “press fit seals” are not acceptable.

E. Side Seals: UHMW seals shall be provided as specified in the “Gate Schedule.” Seals shall be securely fastened to the frame with formed stainless steel retainers and shall be replaceable and adjustable without removing the gate from the installed position. A compression load pad shall be set behind the UHMW seal to allow for a self-adjusting seal system. The face of the UHMW guide that is in contact with the cover bar shall have a machined or extruded groove, in order to create a raised surface on each side, to allow for secondary adjustment of the seal clamp force.

F. The operating stem shall be of a size to safely withstand, without buckling or permanent distortion, the stresses induced by normal operating forces. In addition, the stem shall be designed to transmit in compression at least 2 times the rated output of the floor stand or bench stand with a 40-pound effort on the crank or handwheel. The threaded portion of the stem shall have cold rolled threads of the double lead Acme type with a minimum surface finish of 24 micro-inches. Cut threads shall not be acceptable. Stainless Steel couplings, threaded and keyed to the stems, will join stems of more than one section. All threaded and keyed couplings of the same size will be interchangeable. Manually operated, rising stem type gates will be provided with an adjustable stop collar on the stem to prevent over-opening of the gate.

G. On weir or slide gates, when the width is greater than twice the height and the width is greater than 48 in., a tandem stem arrangement should be used.

H. Stem guides will be split collar bronze type, mounted on cast iron brackets to allow for installation after the stem is placed. They will be adjustable in two directions and will be spaced at sufficient intervals to adequately support the stem. Stem guide spacing will not exceed an L/r ratio of 200.

I. Gate lifts shall be handwheel or geared crank type as shown in the “Gate Schedule.” Lifts shall operate the gate with a maximum pull of 40 lb on the handwheel or crank. Handwheel or crank shall be located approximately 36 in. above grating or walkway. All lifts shall have thrust bearings, bronze lift nuts, and a aluminum stop nut to limit the downward travel of the stem and slide. All geared lifts shall have cast or ductile iron housings and pedestals. All lifts shall be rising stem type. Stem covers made of clear butyrate shall be furnished for all lifts. Lifts shall be grease lubricated and regreasable through grease zerks. Oil bath lifts are not acceptable.

J. Motor-Operated Lift: Shall be engineer’s preference.

K. A clear, polycarbonate plastic stem cover and indicator shall be proved on each slide gate operator. Stem indication shall be provided to denote gate level at quarter, half, three-quarter, and full open. A cast aluminum adaptor shall be used to mount the cover to the lift. The covers shall be capped, vented, and of sufficient length to allow full travel of the gate.

PART 3 – EXECUTION

3.1 INSTALLATION

A. The slide gate equipment and appurtenances shall be installed in accordance with the Installation Manual furnished by the gate manufacturer. Extreme care should be used in handling, storage, and installation of this equipment to prevent damage or distortion of the equipment and to insure proper performance.

3.2 FIELD QUALITY CONTROL

A. Field testing shall be performed after installation of the equipment. The field testing shall demonstrate the following:

1. The equipment has been properly installed in accordance with manufacturer's instructions and recommendations.

2. The equipment has been installed in the specified location and orientation or as shown on the Contract Drawings.

3. The equipment has been aligned.

4. There are no mechanical defects in any of the parts.

5. The slide gates shall undergo a leakage test following installation. The leakage test shall be in accordance with the latest version of AWWA C561.

END OF SECTION 11288

SECTION 31 05 13 - SOILS FOR EARTHWORK

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. General Fill.
2. Select Fill.
3. Topsoil

1.2 UNIT PRICES - MEASUREMENT AND PAYMENT

A. All items including but not limited to materials, equipment, overhead, coordination, testing, labor, and supervision required for a complete and operable project shall be included in the bid for the project. All measurement and payment shall be based on the items of work that are specifically listed in the Bid Proposal. Any items not specifically listed in the Bid Proposal shall be considered subsidiary to unit cost items within the Bid Proposal and no additional payment shall be made for subsidiary items.

1.3 REFERENCES

A. American Association of State Highway and Transportation Officials:

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

B. ASTM International:

1. ASTM D698 - Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft3 (600 kN-m/m3)).
2. ASTM D1557 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft3 (2,700 kN-m/m3)).
3. ASTM D2487 - Standard Classification of Soils for Engineering Purposes (Unified Soil Classification System).

1.4 SUBMITTALS

A. Section 01 33 00 - Submittal Procedures: Requirements for submittals.

B. Samples: Select fill samples shall be taken, stored, and transported per the testing laboratory requirements.

C. Materials Source: Submit name of imported materials source.

D. Manufacturer's Certificate: Certify materials meet or exceed specified requirements.

1.5 QUALITY ASSURANCE

A. Furnish each offsite material from single source throughout the Work.

PART 2 - PRODUCTS

2.1 GENERAL FILL

A. On-site or imported materials free from lumps or clods ≥ 6" diameter. P.I.<20 LL<45

2.2 SELECT FILL

A. Imported fill material free from lumps or clods > 2" diameter P.I.<10 LL<40

B. Free of rocks, frozen material, debris, and organics.

2.3 TOPSOIL MATERIALS

A. Topsoil

1. Imported borrow.
2. Friable loam.
3. Reasonably free of roots, rocks larger than 1/2 inch, subsoil, debris, large weeds, and foreign matter.

    a. Screening: Single screened.

4. Acidity range (pH) of 5.5 to 7.5.
5. Containing minimum of 4 percent and maximum of 25 percent inorganic matter.

2.4 SOURCE QUALITY CONTROL

A. Testing and Analysis of Subsoil Material: Perform in accordance with ASTM D698.

B. Testing and Analysis of Topsoil Material: Perform in accordance with ASTM D698.

C. When tests indicate materials do not meet specified requirements, change material and retest.

D. Furnish materials of each type from same source throughout the Work.

PART 3 - EXECUTION

3.1 EXCAVATION

A. Excavate general fill, select fill, and topsoil from areas designated. Strip topsoil to full depth of topsoil in designated areas.

B. Stockpile excavated material meeting requirements for general fill, select fill, and topsoil].

C. Remove excess excavated materials not intended for reuse, from site.

D. Remove excavated materials not meeting requirements for general fill, select fill, & topsoil.

3.2 STOCKPILING

A. Stockpile materials on site at approved locations designated by Engineer.

B. Stockpile in sufficient quantities to meet Project schedule and requirements.

C. Separate differing materials with dividers or stockpile apart to prevent mixing.

D. Stockpile topsoil 8 feet high maximum.

E. Prevent intermixing of soil types or contamination.

F. Direct surface water away from stockpile site to prevent erosion or deterioration of materials.

G. Stockpile potentially hazardous materials on impervious material and cover to prevent erosion and leaching, until disposed of.

3.3 STOCKPILE CLEANUP

A. Remove stockpile, leave area in clean and neat condition. Grade site surface to prevent free standing surface water.

B. When borrow area is indicated, leave area in clean and neat condition. Grade site surface to prevent free standing surface water.

END OF SECTION

SECTION 31 10 00 - SITE CLEARING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Removing surface debris.
2. Removing designated paving, curbs, pads, and misc. concrete.
3. Removing designated trees, shrubs, and other plant life.
4. Removing abandoned utilities.
5. Excavating topsoil.

1.2 UNIT PRICE - MEASUREMENT AND PAYMENT

A. All items including but not limited to materials, equipment, overhead, coordination, testing, labor, and supervision required for a complete and operable project shall be included in the bid for the project. All measurement and payment shall be based on the items of work that are specifically listed in the Bid Proposal. Any items not specifically listed in the Bid Proposal shall be considered subsidiary to unit cost items within the Bid Proposal and no additional payment shall be made for subsidiary items.

1.3 QUALITY ASSURANCE

A. Conform to city code for, disposal of debris. No burning or herbicides allowed

B. Perform Work in accordance with state and local standard specifications.

PART 2 - PRODUCTS

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify existing plant life designated to remain is tagged or identified.

B. Identify waste area for placing removed materials.

3.2 PREPARATION

A. Call Local Utility Line Information service at 811 or 1-800-545-6005 not less than three working days before performing Work.

1. Request underground utilities to be located and marked within and surrounding construction areas. All existing utilities shall have their locations and depths field verified prior to soil disturbing activities.

3.3 PROTECTION

A. Locate, identify, and protect utilities indicated to remain, from damage.

B. Protect trees, plant growth, and features designated to remain, as final landscaping.

C. Protect bench marks, survey control points, and existing structures from damage or displacement.

3.4 CLEARING

A. Clear areas required for access to site and execution of Work to minimum depth of 6” inches.

B. Remove trees and shrubs within marked areas. Remove stumps, main root ball, root system to depth of 24 inches, surface rock.

C. Clear undergrowth and deadwood, without disturbing subsoil.

3.5 REMOVAL & DEMO

A. The removal and disposal of all items shall be the responsibility of the contractor. All items designated by owner to be salvaged shall be delivered and off loaded to the owner including valves and fittings.

B. Remove debris, rock, and extracted plant life from site.

C. Remove paving, curbs, pads, and all misc. concrete items designated for demo. Potentially hazardous materials such as septic tanks must be removed to a min 18” below grade depth and backfilled with non-organic, granular material, per TCEQ Requirements Chapter 285, Subchapter D.

D. Remove abandoned utilities. Indicated removal termination point for underground utilities on Record Documents.

E. Existing manholes and utility lines to be abandoned shall be plugged with class B concrete and abandoned in place unless otherwise instructed on plans. Manholes shall be filled with sand or gravel.

F. Continuously clean-up and remove waste materials from site. Do not allow materials to accumulate on site.

G. Do not burn or bury materials on site. Leave site in clean condition.

H. Holes or voids left from the demolition of structures, trees, rocks, etc. shall be filled and compacted to meet the existing surrounding grades. This work will be considered subsidiary to the unit prices in the bid form.

3.6 TOPSOIL EXCAVATION

A. Excavate topsoil from areas to be further excavated, relandscaped, or regraded, without mixing with foreign materials for use in finish grading.

B. Do not excavate wet topsoil.

C. Stockpile in area designated on site to depth not exceeding 8 feet and protect from erosion. Stockpile material on impervious material and cover over with same material, until disposal.

D. Remove excess topsoil not intended for reuse, from site.

END OF SECTION

SECTION 31 22 13 - ROUGH GRADING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
1. Excavating topsoil.
2. Excavating subsoil.
3. Cutting, grading, filling, rough contouring, and compacting.

1.2 UNIT PRICE - MEASUREMENT AND PAYMENT

A. All items including but not limited to materials, equipment, overhead, coordination, testing, labor, and supervision required for a complete and operable project shall be included in the bid for the project. All measurement and payment shall be based on the items of work that are specifically listed in the Bid Proposal. Any items not specifically listed in the Bid Proposal shall be considered subsidiary to unit cost items within the Bid Proposal and no additional payment shall be made for subsidiary items.

1.3 REFERENCES

A. American Association of State Highway and Transportation Officials:

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

B. ASTM International:

1. ASTM C136 - Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
2. ASTM D698 - Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft3 (600 kN-m/m3)).
3. ASTM D1556 - Standard Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method.
4. ASTM D1557 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft3 (2,700 kN-m/m3)).
5. ASTM D2167 - Standard Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method.
6. ASTM D2419 - Standard Test Method for Sand Equivalent Value of Soils and Fine Aggregate.
7. ASTM D2434 - Standard Test Method for Permeability of Granular Soils (Constant Head).
8. ASTM D2922 - Standard Test Method for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).
9. ASTM D3017 - Standard Test Method for Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth).

1.4 SUBMITTALS

A. Samples: Submit, in air-tight containers, 10 lb sample of each type of select fill to testing laboratory, when required.

B. Materials Source: Submit name of imported materials suppliers.

C. Manufacturer's Certificate: Certify Products meet or exceed specified requirements.

1.5 CLOSEOUT SUBMITTALS

A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for submittals.

B. Project Record Documents: Accurately record actual locations of utilities remaining by horizontal dimensions, elevations or inverts, and slope gradients.

1.6 QUALITY ASSURANCE

A. Perform Work in accordance with ASTM C136, ASTM D2419, and ASTM D2434.

B. Perform Work in accordance with state and local standard specifications.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Topsoil: As specified in Section 31 05 13.

B. General Fill: As specified in Section 31 05 13.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify survey bench mark and intended elevations for the Work are as indicated on Drawings.

3.2 PREPARATION

A. Call Local Utility Line Information service than three working days before performing Work.

1. Request underground utilities to be located and marked within and surrounding construction areas.

B. Identify required lines, levels, contours, and datum.

C. Notify utility company to remove and relocate utilities where applicable.

D. Protect utilities indicated to remain from damage.

E. Protect plant life, lawns, rock outcropping and other features remaining as portion of final landscaping.

F. Protect bench marks, survey control point, existing structures, fences, sidewalks, paving, and curbs from excavating equipment and vehicular traffic. Any damaged incurred shall be at the expense of the contractor.

3.3 TOPSOIL EXCAVATION

A. Excavate topsoil from areas to be further excavated, relandscaped, or regraded, without mixing with foreign materials for use in finish grading.

B. Do not excavate wet topsoil.

C. Stockpile in area designated on site to depth not exceeding 8 feet and protect from erosion. Stockpile material on impervious material and cover over with same material, until disposal.

D. Remove excess topsoil not intended for reuse, from site.

3.4 SUBSOIL EXCAVATION

A. Excavate subsoil from areas to be further excavated, relandscaped, or regraded.

B. Excavate and process wet material to obtain optimum moisture content.

C. Remove excess subsoil not intended for reuse, from site.

D. Stockpile subsoil in area designated on site to depth not exceeding 8 feet and protect from erosion.

E. Benching Slopes: Horizontally bench existing slopes greater than 1:4 to key placed fill material to slope to provide firm bearing.

F. Stability: Replace damaged or displaced subsoil as specified for fill.

3.5 FILLING

A. Fill areas to contours and elevations with unfrozen materials.

B. Place material in continuous layers as follows:

1. General Fill: Maximum 8 inches compacted depth. Compact to 90% modified proctor.
2. Select Fill: Maximum 6 inches compacted depth. Compact to 95% modified proctor

C. Maintain optimum moisture content of fill materials to attain required compaction density. ±3% optimum.

D. Make grade changes gradual. Blend slope into level areas.

E. Repair or replace items indicated to remain damaged by excavation or filling.

3.6 TOLERANCES

A. Top Surface of Subgrade: Plus or minus 1/10 foot from required elevation.

3.7 FIELD QUALITY CONTROL

A. 01 70 00 - Execution and Closeout Requirements: Field inspecting, testing, adjusting, and balancing.

B. Perform laboratory material tests in accordance with ASTM D698.

C. Perform in place compaction tests in accordance with the following:

1. Density Tests: ASTM D2922.
2. Moisture Tests: ASTM D3017.

D. When tests indicate Work does not meet specified requirements, remove Work, replace and retest.

E. Frequency of Tests: Minimum 1 test per lift, per 1,000 SF

END OF SECTION

SECTION 31 23 16 - EXCAVATION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Excavating for slabs-on-grade.

B. Related Sections:
   1. Section 31 05 13 - Soils for Earthwork: Stockpiling excavated materials.
   2. Section 31 05 16 - Aggregates for Earthwork: Stockpiling excavated materials.
   3. Section 31 22 13 - Rough Grading: Topsoil and subsoil removal from site surface.
   4. Section 31 23 17 - Trenching: Excavating for utility trenches.
   5. Section 31 23 18 - Rock Removal: Removal of rock during excavating.
   6. Section 31 23 23 - Fill.

1.2 UNIT PRICE - MEASUREMENT AND PAYMENT

A. Excavating Soil Materials:
   1. Basis of Measurement: See Bid Proposal
   2. Basis of Payment: Includes excavating to required elevations, loading and placing materials in stockpile and or removing from site. Over Excavating: Payment will not be made for over excavated work nor for replacement materials.

1.3 REFERENCES

A. Refer to local utility standards when working within 24 inches of utility lines.

1.4 SUBMITTALS

A. Section 01 33 00 - Submittal Procedures: Requirements for submittals.

B. Excavation Protection Plan: Describe sheeting, shoring, and bracing materials and installation required to protect excavations and adjacent structures and property; include structural calculations to support plan.

C. Shop Drawings: Indicate soil densification grid for each size and configuration footing requiring soils densification.

D. Contractor shall deliver representative soil samples (1 per each excavation site, not to exceed 4 total) to independent testing lab for proctor testing at contractors expense and submit proctor report to project engineer for evaluation.

1.5 PREPARATION

A. Call 811 not less than three working days before performing Work.
   1. Request underground utilities to be located and marked within and surrounding construction areas.

B. Identify required lines, levels, contours, and datum.

C. Protect utilities indicated to remain from damage.

D. Protect plant life and other features remaining as portion of final landscaping.

E. Protect bench marks, survey control points, existing structures, fences, paving, and curbs from excavating equipment and vehicular traffic.

1.6 SOIL DENSITY

A. Densify existing subsoils below slabs to attain relative density rating of 92% standard proctor density, plus or minus 2% of optimum moisture content.

B. Density Testing: Contractor shall provide random nuclear density testing by an independent laboratory at contractors expense at a rate of 1 test per 8 inch lift of fill material placed for each area of work. Testing results shall be provided to the owner and project engineer in a timely manner by the independent testing laboratory.

1.7 EXCAVATION

A. Slope banks to angle of repose.

B. Grade top perimeter of excavation to prevent surface water from draining into excavation.

C. Trim excavation. Remove loose matter.

D. Remove lumped subsoil, boulders, and rock up to 1/3 cu yd measured by volume. Remove larger material as specified in Section 31 23 23.

E. Notify Engineer of unexpected subsurface conditions before proceeding.

F. Over excavated areas shall be filled with structural fill as directed by the engineer at the contractor's expense.

G. Stockpile subsoil in area designated on site to depth not exceeding 8 feet and protect from erosion.

H. Any items damage by excavation which are indicated to remain shall be immediately reported to the owner and repaired or replaced at the contractors expense.

1.8 FIELD QUALITY CONTROL

A. Request Engineer for visual inspection of density testing and provide 24 hour notice for request of inspection of excavation prior to backfilling and before installing subsequent work.

1.9 PROTECTION

A. Prevent displacement or loose soil from falling into excavation; maintain soil stability.

B. Protect bottom of excavations and soil adjacent to and beneath foundation from freezing.

C. Protect structures, utilities and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earth operations.

END OF SECTION

SECTION 31 23 17 - TRENCHING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Excavating trenches for utilities
2. Backfilling and compaction.

1.2 UNIT PRICE - MEASUREMENT AND PAYMENT

A. All items including but not limited to materials, equipment, overhead, coordination, testing, labor, and supervision required for a complete and operable project shall be included in the bid for the project. All measurement and payment shall be based on the items of work that are specifically listed in the Bid Proposal. Any items not specifically listed in the Bid Proposal shall be considered subsidiary to unit cost items within the Bid Proposal and no additional payment shall be made for subsidiary items.

1.3 REFERENCES

A. American Association of State Highway and Transportation Officials:

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

B. ASTM International:

1. ASTM D698 - Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft3 (600 kN-m/m3)).
2. ASTM D1556 - Standard Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method.
3. ASTM D1557 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft3 (2,700 kN-m/m3)).
4. ASTM D2167 - Standard Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method.
5. ASTM D2922 - Standard Test Method for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).
6. ASTM D3017 - Standard Test Method for Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth).

1.4 DEFINITIONS

A. Utility: Any buried pipe, duct, conduit, or cable.

1.5 SUBMITTALS

A. Excavation Protection Plan: Describe sheeting, shoring, and bracing materials and installation required to protect excavations and adjacent structures and property; include structural calculations to support plan.

B. Product Data: Submit data for geotextile fabric indicating fabric and construction.

C. Samples: Submit, in air-tight containers, 10 lb sample of each type of fill to testing laboratory.

D. Materials Source: Submit name of imported fill materials suppliers.

E. Manufacturer's Certificate: Certify Products meet or exceed specified requirements.

1.6 QUALITY ASSURANCE

A. Perform Work in accordance with state and city standard specifications

1.7 QUALIFICATIONS

A. When trenching 5' or deeper, prepare excavation protection plan under direct supervision of Professional Engineer experienced in design of this Work and licensed in State of Texas.

1.8 COORDINATION

A. Verify Work associated with lower elevation utilities is complete before placing higher elevation utilities.

PART 2 - PRODUCTS

2.1 FILL MATERIALS

A. Unless a more rigorous detail specifically designated otherwise on plans, in no case is a lesser standard approved.

B. Bedding

1. Sanitary and storm sewer lines - Class 1 embedment material, crushed stone, ¾" maximum size, fines included.
2. Waterlines and forcemains – Clean washed sand

C. Haunching

1. Sanitary and storm sewer lines - Class 1 material, crushed stone, ¾" maximum size, fines included.
2. Waterlines and forcemains – Clean washed sand

D. Initial Backfill

1. General site fill – On-site or imported materials free from lumps or clods ≥ 6" diameter P.I. <20 and LL<45

E. Final Backfill

1. General site fill – On-site or imported materials free from lumps or clods ≥ 6" diameter P.I. <20 and LL<45

PART 3 - EXECUTION

3.1 LINES AND GRADES

A. Lay pipes to lines and grades indicated on Drawings.

1. Engineer and Owner reserves right to make changes in lines, grades, and depths of utilities when changes are required for Project conditions.

B. Use laser-beam instrument with qualified operator to establish lines and grades.

3.2 PREPARATION

A. Call Local Utility Line Information service at Texas one call not less than three working days before performing Work. Contractor shall also be responsible for notifying owner and engineer.

1. Request underground utilities to be located and marked within and surrounding construction areas.

B. Identify required lines, levels, contours, and datum locations.

C. Protect plant life, lawns, rock outcropping and other features remaining as portion of final landscaping.

D. Protect bench marks, existing structures, fences, sidewalks, paving, and curbs from excavating equipment and vehicular traffic.

E. Maintain and protect above and below grade utilities indicated to remain.

F. Relocate controls and reroute traffic as required during progress of Work. Conduct work in conformance with traffic control plan approved by owner and engineer.

3.3 TRENCHING

A. Excavate subsoil required for utilities.

B. Do not advance open trench more than 100 feet ahead of installed pipe.

C. Cut trenches sufficiently wide to enable installation and allow inspection. Remove water or materials that interfere with Work.

D. Excavate bottom of trenches maximum 2 feet wider than outside diameter of pipe.

E. Excavate trenches to depth indicated on Drawings. Provide uniform and continuous bearing and support for bedding material and pipe.

F. Do not interfere with 45 degree bearing splay of foundations.

G. When Project conditions permit, slope side walls of excavation starting 2 feet above top of pipe. When side walls can not be sloped, provide sheeting and shoring to protect excavation as specified in excavation safety plan.

H. When subsurface materials at bottom of trench are loose or soft, excavate to greater depth as directed by Engineer until suitable material is encountered.

I. Cut out soft areas of subgrade not capable of compaction in place. Backfill with bedding material and compact to density equal to or greater than requirements for subsequent backfill material.

J. Trim excavation. Hand trim for bell and spigot pipe joints. Remove loose matter.

K. Correct areas over excavated areas with compacted bedding material as specified for authorized excavation or replace with fill concrete as directed by Engineer.

L. Remove excess subsoil not intended for reuse, from site.

M. Stockpile subsoil in area designated on site to depth not exceeding 8 feet and protect from erosion.

3.4 SHEETING AND SHORING

A. Sheet, shore, and brace excavations to prevent danger to persons, structures and adjacent properties and to prevent caving, erosion, and loss of surrounding subsoil.

B. Support trenches more than 5 feet deep excavated through unstable, loose, or soft material. Provide sheeting, shoring, bracing, or other protection to maintain stability of excavation.

C. Design sheeting and shoring to be removed at completion of excavation work.

D. Repair damage caused by failure of the sheeting, shoring, or bracing and for settlement of filled excavations or adjacent soil.

E. Repair damage to new and existing Work from settlement, water or earth pressure or other causes resulting from inadequate sheeting, shoring, or bracing.

3.5 BACKFILLING

A. Backfill trenches to contours and elevations with unfrozen fill materials.

B. Systematically backfill to allow maximum time for natural settlement. Do not backfill over porous, wet, frozen, or spongy subgrade surfaces.

C. Place fill material in continuous layers and compact to 90% modified proctor in general areas and 95% modified proctor under paving and future structures.

D. Place material in continuous layers of maximum 6” thickness

E. Employ placement method that does not disturb or damage foundation perimeter drainage, utilities in trench, and trenchwall stability.

F. Maintain ±3% optimum moisture content of fill materials to attain required compaction density.

G. Do not leave more than 50 feet of trench open at end of working day.

H. Protect open trench to prevent danger to the public.

3.6 TOLERANCES

A. Top Surface of Backfilling Under Paved Areas: Plus or minus 1”

B. Top Surface of General Backfilling: Plus or minus 1”from required elevations.

3.7 FIELD QUALITY CONTROL

A. Perform laboratory material tests in accordance with ASTM D1557. ASTM D698.

B. Perform in place compaction tests in accordance with the following:

1. Density Tests: or ASTM D2922.
2. Moisture Tests: ASTM D3017.

C. When tests indicate Work does not meet specified requirements, remove Work, replace, compact, and retest.

D. Frequency of Tests: minimum one per lift per 1,000’ of trench

3.8 PROTECTION OF FINISHED WORK

A. Section 01 70 00 - Execution and Closeout Requirements: Protecting finished work.

B. Reshape and re-compact fills subjected to vehicular traffic during construction.

END OF SECTION

SECTION 31 25 00 - EROSION AND SEDIMENTATION CONTROLS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Erosion Control Requirements

1.2 UNIT PRICE - MEASUREMENT AND PAYMENT

A. All items including but not limited to materials, equipment, overhead, coordination, testing, labor, and supervision required for a complete and operable project shall be included in the bid for the project. All measurement and payment shall be based on the items of work that are specifically listed in the Bid Proposal. Any items not specifically listed in the Bid Proposal shall be considered subsidiary to unit cost items within the Bid Proposal and no additional payment shall be made for subsidiary items.

1.3 SWPPP REQUIREMENTS

A. When applicable with TCEQ requirements, contractor shall create a complete stormwater pollution prevention plan (SWPPP), Notice of Intent (NOI), and notice of termination (NOT), and pay all fees associated with these permits. These requirements shall be met prior to performing any soil disturbing activities.

B. The contractor shall be responsible for installation, maintenance, and inspection of all temp. and permanent erosion control measures in accordance with the SWP3, TCEQ requirements, and ISWM design manual for construction.

C. Temporary or permanent erosion control measures shall be used to prevent silt from leaving the project site during construction. Temporary erosion controls may include silt fences, straw wattles, berms, dikes, swales, strips or undisturbed vegetation, rock filter check dams, and other methods as required by the engineer or his representative and as specified in the plans and contract documents.

D. All finished grade slopes steeper then 6:1 and flow lines of all drainage ditches and swales, shall be completely covered with soil retention blanket (SRB) to promote re-vegetation and to prohibit erosion. SRB shall be per TxDOT item 169, Class 1, Type B. Other areas shall be covered with hay or straw mulch immediately after permanent seeding. SRBs, mulch, hay, fertilizers, and water used to promote re-vegetation is subsidiary to the unit prices included within the bid form.

E. All disturbed permeable surfaces must be graded to a smooth and uniform appearance that can be easily mowed with a small push mower. Permanent vegetation must be established according to seeding specifications. Residential lawns shall be re-established with block sod to match existing type of lawn grass.

1.4 SUBMITTALS

A. Product Data: Submit minimum one copy of the fully executed SWPPP

1.5 QUALITY ASSURANCE

A. Perform Work in accordance with any State and local standards.

B. Maintain at least one copy of the SWPPP document on site.

PART 2 - PRODUCTS

A. This Section is Intentionally Left Blank.

PART 3 - EXECUTION

3.1 FIELD QUALITY CONTROL

A. Inspect erosion control devices on an as needed basis and after each runoff event. Make necessary repairs to ensure erosion and sediment controls are in good working order.

3.2 CLEANING

A. When sediment accumulation in sedimentation structures has reached a point one-third depth of sediment structure or device, remove and dispose of sediment.

B. Do not damage structure or device during cleaning operations.

C. Do not permit sediment to erode into construction or site areas or natural waterways.

D. Clean channels when depth of sediment reaches approximately one half channel depth.

END OF SECTION

SECTION 32 13 13 – PAVEMENT REPAIR

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Pavement Repair requirements for asphalt and concrete pavements.
2. This section includes the minimum requirements for pavement repair unless otherwise indicated in the plan drawings. All pavement repair of public roadways including city, county, or state roads shall be per TxDOT specifications.

1.2 PRICE AND PAYMENT PROCEDURES

A. All items including but not limited to materials, equipment, overhead, coordination, testing, labor, and supervision required for a complete and operable project shall be included in the bid for the project. All measurement and payment shall be based on the items of work that are specifically listed in the Bid Proposal. Any items not specifically listed in the Bid Proposal shall be considered subsidiary to unit cost items within the Bid Proposal and no additional payment shall be made for subsidiary items.

1.3 REFERENCE STANDARDS

A. American Association of State Highway and Transportation Officials:

1. AASHTO M17 - Standard Specification for Mineral Filler for Bituminous Paving Mixtures.
2. AASHTO M29 - Standard Specification for Fine Aggregate for Bituminous Paving Mixtures.
3. AASHTO M140 - Standard Specification for Emulsified Asphalt.
4. AASHTO M208 - Standard Specification for Cationic Emulsified Asphalt.
5. AASHTO M288 - Standard Specification for Geotextile Specification for Highway Applications.
6. AASHTO M320 - Standard Specification for Performance-Graded Asphalt Binder.
7. AASHTO M324 - Standard Specification for Joint and Crack Sealants, Hot Applied, for Concrete and Asphalt Pavements.
8. AASHTO MP1a - Standard Specification for Performance-Graded Asphalt Binder.

B. American Concrete Institute:

1. ACI 301 - Specifications for Structural Concrete.
2. ACI 304 - Guide for Measuring, Mixing, Transporting, and Placing Concrete.

C. Asphalt Institute:

1. AI MS-2 - Mix Design Methods for Asphalt Concrete and Other Hot- Mix Types.
2. AI MS-19 - Basic Asphalt Emulsion Manual.
3. AI SP-2 - Superpave Mix Design.

D. ASTM International:

1. ASTM A184/A184M - Standard Specification for Fabricated Deformed Steel Bar Mats for Concrete Reinforcement.
2. ASTM A185/A185M - Standard Specification for Steel Welded Wire Fabric, Plain, for Concrete Reinforcement.
3. ASTM A497/A497M - Standard Specification for Steel Welded Wire Fabric, Deformed, for Concrete Reinforcement.
4. ASTM A615/A615M - Standard Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement.
5. ASTM A706/A706M - Standard Specification for Low-Alloy Steel Deformed and Plain Bars for Concrete Reinforcement.
6. ASTM A767/A767M - Standard Specification for Zinc-Coated (Galvanized) Steel Bars for Concrete Reinforcement.
7. ASTM A775/A775M - S Standard Specification for Epoxy-Coated Steel Reinforcing Bars.
8. ASTM A884/A884M - Standard Specification for Epoxy-Coated Steel Wire and Welded Wire Reinforcement.
9. ASTM A934/A934M - Standard Specification for Epoxy-Coated Prefabricated Steel Reinforcing Bars.
10. ASTM C31/C31M - Standard Practice for Making and Curing Concrete Test Specimens in the Field.
11. ASTM C33 - Standard Specification for Concrete Aggregates.
12. ASTM C39/C39M - Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens.
13. ASTM C94/C94M - Standard Specification for Ready-Mixed Concrete.
14. ASTM C143/C143M - Standard Test Method for Slump of Hydraulic Cement Concrete.
15. ASTM C150 - Standard Specification for Portland Cement.
16. ASTM C172 - Standard Practice for Sampling Freshly Mixed Concrete.
17. ASTM C173/C173M - Standard Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method.
18. ASTM C231 - Standard Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method.
19. ASTM C260 - Standard Specification for Air-Entraining Admixtures for Concrete.
20. ASTM C309 - Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete.
21. ASTM C494/C494M - Standard Specification for Chemical Admixtures for Concrete.
22. ASTM C595 - Standard Specification for Blended Hydraulic Cements.
23. ASTM C618 - Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use as a Mineral Admixture in Concrete.
24. ASTM C979 - Standard Specification for Pigments for Integrally Colored Concrete.
25. ASTM C989 - Standard Specification for Ground Granulated Blast-Furnace Slag for Use in Concrete and Mortars.
26. ASTM C1017/C1017M - Standard Specification for Chemical Admixtures for Use in Producing Flowing Concrete.
27. ASTM C1064/C1064M - Standard Test Method for Temperature of Freshly Mixed Hydraulic-Cement Concrete.
28. ASTM C1116 - Standard Specification for Fiber-Reinforced Concrete and Shotcrete.
29. ASTM C1315 - Standard Specification for Liquid Membrane-Forming Compounds Having Special Properties for Curing and Sealing Concrete.
30. ASTM C1371-2004a - Standard Test Method for Determination of Emittance of Materials Near Room Temperature Using Portable Emissometers.
31. ASTM C1549-2004 - Standard Test Method for Determination of Solar Reflectance Near Ambient Temperature Using a Portable Solar Reflectometer.
32. ASTM D1751 - Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types).
33. ASTM D1752 - Standard Specification for Preformed Sponge Rubber and Cork Expansion Joint Fillers for Concrete Paving and Structural Construction.

34. ASTM D6690 - Standard Specification for Joint and Crack Sealants, Hot Applied, for Concrete and Asphalt Pavements.
35. ASTM E408-1971(1996)e1 - Standard Test Methods for Total Normal Emittance of Surfaces Using Inspection-Meter Techniques.
36. ASTM E903-1996 - Standard Test Method for Solar Absorptance, Reflectance, and Transmittance of Materials Using Integrating Spheres.
37. ASTM E1918-1997 - Standard Test Method for Measuring Solar Reflectance of Horizontal and Low-Sloped Surfaces in the Field.
38. ASTM E1980-2001 - Standard Practice for Calculating Solar Reflectance Index of Horizontal and Low-Sloped Opaque Surfaces.

1.4 PRE-INSTALLATION MEETINGS

A. Convene minimum one week prior to commencing work of this section.

1.5 SUBMITTALS

A. Product Data:

1. Submit data on concrete materials, joint filler, admixtures, and curing compounds.
2. Submit product information for asphalt and aggregate materials.
3. Submit mix design with laboratory test results supporting design.

B. Design Data:

1. Submit concrete mix design for each concrete strength.
2. Identify mix ingredients and proportions, including admixtures.
3. Identify chloride content of admixtures and whether or not chloride was added during manufacture.

1.6 QUALITY ASSURANCE

A. Asphalt & Concrete mixing plant shall conform to TxDOT standards and be certified in the state of Texas.

B. Obtain materials from same source throughout project.

C. Perform Work in accordance with state and local standard specifications including ACI 301 and TxDOT.

1.7 AMBIENT CONDITIONS

A. Do not place concrete when base surface temperature is less than 40 degrees F, or surface is wet or frozen.

PART 2 - PRODUCTS

2.1 CONCRETE PAVING

A. Performance / Design Criteria:

1. Paving: Minimum design for any concrete repair shall be 6" concrete surface thickness or match existing if greater than 6" with #4 reinforcing bars @ 24" c-c each way doweled into existing concrete minimum 12" deep. Concrete strength shall be minimum 4,500 psi for TxDOT pavement and 3,600 psi for all other paving at 28 days.

B. Concrete Materials:

1. All concrete materials shall be as specified in "03 30 00 – Cast-in-Place Concrete" "03 10 00 – Concrete Formwork & Accessories" "03 20 00 – Concrete Reinforcement".

C. Aggregate Subbase & Base Course: Unless otherwise noted in plans, the following are minimum base and subbase specifications:

1. Minimum 12" Subbase – Natural ground/approved site soils with topsoil removed and compacted to 95% modified proctor.
2. See embedment detail for materials in trench.

2.2 ASPHALT PAVEMENT

A. 2" TxDOT Type D HMAC riding surface on tack coat.

B. Base Course for asphalt pavement repair shall be minimum 6" thick reinforced concrete as indicated on drawings.

2.3 SOURCE QUALITY CONTROL

A. Submit proposed mix design of each concrete and asphalt to engineer for review.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify utilities beneath paving have been backfilled, compacted, and tested prior to pavement repair. Verify compacted subgrade and subbase is dry and ready to support paving and imposed loads and at correct elevations and gradients. Manhole frames and lids must be in the correct position and elevation prior to pavement placement.

1. Proof roll subbase with loaded dump truck in minimum two perpendicular passes to identify soft spots.
2. Remove soft subbase and replace with compacted select fill.

3.2 PREPARATION

A. Moisten substrate to minimize absorption of water from fresh concrete.

B. Coat surfaces of manholes, catch basins and any metal frames with oil to prevent bond with concrete paving.

C. Notify Engineer minimum 24 hours prior to commencement of paving operations.

3.3 INSTALLATION

A. Subbase and base Course:

1. Prepare subbase

2. Perform capaction testing as required.

B. Concrete Forms:

1. Place and secure forms and screeds to correct location, dimension, profile, and gradient.
2. Assemble formwork to permit easy stripping and dismantling without damaging concrete.

C. Concrete Reinforcement:

1. Place reinforcing as described in this specification.
2. Interrupt reinforcing at contraction and expansion joints.
3. Place reinforcing to achieve paving and curb alignment as necessary
4. Provide doweled joints at 24 inch spacing at interruptions of concrete with one end of dowel set in capped sleeve to allow longitudinal movement.

D. Placing Concrete:

1. Place concrete in accordance with ACI 301.
2. Match existing pavement joints unless otherwise indicated on drawings.

E. Concrete Finishing:

1. Match existing pavement finish.
2. Area Paving: Light broom.
3. Sidewalk Paving: Light broom, radius to 1 inch, and trowel joint edges.
4. Median Barrier: Light broom, radius to 1 inch, and trowel joint edges.
5. Curbs and Gutters: Light broom.
6. Direction of Texturing: Transverse to paving direction.
7. Inclined Vehicular Ramps: Broomed perpendicular to slope.
8. Place curing compound on exposed concrete surfaces immediately after finishing.

F. Concrete Curing and Protection

1. Immediately after placement, protect concrete from premature drying, excessively hot or cold temperatures, and mechanical injury.
2. Maintain concrete with minimal moisture loss at relatively constant temperature for period necessary for hydration of cement and hardening of concrete.
3. Cure concrete according to “Section 03 39 00 – Concrete Curing”

G. Asphalt Tack Coat:

1. Apply tack coat in accordance with. TxDOT

2. Apply tack coat on asphalt and concrete surfaces over subgrade surface at uniform rate.

   a. New Surfaces: 1/2 gal/sq yd.
   b. Existing Surfaces: 1/2 gal/sq yd.

3. Apply tack coat to contact surfaces of curbs, gutters and concrete.

4. Coat surfaces of manhole frames with oil to prevent bond with asphalt paving. Do not tack coat these surfaces.

H. Single Course Asphalt Paving:

1. Install Work in accordance with City and TxDOT standards.
2. Place asphalt within 24 hours of applying primer or tack coat.
3. Place asphalt wearing course to 2 inch compacted thickness.
4. Compact paving by rolling to specified density. Do not displace or extrude paving from position. Hand compact in areas inaccessible to rolling equipment.
5. Perform rolling with consecutive passes to achieve even and smooth finish without roller marks.

3.4 TOLERANCES

A. Maximum Variation of Surface Flatness: 1/4 inch 10 ft

B. Maximum Variation From elevations indicated on drawings: 1/2 inch

C. Maximum Variation From compacted thickness: 1/4”

3.5 FIELD QUALITY CONTROL

A. Perform field inspection and testing in accordance with ASTM C94 ACI 301 and state and local standard specifications including TxDOT.

B. Inspect reinforcing placement for size, spacing, location, support.

C. Testing firm will take cylinders and perform slump and air entrainment tests in accordance with ACI 301.

D. Strength Test Samples:

1. Sampling Procedures: ASTM C172.
2. Cylinder Molding and Curing Procedures: ASTM C31/C31M, cylinder specimens, field cured.
3. Sample concrete and make one set of three cylinders for every 75 cu ydsor less of each class of concrete placed each day and for every 5,000 sfof surface area paving.
4. Make one additional cylinder during cold weather concreting, and field cure.

E. Field Testing:

1. Slump Test Method: ASTM C143/C143M.
2. Air Content Test Method: ASTM C173/C173M.
3. Temperature Test Method: ASTM C1064/C1064M.
4. Measure slump and temperature for each compressive strength concrete sample.
5. Measure air content in air entrained concrete for each compressive strength concrete sample.

F. Cylinder Compressive Strength Testing:

1. Test Method: ASTM C39/C39M.
2. Test Acceptance: Average compressive strength of three consecutive test maximum 500 psi less than specified compressive strength.

3. Test one cylinder at 7 days.
4. Test two cylinders at 28 days.
5. Retain one cylinder for 90 days for testing when requested by Engineer.
6. Dispose remaining cylinders when testing is not required.

G. Maintain records of placed concrete items. Record date, location of pour, quantity, air temperature, and test samples taken.

H. Asphalt Paving Mix Temperature: Measure temperature at time of placement.

I. Asphalt Paving Thickness: ASTM D3549; test one core sample from every 1000 square yards compacted paving.

J. Asphalt Paving Density: ASTM D2950 nuclear method; test one location for every 1000 square yards compacted paving.

3.6 PROTECTION

A. Immediately after placement, protect paving from premature drying, excessive hot or cold temperatures, and mechanical injury.

B. Do not permit pedestrian or vehicular traffic over paving for 7 days minimum after finishing.

END OF SECTION

SECTION 32 92 19 – SEEDING & SODDING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Fertilizing.
2. Seeding.
3. Hydroseeding.
4. Mulching.
5. Fertilizing
6. Preparation of subsoil
7. Placing topsoil
8. Sod Installation
9. Maintenance.

1.2 UNIT PRICE - MEASUREMENT AND PAYMENT

A. All items including but not limited to materials, equipment, overhead, coordination, testing, labor, and supervision required for a complete and operable project shall be included in the bid for the project. All measurement and payment shall be based on the items of work that are specifically listed in the Bid Proposal. Any items not specifically listed in the Bid Proposal shall be considered subsidiary to unit cost items within the Bid Proposal and no additional payment shall be made for subsidiary items.

1.3 REFERENCES

A. ASTM International:

1. ASTM C602 - Standard Specification for Agricultural Liming Materials.

1.4 DEFINITIONS

A. Weeds: Vegetative species other than specified species to be established in given area.

1.5 SUBMITTALS

A. Section 01 33 00 - Submittal Procedures: Requirements for submittals.

B. Product Data: Submit data for seed mix, fertilizer, mulch, and other accessories.

C. Manufacturer's Certificate: Certify Products meet or exceed specified requirements.

1.6 QUALITY ASSURANCE

A. Unless otherwise directed in the contract drawings, all disturbed areas shall be re-graded to pre-construction contours and permanent vegetation established.

B. Seed: Provide seed mixture in containers showing percentage of seed mix, germination percentage, inert matter percentage, weed percentage, year of production, net weight, date of packaging, and location of packaging.

C. Sod: Root development capable of supporting its own weight without tearing, when suspended vertically by holding upper two corners.

D. Perform Work in accordance with state and local standard specifications.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Deliver grass seed mixture in sealed containers. Seed in damaged packaging is not acceptable.

B. Deliver fertilizer in waterproof bags showing weight, chemical analysis, and name of manufacturer.

1.8 MAINTENANCE SERVICE

A. Maintain seeded and sodded areas immediately after placement until grass is well established and exhibits vigorous growing condition for two cuttings.

PART 2 - PRODUCTS

2.1 SEED MIXTURE

A. Materials in accordance with state and local standard specifications

B. Seed Mixture:

1. Gross Weight x Purity x Germination = Pure Live Seed
2. March-September = Bermuda Grass (Hulled) 50 lb/acre
3. October-February = Rye Grass combined with Bermuda grass (unhulled) 20 lb/acre

2.2 SOD

A. Furnish materials in accordance with and local state or city standard specifications.

B. Sod: Approved grade; cultivated grass sod; type indicated in schedule at end of section; with strong fibrous root system, free of stones, burned or bare spots; containing no more than 10 weeds per 1000 sq ft. Match existing type of lawn grass.

2.3 ACCESSORIES

A. Mulching Material: Use straw mulch consisting of oat, wheat, or rice straw or hay mulch of either Bermudagrass or prairie grasses. Use straw or hay mulch free of Johnson grass and other noxious and foreign materials. Keep the mulch dry and do not use molded or rotted material.

B. Tacking Methods: Use a tacking agent in accordance with the manufacturer's recommendations or crimping method on all straw or haw mulch operations. Use tacking agents as approved or as specified on the plans.

C. Mulching Material for Hydroseeding: Use only cellulose fiber mulches that are on TxDOT's approved product list and erosion control approved product list. Keep mulch dry until applied. Do not use molded or rotted material.

D. Fertilizer (when applicable): Commercial grade; recommended for grass; of proportion necessary to eliminate deficiencies of topsoil to the following proportions: Nitrogen 25 percent, phosphoric acid 50 percent, soluble potash 25 percent. Application rate shall be 10 lbs per 1,000 SF

E. Water: Clean, fresh and free of substances or matter capable of inhibiting vigorous growth of grass.

F. Erosion Fabric: Jute matting, open weave.

G. Herbicide: none.

H. Stakes: Softwood lumber, chisel pointed.

I. String: Inorganic fiber.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify prepared soil base is ready to receive the Work of this section.

3.2 FERTILIZING

A. Apply fertilizer at application rate of 10 lbs per 1,000 SF.

B. Apply after smooth raking of topsoil.

C. Do not apply fertilizer at same time or with same machine used to apply seed.

D. Mix fertilizer thoroughly into upper 2 inches of topsoil.

E. Lightly water soil to aid dissipation of fertilizer. Irrigate top level of soil uniformly.

3.3 PREPARATION OF SUBSOIL

A. Prepare sub-soil and eliminate uneven areas and low spots.

B. Maintain lines, levels, profiles and contours. Make changes in grade gradual. Blend slopes into level areas. Must be able to be mowed with a small push lawn mower.

C. Remove foreign materials and undesirable plants and their roots. Do not bury foreign material beneath areas to be seeded or sodded.

D. Remove contaminated subsoil.

E. Scarify sub-soil to depth of 4 inches where topsoil is to be placed.

F. Repeat cultivation in areas where equipment, used for hauling and spreading topsoil, has compacted subsoil.

3.4 PLACING & TILLING OF TOPSOIL

A. Spread or till topsoil to minimum depth of 3 inches over area to be sodded.

B. When applicable, place topsoil during dry weather and on dry unfrozen subgrade.

C. Remove vegetable matter and foreign non-organic material from topsoil while spreading/tilling.

D. Grade topsoil to eliminate rough, low or soft areas and to ensure positive drainage.

3.5 SEEDING

A. Apply seed at required rate evenly in two intersecting directions. Rake in lightly.

B. Do not seed areas in excess of that which can be mulched on same day.

C. Do not sow immediately following rain, when ground is too dry, or when winds are over 12 mph.

D. Immediately following seeding and compacting, apply mulch to thickness of 1/8 inches. Maintain clear of shrubs and trees.

E. Apply water with fine spray immediately after each area has been mulched. Saturate to 4 inches of soil.

3.6 HYDROSEEDING

A. Apply fertilizer, mulch and seeded slurry with hydraulic seeder at specified rate evenly in one pass.

B. After application, apply water with fine spray immediately after each area has been hydroseeded. Saturate to 4 inches of soil and maintain moisture levels two to four inches.

C. Tacking agent shall be Guar Gum, polyacrylamide, or other approved by owner.

3.7 SEED PROTECTION

A. Cover seeded slopes where grade is 4 inches per foot or greater with erosion fabric. Roll fabric onto slopes without stretching or pulling.

B. Lay fabric smoothly on surface, bury top end of each section in 6 inch deep excavated topsoil trench. Overlap edges and ends of adjacent rolls minimum 12 inches. Backfill trench and rake smooth, level with adjacent soil.

C. Secure outside edges and overlaps at 36 inch intervals with stakes.

D. Lightly dress slopes with topsoil to ensure close contact between fabric and soil.

E. At sides of ditches, lay fabric laps in direction of water flow. Lap ends and edges minimum 6 inches.

3.8 LAYING SOD

A. Moisten prepared surface immediately prior to laying sod.

B. Lay sod within 24 hours of delivery to site to prevent deterioration.

C. Lay sod tight with no open joints visible, and no overlapping; stagger end joints 12 inches minimum. Do not stretch or overlap sod pieces.

D. Lay smooth and align with adjoining grass areas.

E. Place top elevation of sod 1/2 inch below adjoining edging, paving, curbs, and structures.

F. On slopes 6 inches per foot and steeper, lay sod perpendicular to slope and secure every row with wooden pegs at maximum 2 feet on center. When using “big roll”, lay sod parallel to slope. Drive pegs flush with soil portion of sod.

G. Do not place sod when temperature is lower than 32 degrees F.

H. Prior to placing sod, on slopes exceeding 8 inches per foot or where indicated, place wire mesh over topsoil. Securely anchor wire mesh in place with wood pegs sunk firmly into ground.

I. Water sodded areas immediately after installation. Saturate sod to 4 inches of soil.

J. When required, roll before first watering.

3.9 MAINTENANCE

A. Mow grass at regular intervals to maintain at maximum height of 2-1/2 inches. Do not cut more than 1/3 of grass blade at each mowing. Perform first mowing when seedlings are 40 percent higher than desired height.

B. Do not let clippings lay in clumps.

C. Water to prevent grass and soil from drying out.

D. Immediately reseed areas showing bare spots.

E. Repair washouts or gullies.

F. Any seeded areas with less than 25% established growth after 12 weeks shall be sodded per this specification.

3.10 SCHEDULE

A. Seed or sod all disturbed areas.

B. Sod shall be installed in all locations specifically designated on plans.

C. Sod in privately-owned areas shall match existing turf grass in each location.

D. Sod type in public R-O-W and general areas shall be Bermuda grass sod unless otherwise noted on plans.

END OF SECTION

SECTION 33 01 30.13 – PIPE AND MANHOLE TESTING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Testing of Gravity Sewer Piping:
2. Testing of pressure piping for waterline or force main.
3. Deflection testing of plastic sewer piping.
4. Testing of Manholes:

1.2 UNIT PRICE - MEASUREMENT AND PAYMENT

A. All items including but not limited to materials, equipment, overhead, coordination, testing, labor, and supervision required for a complete and operable project shall be included in the bid for the project. All measurement and payment shall be based on the items of work that are specifically listed in the Bid Proposal. Any items not specifically listed in the Bid Proposal shall be considered subsidiary to unit cost items within the Bid Proposal and no additional payment shall be made for subsidiary items.

1.3 REFERENCE STANDARDS

A. ASTM International:

1. ASTM C1244 - Standard Test Method for Concrete Sewer Manholes by the Negative Air Pressure (Vacuum) Test Prior to Backfill.

2. ASTM D2122 - Standard Test Method for Determining Dimensions of Thermoplastic Pipe and Fittings.

B. American Water Works Association:

1. AWWA C600 - Installation of Ductile Iron Mains and Their Appurtenances.

1.4 SUBMITTALS

A. Submit following items prior to start of testing:

1. Testing procedures.
2. List of test equipment.
3. Testing sequence schedule.
4. Provisions for disposal of flushing and test water.
5. Certification of test gage calibration.
6. Deflection mandrel drawings and calculations.

B. Test and Evaluation Reports: Indicate results of manhole and piping tests.

PART 2 - PRODUCTS

2.1 VACUUM TESTING

A. Equipment:

1. Vacuum pump.
2. Vacuum line.
3. Vacuum Tester Base:
    a. Compression band seal.
    b. Outlet port.
4. Shutoff valve.
5. Stopwatch.
6. Plugs.
7. Vacuum Gage: Calibrated to 0.1 in. Hg.

2.2 AIR TESTING

A. Equipment:

1. Air compressor.
2. Air supply line.
3. Shutoff valves.
4. Pressure regulator.
5. Pressure relief valve.
6. Stopwatch.
7. Plugs.
8. Pressure Gage: Calibrated to 0.1 psi.

2.3 HYDROSTATIC TESTING

A. Equipment:

1. Hydro pump.
2. Pressure hose.
3. Water meter.
4. Test connections.
5. Pressure relief valve.
6. Pressure Gage: Calibrated to 0.1 psi.

2.4 DEFLECTION TESTING

A. Equipment:

1. TCEQ compliant rigid "Go, no go" mandrels.
    a. Must have an outside diameter equal to 95% of the inside diameter of the pipe.
    b. Constructed of rigid metal or plastic that can withstand 200 psi without deformation. Adjustable or flexible mandrels are prohibited.
    c. Must have 9 or more runners or legs of an odd number.
    d. The length of the mandrel's barrel section must be equal to at least 75% of the inside diameter of the pipe.
2. Pull/retrieval ropes.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that manholes and piping are ready for testing.

B. Verify that trenches are backfilled.

C. Verify that pressure piping thrust restraint system is installed.

3.2 PREPARATION

A. Lamping:

1. Lamp gravity piping after flushing and cleaning.
2. Perform lamping operation by shining light at one end of each pipe section between manholes.
3. Observe light at other end.
4. Pipe not installed with uniform line and grade will be rejected.
5. Remove and reinstall rejected pipe sections.
6. Reclean and lamp until pipe section is installed to uniform line and grade.

B. Plugs:

1. Plug outlets, wye branches, and laterals.
2. Brace plugs to resist test pressures.

3.3 FIELD QUALITY CONTROL

A. Testing of Gravity Sewer Piping:

1. Low Pressure Air Testing:

a. Test each reach of gravity sewer piping between manholes.
b. Introduce air pressure slowly to approximately 4 psig.

1) Determine ground water elevation above spring line of piping.
2) For every foot of ground water above spring line of piping, increase starting air test pressure by 0.43 psi.
3) Do not increase pressure above 10 psig.

c. Allow pressure to stabilize for at least five minutes.
d. Adjust pressure to 3.5 psig or to increased test pressure as determined above when ground water is present.
e. Testing:

1) Determine test duration for reach of sewer with single pipe size from following table; do not make allowance for laterals.

Pipe Diameter (inches)	Minimum Time (seconds)	Max Length for Min Time (feet)	Time for Longer Length (seconds/foot)
6	340	398	0.855
8	454	298	1.520
10	567	239	2.374
12	680	199	3.419
15	850	159	5.342
18	1020	133	7.693
21	1190	114	10.471
24	1360	100	13.676
27	1530	88	17.309
30	1700	80	21.369
33	1870	72	25.856

2) Record drop in pressure during testing period.
3) If air pressure drops more than 1.0 psi during testing period, piping has failed.
4) If 1.0 psi air pressure drop has not occurred during testing period, piping is acceptable; discontinue testing.
5) If piping fails, test reach of piping in incremental stages until leaks are isolated, repair leaks, and retest entire reach between manholes.

B. Testing of Pressure Piping (waterline and force main):

1. Test system according to AWWA C600 and following:

a. Hydrostatically test each portion of pressure piping, including valved section, at equal to or greater than the pipe's rated pressure (pressure class) unless otherwise specified by engineer.
b. Conduct hydrostatic testing for at least two hours.
c. Slowly fill with water portion of piping to be tested, expelling air from piping at high points.
d. Install corporation cocks at high points.
e. Close air vents and corporation cocks after air is expelled.
f. Raise pressure to specified test pressure.
g. Observe joints, fittings, and valves undergoing testing.
h. Remove and renew cracked pipes, joints, fittings, and valves that show visible leakage.
i. Retest.
j. Correct visible deficiencies and continue testing at same test pressure for additional two hours to determine leakage rate.
k. Maintain pressure within plus or minus 5.0 psi of test pressure.
l. Allowed leakage rate shall not exceed 10 gallons per inch of pipe diameter per mile of pipe per day. Leakage is defined as quantity of water supplied to piping necessary to maintain test pressure during period of testing. Compute maximum allowable leakage using following formula:

L = [**SD x sqrt(P)**]/C
L = testing allowance, gph
S = length of pipe tested, feet
D = nominal diameter of pipe, inches
P = average test pressure during hydrostatic testing, psig
C = 155,400

Note:
1. When pipe undergoing testing contains sections of various diameters, calculate allowable leakage from sum of computed leakage for each pipe size.

2. If testing of piping indicates leakage greater than that allowed, locate source of leakage, make corrections, and retest until leakage is within acceptable limits.
3. Correct visible leaks regardless of quantity of leakage.

C. Deflection Testing of Sanitary Sewer Piping:

1. Perform vertical ring deflection testing on PVC and acrylonitrile butadiene styrene sewer piping after backfilling has been in place for at least 30 days but not longer than 12 months.
2. Allowable maximum deflection for installed plastic sewer pipe is no greater than five percent of original vertical internal diameter.
3. Perform deflection testing using properly sized rigid ball or "go, no go" mandrel.
4. Furnish rigid ball or mandrel with diameter not less than 95 percent of base or average inside diameter of pipe, as determined by ASTM standard to which pipe is manufactured; measure pipe diameter in compliance with ASTM D2122.
5. Perform testing without mechanical pulling devices.
6. Locate, excavate, replace, and retest piping that exceeds allowable deflection.

D. Testing of Manholes:

1. Description:

   a. If air testing, test whenever possible prior to backfilling in order to more easily locate leaks.
   b. Repair both outside and inside of joint to ensure permanent seal.
   c. Test manholes with manhole frame set in place.

2. Vacuum test according to ASTM C1244 and following:

   a. All testing shall conform with TCEQ requirements.
   b. Plug pipe openings; securely brace plugs and pipe.
   c. Inflate compression band to create seal between vacuum base and structure.
   d. Connect vacuum pump to outlet port with valve open, then draw vacuum to 10 in. Hg.
   e. Close valve.
   f. Testing:

      1) Each manhole shall be tested for a minimum of 2 minutes.
      2) Record vacuum drop during test period.
      3) If vacuum drop is greater than 1 in. Hg during testing, repair & retest manhole.
      4) If vacuum drop of 1 in. Hg does not occur during test period, manhole is acceptable; discontinue testing.
      5) If vacuum test fails to meet 1 in. Hg drop in specified time after repair, repair and retest manhole.
      6) Manholes within 9’ of potable water lines must not have any leaks indicated by a drop in pressure of zero.

3. If unsatisfactory testing results are achieved, repair manhole and retest until result meets criteria.

4. Repair visible leaks regardless of quantity of leakage.

END OF SECTION

SECTION 33 11 13 – PUBLIC UTILITY PIPING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Pipe and fittings for public utility lines including waterlines, sanitary sewer lines, and storm sewer lines.
2. Tapping sleeves and valves.
3. Underground pipe markers.

1.2 UNIT PRICE - MEASUREMENT AND PAYMENT

A. All items including but not limited to materials, equipment, overhead, coordination, testing, labor, and supervision required for a complete and operable project shall be included in the bid for the project. All measurement and payment shall be based on the items of work that are specifically listed in the Bid Proposal. Any items not specifically listed in the Bid Proposal shall be considered subsidiary to unit cost items within the Bid Proposal and no additional payment shall be made for subsidiary items.

1.3 REFERENCE STANDARDS

A. American Society of Mechanical Engineers:

1. ASME B16.1 - Gray Iron Pipe Flanges and Flanged Fittings: Classes 25, 125, and 250.

B. ASTM International:

1. ASTM A36 - Standard Specification for Carbon Structural Steel.
2. ASTM A123 - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
3. ASTM A307 - Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60 000 PSI Tensile Strength.
4. ASTM D698 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12 400 ft-lbf/ft3 (600 kN-m/m3)).
5. ASTM D1557 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft3 (2,700 kN-m/m3)).
6. ASTM D1785 - Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80, and 120.
7. ASTM D2241 - Standard Specification for Poly(Vinyl Chloride) (PVC) Pressure-Rated Pipe (SDR Series).
8. ASTM D3035 - Standard Specification for Polyethylene (PE) Plastic Pipe (DR-PR) Based on Controlled Outside Diameter.
9. ASTM D3139 - Standard Specification for Joints for Plastic Pressure Pipes Using Flexible Elastomeric Seals.
10. ASTM D6938 - Standard Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth).
11. ASTM F477 - Standard Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe.

C. American Water Works Association:

1. AWWA C104 - Cement-Mortar Lining for Ductile-Iron Pipe and Fittings.
2. AWWA C105 - Polyethylene Encasement for Ductile-Iron Pipe Systems.
3. AWWA C110 - Ductile-Iron and Gray-Iron Fittings.
4. AWWA C111 - Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings.
5. AWWA C115 - Flanged Ductile-Iron Pipe with Ductile-Iron or Gray-Iron Threaded Flanges.
6. AWWA C151 - Ductile-Iron Pipe, Centrifugally Cast.
7. AWWA C153 - Ductile-Iron Compact Fittings.
8. AWWA C200 - Steel Water Pipe, 6 In. (150 mm) and Larger.
9. AWWA C203 - Coal-Tar Protective Coatings and Linings for Steel Water Pipelines - Enamel and Tape - Hot-Applied.
10. AWWA C205 - Cement-Mortar Protective Lining and Coating for Steel Water Pipe - 4 In. (100 mm) and Larger - Shop Applied.
11. AWWA C206 - Field Welding of Steel Water Pipe.
12. AWWA C207 - Steel Pipe Flanges for Waterworks Service - Sizes 4 In. Through 144 In. (100 mm Through 3,600 mm).
13. AWWA C208 - Dimensions for Fabricated Steel Water Pipe Fittings.
14. AWWA C213 - Fusion-Bonded Epoxy Coating for the Interior and Exterior of Steel Water Pipelines.
15. AWWA C300 - Reinforced Concrete Pressure Pipe, Steel-Cylinder Type.
16. AWWA C301 - Prestressed Concrete Pressure Pipe, Steel-Cylinder Type.
17. AWWA C500 - Metal-Seated Gate Valves for Water Supply Service.
18. AWWA C600 - Installation of Ductile-Iron Mains and Their Appurtenances.
19. AWWA C605 - Underground Installation of Polyvinyl Chloride (PVC) Pressure Pipe and Fittings for Water.
20. AWWA C606 - Grooved and Shouldered Joints.
21. AWWA C700 - Cold-Water Meters - Displacement Type, Bronze Main Case.
22. AWWA C701 - Cold-Water Meters - Turbine Type, for Customer Service.
23. AWWA C702 - Cold-Water Meters - Compound Type.
24. AWWA C706 - Direct-Reading, Remote-Registration Systems for Cold-Water Meters.
25. AWWA C900 - Polyvinyl Chloride (PVC) Pressure Pipe and Fabricated Fittings, 4 In. Through 12 In. (100 mm Through 300 mm), for Water Transmission and Distribution.
26. AWWA C901 - Polyethylene (PE) Pressure Pipe and Tubing, 1/2 In. (13 mm) Through 3 In.(76 mm), for Water Service.
27. AWWA C905 - Polyvinyl Chloride (PVC) Pressure Pipe and Fabricated Fittings, 14 In. Through 48 In. (350 mm Through 1,200 mm) for Water Transmission and Distribution.
28. AWWA M6 - Water Meters - Selection, Installation, Testing, and Maintenance.

D. Manufacturers Standardization Society of the Valve and Fittings Industry:

1. MSS SP-60 - Connecting Flange Joints between Tapping Sleeves and Tapping Valves.

1.4 SUBMITTALS

A. Product Data: Submit data on pipe materials, pipe fittings, valves, and accessories.

B. Shop Drawings: Indicate piping layout, including piping specialties.

C. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

D. Field Quality-Control Submittals: Indicate results of Contractor-furnished tests and inspections.

E. Preconstruction Photographs:

1. Submit digital files of colored photographs of Work areas and material storage areas.

1.5 CLOSEOUT SUBMITTALS

A. Project Record Documents: Record actual locations of piping mains, valves, connections, thrust restraints, and invert elevations.

B. Identify and describe unexpected variations to subsoil conditions or discovery of uncharted utilities.

1.6 QUALITY ASSURANCE

A. Valves: Mark valve body with manufacturer's name and pressure rating.

B. Perform Work according to city standards.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Deliver and store valves in shipping containers with manufacturer's labeling in place and inspect for damage.

B. Block individual and stockpiled pipe lengths to prevent moving.

C. Do not place pipe or pipe materials on private property or in areas obstructing pedestrian or vehicle traffic.

D. Store polyethylene and PVC materials out of sunlight.

E. Do not use chains to handle any PVC materials.

1.8 EXISTING CONDITIONS

A. Field Measurements:

1. Verify field measurements prior to fabrication.
2. Indicate field measurements on Shop Drawings.

PART 2 - PRODUCTS

2.1 WATER AND SANITARY SEWER PIPING

A. Ductile-Iron Pipe:

1. Comply with AWWA C151.
2. Bituminous Outside Coating: Comply with AWWA C151.
3. Pipe Class:

a. Comply with AWWA C151.
b. Class 250.

4. Fittings:

a. Material: Ductile iron, AWWA C110.
b. Compact Fittings: Comply with AWWA C153.
c. Coating and Lining:

5. Joints:

a. Mechanical and Push-on Joints: Comply with AWWA C111.
b. Flanged Joints: Comply with AWWA C115 ASME B16.1.
c. Restrained Joints: Boltless, push-on type, joint restraint independent of joint seal.

6. Jackets: Comply with AWWA C105, polyethylene jacket Double layer, half lapped, 10-mil polyethylene tape.

B. PVC: Waterline less than 4” diameter

1. ASTM D2241 SDR-21 PC200 PVC (no glued pipe allowed). Above ground piping shall be ductile iron for 3” diameter piping and threaded galvanized for less than 3” diameter piping.
2. Color: Blue
3. Fittings: Ductile iron AWWA C110 for 3” diameter pipe and PVC fittings for less than 3” diameter pipe.
4. Joints: Gasket

C. PVC: Waterline 4” through 60”

1. Comply with AWWA C900-16 DR18 PC 235.
2. Color: Blue
3. Fittings: Ductile iron Mechanical joints AWWA C110 compact or full body.
4. Joints:
   a. Comply with ASTM D3139 and ASTM F477.
   b. Seals: PVC flexible elastomeric.
   c. Restrained joints required within all casing pipe or when indicated on drawings.
   d. Solvent-cement couplings are not permitted.
   e. Do not over-insert pipe. Insertion lines should be visible. Spigots shall be pushed into the bells, not vice-versa.

D. PVC: Gravity Sewer and forcemain

1. Forcemain comply with D2241 160 psi pressure rating minimum.
2. Gravity Sewer comply with ASTM D3034, SDR-26 or 160 psig pressure rating.
3. Gravity services shall be minimum 4” diameter.
4. Fittings: Ductile Iron AWWA C110.
5. Color: Green
6. Joints: Gasketed

a. Comply with ASTM D3212 ASTM F1336 for D3034 pipe.
b. Seals: PVC flexible elastomeric.
c. Solvent-cement couplings are not permitted.

E. Steel Pipe:

1. Comply with AWWA C200.
2. Type: Fabricated pipe.
3. Minimum Wall Thickness:

a. Pipe Diameters up to 8 Inches: 0.375 inches.
b. Pipe Diameters Greater than 8 Inches: 0.50 inches.

4. Fittings and Special Sections: Comply with AWWA C208.
5. Flanges:

a. Comply with AWWA C207, Class D.
b. Type: Slip-on.

6. Field Welding Materials:

a. Pipe: Comply with AWWA C206.
b. Joints: Comply with AWWA C205.

7. Interior Cement Mortar Lining: Comply with AWWA C205.
8. Buried Steel Pipe Exterior Lining:

a. Comply with AWWA C213; fusion-bonded epoxy coating.

F. Concrete Pipe:

1. Comply with AWWA C301.
2. Type: Prestressed concrete cylinder pipe.
3. Fittings:

a. Comply with AWWA C300.
b. Provide adaptors for concrete-to-iron pipe connections.

4. Joints:

a. Comply with AWWA C300.
b. Type: Rubber gasket.

5. Exterior Mortar Coating: Comply with AWWA C301.

G. Polyethylene Pipe:

1. Comply with AWWA C901.
2. Fittings:

a. Comply with AWWA C901.
b. Type: Molded.

3. Joints: Butt fusion.

H. Pipe Insulation: All above ground or exposed piping must be insulated.
1. Minimum 1.5” thick pre-formed 3 LB density fiberglass insulation (Owen’s Corning or John Manville) covered with aluminum jacket. Seams in aluminum jacket will be sealed with silicone caulk or other approved water proof compound. All exposed penetrations through the fiberglass insulation shall be sealed with a barrier mastic such as Cholders CP-11 or approved equal.

2.2 STORM SEWER PIPING

A. Reinforced Concrete Pipe:

1. Comply with ASTM C76. Minimum Class III with Wall Type A unless otherwise noted in plans. Mesh or Bar reinforced.
2. Fittings: Reinforced Concrete
3. Joints: Comform to ASTM C443 rubber compression gasket.

B. Polyethylene Pipe: N-12 WT IB Pipe

1. Manufacturer: ADS Pipe or prior approved equal
2. Pipe: Comply with ASTM F2648
3. Joint: Bell and Spigot with gasket for water tight connection.

    a. Comply with ASTM 3212 and ASTM C969

4. Only allowed in no traffic areas. Areas of traffic or beneath roadways will require reinforced concrete pipe.

2.3 TAPPING SLEEVES AND VALVES

A. Tapping Sleeves:

1. Manufacturers:

    a. Furnish materials according to city standards.

2. Description:

    a. Material: Ductile iron or cast iron.
    b. Type: Dual compression.
    c. Outlet Flange Dimensions and Drilling: Comply with ASME B16.1, Class 250 and MSS SP-60.

B. Tapping Valves:

1. Manufacturers:

    a. Furnish materials according to city standards.

2. Description:

    a. Comply with AWWA C500.
    b. Type: Double disc with non-rising stem.
    c. Inlet Flanges: Comply with ASME B16.1, Class 250 and MSS SP-60.
    d. Mechanical Joint Outlets: Comply with AWWA C111.

3. Mark manufacturer's name and pressure rating on valve body.

2.4 VALVES AND FIRE HYDRANTS

A. Valves: As specified in Section 40 05 23.15 – Resilient Seated Gate Valves.

B. Fire Hydrants: As specified in Section 33 12 19 - Water Utility Distribution Fire Hydrants.

2.5 AIR RELEASE VALVES

A. Description: Cast-iron body, stainless-steel float. Sized and manufacturer according to plan drawings.

2.6 COMBINATION AIR VALVES (FORCE MAIN)

A. Manufacturer: A.R.I. or approved equal.
   1. Must have minimum 10 years experience in manufacturing of air valves for waste water applications.
   2. Must have ISO 9001 and ISO 14001 certifications.

B. Description: Combination Air Valves designed for wastewater force main operation. Model D-025L or approved equal.
   1. Conical shapped with a double float design.
   2. Rolling seal design with drip tight sealing at operating pressures as low as 3 psi
   3. Valve shall include two ball valves and a 1 ½" male NPT camlock connection at its outlet.
   4. Operating pressure range of 3 to 250 psi.
   5. Body and lower flange shall be reinforced nylon. Upper float shall be solid polypropylene.
   6. All metal hardware shall be 316 stainless steel.
   7. Installed per manufacturer's specifications with a written 5 year warranty.

2.7 UNDERGROUND PIPE MARKERS

A. Tracer Wire and Warning Tape: (1 foot above pipe).

   1. Tracer wire, required on all waterlines only, shall be blue THHN #14 AWG solid copper, high strength with minimum 20 mil insulation.
   2. Warning Tape: 0.5" wide layer of aluminum foil bonded between two pieces of polyethylene film. Required on all piping. Dimensions shall not be less than 5.5 mils thick or 2" wide.
      a. Sanitary sewer shall be green and shall have the wording "Caution Sanitary Sewer Line Buried Below".
      b. Waterlines shall be blue and shall have the wording "Caution Waterline Buried Below"

2.8 PIPE SUPPORTS AND ANCHORING

A. Metal for Pipe Support Brackets: Structural steel galvanized thoroughly coated with bituminous paint.

B. Metal Tie Rods and Clamps or Lugs: Galvanized steel sized according to NFPA 24, thoroughly coated with bituminous paint.

2.9 CONCRETE ENCASEMENT AND CRADLES

A. Concrete:

   1. As specified in Section 03 30 00 - Cast-in-Place Concrete.
   2. Reinforced
   3. Compressive Strength: 3,600 psi at 28 days.
   4. Finish: Rough troweled.

B. Concrete Reinforcement: As specified in Section 03 20 00 - Concrete Reinforcing.

2.10 FINISHES

A. Steel: Hot-dip galvanized after fabrication, according to ASTM A123.

2.11 ACCESSORIES

A. Concrete for Thrust Restraints: As specified in Section 03 30 00 - Cast-in-Place Concrete.

B. Bolt, Lugs, and Brackets: Stainless Steel

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that existing utility water main size, location, and invert are as indicated on Drawings.

3.2 PREPARATION

A. Preconstruction Site Photos:

1. Take photographs along centerline of proposed pipe trench; minimum one photograph for each 50 feet of pipe trench.
2. Show mailboxes, curbing, lawns, driveways, signs, culverts, and other existing Site features.
3. Include Project description, date taken, and sequential number on back of each photograph.

B. Pipe Cutting:

1. Cut pipe ends square, ream pipe and tube ends to full pipe diameter, and remove burrs.
2. Use only equipment specifically designed for pipe cutting; use of chisels or hand saws is not permitted.
3. Grind edges smooth with beveled end for push-on connections.

C. Remove scale and dirt on inside and outside before assembly.

D. Prepare pipe connections to equipment with flanges or unions.

3.3 INSTALLATION

A. Existing Utilities & structures:

1. Utilities shown on plans were taken from field surveys following a utilities locate call by the engineer. The completeness of the accuracy of this data is not guaranteed. The contractor is responsible for verifying the location and depth of all underground utilities and structures and protecting them from damage during construction. Any damage to existing utilities that are caused by the contractor's operations shall be repaired by the

contractor. Repairs will be made immediately and entirely at the contractor's expense. Texas 811 at least 48 hours before soil disturbing activities.

2. All structures damaged to facilitate construction including but not limited to roads, sidewalks, driveways, culverts, fences, retaining walls, pipes, street signs, traffic control devices, etc. will be repaired immediately. This work will be considered subsidiary to the unit prices in the bid form.
3. Contractor shall remove and reset mailboxes, yard lights, sprinkler systems, planters, etc. as required to facilitate line installation. This work will be considered subsidiary to the unit prices in the bid form.
4. Contractor shall protect/shore all existing structures from damage including retaining walls and foundations.
5. Existing waterlines shall remain in service during construction. Water shall be turned off for the tie-ins at a schedule which limits service loss to the greatest extent possible. All down time shall be scheduled with the engineer and approved by the city. Whenever possible, tie-ins shall be installed through use of tapping sleeves, in order to limit service loss. The contractor shall give 24 hr notice to all affected customers. Notice shall be in the form of a pre-approved door hanger listing the time of service loss, a 24 hour phone number, and an estimated time of restored service. The contractor shall not leave the jobsite until all services are restored. Specific areas requiring shutdown of large service areas or sensitive customers may require off peak work (night or weekend). A minimum 72 hour notice will be required to schedule this work.
6. Sewer lines shall remain in service during construction. Contractor shall be responsible for construction sequencing and/or bypass pumping as required to provide uninterrupted service.
7. City utility department will be responsible for operating all existing valves as necessary. Contractor shall not operate any valves without city approval.
8. Contractor may be required to locate existing utilities by excavation an "pot-holing." This work will be considered subsidiary to the unit prices in the bid form.

B. Bedding:

1. Excavation:

   a. Excavate pipe trench per OSHA requirements.
   b. Hand trim excavation for accurate placement of pipe to elevations as indicated on Drawings.

2. Dewater excavations to maintain dry conditions and to preserve final grades at bottom of excavation.
3. Provide sheeting and shoring as needed.
4. Place bedding material at trench bottom, level fill materials in one continuous layer not exceeding 8 inches compacted depth, and compact to 90 percent strandard proctor maximum density.

C. Service Connections

1. Water and sanitary sewer services shown are existing locations identified during a field survey. All water and sanitary sewer services, including but not limited to: new services to be reconnected, and existing services to be relocated, that do not conform with city standards, shall be installed in accordance with water service installation details.
2. In multiple locations, existing meters are cast in pavement structures. This may include concrete, HMAC, or brick. All necessary pavement cuts to make connections to these meters will be made with clean saw cut lines, and pavement structure shall be repaired after connection to new service line.
3. Contractor shall furnish and install new service lines from connection all the way to the meter including coppersetter and connect to existing water service line. If meter box is

damaged or made of corrugated metal or concrete, it shall be replaced. Faulty or damaged meters shall be replaced. All required meters shall be provided by the city and installed by the contractor. Contractor shall purchase and install the meter boxes. Replaced water meters are to be tagged with location and turned in to the city

D. General Piping Installation:

1. Install pipe according to AWWA C600 of AWWA C605. All utility lines must be installed in accordance with the TCEQ standards.
2. Field verify exact locations and depth of all existing utilities and structures prior to beginning soil disturbing activities. All crossing waterlines are to be connected to the proposed waterlines. Any utilities found that are not shown in the plans shall be reported to the engineer immediately.
3. Handle and assemble pipe according to manufacturer instructions and as indicated on Drawings. Chains will not be allowed to move and place piping.
4. Where existing utilities are encountered, separation distances as stipulated by the TCEQ shall be maintained. The contractor shall immediately notify the engineer of any conflict between existing utility lines and proposed utility lines. There shall be a minimum of 9' horizontal separation between all water and wastewater lines. Where the nine foot separation distance cannot be achieved, the following criteria shall apply. (A) parallel lines where a potable waterline parallels a wastewater line and the wastewater line is not leaking, the potable waterline shall be located at least two feet above the wastewater line, measured vertically, and at least four feet away measured horizontally, from the wastewater line. Every effort shall be exerted not to disturb the bedding and backfill of the existing line, (B) Crossing line where a potable waterline crosses a non-pressure rated wastewater line, one segment of the waterline pipe shall be centered over the wastewater line such that the joints of the waterline pipe are equidistant and at least nine feet horizontally from the centerline of the wastewater line.
5. Contractor shall not be authorized to proceed until all necessary state and local permits are obtained.
6. Contractor shall keep all equipment, pipe, materials, etc. off private property and in city easements.
7. Contractor shall not close any streets without prior approval from engineer and city. Streets shall remain passable to residents at all time. Contractor shall notify emergency services and school district 48 prior to closing any streets. If street is closed during a normal trash pickup day, contractor shall collect trash from residences and deliver to a spot that local sanitation can pick up. In instances where construction is taking places in streets, streets shall be backfilled and made passable at end of each day. Contractor to provide traffic control and maintain traffic control signage in accordance with TMUTCD.
8. Access to driveways and mailboxes shall be preserved throughout the construction process. Disturbed mailboxes shall be set in 5 gal. buckets of gravel for temporary use and ease of relocation. No driveway shall be obstructed without the prior approval of the engineer. (24 hr. notice will be required for consideration.)
9. Material testing shall be performed by and independent testing laboratory and paid for by the city. The contractor shall be responsible for all fees for re-testing and re-inspecting due to failed test of workmanship or materials.

E. Water Piping Installation

1. Existing waterlines to be taken out of service shall be cut, capped, and abandoned in place. All existing gate valves located on abandoned waterlines shall be taken out of service by using one of the following methods.

    a. If existing valve is located near area where existing line is to be cut, capped, and abandoned in place, the gate valve shall be removed.

b. If existing valve is located in pavement, or not in an area not immediately adjacent to a spot where the existing waterline is to be unearthed and taken out of service, the contractor shall fill valve flush with 4,000 psi grout and abandoned in place.

2. Install ductile-iron piping and fittings according to AWWA C600.
3. Route pipe in straight line; re-lay pipe that is out of alignment or grade.
4. High Points:

   a. Install pipe with no high points.

5. Bearing:

   a. Install pipe to have bearing along entire length of pipe.
   b. Excavate bell holes to permit proper joint installation.
   c. Do not lay pipe in wet or frozen trench.

6. Prevent foreign material from entering pipe during placement.
7. Install pipe to allow for expansion and contraction without stressing pipe or joints.
8. Close pipe openings with watertight plugs during Work stoppages.
9. Install access fittings to permit disinfection of water system.

10. Cover:

    a. Measure depth of cover from final surface grade to top of pipe barrel.
    b. Minimum cover for water lines is dependent on line diameter size described below or as required to clear existing utilities, whichever is greater.

       1) 8” or smaller =4’ cover
       2) 10-12” = 4.5-5.0’
       3) 16” or greater = 6.0’

11. Pipe Markers:

    a. Install trace wire continuous over top of pipe buried 6 to 12 inches above piping.
    b. Installation Standards: Install Work according to city standards.

12. Tracer wire shall be brought up into each cleanout or manhole for sewer lines and each valve box on waterlines

F. Sanitary Sewer Piping Installation

1. Separation distances as described above must be maintained according to TCEQ standards.
2. Proposed sewer lines replacing existing sewer lines shall be installed to match existing sanitary sewer grades as called out on plans. Contractor shall field verify all existing grades prior to construction.
3. The contractor shall install and maintain water tight plugs in all connections to the city’s sanitary sewer system until the project is accepted by the city.
4. All sanitary sewer piping shall be tested and tv inspected per the technical specifications.
5. Minimum cover for all sanitary sewer piping shall be 5 feet beneath street and 3.5 feet for all other locations (unless otherwise noted on plans).
6. Existing manholes and sewer lines to be abandoned shall be plugged with Class B concrete and abandoned in place.
7. Service taps shall be adjusted as necessary with new cleanouts and connected to new sewer line in accordance with the plans and specifications.
8. Sanitary sewer service lines shall be:

a. Installed on a constant downhill slope of a ¼" per foot (2%), or greater, from the cleanout to the city's sewer main.
b. Installed with a minimum cover of 36"
c. Tested for leakage with air or water prior to backfilling and prior to connection to the city sewer main.
d. Installed with strict accordance with the pipe manufacturer's recommendations. Cleanouts shall be installed at all bends, and at the property line.
e. Contractor shall reconnect all existing service connections to new sanitary sewer in accordance with details and specs.

9. Unless specifically detailed on plans, all piping interconnections and connections to structures shall match flowline to flowline.

G. Storm Sewer Piping Installation

1. Unless specifically detailed on plans, all piping interconnections and connections to structures shall match soffit to soffit.
2. Storm Sewer lines shall be installed to match grades as called out on plans. Contractor shall field verify all existing grades prior to construction.
3. Existing storm sewer lines to be abandoned shall be plugged with Class B concrete and abandoned in place.
4. Storm sewer lines shall be:

a. Installed on a constant downhill slope.
b. Installed with strict accordance with the pipe manufacturer's recommendations.
c. Contractor shall reconnect all existing interconnections to new storm sewer at constant slope with matching soffits.

5. All storm sewer shall be TV inspected upon completion.

H. Polyethylene Encasement:

1. Encase all ductile iron, cast iron, steel fittings or piping in polyethylene to prevent contact with surrounding backfill material.
2. Comply with AWWA C105.
3. Terminate encasement 3 to 6 inches above ground where pipe is exposed.

I. Thrust Restraints: For waterline piping only.

1. Provide valves, tees, bends, caps, and plugs with concrete thrust blocks.
2. Pour concrete thrust blocks against undisturbed earth.
3. Locate thrust blocks at each elbow or change of pipe direction to resist resultant force and to ensure that pipe and fitting joints will be accessible for repair.
4. Install tie rods, clamps, setscrew retainer glands, or restrained joints.
5. Protect metal-restrained joint components against corrosion by applying poly-wrap.
6. Do not encase pipe and fitting joints to flanges.
7. Install thrust blocks, tie rods, and joint restraint at dead ends of water main.

J. Backfilling:

1. Backfill around sides and to top of pipe with cover fill in minimum lifts of 8 inches, tamp in place, and compact to 90 percent standard proctor maximum density.
2. Place and compact material immediately adjacent to pipes to avoid damage to pipe and prevent pipe misalignment.

3. Maintain optimum moisture content of bedding material to attain required compaction density.

K. Disinfection of Potable Water Piping System:

1. As specified in AWWA B300 and AWWA C651.

3.4 TOLERANCES

A. Install pipe to indicated elevation within tolerance of 5/8 inch.

3.5 FIELD QUALITY CONTROL

A. Test piping in accordance with “33 01 30.13 – Pipe and Manhole Testing” and “33 01 30.16 – TV Inspection of Sanitary and Storm Sewer”.

B. Compaction Testing per “Section 31 23 17 – Trenching”

C. All utility installations, connections, and structures shall not be backfilled prior to inspection by the owner or engineer.

D. If tests indicate Work does not meet specified requirements, remove Work, replace, and retest.

END OF SECTION

SECTION 40 05 23.16 – SWING-CHECK VALVES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
1. Swing Check Valve- Sewage service, plant water, potable water, hot and cold water service.
2. Tilting Disc Check Valve- Potable Water.
3. Wafer Type Check Valve, Dual Plate- Air and potable water.
4. Rubber Lined Swing Check Valve- Carbon Slurry.
5. Ball Check Valve- Acids and Chlorine
6. Slanting Disc, Cushion Check Valve
7. Resilient Seated Check Valve- Sewage service, plant water, potable water

1.2 REFERENCE STANDARDS

A. American Society of Mechanical Engineers:

1. ASTM A126 - Standard Specification for Gray Iron Castings for Valves, Flanges, and Pipe Fittings.
2. ASTM B584 - Standard Specification for Copper Alloy Sand Castings for General Applications.

B. American Water Works Association:

1. AWWA C508-17 – Swing-Check Valves for Waterworks Service

1.3 SUBMITTALS

A. The following information shall be provided for all valves for installation on the project. Each valve shall be clearly identified with mark, size, type, location, quantity, etc. as required to facilitate review of the submittal.

B. Three copies of instructions, parts manual, spare parts list, maintenance procedures and shop drawings showing dimensions, weight and material specifications of each size and type of valve shall be submitted for approval by the Engineer.

C. Product Data:

1. Submit catalog information, indicating materials of construction and compliance with indicated standards.

D. Source Quality-Control Submittals: Indicate results of shop or factory tests and inspections.

PART 2 - PRODUCTS

2.1 SWING-CHECK VALVES

A. Manufacturers:

1. Swing Check Valve - Crane, Mueller, Dresser, Stackham, Val-Matic or equal.
2. Tilting Disc Check Valve - Val-Matic, APCO or equal.
3. Wafer Type Check Valve, Dual Plate - Val-Matic, TRW, APCO or equal.
4. Rubber Lined Swing Check Valve- American Darling or approved equivalent.
5. Ball Check Valve.
6. Slanting Disc, Cushioned Check Valves - Slanting disc cushioned check valve shall be valve body, made of cast iron (ASTM A48 Class 30) and disc shall be made of centrifugally cast bronze seat and disc rings. Valve shall have centrifugally cast aluminum pivot pins (ASTM B148-9D) having a Brinell hardness of 200, used in conjunction with centrifugally cast aluminum bronze bushing (ASTM B-143-9C) having a Brinell hardness of 159 to insure maximum wear resistance and prevent galling. The valve shall have bottom mounted buffer used for water filled cylinder. The valve shall have free opening non-slam closing control equipment.
7. Resilient Seated Check Valve - Body shall be ductile iron per ASTM A-536, and rated for 250 psi working pressure. Disc shall be ductile iron fully encapsulated with rubber with nylon reinforcement and stainless steel shaft. Disc shall travel to closure no more than 35 degrees and shall seat drip tight at pressures above 5 psi. Valves shall be fusion bonded epoxy coated on all internal and external surfaces. Outside lever and spring NOT ALLOWED. Valve shall be equipped with external open/closed indicator. American Flow Control, Mueller, or approved equal.
8. Furnish materials according to city standards.

B. Description:

1. AWWA C508.
2. Minimum Working Pressure: 150 psig at 150 degrees F.
3. Maximum Fluid Temperature: 150 degrees F.
4. End Connections: As needed flanged or mechanical joint.
5. Provide gear actuators conforming to AWWA C508 for manual valves.

C. Operation:

1. Non-rising stem.

D. Materials unless otherwise indicated on drawings:

1. All valves shall be painted in conformance with AWWA C-508 Section 3.11, or latest revision.

2.2 SOURCE QUALITY CONTROL

A. Testing: Test check valves according to AWWA C508.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install according to manufacturer's instructions.

B. Valves shall be installed with proper support and shall not carry the weight of adjacent piping. Dashpots and weights shall be adjusted for proper operation. All shaft seal shall be checked for leakage and adjusted as required.

END OF SECTION

SECTION 40 05 23.17 – PLUG VALVES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Plug Valves

1.2 REFERENCE STANDARDS

A. American Society of Mechanical Engineers:

   1. ASTM A126 - Standard Specification for Gray Iron Castings for Valves, Flanges, and Pipe Fittings.
   2. ASTM B584 - Standard Specification for Copper Alloy Sand Castings for General Applications.

B. American Water Works Association:

   1. AWWA C517-16 – Resilient-Seated Cast-Iron Eccentric Plug Valves

1.3 SUBMITTALS

A. The following information shall be provided for all valves for installation on the project. Each valve shall be clearly identified with mark, size, type, location, quantity, etc. as required to facilitate review of the submittal.

B. Three copies of instructions, parts manual, spare parts list, maintenance procedures and shop drawings showing dimensions, weight and material specifications of each size and type of valve shall be submitted for approval by the Engineer.

C. Product Data:

   1. Submit catalog information, indicating materials of construction and compliance with indicated standards.

D. Source Quality-Control Submittals: Indicate results of shop or factory tests and inspections.

PART 2 - PRODUCTS

2.1 PLUG VALVES

A. Manufacturers:

   1. Plug valves shall be Dezurik, Keystone, Val-matic or approved equivalent.
   2. Furnish materials according to city standards.

B. Description:

1. AWWA C517
2. Minimum Working Pressure: 150 psig at 150 degrees F for both the direct and reverse side of the valve.
3. Maximum Fluid Temperature: 200 degrees F.
4. End Connections: As needed flanged or mechanical joint.
5. Provide gear actuators conforming to AWWA C508 for manual valves.
6. Plug valves must be capable of sealing flow from both sides of the valve (direct and reverse sides).

C. Operation:

1. Non-rising stem.

D. Materials unless otherwise indicated on drawings:

1. Plug valves shall be of the non-lubricated, eccentric type with resilient face plugs with flanged ends for pump stations and mechanical joint for buried service.
2. Port areas of valves shall be at least 80% of full pipe area.
3. Bodies shall be ductile iron with seats. Seats in 4" and larger valves shall have a welded-in overlay of not less than 90% pure nickel content on all surfaces contacting the plug face plug.
4. Valves shall have permanently lubricated stainless steel bearings in the upper and lower plug stem journals.
5. All plug valves shall be of the bolted bonnet design. All 4" and larger valves shall be designed so that they can be repacked without removing the bonnet and the packing shall be adjustable.
6. All nuts, bolts, washers, and springs for exposed valves located in finished piping of pump stations shall be zinc plated. Flanged valves shall be faced and drilled to ANSI 125/150 pound standard. Flanges of valves through 12" shall have face-to-face dimensions of standard gate valves.
7. Resilient plug facings shall be of neoprene, suitable for use with sanitary sewage. The interference between the plug face and the body seat, with the plug in the closed position, shall be externally adjustable in the field with the valve in line under pressure.
8. Plug valves shall have lever or gear actuators and tee wrenches, extension stems, etc., as required for either submerged or exposed service.
9. All valves 6" and larger shall be equipped with gear actuators. All gearing shall be enclosed in a ductile iron housing and shall be suitable for running in a lubricant with seals provided on all shafts to prevent entry of dirt and water into the actuator.
10. The actuator shaft and the quadrant shall be supported on permanently lubricated bronze bearings. Actuators shall clearly indicate valve position and an adjustable stop shall be provided to set closing torque.
11. Valves and gear actuators for buried or submerged service shall have seals on all shafts and gaskets on the valve and actuator covers to prevent the entry of water. Actuator mounting brackets for buried or submerged service shall be totally enclosed and shall have gasket seals.
12. All exposed nuts, bolts, springs, and washers shall be stainless steel.

2.2 SOURCE QUALITY CONTROL

A. Testing: Test plug valves according to AWWA C517.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install according to manufacturer's instructions.

B. Valves shall be installed with proper support and shall not carry the weight of adjacent piping.

C. All shaft seal shall be checked for leakage and adjusted as required.

D. Install per detail shown on plans. If detail is not provided, the contractor shall install a 2’ x 2’ x 6” concrete (w/ #3 rebars) valve pad flush with the top of the valve box on grade to allow for easy mowing.

END OF SECTION

SECTION 40 05 23.18 – TELESCOPING (SLIP SEAL) VALVES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Telescoping valves are used primarily for sludge removal, or liquid level control, and are considered to be fully open when in the lowermost position. The valve tube travels inside a cast iron or ductile iron riser pipe as shown in the plan drawings. The normal riser pipe diameter determines the valve tube diameter. Vee notch, flared, or baffled tube tops shall be provided when required by the plan drawings.

1.2 SUBMITTALS

A. The following information shall be provided for all valves for installation on the project. Each valve shall be clearly identified with mark, size, type, location, quantity, etc. as required to facilitate review of the submittal.

B. Three copies of instructions, parts manual, spare parts list, maintenance procedures and shop drawings showing dimensions, weight and material specifications of each size and type of valve shall be submitted for approval by the Engineer.

C. Product Data:

   1. Submit catalog information, indicating materials of construction and compliance with indicated standards.

D. Source Quality-Control Submittals: Indicate results of shop or factory tests and inspections.

PART 2 - PRODUCTS

2.1 TELESCOPING VALVES

A. Manufacturers:

   1. Telescoping Valve – Telescoping valve shall be as manufactured by Waterman Industries, Inc., Online Engineering, or equal.

B. Materials unless otherwise indicated on drawings:

   1. Tube (metal)
      a. 304 Stainless steel tubes up through 24” size shall be manufactured from seamless pipe or tube.
      b. Tube lengths shall be as shown or noted on the drawings and must be of sufficient length to facilitate valve travel and maintain an appropriate insert depth.
      c. Valve tubes are to be a minimum 1/8” thick and are attached to connecting stems by use of a lifting bail.

2. Seal Flange
   a. A stainless steel companion flange and neoprene slip seal gasket shall be provided by the valve manufacturer. The gasket must be a minimum ¼" thick.
   b. The inside diameter of the gasket is to be 1/8" smaller than the outside diameter of the valve tube to provide a friction seal.
   c. The gasket is to be sandwiched between the riser pipe flange and the companion flange. The gasket and companion flange shall include a 125# standard drilling pattern to match the riser pipe.

3. Lifting Bail
   a. The bail shall be the same material as the tube and be rigidly welded to the tube.

4. Lift and Stems (Rising)
   a. Lifts shall be handwheel type, with UHMW polyethylene thrust bearings along with a stub acme threaded type 304 stainless steel stem to provide automatic self-locking, infinite valve positioning.
   b. The standard rising stem lift shall use a square tube with torque nut design to prevent telescoping valve tube rotation. Alternately, where conditions require, a vee keyed shaft, with torque plate, shall be used to prevent valve tube rotation.
   c. Handwheels shall be 304 stainless steel and be a minimum of 12" in diameter and shall include a clear plastic Butyrate stem cover with a mylar strip type position indicator, calibrated in ¼ inch increments to illustrate valve position.
   d. The mylar strip, provided by the manufacturer, will be affixed by the contractor after installation to provide a true and accurate indication of the tube elevation by comparing it to the top of the rising stem.
   e. Stainless steel anchor bolts shall be provided for all pedestals. Cleaning and shop prime coat of lift housing and handwheel will be (as specified elsewhere in this specification) (manufacturer's standard).

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install according to manufacturer's instructions.

B. Valves shall be installed with proper support and shall not carry the weight of adjacent piping. Dashpots and weights shall be adjusted for proper operation. All shaft seal shall be checked for leakage and adjusted as required.

END OF SECTION

SECTION 40 05 23.15 – RESILIENT SEATED GATE VALVES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Resilient-seated gate valves.

1.2 REFERENCE STANDARDS

A. American Society of Mechanical Engineers:

1. ASTM A126 - Standard Specification for Gray Iron Castings for Valves, Flanges, and Pipe Fittings.
2. ASTM B584 - Standard Specification for Copper Alloy Sand Castings for General Applications.

B. American Water Works Association:

1. AWWA C509 - Resilient-Seated Gate Valves for Water Supply Service.

1.3 SUBMITTALS

A. Product Data:

1. Submit catalog information, indicating materials of construction and compliance with indicated standards.

B. Source Quality-Control Submittals: Indicate results of shop or factory tests and inspections.

PART 2 - PRODUCTS

2.1 RESILIENT-SEATED GATE VALVES

A. Manufacturers:

1. Mueller, Golden Anderson, J&S or approved equal
2. Furnish materials according to city standards.

B. Description:

1. AWWA C509.
2. Minimum Working Pressure: 150 psig at 150 degrees F.
3. Maximum Fluid Temperature: 150 degrees F.
4. End Connections: As needed flanged or mechanical joint.
5. Provide gear actuators conforming to AWWA C509 for manual valves.

C. Operation:

1. Non-rising stem.

D. Materials unless otherwise indicated on drawings:

1. Wedge: Resilient ASTM A126, cast iron, fully encapsulated with Buna-N.
2. Body and Disc: ASTM A536, ductile iron, Buna-N coated.
3. Stem, Stem Nuts, Glands, and Bushings: ASTM B584, bronze.
4. Connecting Hardware: Type 316 stainless steel.
5. Valve Box – Adjustable cast iron.
6. 2'x2'x6" concrete valve pad.
7. All valve covers shall clearly identify the type of valve; ie: water, sewer, or forcemain.

2.2 SOURCE QUALITY CONTROL

A. Testing: Test gate valves according to AWWA C509.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install according to manufacturer's instructions.

B. Support valves in plastic piping to prevent undue stresses on piping.

C. Install per detail shown on plans. If detail is not provided, the contractor shall install a 2' x 2' x 6" concrete (w/ #3 rebars) valve pad flush with the top of the valve box on grade to allow for easy mowing.

END OF SECTION

CITY OF ENNIS, TEXAS

WTP LAGOON UPGRADES

CITY OF ENNIS:

ENNIS TEXAS
The bluebonnet spirit of Texas

MAYOR:
ANGELINE JUENEMANN

MAYOR PRO TEM:
JAKE HOLLAND

COMMISSIONER WARD 1:
ROWDY PRUITT

COMMISSIONER WARD 2:
BRUCE JONES

COMMISSIONER WARD 3:
KAMERON RABURN

COMMISSIONER WARD 4:
SHIRLEY WATSON

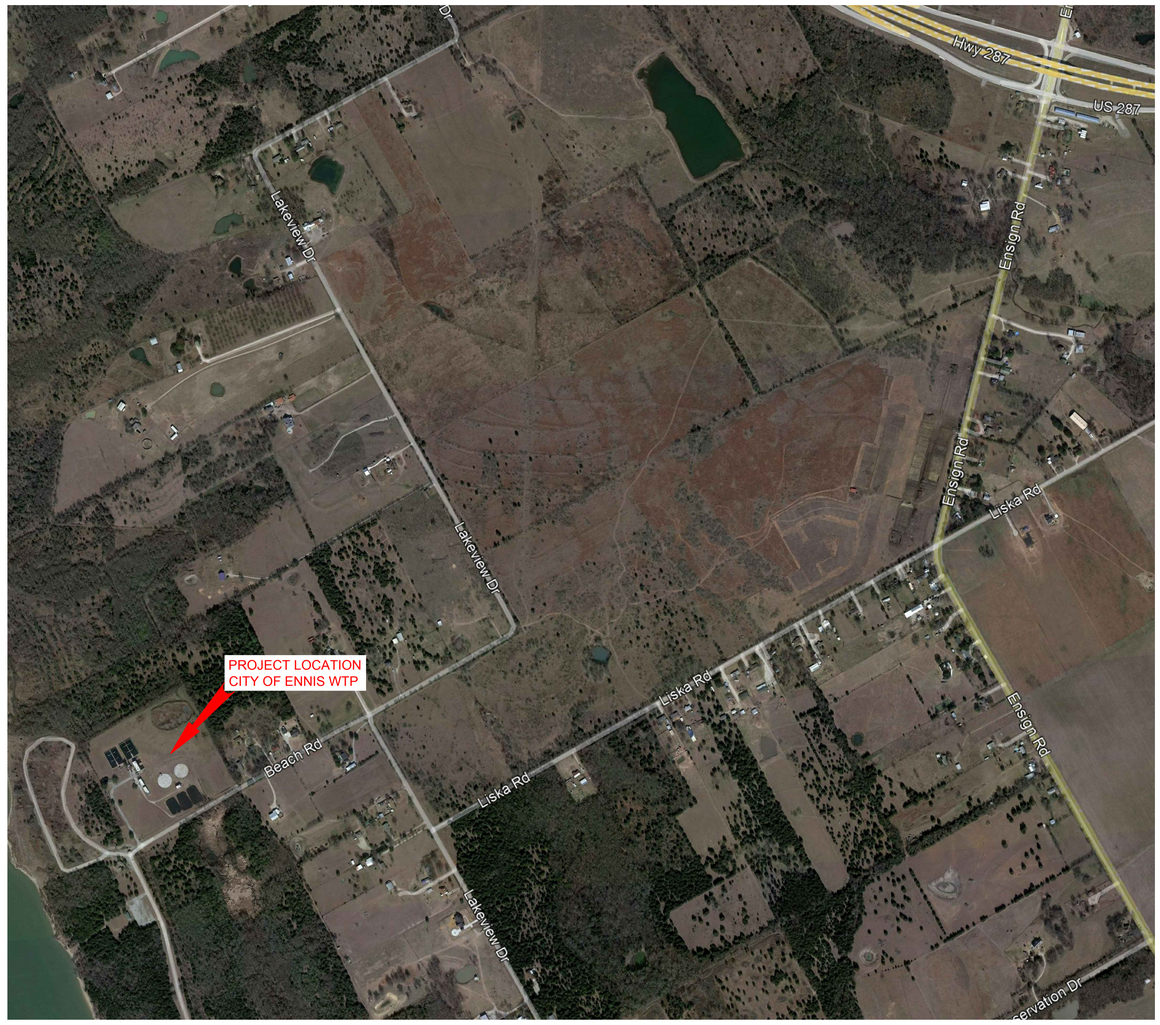
COMMISSIONER WARD 5:
BILL HONZA

CITY MANAGER
MARTY NELSON

DIRECTOR OF PUBLIC WORKS:
ED GREEN, P.E.

SHEET INDEX:

LOCATION MAP:



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STATE OF TEXAS
JEREMY P. BUECHTER
92554
LICENSED PROFESSIONAL ENGINEER
03/30/2023

ENNIS TEXAS
The bluebonnet spirit of Texas

WTP LAGOON UPGRADES

COVER SHEET AND SHEET INDEX

REVISIONS:

PLANS ARE FORMATTED FOR 22"X34" PLAN SHEETS. IF PRINTED ON 11"X17" SHEETS THE SCALES ARE HALF THE SIZE NOTED.

BEFORE YOU DIG Texas811.com

DRAWN BY:
N. UNDERWOOD

REVIEWED BY:
J. BUECHTER

PROJECT NO:
923239.00

SHEET NO:
1

FILENAME: X:\CLIENTS\ENNIS-CITY OF\923239.00 WTP INTAKE AND LAGOONS\CAD\00-LAGOON BID PACKAGE\01-COVER.DWG PLOT DATE: 4/4/2023 11:26 AM

TCEQ WATER DISTRIBUTION SYSTEM - GENERAL CONSTRUCTION NOTES

1. THIS WATER DISTRIBUTION SYSTEM MUST BE CONSTRUCTED IN ACCORDANCE WITH THE CURRENT TEXAS COMMISSION ON ENVIRONMENTAL QUALITY (TCEQ) RULES AND REGULATIONS FOR PUBLIC WATER SYSTEMS 30 TEXAS ADMINISTRATIVE CODE (TAC) CHAPTER 290 SUBCHAPTER D. WHEN CONFLICTS ARE NOTED WITH LOCAL STANDARDS, THE MORE STRINGENT REQUIREMENT SHALL BE APPLIED. CONSTRUCTION FOR PUBLIC WATER SYSTEMS MUST ALWAYS, AT A MINIMUM, MEET TCEQ'S "RULES AND REGULATIONS FOR PUBLIC WATER SYSTEMS.
2. AN APPOINTED ENGINEER SHALL NOTIFY IN WRITING THE LOCAL TCEQ'S REGIONAL OFFICE WHEN CONSTRUCTION WILL START. PLEASE KEEP IN MIND THAT UPON COMPLETION OF THE WATER WORKS PROJECT, THE ENGINEER OR OWNER SHALL NOTIFY THE COMMISSION'S WATER SUPPLY DIVISION, IN WRITING, AS TO ITS COMPLETION AND ATTEST TO THE FACT THAT THE WORK HAS BEEN COMPLETED ESSENTIALLY ACCORDING TO THE PLANS AND CHANGE ORDERS ON FILE WITH THE COMMISSION AS REQUIRED IN 30 TAC §290.39(H)(3).
3. ALL NEWLY INSTALLED PIPES AND RELATED PRODUCTS MUST CONFORM TO AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)/NSF INTERNATIONAL STANDARD 61 AND MUST BE CERTIFIED BY AN ORGANIZATION ACCREDITED BY ANSI, AS REQUIRED BY 30 TAC §290.44(A)(1).
4. PLASTIC PIPE FOR USE IN PUBLIC WATER SYSTEMS MUST BEAR THE NSF INTERNATIONAL SEAL OF APPROVAL (NSF-PW) AND HAVE AN ASTM DESIGN PRESSURE RATING OF AT LEAST 150 PSI OR A STANDARD DIMENSION RATIO OF 26 OR LESS, AS REQUIRED BY 30 TAC §290.44(A)(2).
5. NO PIPE WHICH HAS BEEN USED FOR ANY PURPOSE OTHER THAN THE CONVEYANCE OF DRINKING WATER SHALL BE ACCEPTED OR RELOCATED FOR USE IN ANY PUBLIC DRINKING WATER SUPPLY, AS REQUIRED BY 30 TAC §290.44(A)(3).
6. WATER TRANSMISSION AND DISTRIBUTION LINES SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS. HOWEVER, THE TOP OF THE WATER LINE MUST BE LOCATED BELOW THE FROST LINE AND IN NO CASE SHALL THE TOP OF THE WATER LINE BE LESS THAN 24 INCHES BELOW GROUND SURFACE, AS REQUIRED BY 30 TAC §290.44(A)(4). REVISED MARCH 4, 2015
7. PURSUANT TO 30 TAC §290.44(A)(5), THE HYDROSTATIC LEAKAGE RATE SHALL NOT EXCEED THE AMOUNT ALLOWED OR RECOMMENDED BY THE MOST CURRENT AWWA FORMULAS FOR PVC PIPE, CAST IRON AND DUCTILE IRON PIPE. INCLUDE THE FORMULAS IN THE NOTES ON THE PLANS.
   - O THE HYDROSTATIC LEAKAGE RATE FOR POLYVINYL CHLORIDE (PVC) PIPE AND APPURTENANCES SHALL NOT EXCEED THE AMOUNT ALLOWED OR RECOMMENDED BY FORMULAS IN AMERICA WATER WORKS ASSOCIATION (AWWA) C-605 AS REQUIRED IN 30 TAC §290.44(A)(5). PLEASE ENSURE THAT THE FORMULA FOR THIS CALCULATION IS CORRECT AND MOST CURRENT FORMULA IS IN USE;

     WHERE:
     - Q = THE QUANTITY OF MAKEUP WATER IN GALLONS PER HOUR,
     - L = THE LENGTH OF THE PIPE SECTION BEING TESTED, IN FEET,
     - D = THE NOMINAL DIAMETER OF THE PIPE IN INCHES, AND
     - P = THE AVERAGE TEST PRESSURE DURING THE HYDROSTATIC TEST IN POUNDS PER SQUARE INCH (PSI).

   O THE HYDROSTATIC LEAKAGE RATE FOR DUCTILE IRON (DI) PIPE AND APPURTENANCES SHALL NOT EXCEED THE AMOUNT ALLOWED OR RECOMMENDED BY FORMULAS IN AMERICA WATER WORKS ASSOCIATION (AWWA) C-600 AS REQUIRED IN 30 TAC §290.44(A)(5). PLEASE ENSURE THAT THE FORMULA FOR THIS CALCULATION IS CORRECT AND MOST CURRENT FORMULA IS IN USE;

     WHERE:
     - L = THE QUANTITY OF MAKEUP WATER IN GALLONS PER HOUR,
     - S = THE LENGTH OF THE PIPE SECTION BEING TESTED, IN FEET,
     - D = THE NOMINAL DIAMETER OF THE PIPE IN INCHES, AND
     - P = THE AVERAGE TEST PRESSURE DURING THE HYDROSTATIC TEST IN POUNDS PER SQUARE INCH (PSI).

8. THE MAXIMUM ALLOWABLE LEAD CONTENT OF PIPES, PIPE FITTINGS, PLUMBING FITTINGS, AND FIXTURES TO 0.25 PERCENT.
9. THE SYSTEM MUST BE DESIGNED TO MAINTAIN A MINIMUM PRESSURE OF 35 PSI AT ALL POINTS WITHIN THE DISTRIBUTION NETWORK AT FLOW RATES OF AT LEAST 1.5 GALLONS PER MINUTE PER CONNECTION. WHEN THE SYSTEM IS INTENDED TO PROVIDE FIREFIGHTING CAPABILITY, IT MUST ALSO BE DESIGNED TO MAINTAIN A MINIMUM PRESSURE OF 20 PSI UNDER COMBINED FIRE AND DRINKING WATER FLOW CONDITIONS AS REQUIRED BY 30 TAC §290.44(D). REVISED MARCH 4, 2015
10. THE CONTRACTOR SHALL INSTALL APPROPRIATE AIR RELEASE DEVICES IN THE DISTRIBUTION SYSTEM AT ALL POINTS WHERE TOPOGRAPHY OR OTHER FACTORS MAY CREATE AIR LOCKS IN THE LINES. ALL VENT OPENINGS TO THE ATMOSPHERE SHALL BE COVERED WITH 16-MESH OR FINER, CORROSION RESISTANT SCREENING MATERIAL OR AN ACCEPTABLE EQUIVALENT AS REQUIRED BY 30 TAC §290.44(D)(1).
11. PURSUANT TO 30 TAC §290.44(D)(4), ACCURATE WATER METERS SHALL BE PROVIDED. SERVICE CONNECTIONS AND METER LOCATIONS SHOULD BE SHOWN ON THE PLANS.
12. PURSUANT TO 30 TAC §290.44(D)(5), SUFFICIENT VALVES AND BLOWOFFS TO MAKE REPAIRS. THE ENGINEERING REPORT SHALL ESTABLISH CRITERIA FOR THIS DESIGN.
13. PURSUANT TO 30 TAC §290.44(D)(6), THE SYSTEM SHALL BE DESIGNED TO AFFORD EFFECTIVE CIRCULATION OF WATER WITH A MINIMUM OF DEAD ENDS. ALL DEAD-END MAINS SHALL BE PROVIDED WITH ACCEPTABLE FLUSH VALVES AND DISCHARGE PIPING. ALL DEAD-END LINES LESS THAN TWO INCHES IN DIAMETER WILL NOT REQUIRE FLUSH VALVES IF THEY END AT A CUSTOMER SERVICE. WHERE DEAD ENDS ARE NECESSARY AS A STAGE IN THE GROWTH OF THE SYSTEM, THEY SHALL BE LOCATED AND ARRANGED TO ULTIMATELY CONNECT THE ENDS TO PROVIDE CIRCULATION.
14. THE CONTRACTOR SHALL MAINTAIN A MINIMUM SEPARATION DISTANCE IN ALL DIRECTIONS OF NINE FEET BETWEEN THE PROPOSED WATERLINE AND WASTEWATER COLLECTION FACILITIES INCLUDING MANHOLES AND SEPTIC TANK DRAINFIELDS. IF THIS DISTANCE CANNOT BE MAINTAINED, THE CONTRACTOR MUST IMMEDIATELY NOTIFY THE PROJECT ENGINEER FOR FURTHER DIRECTION. SEPARATION DISTANCES, INSTALLATION METHODS, AND MATERIALS UTILIZED MUST MEET 30 TAC §290.44(E)(1-4) OF THE CURRENT RULES.
15. PURSUANT TO 30 TAC §290.44(E)(5), THE SEPARATION DISTANCE FROM A POTABLE WATERLINE TO A WASTEWATER MAIN OR LATERAL MANHOLE OR CLEANOUT SHALL BE A MINIMUM OF NINE FEET. WHERE THE NINE-FOOT SEPARATION DISTANCE CANNOT BE ACHIEVED, THE POTABLE WATERLINE SHALL BE ENCASED IN A JOINT OF AT LEAST 150 PSI PRESSURE CLASS PIPE AT LEAST 18 FEET LONG AND TWO NOMINAL SIZES LARGER THAN THE NEW CONVEYANCE. THE SPACE AROUND THE CARRIER PIPE SHALL BE SUPPORTED AT FIVE-FOOT INTERVALS WITH SPACERS OR BE FILLED TO THE SPRINGLINE WITH WASHED SAND. THE ENCASEMENT PIPE SHALL BE CENTERED ON THE CROSSING AND BOTH ENDS SEALED WITH CEMENT GROUT OR MANUFACTURED SEALANT.
16. PURSUANT TO 30 TAC §290.44(E)(6), FIRE HYDRANTS SHALL NOT BE INSTALLED WITHIN NINE FEET VERTICALLY OR HORIZONTALLY OF ANY WASTEWATER LINE, WASTEWATER LATERAL, OR WASTEWATER SERVICE LINE REGARDLESS OF CONSTRUCTION.
17. PURSUANT TO 30 TAC §290.44(E)(7), SUCTION MAINS TO PUMPING EQUIPMENT SHALL NOT CROSS WASTEWATER MAINS, WASTEWATER LATERALS, OR WASTEWATER SERVICE LINES. RAW WATER SUPPLY LINES SHALL NOT BE INSTALLED WITHIN FIVE FEET OF ANY TILE OR CONCRETE WASTEWATER MAIN, WASTEWATER LATERAL, OR WASTEWATER SERVICE LINE.
18. PURSUANT TO 30 TAC §290.44(E)(8), WATERLINES SHALL NOT BE INSTALLED CLOSER THAN TEN FEET TO SEPTIC TANK DRAINFIELDS. REVISED MARCH 4, 2015
19. PURSUANT TO 30 TAC §290.44(F)(1), THE CONTRACTOR SHALL NOT PLACE THE PIPE IN WATER OR WHERE IT CAN BE FLOODED WITH WATER OR SEWAGE DURING ITS STORAGE OR INSTALLATION.
20. PURSUANT TO 30 TAC §290.44(F)(2), WHEN WATERLINES ARE LAID UNDER ANY FLOWING OR INTERMITTENT STREAM OR SEMI-PERMANENT BODY OF WATER THE WATER MAIN SHALL BE INSTALLED IN A SEPARATE WATERTIGHT PIPE ENCASEMENT. VALVES MUST BE PROVIDED ON EACH SIDE OF THE CROSSING WITH FACILITIES TO ALLOW THE UNDERWATER PORTION OF THE SYSTEM TO BE ISOLATED AND TESTED.
21. THE CONTRACTOR SHALL DISINFECT THE NEW WATER MAINS IN ACCORDANCE WITH AWWA STANDARD C-651 AND THEN FLUSH AND SAMPLE THE LINES BEFORE BEING PLACED INTO SERVICE. SAMPLES SHALL BE COLLECTED FOR MICROBIOLOGICAL ANALYSIS TO CHECK THE EFFECTIVENESS OF THE DISINFECTION PROCEDURE WHICH SHALL BE REPEATED IF CONTAMINATION PERSISTS. A MINIMUM OF ONE SAMPLE FOR EACH 1,000 FEET OF COMPLETED WATER LINE WILL BE REQUIRED OR AT THE NEXT AVAILABLE SAMPLING POINT BEYOND 1,000 FEET AS DESIGNATED BY THE DESIGN ENGINEER, IN ACCORDANCE WITH 30 TAC §290.44(F)(3).

GENERAL NOTES:

1. DRAWINGS SHOW INFORMATION OBTAINED FROM FIELD OBSERVATION. TOPOGRAPHIC SURVEY, ENNIS MAPPING, INFORMATION PROVIDED BY THE UTILITY COMPANIES, AND EXISTING CONSTRUCTION DRAWINGS. HOWEVER, ACCURACY OF OR COMPLETENESS OF SUCH INFORMATION IS NOT GUARANTEED. THE CONTRACTOR SHALL VERIFY ALL EXISTING UTILITY ELEVATIONS, DEPTHS, MATERIALS, SIZES, DIMENSIONS, AND CONDITIONS IN THE FIELD BEFORE COMMENCING ANY WORK. UTILITY LOCATIONS SHALL BE COORDINATED WITH ENNIS, AND TEXAS 811. ALL EXISTING UTILITIES SHALL BE PROTECTED FROM DAMAGE DURING CONSTRUCTION. A PAYMENT ITEM HAS BEEN ESTABLISHED TO PROVIDE FOR THE CONTRACTOR TO LOCATE UTILITIES. THIS MAY AFFECT PROPOSED ALIGNMENTS, IN ADVANCE OF CONSTRUCTION. CONTRACTOR SHALL MEET WITH ENGINEER/OWNER PRIOR TO PRE-CONSTRUCTION LOCATIONS, TO REVIEW THE LOCATIONS AND NUMBER OF CONFIRMATION SITES. CHANGES IN HORIZONTAL AND VERTICAL ALIGNMENTS MAY BE NECESSARY DUE TO CONFLICTS FOUND DURING CONFIRMATION PROCEDURES. THESE CONFLICTS AND DISCREPANCIES SHALL BE REPORTED TO THE OWNER AND ENGINEER IN A TIMELY MANNER. ALL REVISED ALIGNMENTS MUST STAY WITHIN RIGHT-OF-WAYS AND UTILITY EASEMENTS, AND MUST BE APPROVED BY ENGINEER/OWNER, PRIOR TO CONSTRUCTION.
2. TRACER MARKING TAPE SHALL BE INSTALLED OVER PVC MAINS. UNDERGROUND MARKING TAPE SHALL BE INSTALLED 6"-12" ABOVE THE TOP OF ALL PVC PIPE. MARKING TAPE SHALL CONSIST OF A 2 INCH WIDE LAYER OF ALUMINUM FOIL BONDED BETWEEN TWO PIECES OF POLYETHYLENE FILM. THE DIMENSIONS OF THE MARKING TAPE SHALL BE NOT LESS THAN 5.5 MILS THICK NOR LESS THAN 2 INCHES WIDE. WATER LINE MARKING TAPE SHALL BE BLUE IN COLOR FOR WATER PIPE AND SHALL HAVE THE WORDING "CAUTION WATER LINE BURIED BELOW" DISPLAYED PROMINENTLY AND CONTINUOUSLY ALONG THE TAPE. THE ENDS OF THE MARKING TAPE SHALL BE BROUGHT UP INSIDE EACH MAIN LINE VALVE BOX. THIS WORK WILL BE CONSIDERED SUBSIDIARY TO THE UNIT PRICE BID FOR PIPE, AND NO SEPARATE PAYMENT WILL BE MADE.
3. RESTRAINED JOINT PIPE SHALL BE USED FOR ALL BORES, WHETHER CASED OR UNCASED. BORES UP TO 20' MAY BE PERFORMED WITH A SINGLE UNJOINTED PIPE LENGTH.
4. MEASUREMENT AND PAYMENT: ONLY THOSE ITEMS IN THE PROPOSAL WILL BE MEASURED AND PAID FOR. ALL OTHER ITEMS OF WORK REQUIRED TO COMPLETE THE PROJECT SHALL BE CONSIDERED SUBSIDIARY TO THE PAY ITEMS IN THE PROPOSAL AND NO CLAIMS WHATSOEVER FOR EXTRA WORK FOR SUCH SUBSIDIARY ITEMS WILL BE CONSIDERED.
5. TESTING: OWNER SHALL PAY FOR AND CONDUCT BACKFILL AND COMPACTION TESTING. CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATION WITH TESTING LABORATORY AND SHALL PAY FOR RE-TESTING DUE TO FAILED TESTS. CONTRACTOR SHALL PAY FOR AND CONDUCT PIPE AND ASSEMBLY TESTING REQUIRED BY SPECIFICATIONS SUCH AS PRESSURE TESTING.
6. CUT, CAP, AND ABANDONMENT IN PLACE OF EXISTING WATERLINES SHALL BE CONSIDERED SUBSIDIARY TO OTHER UNIT PRICE BIDS, AND NO SEPARATE PAYMENTS WILL BE MADE.
7. CONTRACTOR IS RESPONSIBLE FOR ALL CONSTRUCTION STAKING AND UTILITY LOCATES PRIOR TO CONSTRUCTION
8. ALL HATCHES REQUIRE FALL NETS.
9. BEFORE BEGINNING CONSTRUCTION, THE CONTRACTOR SHALL PREPARE A CONSTRUCTION SEQUENCE SCHEDULE. THE CONSTRUCTION SCHEDULE SHALL BE SUCH THAT THERE IS THE MINIMUM INTERFERENCE WITH TRAFFIC ALONG OR ADJACENT TO THE PROJECT.
10. UTILITIES SHOWN ON THE PLANS WERE TAKEN FROM FIELD SURVEYS, CITY OF ENNIS MAPPING, AND INFORMATION PROVIDED BY THE UTILITY COMPANIES. THE COMPLETENESS AND THE ACCURACY OF THIS DATA IS NOT GUARANTEED. THE CONTRACTOR IS RESPONSIBLE FOR VERIFYING THE LOCATION OF ALL UNDERGROUND UTILITIES AND STRUCTURES AND PROTECTING THEM FROM DAMAGE DURING CONSTRUCTION. CONTACT TEXAS 811 AT LEAST 48 HOURS BEFORE EXCAVATING.
11. CONSTRUCTION MAY NOT BEGIN EARLIER THAN 7:00 A.M. ON WEEKDAYS NOR CONTINUE AFTER DARK WITHOUT PERMISSION FROM THE CITY OF ENNIS. WORK SATURDAY ON SUNDAY IS PROHIBITED WITHOUT SPECIAL PERMISSION. NO EXCAVATION WORK SHALL BE PERMITTED ON SATURDAY, SUNDAY, OR CITY OF ENNIS HOLIDAYS.
12. ANY DAMAGE TO THE EXISTING UTILITIES AND SUBSEQUENT REPAIRS WILL BE THE RESPONSIBILITY OF THE CONTRACTOR. REPAIRS WILL BE MADE IMMEDIATELY AT THE CONTRACTOR'S EXPENSE.
13. MATERIAL TESTING SHALL BE PERFORMED BY AN INDEPENDENT TESTING LABORATORY AND PAID FOR BY THE CITY. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL FEES FOR RE-TESTING AND RE-INSPECTING DUE TO FAILED TESTS OF WORKMANSHIP OR MATERIALS.
14. CONTRACTOR MAY BE REQUIRED TO LOCATE EXISTING UTILITIES BY EXCAVATION AND "POT HOLING". THIS WORK WILL BE CONSIDERED SUBSIDIARY TO THE OTHER BID ITEMS AND NO SEPARATE PAYMENT WILL BE MADE.
15. ALL EXCAVATION ON THE PROJECT IS UNCLASSIFIED. CONTRACTOR TO REVIEW SITE CONDITIONS/LOCAL SOILS PRIOR TO BIDDING.
16. THE CONTRACTOR SHALL MAINTAIN TWO-WAY TRAFFIC AT ALL TIMES ALONG THE PROJECT.
17. ACCESS TO DRIVEWAYS AND MAILBOXES SHALL BE PRESERVED THROUGHOUT THE CONSTRUCTION PROCESS. DISTURBED MAILBOXES SHALL BE SET IN 5 GAL. BUCKETS OF GRAVEL FOR TEMPORARY USE AND EASE OF RELOCATION. NO DRIVEWAY SHALL BE OBSTRUCTED WITHOUT THE PRIOR APPROVAL OF THE ENGINEER. (24 HR. NOTICE WILL BE REQUIRED FOR CONSIDERATION.)
18. CONTRACTOR SHALL REMOVE AND RESET ALL MAILBOXES, YARD LIGHTS, SPRINKLER SYSTEMS, DRIVEWAY CULVERTS ETC. AS REQUIRED TO FACILITATE LINE INSTALLATION. THIS WILL BE CONSIDERED SUBSIDIARY TO UNIT PRICE BID FOR PIPE AND NO SEPARATE PAYMENT WILL BE MADE.
19. REMOVE, SALVAGE AND REPLACE ALL STREET AND TRAFFIC CONTROL SIGNS, WHICH MAY BE DAMAGED BY THE CONSTRUCTION OF THE PROJECT, AT THE DIRECTION OF THE CITY. THIS WORK WILL BE CONSIDERED SUBSIDIARY TO THE UNIT PRICE BIDS, AND NO SEPARATE PAYMENT WILL BE MADE.
20. CONTRACTOR SHALL NOT BE AUTHORIZED TO PROCEED UNTIL ALL NECESSARY STATE, LOCAL, AND PRIVATE PERMITS
21. CONTRACTOR SHALL KEEP ALL EQUIPMENT, PIPE, MATERIALS, ETC. OFF PRIVATE PROPERTY AND WITHIN CITY EASEMENTS, OR CITY PROPERTY.
22. ALL TRENCHING AND EXCAVATION SHALL BE PERFORMED IN ACCORDANCE WITH OSHA STANDARDS.
23. THE CONTRACTOR SHALL GUARANTEE THE BACKFILLING OF EXCAVATION AND TRENCHES AGAINST EXCESSIVE (AS DETERMINED BY THE ENGINEER) SETTLEMENT FOR A PERIOD OF TWO YEAR AFTER THE FINAL COMPLETION OF THE CONTRACT UNDER WHICH THE WORK IS PERFORMED. MAKE ALL REPAIRS OR REPLACEMENTS MADE NECESSARY BY SETTLEMENT INCLUDING REFILLING AND COMPACTING THE UPPER PORTION OF THE DITCH AND REPAIRING BROKEN OR SETTLED PAVEMENTS WITHIN THIRTY (30) DAYS AFTER RECEIVING NOTICE FROM THE CITY.

SOIL LINER NOTES

1. CONTRACTOR SHALL PROVIDE AND INSTALL CLAY LINER PER TCEQ REGULATIONS. ALL TESTING AND INSTALLATION REQUIREMENTS OUTLINED IN THE TEXAS ADMINISTRATIVE CODE CHAPTER 217 SUBCHAPTER H MUST BE MET.
2. ALL CORRESPONDENCE AND SCHEDULING WITH THE TESTING LAB SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. ALL TESTING LABORATORY FEES SHALL BE PAID FOR OUT OF THE "LABORATORY TESTING" BID ITEM.
3. PRECONSTRUCTION SAMPLING FOR IMPORTED LINERS MUST INCLUDE 4 TESTED SAMPLES. AT LEAST 1 OF THESE 4 SAMPLES MUST BE TESTED FOR PERMEABILITY ACCORDING TO TCEQ REQUIREMENTS.
4. POST-CONSTRUCTION SAMPLING MUST INCLUDE A MINIMUM OF ONE UNDISTURBED CORE SAMPLE AND ANALYZED FOR PERMEABILITY.
5. PRECONSTRUCTION AND POST-CONSTRUCTION SAMPLES MUST MEET TCEQ REQUIREMENTS AND THE FOLLOWING CRITERIA:
   - COEFFICIENT OF PERMEABILITY MUST BE LESS THAN 1X10^-7 CM/SEC
   - 30% OF LINER MATERIAL MUST PASS THROUGH A 200 MESH SIEVE
   - MUST HAVE A LIQUID LIMIT (LL) GREATER THAN 30% AND PLASTICITY INDEX (PI) >15
6. ALL SOIL LINERS MUST BE OF COMPACTED MATERIAL, AT LEAST 24 INCHES THICK, COMPACTED IN LIFTS NO GREATER THAN 6 INCHES THICK AND COMPACTED TO 95% OF STANDARD PROCTOR DENSITY AT -1% TO +3% OPTIMUM MOISTURE. IN-SITU CLAY SOILS MEETING THE SOILS LINER REQUIREMENTS SHALL BE EXCAVATED AND RE-COMPACTED A MINIMUM OF 6 INCHES BELOW PLANNED GRADE TO ASSURE A UNIFORMLY COMPACTED FINISHED SURFACE.
7. THE IN-SITU SUBGRADE MUST HAVE TOPSOIL REMOVE AND STOCKPILED AND SCARIFIED PRIOR TO PLACEMENT OF THE LINER.
8. FINISH GRADE AT TOP OF SLOPE SHALL BE A MINIMUM 2' ABOVE THE NORMAL OPERATING WATER LEVEL. SEE BELOW:
   - PROPOSED WATER SURFACE ELEVATION = 153.00' (POND #1, 2, 3)
   - PROPOSED TOP OF SOIL LINER AROUND PONDS = 155.50'

SEQUENCE OF WORK FOR POND REHABILITATION

1. THE PONDS SHALL BE RECONSTRUCTED IN REVERSE ORDER, WITH ONLY ONE POND OUT OF SERVICE AT A TIME.
2. CONTRACTOR IS RESPONSIBLE FOR COORDINATION AND SCHEDULING
3. THE CITY WILL PUMP THE WATER AND SLUDGE FROM EACH POND - THIS WILL REQUIRE 2 WEEKS NOTICE FOR EACH POND.
4. THE CONTRACTOR WILL BE RESPONSIBLE FOR REMOVING ANY RESIDUAL SLUDGE AND WATER TO BEGIN WORK. THIS CAN BE DISPOSED ONSITE.
5. WHILE THE POND IS EMPTY THE CONTRACTOR SHALL (AS DETAILED IN THE PLANS AND SPECIFICATIONS):
6. COORDINATE WITH GEOTECHNICAL TESTING FIRM TO TEST EACH POND LINER IN APPROXIMATELY 12 LOCATIONS TO DETERMINE THE CONDITION OF THE CLAY LINER. THE OWNER WILL REIMBURSE THE COST OF THESE TESTS FROM THE "OWNER'S ALLOWANCE FOR CONSTRUCTION MATERIALS TESTING" BID ITEM.
7. REPAIR ALL COMPROMISED AREAS OF LINER, AS DELINEATED BY THE GEOTECHNICAL TESTING FIRM, WITH APPROVED CLAY MATERIAL AND BE PAID FOR EACH SQUARE YARD REPAIRED UNDER BID ITEM 12.
8. INSTALL A NEW 16" GRAVITY FILL LINE AND 16" GATE VALVE FROM THE EXISTING MANHOLE.
9. INSTALL A NEW 8" SLUDGE SUCTION LINE WITH PIPE SUPPORTS AND CONCRETE SUCTION PAD.
10. INSTALL A NEW ALUMINUM WALKWAY AND HANDRAIL ON THE OUTLET STRUCTURE.
11. INSTALL NEW WOOD BAFFLES ON THE OUTLET STRUCTURE.
12. INSTALL A NEW TEE ON THE EXISTING 12" DRAIN LINE WITHIN THE OUTFALL STRUCTURE.
13. INSTALL A RISING STEM GATE VALVE ON ONE SIDE OF THE NEW DRAIN LINE TEE.
14. INSTALL A TELESCOPING VALVE ON THE OTHER SIDE OF THE NEW DRAIN LINE TEE.
15. REPAIR ABOVE WATERLINE SIDE SLOPES AND DRIVES BETWEEN PONDS WITH GENERAL SITE FILL WITH MAXIMUM 3: 1 SIDE SLOPES AND DRIVE WIDTHS AS INDICATED ON THE PLANS.
16. SLOPES AND DRIVES SHALL BE STABILIZED WITH VEGETATION, EROSION CONTROL BLANKET REQUIRED ON SLOPES.

SCHAUMBURG & POLK, INC.
BEAUMONT | GARLAND | HOUSTON
PORT ARTHUR | TERRELL | TYLER
320 S. Broadway Ave., SUITE 200
Tyler, TX 75702
903.595.3913
Firm Registration No. F-520

STATE OF TEXAS
JEREMY P. BUECHTER
92554
LICENSED PROFESSIONAL ENGINEER
03/30/2023

ENNIS TEXAS
The bluebonnet spirit of Texas

WTP LAGOON UPGRADES

TCEQ GENERAL CONSTRUCTION NOTES

REVISIONS:

PLANS ARE FORMATTED FOR 22"X34" PLAN SHEETS. IF PRINTED ON 11"X17" SHEETS THE SCALES ARE "HALF" THE SIZE NOTED.

BEFORE YOU DIG Texas811.com

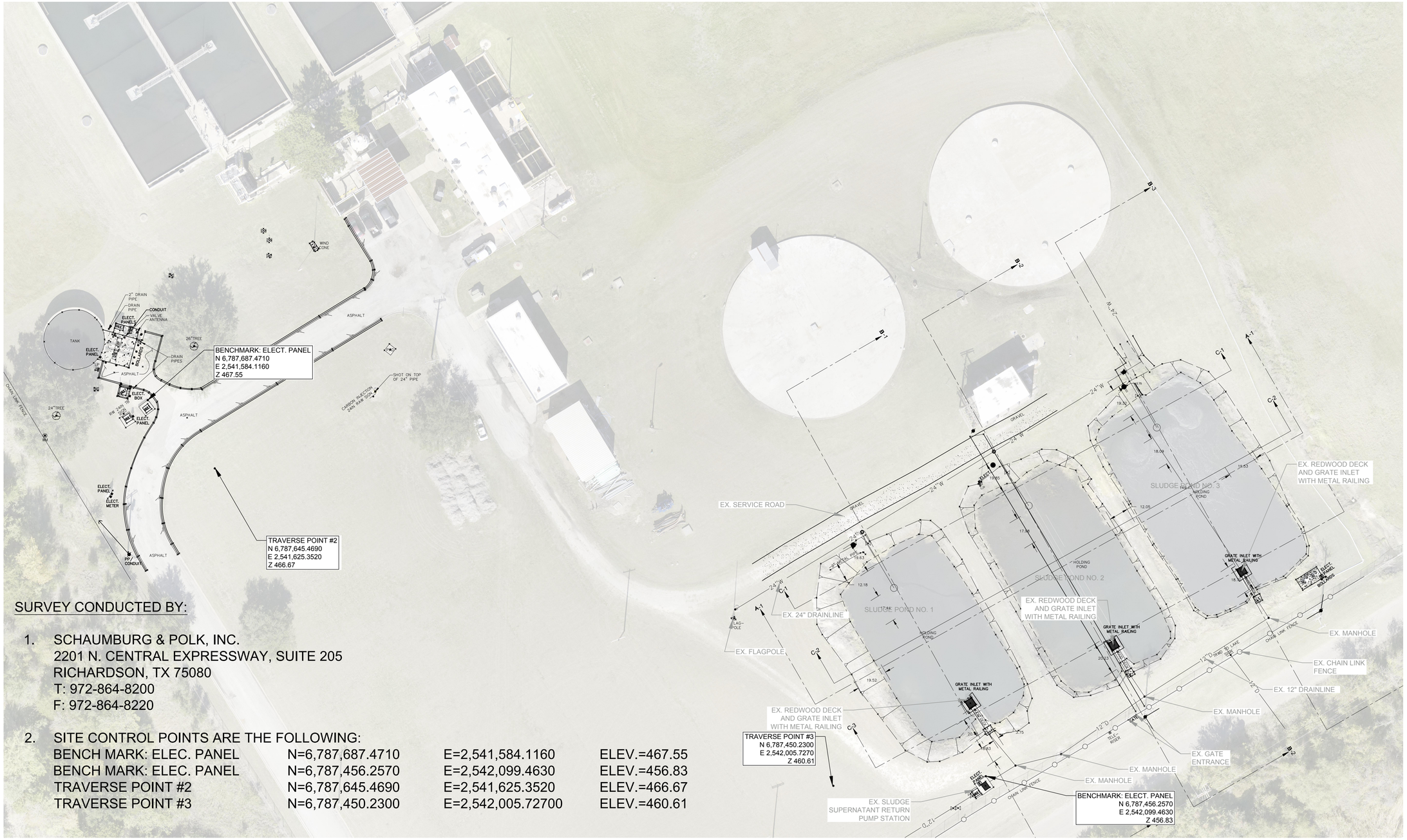
DRAWN BY: N. UNDERWOOD

REVIEWED BY: J. BUECHTER

PROJECT NO: 923239.00

SHEET NO: 2

FILENAME: X:\CLIENTS\ENNIS-CITY OF\923239.00 WTP INTAKE AND LAGOONS\CAD\00-LAGOON BID PACKAGE\01-COVER.DWG PLOT DATE: 4/4/2023 11:26 AM



SURVEY CONDUCTED BY:

1. SCHAUMBURG & POLK, INC.
   2201 N. CENTRAL EXPRESSWAY, SUITE 205
   RICHARDSON, TX 75080
   T: 972-864-8200
   F: 972-864-8220

2. SITE CONTROL POINTS ARE THE FOLLOWING:

BENCH MARK: ELEC. PANEL	N=6,787,687.4710	E=2,541,584.1160	ELEV.=467.55
BENCH MARK: ELEC. PANEL	N=6,787,456.2570	E=2,542,099.4630	ELEV.=456.83
TRAVERSE POINT #2	N=6,787,645.4690	E=2,541,625.3520	ELEV.=466.67
TRAVERSE POINT #3	N=6,787,450.2300	E=2,542,005.72700	ELEV.=460.61

EXISTING SITE & SURVEY PLAN
SCALE: 1"=30'

FILENAME: X:\CLIENTS\ENNIS-CITY OF\923239.00 WTP INTAKE AND LAGOONS\CAD\00-LAGOON BID PACKAGE\EXISTING SLUDGE PONDS - FROM SURVEY.DWG
PLOT DATE: 4/4/2023 11:27 AM

SCHAUMBURG & POLK, INC.
BEAUMONT | GARLAND | HOUSTON
PORT ARTHUR | TERRELL | TYLER
320 S. Broadway Ave., SUITE 200
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JEREMY P. BUECHTER
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03/30/2023

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WTP LAGOON UPGRADES

EXISTING SITE PLAN

REVISIONS:

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DRAWN BY:
N. UNDERWOOD

REVIEWED BY:
J. BUECHTER

PROJECT NO:
923239.00

SHEET NO:
3

SEQUENCE OF WORK FOR POND REHABILITATION

1. THE PONDS SHALL BE RECONSTRUCTED IN REVERSE ORDER, WITH ONLY ONE POND OUT OF SERVICE AT A TIME.
2. CONTRACTOR IS RESPONSIBLE FOR COORDINATION AND SCHEDULING
3. THE CITY WILL PUMP THE WATER AND SLUDGE FROM EACH POND - THIS WILL REQUIRE 2 WEEKS NOTICE FOR EACH POND.
4. THE CONTRACTOR WILL BE RESPONSIBLE FOR REMOVING ANY RESIDUAL SLUDGE AND WATER TO BEGIN WORK. THIS CAN BE DISPOSED ONSITE.
5. WHILE THE POND IS EMPTY THE CONTRACTOR SHALL (AS DETAILED IN THE PLANS AND SPECIFICATIONS):
6. COORDINATE WITH GEOTECHNICAL TESTING FIRM TO TEST EACH POND LINER IN APPROXIMATELY 12 LOCATIONS TO DETERMINE THE CONDITION OF THE CLAY LINER. THE OWNER WILL REIMBURSE THE COST OF THESE TESTS FROM THE "OWNER'S ALLOWANCE FOR CONSTRUCTION MATERIALS TESTING" BID ITEM.
7. REPAIR ALL COMPROMISED AREAS OF LINER, AS DELINEATED BY THE GEOTECHNICAL TESTING FIRM, WITH APPROVED CLAY MATERIAL AND BE PAID FOR EACH SQUARE YARD REPAIRED UNDER BID ITEM 12.
8. INSTALL A NEW 16" GRAVITY FILL LINE AND 16" GATE VALVE FROM THE EXISTING MANHOLE.
9. INSTALL A NEW 8" SLUDGE SUCTION LINE WITH PIPE SUPPORTS AND CONCRETE SUCTION PAD.
10. INSTALL A NEW ALUMINUM WALKWAY AND HANDRAIL ON THE OUTLET STRUCTURE.
11. INSTALL NEW WOOD BAFFLES ON THE OUTLET STRUCTURE.
12. INSTALL A NEW TEE ON THE EXISTING 12" DRAIN LINE WITHIN THE OUTFALL STRUCTURE.
13. INSTALL A RISING STEM GATE VALVE ON ONE SIDE OF THE NEW DRAIN LINE TEE.
14. INSTALL A TELESCOPING VALVE ON THE OTHER SIDE OF THE NEW DRAIN LINE TEE.
15. REPAIR ABOVE WATERLINE SIDE SLOPES AND DRIVES BETWEEN PONDS WITH GENERAL SITE FILL WITH MAXIMUM 3: 1 SIDE SLOPES AND DRIVE WIDTHS AS INDICATED ON THE PLANS.
16. SLOPES AND DRIVES SHALL BE STABILIZED WITH VEGETATION, EROSION CONTROL BLANKET REQUIRED ON SLOPES.

REMOVE & REPLACE MANHOLE FL (W) = 449.73

STA. 0+ 07.48: INSTALL NEW 16" GATE VALVE
STA. 0+ 16.88: REMOVE EX. PLUG VALVE

STA. 0+72 OUTLET. INSTALL 8" MALE QUICK CONNECT COUPLING. CONNECT TO SLUDGE VACUUM PUMP AS NEEDED FOR SLUDGE CLEAN OUT. INSTALL CONCRETE SUPPORT STRUCTURE BENEATH OUTLET.

INSTALL PIPE SUPPORT STRUCTURES ALONG 8" SLUDGE LINE. 17.98' ON-CENTER SPACING.

STA. 11+86 TO 12+80 REMOVE AND REPLACE 94 LF OF 24" C900 DR18 PC235 PVC Pipe AT 0.30% GRADE

REMOVE & REPLACE MANHOLE FL (W) = 450.11 FL (E) = 450.01

STA. 0+ 07.50: INSTALL NEW 16" GATE VALVE
STA. 0+ 15.36: REMOVE EX. PLUG VALVE

STA. 0+72 OUTLET. INSTALL 8" MALE QUICK CONNECT COUPLING. INSTALL CONCRETE SUPPORT STRUCTURE BENEATH OUTLET.

INSTALL NEW 40 LF OF 16" C900 DR18 PC235 PVC Pipe AT 2.51% GRADE FL OUT = 449.64 FL IN = 448.65

STA. 10+91 TO 11+86 REMOVE AND REPLACE 95 LF OF 24" C900 DR18 PC235 PVC Pipe AT 0.48% GRADE

STA. 0+07.60: INSTALL NEW 16" GATE VALVE
STA. 0+08: REMOVE EX. PLUG VALVE

INSTALL 72 LF OF NEW 8" D2241 PR 160 SDR-26 PVC AT 4.85% GRADE

INSTALL PIPE SUPPORT STRUCTURES ALONG 8" SLUDGE LINE. 18.09' ON-CENTER SPACING.

REMOVE & REPLACE MANHOLE FL (W) = 450.66 FL (E) = 450.56

STABILIZE BANKS AT SLUDGE PONDS 1-3.

STA. 0+70 OUTLET. INSTALL 8" MALE QUICK CONNECT COUPLING. INSTALL CONCRETE SUPPORT BENEATH OUTLET.

INSTALL NEW 40 LF OF 16" C900 DR18 PC235 PVC Pipe AT 3.88% % GRADE FL OUT = 450.00 FL IN = 448.46

STA. 10+00 TO 10+91 INSTALL NEW 91 LF OF 24" C900 DR18 PC235 PVC Pipe AT 2.39% GRADE

INSTALL 72 LF OF NEW 8" D2241 PR 160 SDR-26 PVC AT 2.79% GRADE

REHAB ALL EXISTING OUTFALL STRUCTURE. DECANT BOARDS SHALL BE REMOVED AND REPLACED AND BOLTED TO EXISTING CONCRETE STRUCTURE.

INSTALL 6" TELESCOPING DECANT VALVE IN EACH OUTFALL STRUCTURE AS PER DETAIL SHEET NO. 12. CONNECT TO EXISTING 12" DRAIN PIPE.

INSTALL 12" GATE VALVE IN EACH OUTFALL STRUCTURE AS PER DETAIL SHEET NO. 9

(3 EACH)

INSTALL NEW 40 LF OF 16" C900 DR18 PC235 PVC Pipe AT 3.03% GRADE FL OUT = 450.53 FL IN = 449.33

INSTALL 70 LF OF NEW 8" D2241 PR 160 SDR-26 PVC AT 5.94% GRADE

REMOVE & REPLACE DROP MANHOLE FL (E) = 452.85

REMOVE EXISTING12" PLUG VALVE. APPROX. 5' DEPTH

CLEAR AND GRUB PATH TO ORIGINAL STATE. DRIVEWAY WIDTH SHALL BE 12' MIN.

INSTALL PIPE SUPPORT STRUCTURES ALONG 8" SLUDGE LINE. 17.44' ON-CENTER SPACING

ALL PONDS SHALL BE REGRADED TO ORIGINAL DIMENSIONS. TOP ELEV. = 455.5 BOTTOM ELEV. = 447.0 SLOPE = 2:1

TRAVERSE POINT #3 N 6,787,450.2300 E 2,542,005.7270 Z 460.61

REPLACE REDWOOD WALKWAY AND GUARD RAILS WITH PROPOSED ALUMINUM 5' WIDE X 15' LONG WALKWAY AND BOLT TO EX. CONCRETE STRUCTURES. (3 EACH)

CLEAR AND GRUB PATH TO ORIGINAL STATE. DRIVEWAY WIDTH 15' MIN.

BENCHMARK: ELECT. PANEL N 6,787,456.2570 E 2,542,099.4630 Z 456.83

NOTE: EXACT LOCATIONS AND DEPTH OF MANHOLES SHALL BE FIELD VERIFIED PRIOR TO CONSTRUCTION.

NOTES:

1. SCHAUMBURG & POLK, INC.
   2201 N. CENTRAL EXPRESSWAY, SUITE 205
   RICHARDSON, TX 75080
   T: 972-864-8200
   F: 972-864-8220
2. SITE CONTROL POINTS ARE THE FOLLOWING:
   BENCH MARK N=6,787,456.2570 E=2,542,099.4630 ELEV.=456.83
   TRAVERSE POINT #3 N=6,787,450.2300 E=2,542,005.7270 ELEV.=460.61

PROPOSED SLUDGE LAGOON SITE PLAN
SCALE: 1"=20'

SCALE 1" = 20'

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Firm Registration No. F-520

STATE OF TEXAS
JEREMY P. BUECHTER
92554
LICENSED PROFESSIONAL ENGINEER
03/30/2023

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WTP LAGOON UPGRADES

PROPOSED SLUDGE LAGOON SITE PLAN

REVISIONS:

PLANS ARE FORMATTED FOR 22"X34" PLAN SHEETS. IF PRINTED ON 11"X17" SHEETS THE SCALES ARE HALF THE SIZE NOTED.

BEFORE YOU DIG Texas811.com

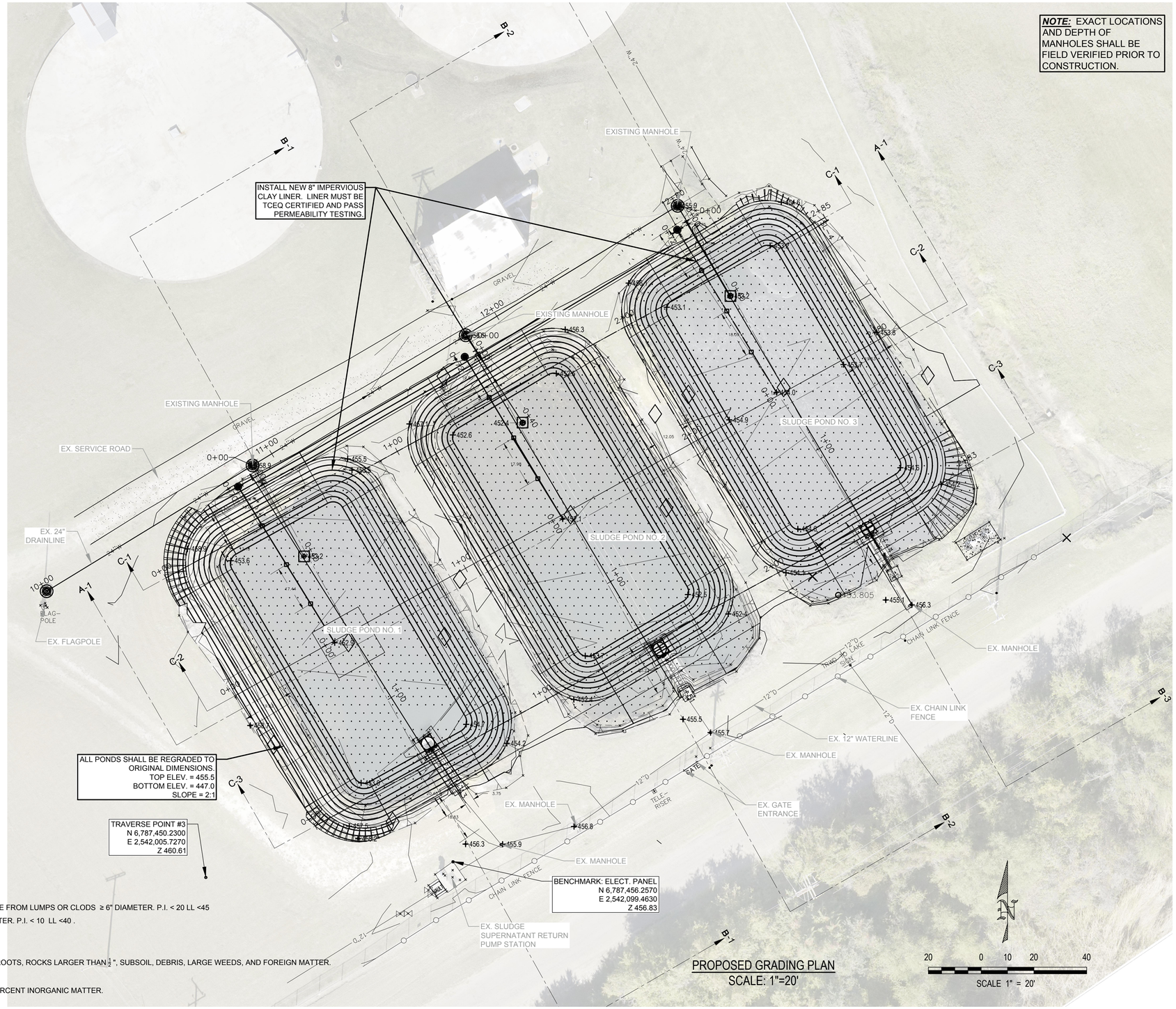
DRAWN BY: N. UNDERWOOD

REVIEWED BY: J. BUECHTER

PROJECT NO: 923239.00

SHEET NO: 4

FILENAME: X:\CLIENTS\ENNIS-CITY OF\923239.00 WTP INTAKE AND LAGOONS\CAD\00-LAGOON BID PACKAGE\EXISTING SLUDGE PONDS - FROM SURVEY.DWG PLOT DATE: 4/4/2023 11:27 AM



SOIL FOR EARTHWORK NOTES:

1. GENERAL FILL : ON SITE- OR IMPORTED MATERIALS SHALL BE FREE FROM LUMPS OR CLODS ≥ 6" DIAMETER. P.I. < 20 LL <45
2. SELECT FILL : SHALL BE FREE FROM LUMPS OR CLODS > 2" DIAMETER. P.I. < 10 LL <40 .
3. FREE OF ROCKS, FROZEN MATERIAL, DEBRIS, AND ORGANICS.
4. TOP SOIL MATERIALS:
   - IMPORTED BORROW, FRIABLE LOAM, REASONABLY FREE OF ROOTS, ROCKS LARGER THAN $\frac{1}{2}$ ", SUBSOIL, DEBRIS, LARGE WEEDS, AND FOREIGN MATTER.
   - ACIDITIY RANGE (pH): 5.5 TO 7.5
   - CONTAINING MINIMUM OF 4 PERCENT AND MAXIMUM OF 25 PERCENT INORGANIC MATTER.
5. STOCKPILING MATERIALS ON SITE SHALL BE APPROVED LOCATIONS DESIGNATED BY ENGINEER AND SHALL BE ADHERED TO THE REQUIREMENTS OUTLINED IN THE TECHNICAL SPECIFICATIONS.
6. STOCKPILE CLEANUP SHALL BE ADHERED TO THE REQUIREMENTS OUTLINED IN THE TECHNICAL SPECIFICATIONS.

FILENAME: X:\CLIENTS\ENNIS-CITY OF\923239.00 WTP INTAKE AND LAGOONS\CAD\00-LAGOON BID PACKAGE\EXISTING SLUDGE PONDS – FROM SURVEY.DWG
PLOT DATE: 4/4/2023 11:28 AM

SCHAUMBURG & POLK, INC.
BEAUMONT | GARLAND | HOUSTON
PORT ARTHUR | TERRELL | TYLER
320 S. Broadway Ave., SUITE 200
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903.595.3913
Firm Registration No. F-520

STATE OF TEXAS
JEREMY P. BUECHTER
92554
LICENSED PROFESSIONAL ENGINEER
03/30/2023

ENNIS TEXAS
The bluebonnet spirit of Texas

WTP LAGOON UPGRADES

PROPOSED GRADING PLAN AT SLUDGE LAGOON

REVISIONS:

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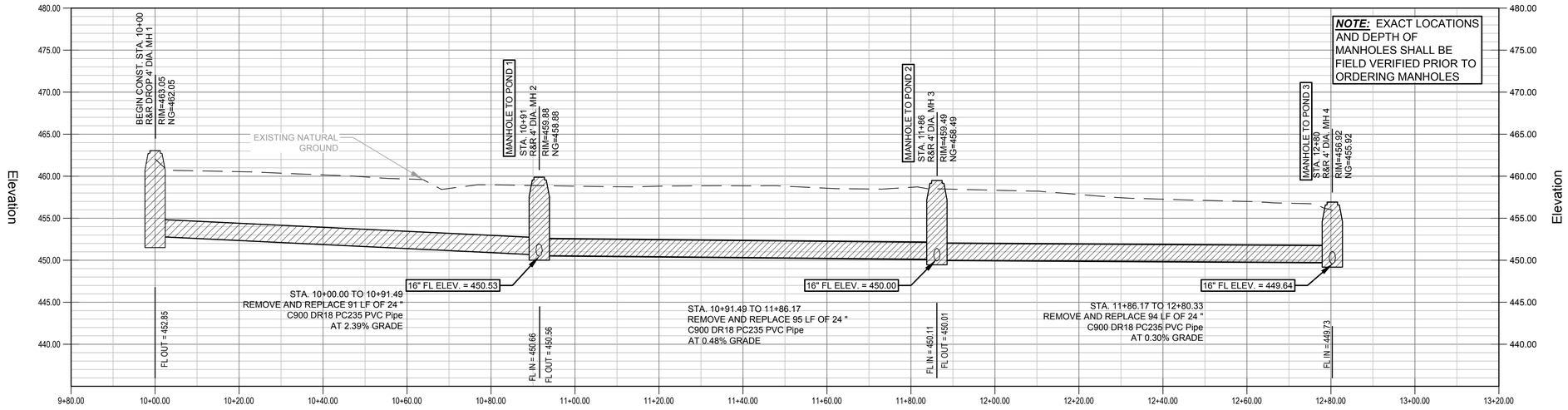
DRAWN BY: N. UNDERWOOD

REVIEWED BY: J. BUECHTER

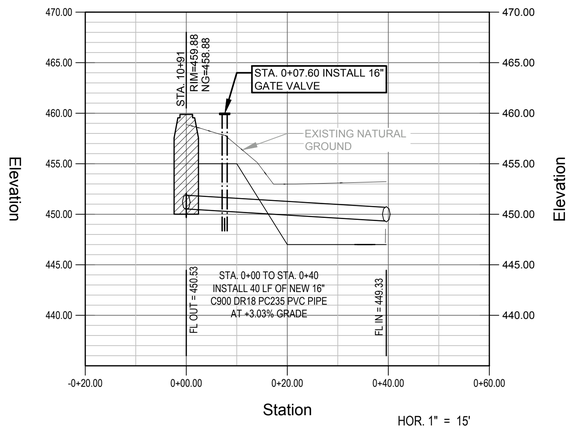
PROJECT NO: 923239.00

SHEET NO: 5



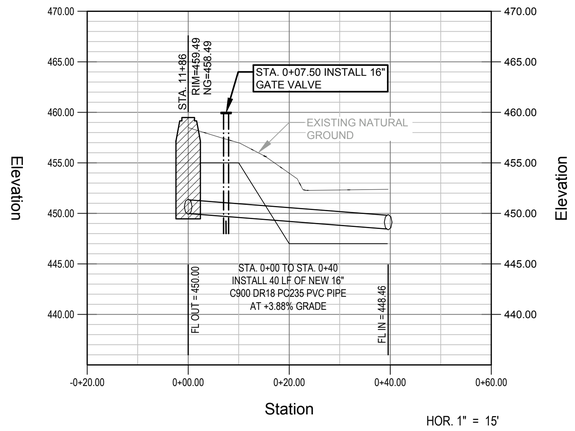
PROPOSED PROFILE - 24" DRAIN
SCALE: HOR. 1"=15', VERT. 1' = 10"

HOR. 1" = 15'
15 0 7.5 15 30
10 0 5 10 20
VERT. 1" = 10'



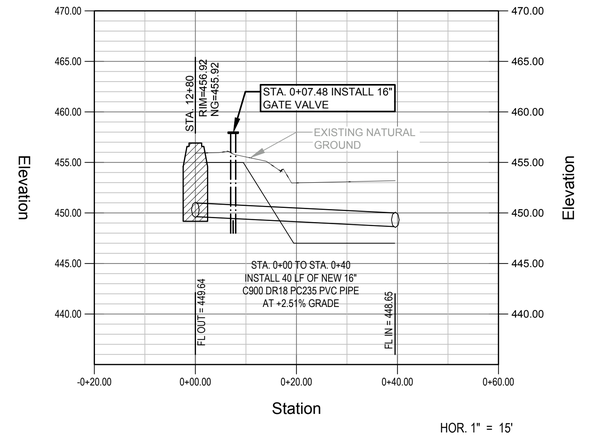
PROPOSED PROFILE - 16" LINE TO POND 1
SCALE: HOR. 1"=15', VERT. 1' = 10"

HOR. 1" = 15'
15 0 7.5 15 30
10 0 5 10 20
VERT. 1" = 10'



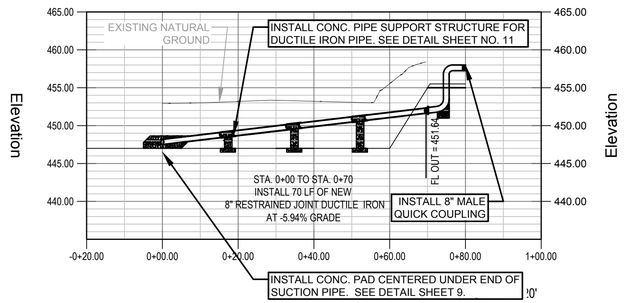
PROPOSED PROFILE - 16" LINE TO POND 2
SCALE: HOR. 1"=15', VERT. 1" = 10'

HOR. 1" = 15'
15 0 7.5 15 30
10 0 5 10 20
VERT. 1" = 10'



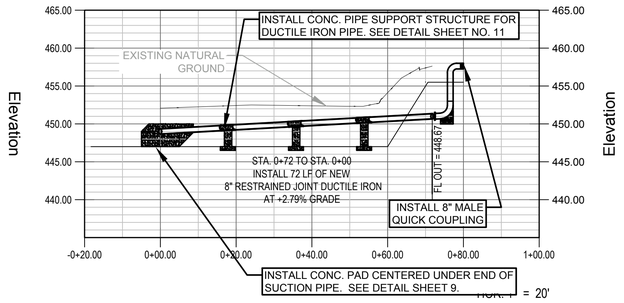
PROPOSED PROFILE - 16" LINE TO POND 3
SCALE: HOR. 1"=15', VERT. 1' = 10'

HOR. 1" = 15'
15 0 7.5 15 30
10 0 5 10 20
VERT. 1" = 10'



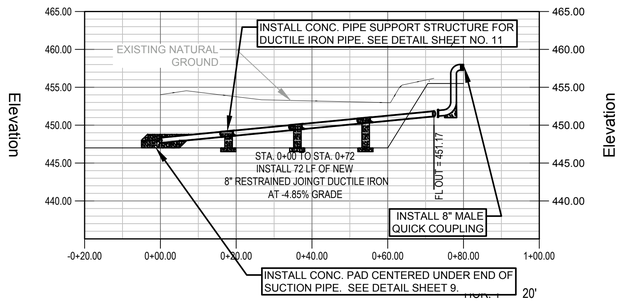
PROPOSED PROFILE - 8" SLUDGE LINE TO POND 1
SCALE: HOR. 1" = 20', VERT. 1" = 10'

HOR. 1" = 20'
20 0 10 20 40
10 0 5 10 20
VERT. 1" = 10'



PROPOSED PROFILE - 8" SLUDGE LINE TO POND 2
SCALE: HOR. 1" = 20', VERT. 1" = 10'

HOR. 1" = 20'
20 0 10 20 40
10 0 5 10 20
VERT. 1" = 10'



PROPOSED PROFILE - 8" SLUDGE LINE TO POND 3
SCALE: HOR. 1" = 20', VERT. 1" = 10"

HOR. 1" = 20'
20 0 10 20 40
10 0 5 10 20
VERT. 1" = 10'

FILENAME: X:\CLIENTS\ENNIS-CITY OF\923239.00 WTP INTAKE AND LAGOONS\CAD\00-LAGOON BID PACKAGE\EXISTING SLUDGE PONDS – FROM SURVEY.DWG PLOT DATE: 4/4/2023 11:28 AM

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LICENSED PROFESSIONAL ENGINEER
03/30/2023

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PROPOSED PROFILES – SLUDGE LAGOONS

REVISIONS:

PLANS ARE FORMATTED FOR 22"X34" PLAN SHEETS. IF PRINTED ON 11"X17" SHEETS THE SCALES ARE HALF THE SIZE NOTED.

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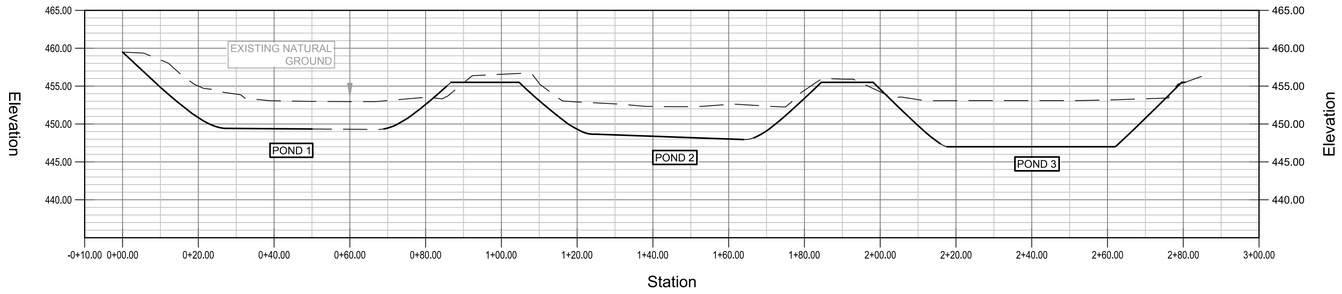
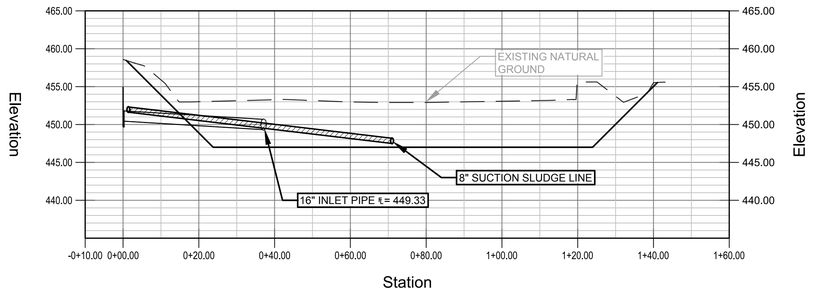


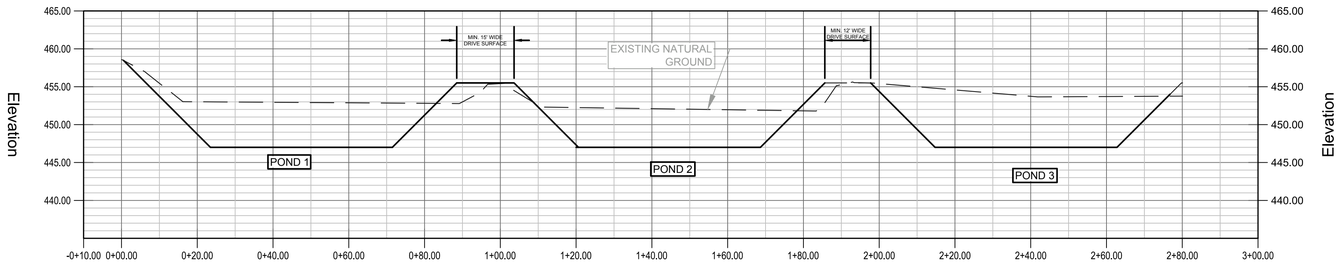
PROPOSED PROFILE - SECTION C-1
SCALE: HOR. 1" = 20', VERT. 1" = 10'

HOR. 1" = 20'
VERT. 1" = 10'



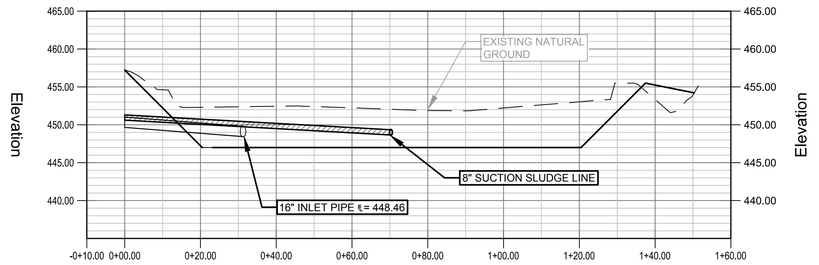
POND 1: PROPOSED PROFILE - SECTION B-B1
SCALE: HOR. 1" = 20', VERT. 1" = 10'

HOR. 1" = 20'
VERT. 1" = 10'



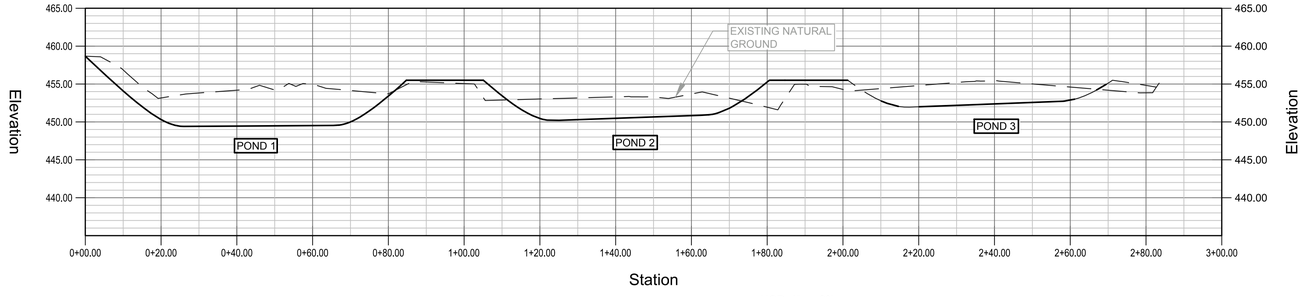
PROPOSED PROFILE - SECTION C-2
SCALE: HOR. 1" = 20', VERT. 1" = 10'

HOR. 1" = 20'
VERT. 1" = 10'



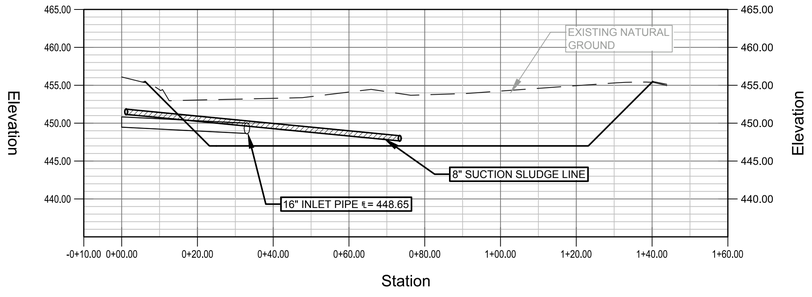
POND 2: PROPOSED PROFILE - SECTION B-B2
SCALE: HOR. 1" = 20', VERT. 1" = 10'

HOR. 1" = 20'
VERT. 1" = 10'



PROPOSED PROFILE - SECTION C-3
SCALE: HOR. 1" = 20', VERT. 1" = 10'

HOR. 1" = 20'
VERT. 1" = 10'



POND 3: PROPOSED PROFILE - SECTION B-B3
SCALE: HOR. 1" = 20', VERT. 1" = 10'

HOR. 1" = 20'
VERT. 1" = 10'

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WTP LAGOON UPGRADES

PROPOSED PROFILES - SECTIONS

REVISIONS:

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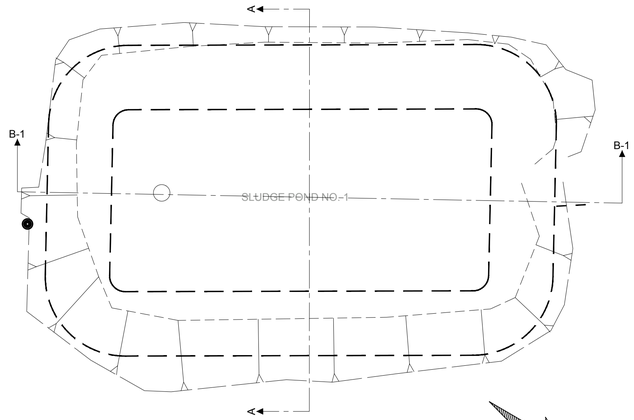
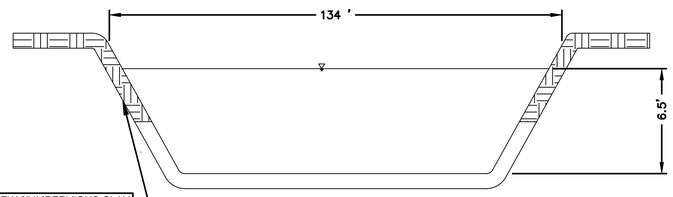
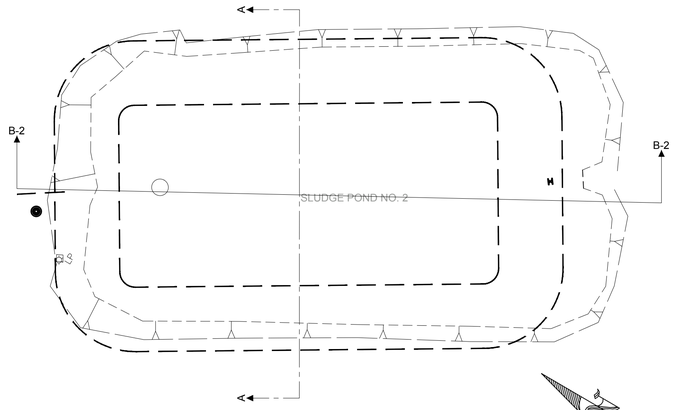


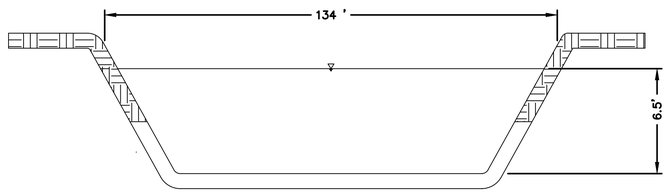
SLUDGE POND 1 PLAN
SCALE: 1"=20'



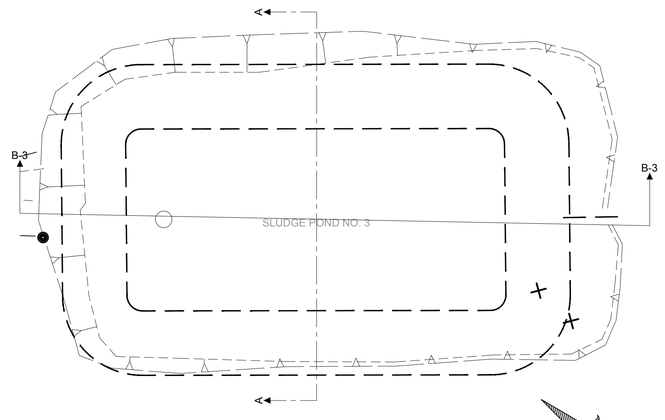
PROPOSED TYPICAL POND 1 SECTION B1
DETAIL
SCALE: N.T.S.



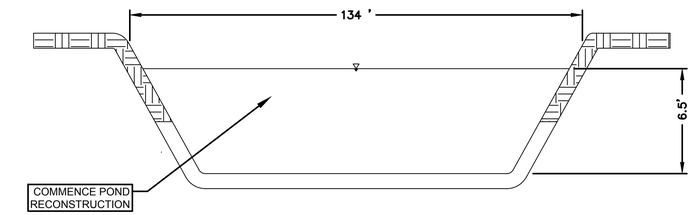
SLUDGE POND 2 PLAN
SCALE: 1"=20'



PROPOSED TYPICAL POND 2 SECTION B2
DETAIL
SCALE: N.T.S.



SLUDGE POND 3 PLAN
SCALE: 1"=20'



PROPOSED TYPICAL POND 3 SECTION B3
DETAIL
SCALE: N.T.S.

NOTES:

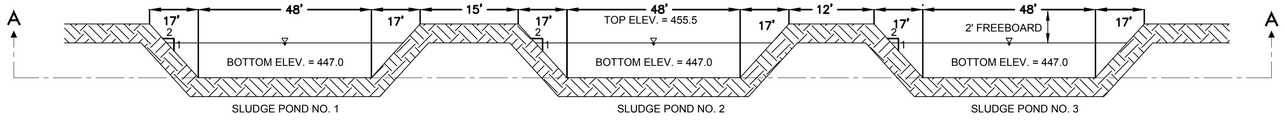
1. OWNER WILL CLEAN AND REMOVE SLUDGE FROM ALL PONDS PRIOR TO CONSTRUCTION. ANY RESIDUAL SLUDGE REMAINING SHALL BE CLEANED UP BY CONTRACTOR AND DISPOSED ON SITE.
2. CONTRACTOR SHALL PROTECT, AND PREVENT DAMAGE TO LAGOON BERMS, EXISTING SURFACE COVER, AND ALL EXISTING UTILITIES AND FACILITIES.
3. CONTRACTOR TO RESTORE STAGING AREAS AND SITE ACCESS AREAS TO EXISTING OR BETTER CONDITIONS IN THE EVENT ANY DAMAGE OR DEGRADATION RESULTS FROM THE WORK.
4. CONTRACTOR SHALL COORDINATE WITH PLANT OPERATORS AND ENGINEERS PRIOR TO INSTALLATION OF TEMPORARY PIPING IF REQUIRED.
5. CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGE ASSOCIATED WITH TEMPORARY PIPING, INSTALLATION, USE, AND/OR REMOVAL AND SHALL RESTORE SITES TO EXISTING CONDITIONS.
6. ANY IMPROVEMENTS TO SITE ACCESS, STAGING AREA OR EXISTING DRIVEWAY, IF NEEDED, SHALL BE SUBSIDIARY TO UNIT COST PER DRY TON.

SEQUENCE OF CONSTRUCTION:

1. CONTRACTOR SHALL COMMENCE POND RECONSTRUCTION WITH SLUDGE POND NO. 3.
2. CONTRACTOR SHALL NOTIFY THE OWNERS, OPERATORS, AND ENGINEER 14 DAYS MINIMUM PRIOR TO THE COMMENCEMENT OF POND NO. 3.
3. SLUDGE PONDS WILL BE RECONSTRUCTED SEPARATELY TO ALLOW FULL SERVICE OPERATION BE CONTINUED AT THE WTP. AT NO TIME WILL ALL 3 PONDS BE OUT OF COMMISSION.
4. CONTRACTOR SHALL NOTIFY THE OWNERS, OPERATORS, ENGINEER, AND INSPECTOR 30 DAYS MINIMUM PRIOR TO SCHEDULED SHUTDOWN IF REQUIRED.
5. CONTRACTOR SHALL NOTIFY THE OWNERS, OPERATORS, ENGINEER, AND INSPECTOR 48 HOURS PRIOR TO ANY CHANGE IN SCHEDULED POWER OR EQUIPMENT OUTAGES NEEDED TO PERFORM THE CONTRACT WORK.

SOIL LINER NOTES: 30 TAC 217.203

1. CONTRACTOR SHALL PROVIDE PROOF THAT EXISTING CLAY LINER IS IN GOOD CONDITION PRIOR TO REUSE. NEW CLAY LINER SHALL BE PAID BY SQUARE YARDS, IN PLACE COMPACTED ACCORDING TO TCEQ LINER SPECIFICATIONS.
2. CONTRACTOR SHALL PROTECT, AND PREVENT DAMAGE TO LAGOON BERMS, EXISTING SURFACE COVER, AND ALL EXISTING UTILITIES AND FACILITIES.
3. STORAGE LAGOONS MUST BE CONSTRUCTED WITH A LINER MATERIAL THAT HAS A COEFFICIENT OF PERMEABILITY LESS THAN 1 × 10-7 CENTIMETERS PER SECOND FOR A THICKNESS OF:
   - 2.0 FEET FOR WATER DEPTHS LESS THAN OR EQUAL TO 8.0 FEET; AND
   - 3.0 FEET FOR WATER DEPTHS GREATER THAN 8.0 FEET.
4. SAMPLING REQUIREMENTS FOR SOIL LINERS:AT LEAST 30% OF THE LINER MATERIAL MUST PASS THROUGH A 200-MESH SIEVE; THE LINER MATERIAL MUST HAVE A LIQUID LIMIT GREATER THAN 30%; AND THE LINER MATERIAL MUST HAVE A PLASTICITY INDEX OF 15 OR GREATER.
6. ALL SOIL LINERS MUST BE OF COMPACTED MATERIAL, AT LEAST 24 INCHES THICK, COMPACTED IN LIFTS NO GREATER THAN 6 INCHES THICK AND COMPACTED TO 95% OF STANDARD PROCTOR DENSITY AT -1% TO +3% OPTIMUM MOISTURE. IN-SITU CLAY SOILS MEETING THE SOILS LINER REQUIREMENTS SHALL BE EXCAVATED AND RE-COMPACTED A MINIMUM OF 6 INCHES BELOW PLANNED GRADE TO ASSURE A UNIFORMLY COMPACTED FINISHED SURFACE.



PROPOSED TYPICAL POND CROSS SECTION
SCALE: N.T.S.

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TYPICAL POND DETAILS – SLUDGE LAGOONS

REVISIONS:

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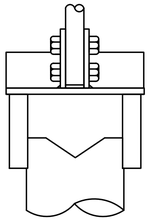
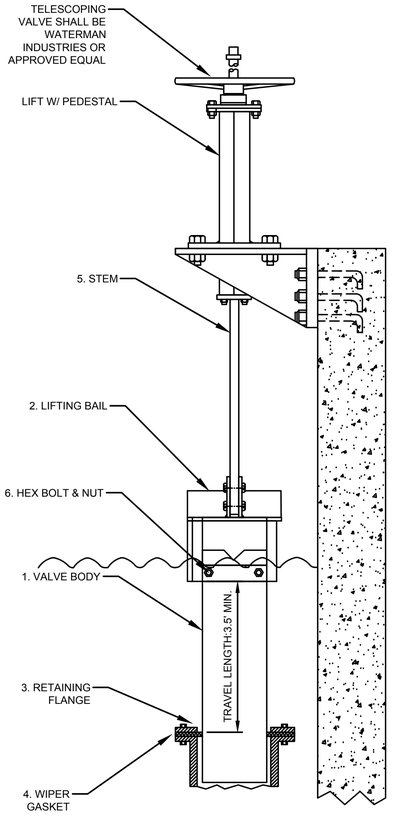


V NOTCH STYLE STAINLESS STEEL
SCALE: N.T.S.

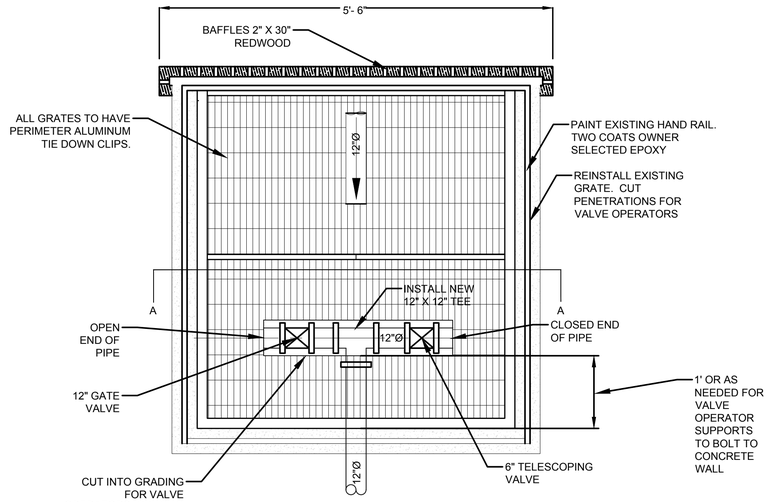


PROPOSED 6" TELESCOPING VALVE ELEVATION
SCALE: N.T.S.

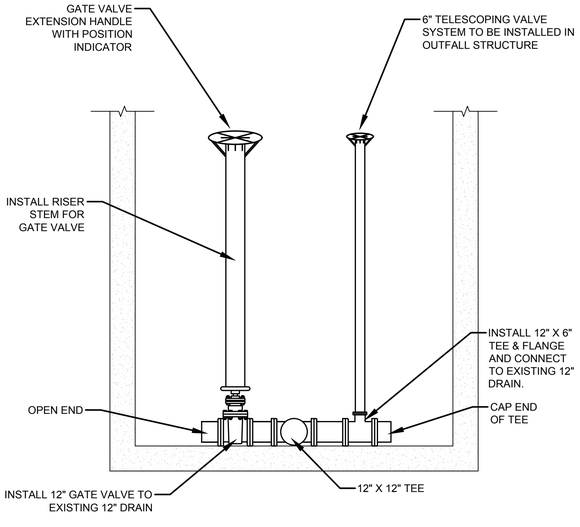
KEY PARTS

1. 304 OR 316 STAINLESS STEEL
2. LIFTING STRAP-STAINLESS ASTM A-276
3. RETAINER FLANGE-STAINLESS STEEL
4. WIPER GASKET-NEOPRENE ASTM D-2000
5. LIFTING STEM-STAINLESS STEEL ASTM A-276
6. HEX BOLT & NUT -STAINLESS STEEL ASTM F-593

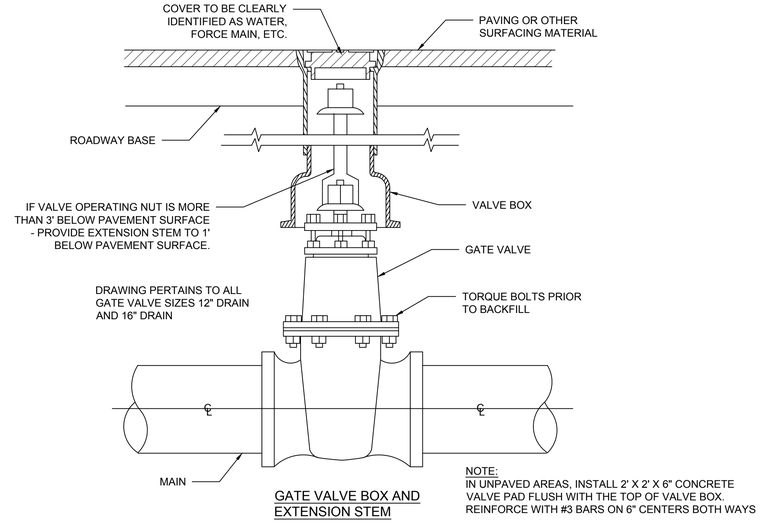
CONTRACTOR SHALL INSTALL ALL TELESCOPE VALVES AS PER THE TECHNICAL SPECIFICATIONS.



OUTFALL STRUCTURE - PLAN
N.T.S.



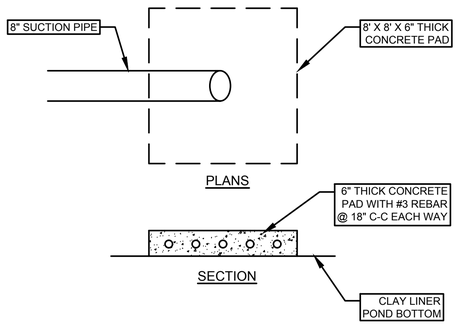
OUTFALL STRUCTURE SECTION A-A
N.T.S.



GATE VALVE BOX AND EXTENSION STEM

NOTE:
IN UNPAVED AREAS, INSTALL 2' X 2' X 6" CONCRETE VALVE PAD FLUSH WITH THE TOP OF VALVE BOX. REINFORCE WITH #3 BARS ON 6" CENTERS BOTH WAYS

GATE VALVE 12" TO 16" BOX & EXTENSION STEM
SCALE: N.T.S.



CONCRETE PAD AT OUTFALL PIPES
SCALE: N.T.S.

NOTES:
1. CONTRACTOR SHALL FIELD VERIFY THE LOCATION OF 12" DRAIN LINE.
2. BOTH TELESCOPING VALVE AND GATE VALVE SHALL BE INSTALLED ON 12" DRAIN INSIDE OF ALL OUTFALL STRUCTURES. VALVES SHALL BE CONNECTED TO 12" DRAIN LINE WITH A 90° ANGLE
3. CONTRACTOR SHALL PROTECT, AND PREVENT DAMAGE TO LAGOON BERMS, EXISTING SURFACE COVER, AND ALL EXISTING UTILITIES AND FACILITIES.
4. VALVE OPERATORS SHALL INCLUDE POSITION INDICATORS AND BE BOLTED SECURELY TO THE CONCRETE WALL OF THE OUTFALL STRUCTURE
5. OUTFALL STRUCTURE DIMENSIONS ARE APPROXIMATELY 5X5' OUTSIDE AND STRUCTURE WALLS ARE APPROXIMATELY 8" THICK. GRATING DIRECTLY OVER THE THREE EXISTING CONCRETE STRUCTURES SHALL BE REUSED. NEW ANCHOR BOLTS ARE REQUIRED FOR THE THREE WALKWAY PLATFORM SUPPORTS, DRILL AND EPOXY 3/4" SS BOLTS WITH 4" MINIMUM EMBEDMENT.
6. TELESCOPING VALVE SHALL BE HANDWHEEL OPERATED. VALVE SHALL ONLY BE ORDERED AFTER FIELD CONFIRMATION OF DIMENSIONS. ANTICIPATED MEASUREMENTS ARE:
   - OFFSET FROM WALL SHALL BE APPROXIMATELY 12".
   - TOTAL HEIGHT FROM OUTFALL PIPE TO TOP OF OUTFALL STRUCTURE SHALL BE APPROXIMATELY 8'
   - TOTAL MAXIMUM DEPTH OF WATER SHALL BE APPROXIMATELY 7'
   - TRAVEL LENGTH SHALL BE 3.5'. - OR MAXIMUM POSSIBLE BASED ON OPERATING WATER DEPTH.

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WTP LAGOON UPGRADES

TYPICAL OUTFALL STRUCTURE DETAILS

REVISIONS:

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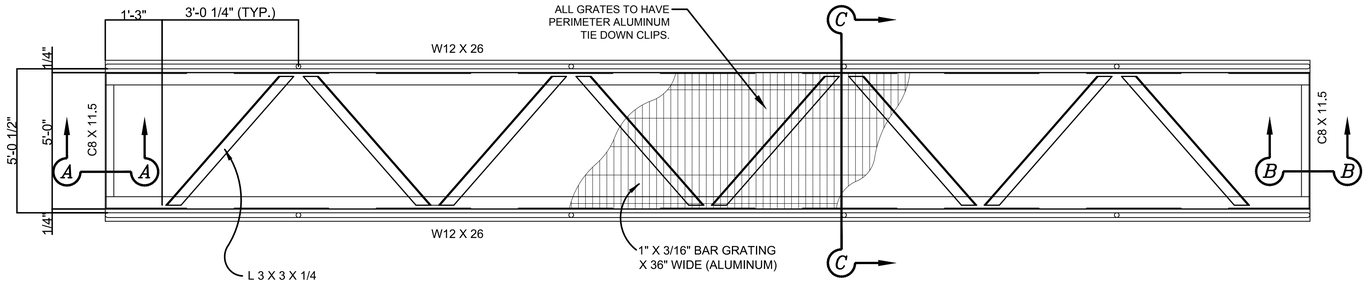
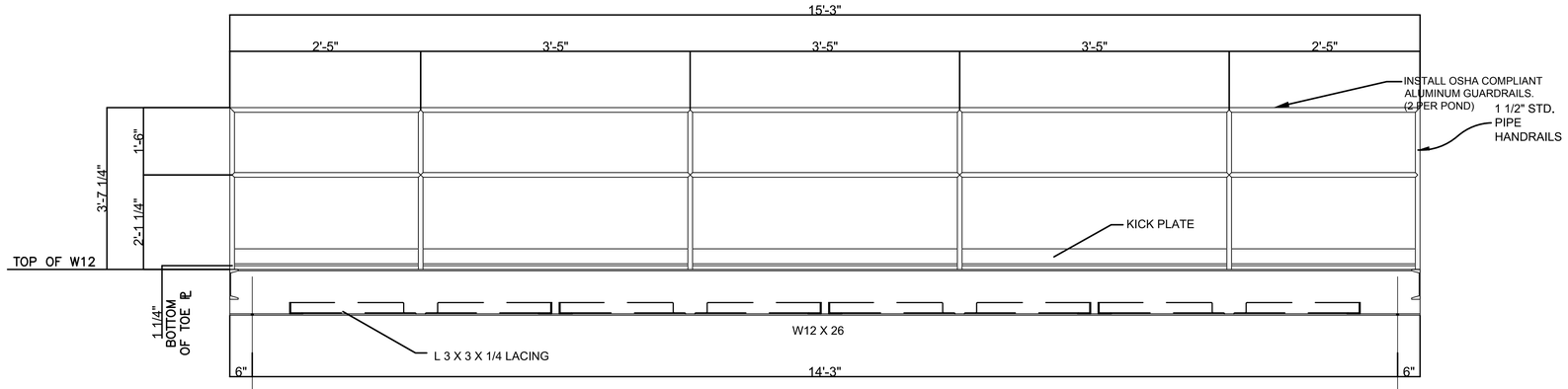


PROPOSED WALKWAY PLAN

SCALE: 1/2" = 1'-0"

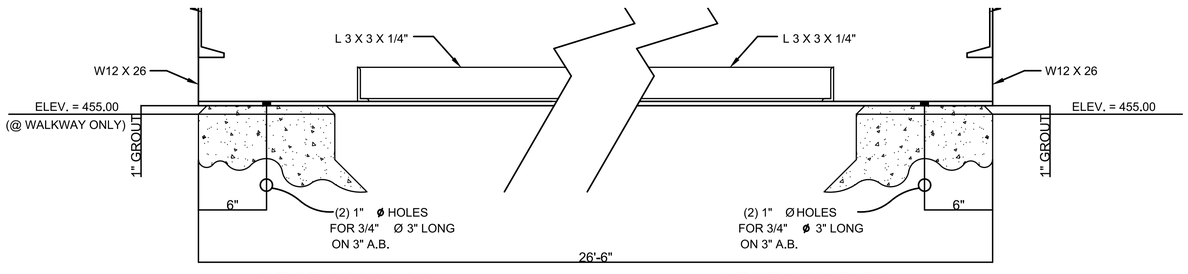


PROPOSED WALKWAY ELEVATION

SCALE: 1/2" = 1'-0"

NOTE:

1. INSTALL 3 STAINLESS STEEL (316) FASTENER AND CONNECT TO EACH EXISTING OUTFALL CONCRETE STRUCTURE. (OR APPROVED EQUAL) (3) . ALL FASTENERS SHALL BE WEATHER RESISTANT.
2. PROPOSED 5' W X 15'-4" L (TO BE VERIFIED PRIOR TO CONSTRUCTION) ALUMINUM WALKWAY OR APPROVED EQUAL MANUFACTURER. WALKWAY SHALL BE WEATHER RESISTANT.
3. NUMBER OF DIAGONALS SHALL BE BASED ON SPACING SHOWN AND 15'-4" LENGTH.

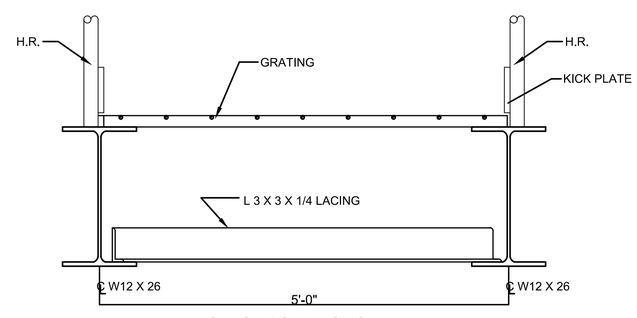


SECTION "A-A"

SCALE: N.T.S.

SECTION "B-B"

SCALE: N.T.S.



SECTION "C-C"

SCALE: N.T.S.

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WTP LAGOON UPGRADES

WALKWAY DETAILS

REVISIONS:

PLANS ARE FORMATTED FOR 22"X34" PLAN SHEETS. IF PRINTED ON 11"X17" SHEETS THE SCALES ARE HALF THE SIZE NOTED.

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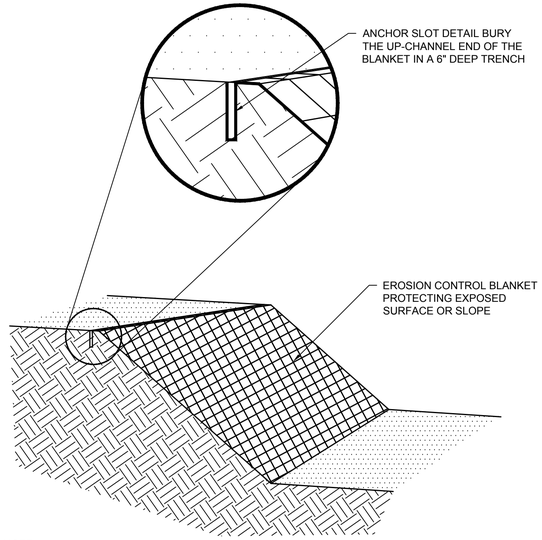
DRAWN BY: N. UNDERWOOD

REVIEWED BY: J. BUECHTER

PROJECT NO: 923239.00

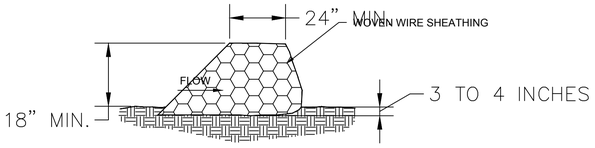
SHEET NO: 10

FILENAME: X:\CLIENTS\ENNIS-CITY OF\923239.00 WTP INTAKE AND LAGOONS\CAD\00-LAGOON BID PACKAGE\EXISTING SLUDGE PONDS - FROM SURVEY.DWG PLOT DATE: 4/4/2023 11:28 AM

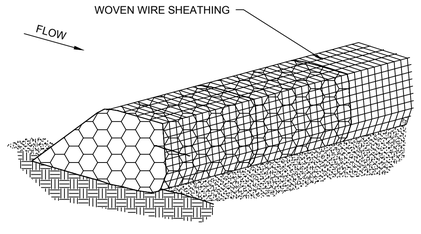


NOTE:
ANCHORING OF THE EROSION CONTROL BLANKETS SHALL BE DONE IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.

EROSION CONTROL BLANKETS
SCALE: N.T.S.

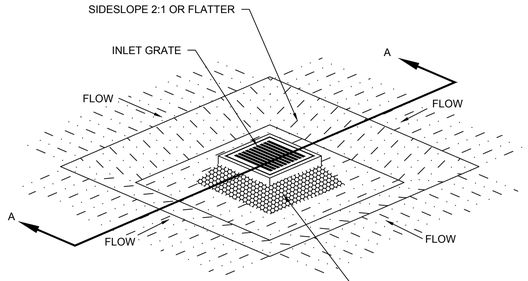


CROSS SECTION
N.T.S.

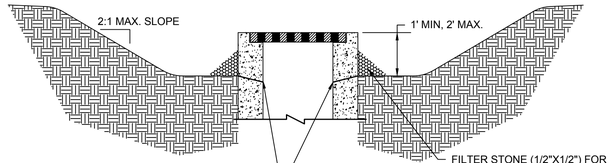


ISOMETRIC PLAN VIEW
N.T.S.

ROCK BERM
SCALE: N.T.S.

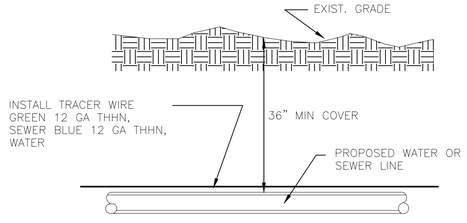


ISOMETRIC PLAN VIEW
N.T.S.

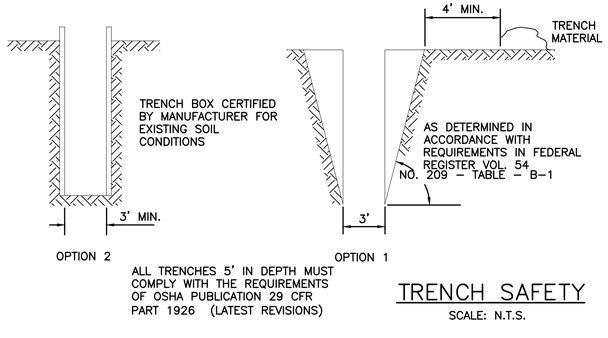


SECTION A-A
N.T.S.

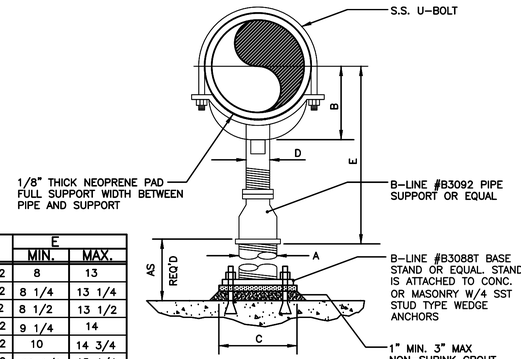
INLET PROTECTION EXCAVATED IMPOUNDMENT
SCALE: N.T.S.



TYP. COVER DETAIL
SCALE: N.T.S.



TRENCH SAFETY
SCALE: N.T.S.



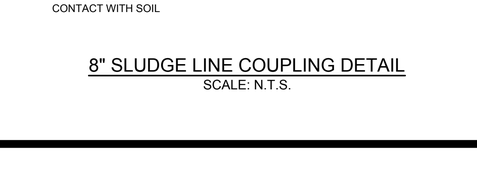
PIPE SIZE	A	B	C	D	E MIN.	E MAX.
2 1/2	2 1/2	3 1/2	9	1 1/2	8	13
3	2 1/2	3 3/4	9	1 1/2	8 1/4	13 1/4
3 1/2	2 1/2	4	9	1 1/2	8 1/2	13 1/2
4	3	4 1/4	9	2 1/2	9 1/4	14
5	3	4 7/8	9	2 1/2	10	14 3/4
6	3	5 1/2	9	2 1/2	10 1/2	15 1/4
8	3	6 7/8	9	2 1/2	11 3/4	16 1/2
10	3	8 1/2	9	2 1/2	13 1/2	18 1/4
12	3	9 15/16	9	2 1/2	15	19 3/4
14	4	10 15/16	11	3	16 1/4	20 3/4
16	4	12 3/8	11	3	17 3/4	22 1/4
18	6	13 7/8	13 1/2	3 1/2	19 1/2	24
20	6	15 3/8	13 1/2	3 1/2	21	25 1/2
24	6	17 15/16	13 1/2	4	23 3/4	28 1/4

1. PROVIDE HALF ROUND RIGID INSULATION & INSULATION PROTECTION SHIELD, SIMILAR TO GRINNELL FIG.167 OR ELCEN FIG.219 WHEN PIPING IS INSULATED.

2. FOR BASE, HEIGHT, & FLANGE DIMENSIONS, SEE TABLE TO RIGHT. ALL DIMENSIONS IN INCHES.

3. ALL COMPONENTS OF PIPE SUPPORT SHALL BE STAINLESS STEEL.

ADJUSTABLE PIPE SUPPORT
SCALE: N.T.S.

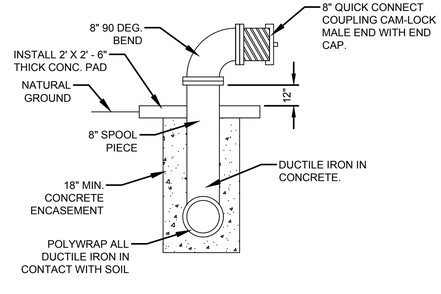


FRONT ELEVATION

NOTES:

1. CONCRETE PIPE SUPPORT STRUCTURES SHALL BE INSTALLED AT ALONG 8" SLUDGE PIPE. HEIGHT VARIES BASED ON POND DEPTHS AND LOCATION.

CONCRETE SUPPORT STRUCTURE
SCALE: N.T.S.



8" SLUDGE LINE COUPLING DETAIL
SCALE: N.T.S.

SCHAUMBURG & POLK, INC.
BEAUMONT | GARLAND | HOUSTON
PORT ARTHUR | TERRELL | TYLER
320 S. Broadway Ave., SUITE 200
Tyler, TX 75702
903.595.3913
Firm Registration No. F-520

STATE OF TEXAS
JEREMY P. BUECHTER
92554
LICENSED PROFESSIONAL ENGINEER
03/30/2023

ENNIS TEXAS
The bluebonnet spirit of Texas

WTP LAGOON UPGRADES

MISCELLANEOUS DETAILS

REVISIONS:

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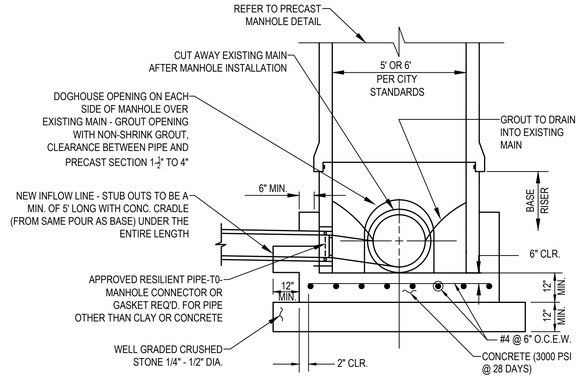
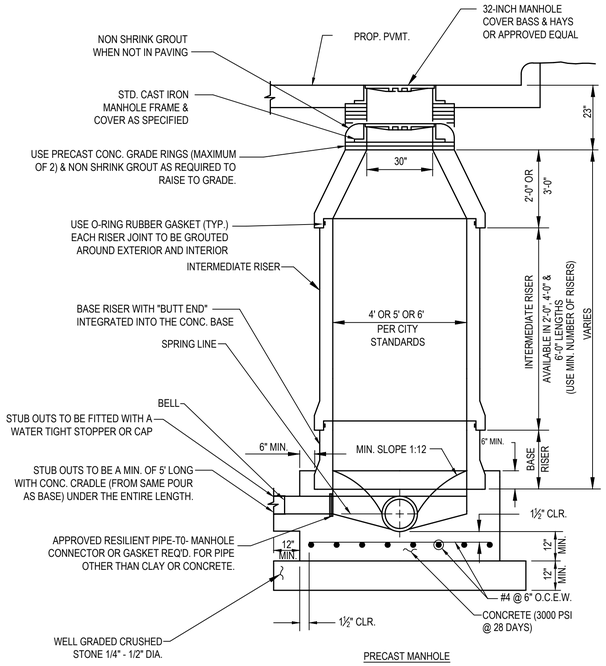
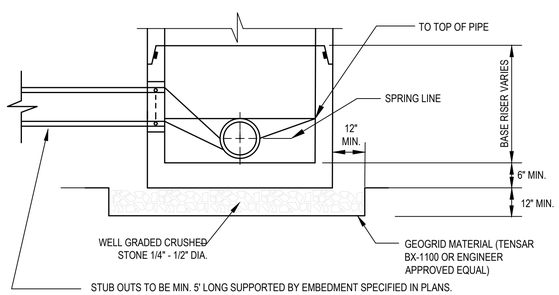


DOGHOUSE MANHOLE INSTALLED ON EXISTING MAIN



PRECAST MANHOLE

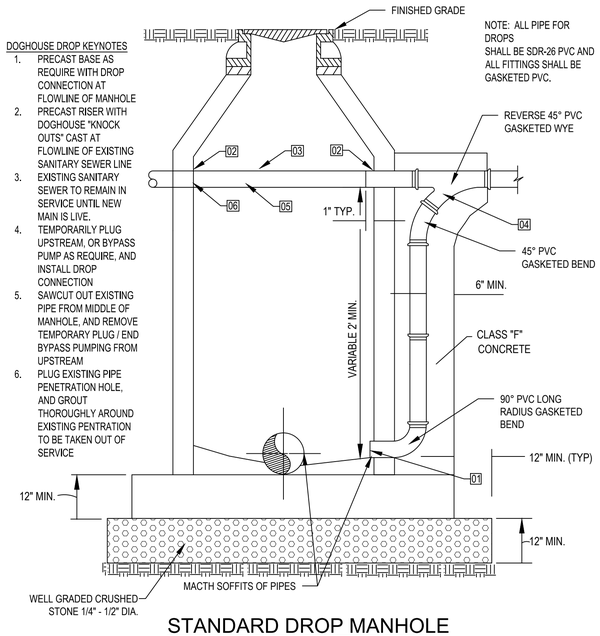


PRECAST MANHOLE

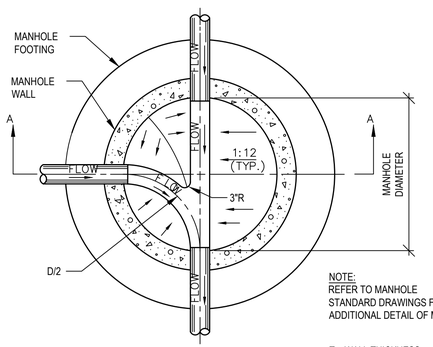
PRECAST WASTEWATER MANHOLE AND BASE

NOTES:

1. MANHOLES PLACED AT THE END OF A WASTEWATER COLLECTION SYSTEM PIPE THAT MAY BE EXTENDED IN THE FUTURE MUST INCLUDE PIPE STUB OUTS WITH PLUGS. THE LENGTH OF THE STUB OUT SHALL BE DECIDED BY THE DIRECTOR OF UTILITIES.
2. A MANHOLE MUST BE MADE OF MONOLITHIC, CAST-IN-PLACE CONCRETE, OR PRE-CAST CONCRETE. THE USE OF BRICKS TO ADJUST A MANHOLE COVER TO GRADE OR CONSTRUCT A MANHOLE IS PROHIBITED.
3. THE INSIDE DIAMETER OF A MANHOLE MUST BE NO LESS THAN 60-INCHES. A MANHOLE DIAMETER MUST BE SUFFICIENT TO ALLOW PERSONNEL AND EQUIPMENT TO ENTER, EXIT, AND WORK IN THE MANHOLE AND TO ALLOW PROPER JOINING OF THE COLLECTION SYSTEM PIPES IN THE MANHOLE WALL.
4. TOP OF MANHOLE TO BE 2'-0" (±2") ABOVE EXISTING GROUND IN UNDEVELOPED AREAS UNLESS OTHERWISE DIRECTED BY THE ENGINEER. MOUND DIRT AROUND MANHOLE @ 6:1 SLOPE.
5. TOP OF MANHOLE TO BE 6" (±1") ABOVE EXISTING GROUND IN DEVELOPED AREAS AND ON STREET RIGHT-OF-WAYS UNLESS OTHERWISE DIRECTED BY THE ENGINEER. MOUND DIRT AROUND MANHOLE @ 6:1 SLOPE.
6. ALL MANHOLES IN PUBLIC R.O.W. SHALL HAVE PROVISIONS TO FACILITATE ANY NECESSARY ADJUSTMENT IN HEIGHT.
7. PRE CAST RISERS, CONES, FLAT TOP SLABS, REDUCING FLAT SLABS, FLOORS, GRADE RINGS & RINGS AND COVERS SHALL BE MANUFACTURED ACCORDING TO THE MOST RECENT ASTM C-478 SPECIFICATIONS.
8. MANHOLE WATERPROOFING SHALL BE ONE HEAVY EXTERIOR COAT OF TAR PAINT SUCH AS KOPPERS "BITUMASTIC SUPER-SERVICE BLACK", TNEMEC "46-449 HEAVY DUTY BLACK", VALSPAR "35-J-10", OR APPROVED EQUIVALENT.
9. EACH RISER JOINT TO BE GROUTED AROUND EXTERIOR AND INTERIOR.
10. MANHOLES MUST MEET THE FOLLOWING REQUIREMENTS FOR COVERS, INLETS, AND BASES:
    a. MANHOLE COVERS AND FRAMES MUST BE PAM REX AND MUST BE GROUTED TO THE MANHOLE.
    b. A MANHOLE WHERE PERSONNEL ENTRY IS ANTICIPATED REQUIRES AT LEAST A 30 INCH DIAMETER CLEAR OPENING.
    c. A MANHOLE LOCATED WITHIN A 100-YEAR FLOOD PLAIN MUST HAVE A MEANS OF PREVENTING INFLOW.
    d. A MANHOLE COVER THAT IS LOCATED IN A ROADWAY MUST MEET OR EXCEED THE AMERICAN ASSOCIATION OF STATE HIGHWAYS AND TRANSPORTATION OFFICIALS STANDARD M-306 FOR LOAD BEARING.



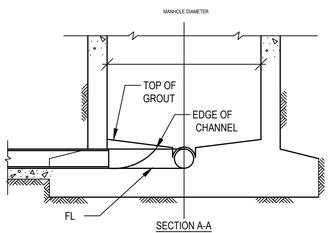
STANDARD DROP MANHOLE



PLAN

NOTE:
REFER TO MANHOLE STANDARD DRAWINGS FOR ADDITIONAL DETAIL OF M.H.

T = WALL THICKNESS
D = MANHOLE DIAMETER

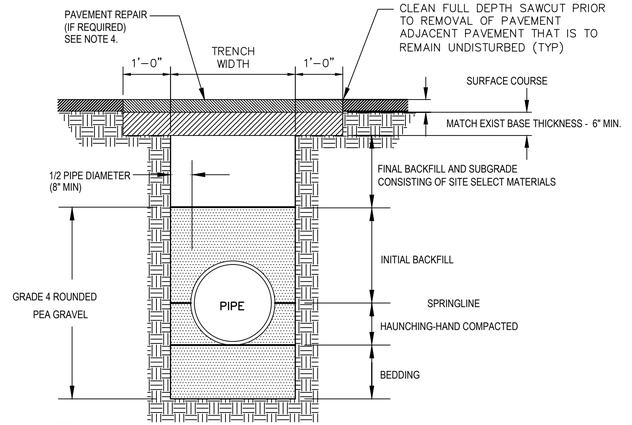


SECTION A-A

MANHOLE INVERTS

1. THE BOTTOM OF A MANHOLE MUST CONTAIN A U-SHAPED CHANNEL THAT IS A SMOOTH CONTINUATION OF THE INLET AND OUTLET PIPES.
2. A MANHOLE CONNECTED TO A PIPE LESS THAN 15 INCHES IN DIAMETER MUST HAVE A CHANNEL DEPTH EQUAL TO AT LEAST HALF THE LARGEST PIPE'S DIAMETER.
3. A MANHOLE CONNECTED TO A PIPE AT LEAST 15 INCHES IN DIAMETER BUT NOT MORE THAN 24 INCHES IN DIAMETER MUST HAVE A CHANNEL DEPTH EQUAL TO AT LEAST THREE-FOURTHS OF THE LARGEST PIPE'S DIAMETER.
4. A MANHOLE CONNECTED TO A PIPE GREATER THAN 24 INCHES IN DIAMETER MUST HAVE A CHANNEL DEPTH EQUAL TO AT LEAST THE LARGEST PIPE'S DIAMETER.
5. A MANHOLE WITH PIPES OF DIFFERENT SIZES MUST HAVE THE TOPS OF THE PIPES AT THE SAME ELEVATION AND FLOW CHANNELS IN THE INVERT SLOPED ON AN EVEN SLOPE FROM PIPE TO PIPE.
6. A BENCH PROVIDED ABOVE A CHANNEL MUST SLOPE AT A MINIMUM OF 0.5 INCH PER FOOT.
7. A WASTEWATER COLLECTION SYSTEM PIPE ENTERING A MANHOLE MORE THAN 6 INCHES ABOVE AN INVERT MUST HAVE A DROP PIPE.
8. THE INCLUSION OF STEPS IN A MANHOLE IS PROHIBITED.

WASTEWATER MANHOLE LINE INTERSECTION



NOTES:

1. SAWCUT EXISTING PAVEMENT A MINIMUM OF 3" DEEP ALONG PERIMETER OF PAVEMENT REPAIR. FOR CONCRETE PAVEMENT - SEE CONCRETE PAVEMENT REPAIR DETAIL. WHERE WITHIN 12" OF AN EXISTING JOINT EXTEND THE PAVEMENT REMOVAL AND REPLACEMENT TO THE JOINT.
2. THE FOLLOWING MATERIALS SHALL BE USED:
    a. BEDDING, HAUNCHING, AND INITIAL BACKFILL: GRADE 4 ROUNDED PEA GRAVEL SHALL BE USED FROM 6" BELOW PIPE TO 6" ABOVE TOP OF PIPE CROWN.
    b. FINAL BACKFILL: SELECT SITE MATERIALS, FREE FROM LUMPS OR CLODS >6" DIA. PI<20, LL<45
3. WHEN AN UNSTABLE TRENCH BOTTOM IS ENCOUNTERED, CONTRACTOR SHALL OVER EXCAVATE TRENCH AND PLACE 6" OF CLASS I MATERIAL FOR FOUNDATION.
4. ALL BACKFILL SHALL BE PLACED IN 8" MAX. LIFTS AND BE COMPACTED TO 90% STANDARD PROCTOR. BACKFILL UNDERNEATH ASPHALT, CONCRETE, DRIVES, OR FUTURE STRUCTURES SHALL BE COMPACTED TO 95% STANDARD PROCTOR.
5. PAVEMENT REPAIRS SHALL MATCH EXISTING PAVEMENT PROFILES, HOWEVER, THE FOLLOWING MINIMUM CRITERIA SHALL APPLY.
    a. SUBGRADE SHALL BE COMPACTED TO 95% STD. PROCTOR.
    b. MINIMUM 6" FLEXIBLE BASE SHALL BE TXDOT TYPE A CRUSHED STONE, GRADE 1 COMPACTED TO 95% STD. PROCTOR FOR ASPHALT PAVEMENT
    c. 2" MIN. HMAC TYPE D SURFACE PER TXDOT ITEM 341 OR 4" MIN. REINFORCED CONCRETE PAVEMENT PER TXDOT ITEM 360 AND ITEM 440.
    d. PRIME AND/OR TACK COATS WILL BE REQUIRED AS APPLICABLE
    e. FOR INSTALLATION REQUIREMENTS, SEE TXDOT STANDARDS AS REFERENCED IN THE TECHNICAL SPECIFICATIONS.

PIPE EMBEDMENT AND PAVEMENT REPAIR DETAIL

SCHAUMBURG & POLK, INC.
BEAUMONT | GARLAND | HOUSTON
PORT ARTHUR | TERRELL | TYLER
320 S. Broadway Ave., SUITE 200
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903.595.3913
Firm Registration No. F-520

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