CONTRACT DOCUMENTS AND TECHNICAL SPECIFICATIONS FOR

6th and Peach Infrastructure (PW20-001)

ISSUED FOR BID

Submission Deadline:

2:00 PM, September 11, 2020

Submit Proposals to:

Town of Pecos City
Attn: Syra Nichols, City Secretary
115 W. 3rd Street
Pecos, TX 79772

00 01 07 SEALS PAGE

This document was prepared under the direction of and is released for bidding purposes under the authority of:

Seth A. Sorensen, P.E.
City Manager

PECOS
★ T E X A S ★
110 E. 6th Street
Pecos, TX 79772
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432-445-2421
432-445-6670 (fax)

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ADVERTISEMENT FOR BIDS

Sealed Bids for 6TH AND PEACH INFRASTRUCTURE (PW20-001) will be received by the Town of Pecos City at Pecos City Hall, 115 W. 3rd Street, Pecos, Texas 79772, until 2:00 PM on Friday, September 11, 2020 at which time the bids will be publicly opened and read aloud in the City Council Chambers of Pecos City Hall.

The Project basically consists of:

Clearing and grubbing, hauling and installing fill material, grading and compaction, installation of water and sewer utilities, curb and gutter, sidewalk, driveways, ADA ramps and HMAC Pavement.

The Issuing Office for the Bidding Documents is: Town of Pecos City Public Works, 115 W. 3rd Street, Pecos, Texas 79772. Requests for clarification may be directed to Seth Sorensen, P.E., City Manager, at (432) 445-2421 or ssorensen@pecostx.gov.

Prospective Bidders may examine at no cost the Bidding Documents at the Issuing Office on Mondays through Fridays between the hours of 8:00 AM and 5:00 PM. Bidding Documents may be downloaded online without charge from the City's website at www.pecostx.gov and www.ciplist.com. Notification of any revisions to the bid documents will be issued through www.ciplist.com.

The cost of Bidding Documents from the Issuing Office is $100.00 for a printed set and $20.00 for an electronic form on a thumb drive (plus the cost of shipping). Cost of Bidding Documents and shipping is non-refundable. Upon Issuing Office's receipt of payment, Bidding Documents will be sent via the prospective Bidder's delivery method of choice. The date that the Bidding Documents are transmitted by the Issuing Office will be considered the Bidder's date of receipt of the Bidding Documents. Partial sets of the Bidding Documents will not be available from the Issuing Office.

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.

Successful Bidder will be required to furnish Performance and Payment Bonds and proof of insurance, complying with the General Conditions of the Agreement.

Owner reserves the right to reject any or all Bids, including without limitation, nonconforming, nonresponsive, unbalanced, or conditional Bids. Bids will remain subject to acceptance for 60 days after the Bid opening.

Owner: Town of Pecos City

By: Syra Nichols

Title: City Secretary

Dates: August 20, 2020

August 27, 2020

+ + END OF ADVERTISEMENT FOR BIDS + +

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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 for bids.

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, Bidder shall submit with its Bid the Statement of Qualifications as found in Section 00 45 13.

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.

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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 Section 00 72 00 "Standard General Conditions" will apply.

B. Underground Facilities: Information and data shown or indicated in the Bidding Documents with respect to existing Underground Facilities at or contiguous 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. Appointments for site visits shall be made by contacting the Issuing Office.

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

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.

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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.

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ARTICLE 6 – PRE-BID CONFERENCE

6.01 A Non-Mandatory Pre-Bid conference will be held at 2:00 PM local time on Thursday September 3, 2020 in the City Council Chambers, located at 115 W. 3rd Street, Pecos, TX 79772.

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 the Work is to be substantially 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.

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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, and those "or-equal" or substitute or materials and equipment subsequently approved by Engineer prior to the submittal of Bids and identified by Addendum. No item of material or equipment will be considered by Engineer as an "or-equal" or substitute unless written request for approval has been submitted by Bidder and has been received by Engineer at least 15 days prior to the date for receipt of Bids. Each such request shall comply with the requirements of Paragraphs 7.04 and 7.05 of the General Conditions. The burden of proof of the merit of the proposed item is upon Bidder. Engineer's decision of approval or disapproval of a proposed item will be final. If Engineer approves any such proposed item, such approval will be set forth in an Addendum issued to all prospective Bidders. Bidders shall not rely upon approvals made in any other manner.

11.02 All prices that Bidder sets forth in its Bid shall be based on the presumption that the Contractor will furnish the materials and equipment specified or described in the Bidding Documents, as supplemented by Addenda. Any assumptions regarding the possibility of post-Bid approvals of "or-equal" or substitution requests are made at Bidder's sole risk.

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 portions of the Work:

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, without an increase in Bid price.

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 not 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.

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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 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 official address of the firm shall be shown.

13.04 A Bid by an individual shall show the Bidder's name and official address.

13.05 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 official address of the joint venture shall be shown.

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

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

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

13.09 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. Bid Alternates will not be considered as part of this bid.

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

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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 Town of Pecos City, Attn: Syra Nichols, City Secretary, 110 E. 6th Street, Pecos, Texas 79772.

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.

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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. For the determination of the apparent low Bidder when unit price bids are submitted, Bids will be compared on the basis of the total of the products of the estimated quantity of each item and unit price Bid for that item, together with any lump sum items.

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.

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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.

ARTICLE 22 – SALES AND USE TAXES

22.01 Owner is exempt from state sales and use taxes on materials and equipment to be incorporated in the Work. Said taxes shall not be included in the Bid. Refer to Paragraph SC-7.09 of the Supplementary Conditions for additional information.

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00 31 21 SURVEY INFORMATION

GENERAL

INFORMATION PROVIDED

1. A full set of construction plans are issued for this project.
2. Survey Coordinates are locally assumed. Contractor will be responsible to establish all secondary control.

PRODUCTS (NOT USED)

EXECUTION (NOT USED)

END OF SECTION

TOWN OF PECOS CITY
6th and Peach Infrastructure
(PW20-001)

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ARTICLE 1 – BID RECIPIENT

1.01 This Bid is submitted to:

TOWN OF PECOS CITY
ATTN: SYRA NICHOLS, CITY SECRETARY
115 W. 3RD ST.
PECOS, TEXAS 79772

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 60 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 reports and drawings relating to Hazardous Environmental Conditions, if any, at or adjacent to the Site that have been identified in the Supplementary Conditions.

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

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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

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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 price(s) shown in the attached Exhibit.

5.02 Bidder acknowledges that (1) each Bid Unit Price includes an amount considered by Bidder to be adequate to cover Contractor's overhead and profit for each separately identified item, and (2) 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.

5.03 Extended amounts have been computed in accordance with the General Conditions.

5.04 Unit Price and Figures Column will be used to compute the actual bid price.

5.05 Bidder accepts the Measurement and Basis of Payment provisions of Paragraph 1.08 of Section 01 29 00: Payment Procedures.

ARTICLE 6 – TIME OF COMPLETION

6.01 Bidder agrees that the Work will be substantially complete within 150 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 180 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. Basis of Bid Form Exhibit

B. Required Bid security;

C. List of Proposed Subcontractors;

D. List of Proposed Suppliers;

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. Required Bidder Qualification Statement with supporting data.

G. Vendor Compliance to State Law

H. Contractor Compliance to Texas Sales Tax Code

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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 – VENUE

9.01 Bidder agrees that venue shall lie exclusively in Reeves County, Texas, in which the Owner is located, for any legal action.

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ARTICLE 10 – 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)

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00 44 00.13 BASIS OF BID EXHIBIT

6TH AND PEACH INFRASTRUCTURE

ITEM	QUANTITY	UNIT	DESCRIPTION & UNIT PRICE (LIST UNIT PRICE IN BOTH WORDS AND NUMBERS)	EXTENDED PRICE
1	1	LS	MOBILIZATION	
			DOLLARS &	
			CENTS	$
			PER LUMP SUM ($_____)	
2	1	LS	BONDS AND INSURANCE	
			DOLLARS &	
			CENTS	$
			PER LUMP SUM ($_____)	
3	1	LS	MATERIALS TESTING	
			DOLLARS &	
			CENTS	$
			PER LUMP SUM ($_____)	
4	1	LS	CONSTRUCTION SURVEYING	
			DOLLARS &	
			CENTS	$
			PER LUMP SUM ($_____)	
5	1	LS	TRAFFIC CONTROL	
			DOLLARS &	
			CENTS	$
			PER LUMP SUM ($_____)	

6TH AND PEACH INFRASTRUCTURE

ITEM	QUANTITY	UNIT	DESCRIPTION & UNIT PRICE (LIST UNIT PRICE IN BOTH WORDS AND NUMBERS)	EXTENDED PRICE
6	1	$$	CONTINGENCY	
			FIFTY THOUSAND DOLLARS &	
			ZERO CENTS	$50,000.00
			PER FORCE ACCOUNT ($_____50,000.00_____)	
7	600	LF	REMOVE 8" WATER LINE – AC PIPE	
			DOLLARS &	
			CENTS	$
			PER LINEAR FOOT ($_____)	
8	1	EA	REMOVE FIRE HYDRANT	
			DOLLARS &	
			CENTS	$
			PER EACH ($_____)	
9	1.5	ACRE	CLEARING AND GRUBBING	
			DOLLARS &	
			CENTS	$
			PER ACRE ($_____)	
10	200	CY	UNCLASSIFIED EXCAVATION	
			DOLLARS &	
			CENTS	$
			PER CUBIC YARD ($_____)	
11	2000	CY	HAULING AND INSTALLATION OF FILL MATERIAL	
			DOLLARS &	
			CENTS	$
			PER CUBIC YARD ($_____)	

6TH AND PEACH INFRASTRUCTURE

ITEM	QUANTITY	UNIT	DESCRIPTION & UNIT PRICE (LIST UNIT PRICE IN BOTH WORDS AND NUMBERS)	EXTENDED PRICE
12	650	CY	FLEXIBLE "CALICHE" BASE	
			DOLLARS &	
			CENTS	$
			PER CUBIC YARD ($_____)	
13	1	LS	GRADING AND COMPACTION	
			DOLLARS &	
			CENTS	$
			PER LUMP SUM ($_____)	
14	4500	LF	CURB & GUTTER/LAYDOWN CURB	
			DOLLARS &	
			CENTS	$
			PER LINEAR FOOT ($_____)	
15	400	SY	6" THICK CONCRETE DRIVEWAYS – REINFORCED	
			DOLLARS &	
			CENTS	$
			PER SQUARE YARD ($_____)	
16	180	SY	6" REINFORCED CONCRETE ALLEYWAY TRANSITIONS	
			DOLLARS &	
			CENTS	$
			PER SQUARE YARD ($_____)	
17	63	SY	6" REINFORCED CONCRETE DUMPSTER PAD	
			DOLLARS &	
			CENTS	$
			PER SQUARE YARD ($_____)	

6TH AND PEACH INFRASTRUCTURE

ITEM	QUANTITY	UNIT	DESCRIPTION & UNIT PRICE (LIST UNIT PRICE IN BOTH WORDS AND NUMBERS)	EXTENDED PRICE
18	12,500	SF	ADA COMPLIANT SIDEWALK – 4" THICKNESS	
			DOLLARS &	
			CENTS	$
			PER SQUARE FOOT ($_____)	
19	16	EA	ADA DETECTABLE WARNING SURFACE	
			DOLLARS &	
			CENTS	$
			PER EACH ($_____)	
20	200	GAL	PRIME COAT (SS-1)	
			DOLLARS &	
			CENTS	$
			PER GALLON ($_____)	
21	190	TON	TxDOT TYPE "D" HMAC	
			DOLLARS &	
			CENTS	$
			PER TON ($_____)	
22	50	TON	TxDOT TYPE "D" HMAC – ASPHALT PATCHING	
			DOLLARS &	
			CENTS	$
			PER TON ($_____)	
23	700	LF	8" PVC SDR 35 SEWER LINE	
			DOLLARS &	
			CENTS	$
			PER LINEAR FOOT ($_____)	

6TH AND PEACH INFRASTRUCTURE

ITEM	QUANTITY	UNIT	DESCRIPTION & UNIT PRICE (LIST UNIT PRICE IN BOTH WORDS AND NUMBERS)	EXTENDED PRICE
24	2	EA	FIBERGLASS MANHOLE (COMPLETE)	
			DOLLARS &	
			CENTS	$
			PER EACH ($_____)	
25	24	EA	6" SEWER SERVICE CONNECTION (COMPLETE)	
			DOLLARS &	
			CENTS	$
			PER EACH ($_____)	
26	2	EA	8” LATERAL PRESSURE INTERCONNECTION (HOT TAP) W/8" GATE VALVE	
			DOLLARS &	
			CENTS	$
			PER EACH ($_____)	
27	2600	LF	8" AWWA C900 or C909 PVC PIPE CLASS 150, DR-18	
			DOLLARS &	
			CENTS	$
			PER LINEAR FOOT ($_____)	
28	3	EA	FIRE HYDRANT ASSEMBLY W/6" GATE VALVE (COMPLETE)	
			DOLLARS &	
			CENTS	$
			PER EACH ($_____)	
29	24	EA	3/4" WATER SERVICE CONNECTION (COMPLETE)	
			DOLLARS &	
			CENTS	$
			PER EACH ($_____)	

6TH AND PEACH INFRASTRUCTURE

ITEM	QUANTITY	UNIT	DESCRIPTION & UNIT PRICE (LIST UNIT PRICE IN BOTH WORDS AND NUMBERS)	EXTENDED PRICE
30	12	EA	8" GATE VALVE - MJ	
			DOLLARS &	
			CENTS	$
			PER EACH ($_____)	
31	1	EA	8"x8" DUCTILE IRON TEE - MJ	
			DOLLARS &	
			CENTS	$
			PER EACH ($_____)	
32	2	EA	8"x8" DUCTILE IRON CROSS - MJ	
			DOLLARS &	
			CENTS	$
			PER EACH ($_____)	
33	8	EA	8"x8" DUCTILE 45° or 90° BEND - MJ	
			DOLLARS &	
			CENTS	$
			PER EACH ($_____)	
34	2	EA	8"x8" DUCTILE IRON COUPLER - MJ	
			DOLLARS &	
			CENTS	$
			PER EACH ($_____)	
35	12	EA	VALVE BOX AND RISER	
			DOLLARS &	
			CENTS	$
			PER EACH ($_____)	

6TH AND PEACH INFRASTRUCTURE

ITEM	QUANTITY	UNIT	DESCRIPTION & UNIT PRICE (LIST UNIT PRICE IN BOTH WORDS AND NUMBERS)	EXTENDED PRICE
36	2	EA	ADJUST MANHOLE/VALVE COVER TO FINISHED GRADE	
			DOLLARS &	
			CENTS	$
			PER EACH ($_____)	
37	2	EA	MANHOLE CONCRETE COLLARS	
			DOLLARS &	
			CENTS	$
			PER EACH ($_____)	
38	1	EA	4” LATERAL PRESSURE INTERCONNECTION (HOT TAP) W/4" GATE	
			DOLLARS &	
			CENTS	$
			PER EACH ($_____)	
39	50	LF	DIRECTIONAL BORE - 8” SEWER	
			DOLLARS &	
			CENTS	$
			PER LINEAR FOOT ($_____)	
40	510	LF	REMOVE CONCRETE CURB AND GUTTER	
			DOLLARS &	
			CENTS	$
			PER LINEAR FOOT ($_____)	
41	5245	SF	REMOVE CONCRETE (VARYING THICKNESSES)	
			DOLLARS &	
			CENTS	$
			PER SQUARE FOOT ($_____)	

6TH AND PEACH INFRASTRUCTURE

ITEM	QUANTITY	UNIT	DESCRIPTION & UNIT PRICE (LIST UNIT PRICE IN BOTH WORDS AND NUMBERS)	EXTENDED PRICE
42	20	LF	12" AWWA C900 PVC PIPE CLASS 150, DR-18 (CARRIER PIPE)	
			DOLLARS &	
			CENTS	$
			PER LINEAR FOOT ($_____)	

TOTAL BASE BID _____ DOLLARS &

_____ CENTS

($_____)

00 43 13 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)*:
Town of Pecos City
115 W. 3rd St.
Pecos, TX 79772

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 one year 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.

00 45 13 BIDDER'S QUALIFICATIONS

THE INFORMATION SUPPLIED IN THIS DOCUMENT IS CONFIDENTIAL TO THE EXTENT PERMITTED BY LAWS AND REGULATIONS

1. SUBMITTED BY:

Official Name of Firm: _____

Address: _____

_____

_____

2. SUBMITTED TO: _____

3. SUBMITTED FOR: _____

Owner: _____

Project Name: _____

_____

TYPE OF WORK: _____

_____

_____

4. CONTRACTOR'S CONTACT INFORMATION

Contact Person: _____

Title: _____

Phone: _____

Email: _____

5. AFFILIATED COMPANIES:

Name: _____

Address: _____

_____

_____

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6. TYPE OF ORGANIZATION:

☐ SOLE PROPRIETORSHIP

Name of Owner: _____

Doing Business As: _____

Date of Organization: _____

☐ PARTNERSHIP

Date of Organization: _____

Type of Partnership: _____

Name of General Partner(s): _____

_____

_____

☐ CORPORATION

State of Organization: _____

Date of Organization: _____

Executive Officers:

- President: _____
- Vice President(s): _____

_____

_____

- Treasurer: _____
- Secretary: _____

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☐ LIMITED LIABILITY COMPANY

State of Organization: _____

Date of Organization: _____

Members: _____

_____

_____

_____

☐ JOINT VENTURE

Sate of Organization: _____

Date of Organization: _____

Form of Organization: _____

Joint Venture Managing Partner

- Name: _____
- Address: _____

_____

_____

Joint Venture Managing Partner

- Name: _____
- Address: _____

_____

Joint Venture Managing Partner

- Name: _____
- Address: _____

_____

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7. LICENSING

Jurisdiction: _____

Type of License: _____

License Number: _____

Jurisdiction: _____

Type of License: _____

License Number: _____

8. CERTIFICATIONS

CERTIFIED BY:

Disadvantage Business Enterprise: _____

Minority Business Enterprise: _____

Woman Owned Enterprise: _____

Small Business Enterprise: _____

Other (_____): _____

9. BONDING INFORMATION

Bonding Company: _____

Address: _____

_____

Bonding Agent: _____

Address: _____

_____

_____

Contact Name: _____

Phone: _____

Aggregate Bonding Capacity: _____

Available Bonding Capacity as of date of this submittal:_____

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10. FINANCIAL INFORMATION

Financial Institution: _____

Address: _____

_____

Account Manager: _____

Phone: _____

INCLUDE AS AN ATTACHMENT AN AUDITED BALANCE SHEET FOR EACH OF THE LAST 3 YEARS

11. CONSTRUCTION EXPERIENCE:

Current Experience:

List on **Schedule A** all uncompleted projects currently under contract (If Joint Venture list each participant's projects separately).

Previous Experience:

List on **Schedule B** all similar projects completed within the last 5 Years (If Joint Venture list each participant's projects separately).

Has firm listed in Section 1 ever failed to complete a construction contract awarded to it?

☐ YES ☐ NO

If YES, attach as an Attachment details including Project Owner's contact information.

Has any Corporate Officer, Partner, Joint Venture participant or Proprietor ever failed to complete a construction contract awarded to them in their name or when acting as a principal of another entity?

☐ YES ☐ NO

If YES, attach as an Attachment details including Project Owner's contact information.

Are there any judgments, claims, disputes or litigation pending or outstanding involving the firm listed in Section 1 or any of its officers (or any of its partners if a partnership or any of the individual entities if a joint venture)?

☐ YES ☐ NO

If YES, attach as an Attachment details including Project Owner's contact information.

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12. SAFETY PROGRAM:

Name of Contractor's Safety Officer:_____

Include the following as attachments:

Provide as an Attachment Contractor's (and Contractor's proposed Subcontractors and Suppliers furnishing or performing Work having a value in excess of 10 percent of the total amount of the Bid) OSHA No. 500- Log & Summary of Occupational Injuries & Illnesses for the past 5 years.

Provide as an Attachment Contractor's (and Contractor's proposed Subcontractors and Suppliers furnishing or performing Work having a value in excess of 10 percent of the total amount of the Bid) list of all OSHA Citations & Notifications of Penalty (monetary or other) received within the last 5 years (indicate disposition as applicable) - IF NONE SO STATE.

Provide as an Attachment Contractor's (and Contractor's proposed Subcontractors and Suppliers furnishing or performing Work having a value in excess of 10 percent of the total amount of the Bid) list of all safety citations or violations under any state all received within the last 5 years (indicate disposition as applicable) - IF NONE SO STATE.

Provide the following for the firm listed in Section 1 (and for each proposed Subcontractor furnishing or performing Work having a value in excess of 10 percent of the total amount of the Bid) the following (attach additional sheets as necessary):

Workers' compensation Experience Modification Rate (EMR) for the last 5 years:

YEAR	_____	EMR	_____
YEAR	_____	EMR	_____
YEAR	_____	EMR	_____
YEAR	_____	EMR	_____
YEAR	_____	EMR	_____

Total Recordable Frequency Rate (TRFR) for the last 5 years:

YEAR	_____	TRFR	_____
YEAR	_____	TRFR	_____
YEAR	_____	TRFR	_____
YEAR	_____	TRFR	_____
YEAR	_____	TRFR	_____

Total number of man-hours worked for the last 5 Years:

YEAR	_____	TOTAL NUMBER OF MAN-HOURS	_____
YEAR	_____	TOTAL NUMBER OF MAN-HOURS	_____
YEAR	_____	TOTAL NUMBER OF MAN-HOURS	_____
YEAR	_____	TOTAL NUMBER OF MAN-HOURS	_____
YEAR	_____	TOTAL NUMBER OF MAN-HOURS	_____

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Provide Contractor's (and Contractor's proposed Subcontractors and Suppliers furnishing or performing Work having a value in excess of 10 percent of the total amount of the Bid) Days Away From Work, Days of Restricted Work Activity or Job Transfer (DART) incidence rate for the particular industry or type of Work to be performed by Contractor and each of Contractor's proposed Subcontractors and Suppliers) for the last 5 years:

YEAR	_____	DART	_____
YEAR	_____	DART	_____
YEAR	_____	DART	_____
YEAR	_____	DART	_____
YEAR	_____	DART	_____

13. EQUIPMENT:

MAJOR EQUIPMENT:

List on **Schedule C** all pieces of major equipment available for use on Owner's Project.

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I HEREBY CERTIFY THAT THE INFORMATION SUBMITTED HEREWITH, INCLUDING ANY ATTACHMENTS, IS TRUE TO THE BEST OF MY KNOWLEDGE AND BELIEF.

NAME OF ORGANIZATION: _____

BY: _____

TITLE: _____

DATED: _____

NOTARY ATTEST:

SUBSCRIBED AND SWORN TO BEFORE ME

THIS _____ DAY OF _____, 20___

NOTARY PUBLIC - STATE OF _____

MY COMMISSION EXPIRES:_____

REQUIRED ATTACHMENTS

1. Schedule A (Current Experience).
2. Schedule B (Previous Experience).
3. Schedule C (Major Equipment).
4. Audited balance sheet for each of the last 3 years for firm named in Section 1.
5. Evidence of authority for individuals listed in Section 7 to bind organization to an agreement.
6. Resumes of officers and key individuals (including Safety Officer) of firm named in Section 1.
7. Required safety program submittals listed in Section 13.
8. Additional items as pertinent.

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SCHEDULE A

CURRENT EXPERIENCE

Project Name	Owner's Contact Person	Design Engineer	Contract Date	Type of Work	Status	Cost of Work
	Name: Address: Telephone:	Name: Company: Telephone:				
	Name: Address: Telephone:	Name: Company: Telephone:				
	Name: Address: Telephone:	Name: Company: Telephone:				
	Name: Address: Telephone:	Name: Company: Telephone:				
	Name: Address: Telephone:	Name: Company: Telephone:				
	Name: Address: Telephone:	Name: Company: Telephone:				
	Name: Address: Telephone:	Name: Company: Telephone:				

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SCHEDULE B

PREVIOUS EXPERIENCE (Include ALL Projects Completed within last 5 years)

Project Name	Owner's Contact Person	Design Engineer	Contract Date	Type of Work	Status	Cost of Work
	Name: Address: Telephone:	Name: Company: Telephone:				
	Name: Address: Telephone:	Name: Company: Telephone:				
	Name: Address: Telephone:	Name: Company: Telephone:				
	Name: Address: Telephone:	Name: Company: Telephone:				
	Name: Address: Telephone:	Name: Company: Telephone:				
	Name: Address: Telephone:	Name: Company: Telephone:				
	Name: Address: Telephone:	Name: Company: Telephone:				

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SCHEDULE B

PREVIOUS EXPERIENCE (Include ALL Projects Completed within last 5 years)

Project Name	Owner's Contact Person	Design Engineer	Contract Date	Type of Work	Status	Cost of Work
	Name: Address: Telephone:	Name: Company: Telephone:				
	Name: Address: Telephone:	Name: Company: Telephone:				
	Name: Address: Telephone:	Name: Company: Telephone:				
	Name: Address: Telephone:	Name: Company: Telephone:				
	Name: Address: Telephone:	Name: Company: Telephone:				
	Name: Address: Telephone:	Name: Company: Telephone:				
	Name: Address: Telephone:	Name: Company: Telephone:				

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SCHEDULE C - LIST OF MAJOR EQUIPMENT AVAILABLE

ITEM	PURCHASE DATE	CONDITION	ACQUIRED VALUE

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00 45 46.01 VENDOR COMPLIANCE TO STATE LAW

Section 2252.002, Texas Government Code, provides that, in order to be awarded a contract as low bidder, non-resident bidders (out-of-state contractors whose corporate offices or principal place of business are outside of the State of Texas) bid projects for construction, improvements, supplies or services in Texas at an amount lower than the lowest Texas resident bidder by the same amount that a Texas resident bidder would be required to underbid a non-resident bidder in order to obtain a comparable contract in the State in which the non-resident's principal place of business is located. The appropriate blanks in Section A must be filled out by all out-of-state or non-resident bidders in order for your bid to meet specifications. The failure of out-of-state or non-resident contractors to do so will automatically disqualify that bidder.

Check the statement that is correct for Bidder.

[__] Non-resident vendors in _____(give state), our principal place of business, are required to be_____percent lower than resident bidders by state law. A copy of the statute is attached.

[__] Non-resident vendors in_____(give state), our principal place of business, are not required to underbid resident bidders.

[__] Our principal place of business or corporate office is in the State of Texas.

Bidder:

Company Name:	
By:	
Name:	
Title:	
Business Address:	
Phone:	
Fax:	
Email:	

END OF SECTION

00 42 23.03 CONTRACTOR COMPLIANCE TO TEXAS SALES TAX CODE

ARTICLE 1 - LEGAL REQUIREMENT

1.01 Comply with all requirements of the Texas Sales Tax Code.

ARTICLE 2 - DECLARATIONS

2.1 Contractor hereby certifies that the Contract Amount is divided as follows:

Material permanently incorporated into the Project and resold to the Owner as defined in Tax Code.	$ _____
All other charges and costs	$ _____
Total (Total must equal the Contract Price)	$ _____

2.2 The Total Amount of Bid for Materials and Services must equal the sum of the Total Amount Bid for Materials and the Total Amount Bid for Services as well as the sum of all individual bid items.

2.3. Materials are those items which are tax exempt and are physically incorporated into the facilities constructed for the OWNER. Materials include, but are not limited to, purchased items such as pipe, embedment, concrete, manholes, asphalt, road base, machinery, and equipment, etc.

2.4. Services are those items which are not tax exempt and are used by the CONTRACTOR but are not physically incorporated into the OWNER'S facilities and/or items that are consumed by construction. Services include, but are not limited to, supplies, tools, concrete forms, scaffolding, temporary buildings, the rental of equipment, skill, and labor, etc.

ARTICLE 3 - AUTHORIZATION

3.01 Execute this form at time of execution of contract and make a part of the contract.

Company Name: _____

(typed or printed)

By _____

(Signature -- attach evidence of authority to sign)

Name: _____

(typed or printed)

Title: _____

(Signature of Corporate Secretary)

Business address: _____

Phone: _____ Facsimile: _____ E-mail _____

END OF SECTION

00 51 00 NOTICE OF AWARD

Date of Issuance:

Owner:	Town of Pecos City, Texas	Owner's Contract No.:	
Engineer:	Seth Sorensen	Engineer's Project No.:	PW20-001
Project:		Contract Name:	
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:

Danville Road Resurfacing, Cargill Road Resurfacing and Reconstruction, Miscellaneous Asphalt Paving

The Contract Price of the awarded Contract is: $_____

[ ] 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. *[revise if multiple copies accompany the Notice of Award]*

☐ 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 receipt 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

Authorized Signature

By:

Title:

Copy: Engineer

00 52 13 CONTRACT AGREEMENT FORM

AGREEMENT
BETWEEN OWNER AND CONTRACTOR
FOR CONSTRUCTION CONTRACT

THIS AGREEMENT is by and bet The Town of Pecos City, Texas ("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:

Clearing and grubbing, hauling and installing fill material, grading and compaction, installation of water and sewer utilities, curb and gutter, sidewalk, driveways, ADA ramps and HMAC pavement.

ARTICLE 2 – THE PROJECT

2.01 The Project, of which the Work under the Contract Documents is a part, is generally described as follows:

6TH AND PEACH INFRASTRUCTURE (PW20-001)

ARTICLE 3 – ENGINEER

3.01 The Project has been designed by The Town of Pecos City.

3.02 The Public Works Department of the Town of Pecos City and its designated personnel ("Engineer") have been assigned by the Owner 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*

A. All time limits for Milestones, if any, Substantial Completion, and completion and readiness for final payment as stated in the Contract Documents are of the essence of the Contract.

4.02 *Contract Times: Days*

A. The Work will be substantially completed within 150 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 180 days after the date when the Contract Times commence to run.

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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 Three Hundred Dollars and No Cents ($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 Time (as duly adjusted pursuant to the Contract) for completion and readiness for final payment, Contractor shall pay Owner Six Hundred Dollars and No Cents ($600.00) 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. Failure to complete reconstruction work may be additive and imposed concurrently with substantial completion and/or final completion.

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.

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.

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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). If the Work has been 50 percent completed as determined by Engineer, and if the character and progress of the Work have been satisfactory to Owner and Engineer, then as long as the character and progress of the Work remain satisfactory to Owner and Engineer, there will be no additional retainage; and

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

B. Upon Substantial Completion, Owner shall pay an amount sufficient to increase total payments to Contractor to 100 percent of the Work completed, less such amounts set off by Owner pursuant to Paragraph 15.01.E of the General Conditions, and less 100 percent of Engineer's estimate of the value of Work to be completed or corrected as shown on the punch list of items to be completed or corrected prior to final payment.

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 *3* 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 reports and drawings relating to Hazardous Environmental Conditions, if any, at or adjacent to the Site that have been identified in the Supplementary Conditions.

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, if any, with respect to the effect of such information, observations, and documents on (1) the cost, progress, and

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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 (Section 00 52 13)
2. Plans Set
3. Performance Bond (Section 00 61 13.13)
4. Payment Bond. (Section 00 61 13.16)
5. General Conditions. (Section 00 72 00)
6. Supplementary Conditions. (Section 00 73 00)
7. Specifications as listed in the table of contents of the Project Manual.
8. Attached Layouts, Maps, and Photographs.
9. Addenda.
10. Exhibits to this Agreement (enumerated as follows):
    a. Contractor's Basis of Bid (Section 00 41 00.01)
11. Documentation submitted by Contractor prior to Notice of Award.
12. 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.

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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 any thing 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

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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.

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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:	CONTRACTOR:
The Town of Pecos City, Texas	_____
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:
110 E. 6th St.	_____
Pecos, TX 79772	_____
_____	_____
	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.)

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00 55 00 NOTICE TO PROCEED

Owner:	Town of Pecos City, Texas	Owner's Contract No.:	
Contractor:		Contractor's Project No.:	
Engineer:	Seth Sorensen	Engineer's Project No.:	PW20-001
Project:	6TH AND PEACH INFRASTRUCTURE	Contract Name:	
		Effective Date of Contract:	

TO CONTRACTOR:

Owner hereby notifies Contractor that the Contract Times under the above Contract will commence to run on _____. *[see Paragraph 4.01 of the General Conditions]*

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 number of days to achieve Substantial Completion is 150, and the number of days to achieve readiness for final payment is 180.

Before starting any Work at the Site, Contractor must comply with the following:
[Place Items Here]

Owner**:**

Authorized Signature

By:

Title:

Date Issued:

Copy: Engineer

00 61 13.13 PERFORMANCE BOND

CONTRACTOR *(name and address)*:

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

OWNER *(name and address)*:
Town of Pecos City
115 W. 3RD ST.
Pecos, TX 79772

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

_____ *(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.

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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.

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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:

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00 61 13.16 PAYMENT BOND

CONTRACTOR *(name and address)*:

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

OWNER *(name and address)*:
Town of Pecos City
115 W. 3RD ST
Pecos, TX 79772

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 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.

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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.

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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 one year 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:

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00 62 11 SUBMITTAL TRANSMITTAL FORM

OWNER: TOWN OF PECOS CITY **PROJECT NUMBER:** _____

PROJECT NAME: _____

CONTRACTOR: _____

Contractor's Submittal No.: _____ Specification Section: _____

Plan Sheet No.: _____ Description: _____

CONTRACTOR'S CERTIFICATION: I hereby certify that this submittal has been reviewed by the Contractor and is in strict conformance with the Contract Documents as modified by Addenda, Change Orders, and Field Orders. **CERTIFIED BY:** _____ **DATE:** _____

TYPE	#	DESCRIPTION	#SENT	#RET'D		STATUS
P		Application for Payment				Approved
CO		Change Order				Approved As Corrected
MR		Contract Modification Request				Not Approved
CTR		Certified Test Report				Revise & Resubmit
EIR		Equipment Installation Report				Filed As Received
FO		Field Order				Final Distribution
NBC		Notification by Contractor				Change Order Issued
O&M		Operation & Maintenance Manuals				Field Order Issued
PD		Photographic Documentation				Recommended For Approval
RD		Record Data				Returned W/O Review
RFI		Request for Information				Add'l Information Required
AM		Sample				Cancelled
SD		Shop Drawings				See Review Comments
SCH		Schedule of Progress				Pending Change Order

FOR ENGINEER'S USE ONLY

DATE RECEIVED: _____ BY: _____ DATE RETURNED: _____ BY: _____

COMMENTS: _____

DISTRIBUTION				REVIEW			
NO.	SENT TO.	NO.	SENT TO.	DEPT.	BY	DATE SENT	DATE RET'D

CERTIFICATE OF INSURANCE

Owner_____ Date_____

Address_____ Project No._____

_____ Type of Project_____

THIS IS TO CERTIFY THAT _____

(Name and address of insured)

is, at the date of this certificate, 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	Expires	Limits of Liability
Workmen's Compensation				
Public Liability				1 person $_____ 1 accident $_____
Contingent Liability				1 person $ _____ 1 accident $_____
Property Damage				
Builder's Risk				
Automobile				
Other				

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.

Where 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: _____

00 62 76 **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)

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00 63 39 FIELD ORDER

Field Order No. _____

Date of Issuance:	Effective Date:
Owner: Town of Pecos City	Owner's Contract No.:
Contractor:	Contractor's Project No.:
Engineer:	Engineer's Project No.:
Project:	Contract Name:

Contractor is hereby directed to promptly execute this Field Order, issued in accordance with General Conditions Paragraph 11.01, for minor changes in the Work without changes in Contract Price or Contract Times. If Contractor considers that a change in Contract Price or Contract Times is required, submit a Change Proposal before proceeding with this Work.

Reference: _____ _____

Specification(s) Drawing(s) / Detail(s)

Description:

Attachments:

ISSUED:	RECEIVED:
By: _____	By: _____
Engineer (Authorized Signature)	Contractor (Authorized Signature)
Title: _____	Title: _____
Date: _____	Date: _____

Copy to: Owner

Work Change Directive No.

Date of Issuance: Effective Date:

Owner: Town of Pecos City Owner's Contract No.:

Contractor: Contractor's Project No.:

Engineer: Engineer's Project No.:

Project: Contract Name:

Contractor is directed to proceed promptly with the following change(s):

Description:

Attachments: *[List documents supporting change]*

Purpose for Work Change Directive:

Directive to proceed promptly with the Work described herein, prior to agreeing to changes on Contract Price and Contract Time, is issued due to: *[check one or both of the following]*

☐ Non-agreement on pricing of proposed change.

☐ Necessity to proceed for schedule or other Project reasons.

Estimated Change in Contract Price and Contract Times (non-binding, preliminary):

Contract Price $ [increase] [decrease].

Contract Time days [increase] [decrease].

Basis of estimated change in Contract Price:

☐ Lump Sum ☐ Unit Price

☐ Cost of the Work ☐ Other

RECOMMENDED:	AUTHORIZED BY:	RECEIVED:
By:	By:	By:
Engineer (Authorized Signature)	Owner (Authorized Signature)	Contractor (Authorized Signature)
Title:	Title:	Title:
Date:	Date:	Date:

Approved by Funding Agency (if applicable)

By: Date:

Title:

00 63 63 CHANGE ORDER

Change Order No. _____

Date of Issuance:	Effective Date:
Owner: Town of Pecos City	Owner's Contract No.:
Contractor:	Contractor's Project No.:
Engineer:	Engineer's Project No.:
Project:	Contract Name:

The Contract is modified as follows upon execution of this Change Order:

Description:

Attachments: *[List documents supporting change]*

CHANGE IN CONTRACT PRICE	**CHANGE IN CONTRACT TIMES** ***[note changes in Milestones if applicable]***
Original Contract Price: $_____	Original Contract Times: Substantial Completion: _____ Ready for Final Payment: _____ days or dates
[Increase] [Decrease] from previously approved Change Orders No. __ to No. __: $_____	[Increase] [Decrease] from previously approved Change Orders No. __ to No. __: Substantial Completion: _____ Ready for Final Payment: _____ days
Contract Price prior to this Change Order: $_____	Contract Times prior to this Change Order: Substantial Completion: _____ Ready for Final Payment: _____ days or dates
[Increase] [Decrease] of this Change Order: $_____	[Increase] [Decrease] of this Change Order: Substantial Completion: _____ Ready for Final Payment: _____ days or dates
Contract Price incorporating this Change Order: $_____	Contract Times with all approved Change Orders: Substantial Completion: _____ Ready for Final Payment: _____ days or dates

RECOMMENDED:	ACCEPTED:	ACCEPTED:
By: _____	By: _____	By: _____
Engineer (if required)	Owner (Authorized Signature)	Contractor (Authorized Signature)
Title: _____	Title _____	Title: _____
Date: _____	Date _____	Date: _____

Approved by Funding Agency (if applicable)

By: _____ Date:

Title: _____

00 65 16 CERTIFICATE OF SUBSTANTIAL COMPLETION

Owner:	Town of Pecos City, Texas	Owner's Contract No.:	
Contractor:		Contractor's Project No.:	
Engineer:	Seth Sorensen	Engineer's Project No.:	PW20-001
Project:	6th and Peach Infrastructure	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: _____	By: _____	By: _____
(Authorized signature)	Owner (Authorized Signature)	Contractor (Authorized Signature)
Title: _____	Title: _____	Title: _____
Date: _____	Date: _____	Date: _____

00 65 19.13 AFFIDAVIT OF PAYMENT OF DEBTS AND CLAIMS AND RELEASE OF LIENS FORM

PROJECT NAME: _____

PROJECT NO.: _____

I CERTIFY to the best of my knowledge and belief that all work has been performed and materials supplied in strict accordance with the terms and conditions of the corresponding contract documents between the TOWN OF PECOS CITY, hereinafter called the OWNER, and

_____,
hereinafter called the CONTRACTOR, for the above referenced project.

I further certify and declare that, except as listed below, all bills for materials, supplied, utilities, and for all other things furnished or caused to be furnished by the CONTRACTOR and used in the execution of the contract will be fully paid upon receipt of Final Payment and that there are no unpaid obligations, liens, claims, security interests, encumbrances, liabilities, and/or demands of State Agencies, subcontractors, materialmen, mechanics, laborers, or any others resulting from or arising out of any work done, caused to be done, or ordered to be done by the CONTRACTOR under the contract.

EXCEPTIONS: (If none, write "NONE," Contractor shall furnish a bond, acceptable to the Owner, for each exception)

In consideration of the prior and final payments made and all payments made for authorized changes, the CONTRACTOR releases and forever discharges the OWNER from any and all obligations, liens, claims, security interests, encumbrances, and/or liabilities arising by virtue of the contract and authorized changes between the parties, either verbal or in writing, and any and all claims and demands of every kind and character whatsoever against the OWNER, arising out of or in any way relating to the contract and authorized changes.

I further certify and agree that the warranty period is defined as commencing with Substantial Completion (or with each Substantial Completion if there is more than one) of the Project, or any portion thereof, and continuing for one (1) calendar year from the date of Final Acceptance of the entire project unless otherwise modified in writing as part of the Substantial Completion of Final Acceptance.

This statement is made for the purpose of inducing the OWNER to make FINAL PAYMENT under the terms of the contract, relying on the trust and statements contained herein.

(Seal) CONTRACTOR

_____ _____
(Signature) (Title)

Subscribed and sworn to me this ____ Day of _____, 20____

(Seal) NOTARY

My Commission Expires: _____

00 65 19.19 CONSENT OF SURETY TO FINAL PAYMENT FORM

TO OWNER: TOWN OF PECOS CITY
115 W. 3RD ST
PECOS, TEXAS 79772

PROJECT NAME: _____

PROJECT NO.: _____

DATE: _____

In accordance with the provisions of the Contract between the Owner and the Contractor as indicated above, the

Surety Name: _____

Address: _____

_____

_____ , SURETY,

on bond of

Contractor Name: _____

Address: _____

_____

_____ , CONTRACTOR,

hereby approves of the final payment to the Contractor, and agrees that final payment to the Contractor shall not relieve the Surety of any of its obligations to

TOWN OF PECOS CITY
115 W. 3RD ST
PECOS, TEXAS 79772

, OWNER,

as set forth in said Surety's bond.

IN WITNESS WHEREOF, the Surety has hereunto set its hand on this ____ day of _____, 20____

_____
(Surety)

Attest:
(Seal):

_____
(Signature of Authorized Representative)

_____
(Printed Name and Title)

00 72 00 STANDARD GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

Prepared by

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ENGINEERS JOINT CONTRACT DOCUMENTS COMMITTEE

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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

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seq. ("CERCLA"); (b) the Hazardous Materials Transportation Act, 49 U.S.C. §§5501 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.

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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.

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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.

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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.

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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.

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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.

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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

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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.

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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.

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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

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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.

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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.

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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:

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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.

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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.H 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

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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 one year 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.

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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).

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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

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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:

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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

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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.

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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 unless previously approved by Owner or its representatives via written consent, which will not be unreasonably withheld.

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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

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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.

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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

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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.

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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

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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

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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.

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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.

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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.

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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.

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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.

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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 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.

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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.

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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.

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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

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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

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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 11.01.C.2.a and 11.01.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

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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

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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

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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.

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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.

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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.

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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;

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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

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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 special 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

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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

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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.

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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.

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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.

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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.

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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 one year 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

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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 one year 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

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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.

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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

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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.

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00 73 00 SUPPLEMENTARY CONDITIONS

These Supplementary Conditions amend or supplement the Standard General Conditions of the Construction Contract, EJCDC® C-700 (2013 Edition). All provisions that are not so amended or supplemented remain in full force and effect.

The terms used in these Supplementary Conditions have the meanings stated in the General Conditions. Additional terms used in these Supplementary Conditions have the meanings stated below, which are applicable to both the singular and plural thereof.

The address system used in these Supplementary Conditions is the same as the address system used in the General Conditions, with the prefix "SC" added thereto.

ARTICLE 1: DEFINITIONS AND TERMINOLOGY

SC-1.01 DEFINED TERMS

A. Add a new Paragraph 1.01.A.49:

"49. Written Amendment – A written statement modifying the Contract Documents, signed by Owner and Contractor on or after the Effective Date of the Agreement and normally dealing with the nonengineering or nontechnical rather than strictly construction-related aspects of the Contract Documents."

SC-1.02 TERMINOLOGY

A. Add a new Paragraph 1.02.B.2 as follows:

"2. "At no additional cost to Owner", "With no extra compensation to Contractor", "At Contractor's own expense", "incidental to" or similar words mean that the Contractor will perform or provide specified Work and that all cost for performing the Work is included in the Contract Price. "

B. Delete Paragraph 1.02.C and add the following:

"C. Day

1. A "calendar day" shall be a day of 24 hours measured from midnight to the next midnight, and is any day of the year, with no days being excluded.
2. A "working day" shall be a day which permits construction of the principal units of the Work for a period of not less than 7 hours between 7:00 a.m. and 6:00 p.m. Working days do not include days on which weather or other conditions not under the control of the Contractor prevent Contractor from working the seven hours defining a working day. Working days do not include Saturdays, Sundays or any of the following holidays: New Year, President's Day, Good Friday, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, the day after Thanksgiving and Christmas Eve and Christmas Day."

C. Add new Paragraphs 1.02.E.5 and 1.02.E.6 as follows:

"5. Specifications are written in modified brief style. Requirements apply to all Work of the same kind, class, and type even though the word "all" is not stated."

"6. Simple imperative sentence structure is used which places a verb as the first word in the sentence. It is understood that the words "furnish", "install", "provide", or

similar words include the meaning of the phrase "The Contractor shall..." before these words."

ARTICLE 2: PRELIMINARY MATTERS

SC-2.03 BEFORE STARTING CONSTRUCTION

A. Add a new paragraph immediately after Paragraph 2.05.A.3:

"B. Before undertaking each part of the Work, Contractor shall carefully study and compare the Contract Documents and check and verify pertinent figures shown thereon and all applicable field measurements. Contractor shall promptly report in writing to the Engineer any conflict, error, ambiguity or discrepancy which the Contractor may discover and shall obtain a written interpretation from the Engineer before proceeding with any Work affected thereby. In the event of a conflict in the Drawings, Specifications, or other portions of the Contract Documents which were not reported prior to the Award of the Contract, the Contractor shall be deemed to have included the most expensive item in their Bid."

ARTICLE 3: DOCUMENTS: INTENT, REQUIREMENTS, REUSE

SC-3.01 INTENT

A. Add the following to Paragraph 3.01.A:

"Drawings and Specifications do not indicate or describe all of the Work required to complete the Project. Additional details required for the correct installation of selected products are to be provided by the Contractor and coordinated with the Engineer. Provide any work, materials or equipment required for a complete and functional system even if they are not detailed or specified.

1. The Contract requirements described in the General Conditions, Supplementary Conditions and General Requirements apply to each and all Sections of the Specifications unless specifically noted otherwise.

2. Organization of Contract Documents is not intended to control or to lessen the responsibility of the Contractor when dividing Work among Subcontractors, or to establish the extent of Work to be performed by any trade, Subcontractor or Supplier. Specifications or details do not need to be indicated or specified in each specification or drawing. Items shown in the Contract Documents are applicable regardless of location in the Contract Documents.

3. Standard paragraph titles and other identifications of subject matter in the Specifications are intended to aid in locating and recognizing various requirements of the Specifications. Titles do not define, limit, or otherwise restrict specification text."

B. Add new Paragraphs 3.01.F through 3.01.H as follows:

"F. Comply with the most stringent requirements where compliance with two or more standards is specified, and they establish different or conflicting requirements for minimum quantities or quality levels, unless Contract Documents indicate otherwise.

1. Quantity or quality level shown or indicated shall be the minimum to be

provided or performed in every instance.

2. Actual installation must meet or exceed the minimum quality indicated.

3. In complying with these requirements, indicated numeric values are minimum or maximum values, as noted, or appropriate for context of requirements.

4. Refer instances of uncertainty to the Engineer for a decision before proceeding."

"G. Provide materials and equipment comparable in quality to similar materials and equipment incorporated in the Project or as required to meet the minimum requirements of the application if the materials and equipment are shown in the Drawings but are not included in the Specifications."

"H. The Contract Documents comprise the entire Agreement between Owner and Contractor. The Contract Documents may be modified only by Field Order, Change Order or Written Amendment."

SC-3.02 REFERENCE STANDARDS

A. Add a new Paragraph 3.02.B as follows:

"B. Comply with applicable construction industry standards as if bound or copied directly into the Contract Documents regardless of lack of reference in the Contract Documents. Apply provisions of the Contract Documents where Contract Documents include more stringent requirements than these referenced standards.

1. Standards referenced directly in the Contract Documents take precedence over standards that are not referenced but recognized in the construction industry as applicable.

2. Comply with standards not referenced but recognized in the construction industry as applicable for performance of the Work except as otherwise limited by the Contract Documents. The Engineer determines whether code or standard is applicable, or which of several are applicable.

3. Make copies of reference standards available as requested by Engineer or Owner."

SC-3.03 REPORTING AND RESOLVING DISCREPANCIES

A. Delete Paragraph 3.03.A.3 entirely and insert the following in its place:

"3. In the event of a conflict in the Drawings, Specifications, or other portions of the Contract Documents which were not reported prior to the Bidding of the Contract, the Contractor shall be deemed to have included the most expensive item, system, procedure, etc. in his Bid."

SC-3.05 REUSE OF DOCUMENTS

A. Delete the last sentence of Paragraph 3.05.B entirely and insert the following in its place:

"B. Nothing herein shall preclude Contractor from retaining copies of the Contract Documents for record purposes, unless specifically prohibited in writing by the Owner

for security reasons. If the Owner so directs, Contractor shall surrender all copies of the construction Contract Documents and other related documents, in paper or digital format and remove these documents from computer equipment or storage devices as a condition of final payment."

ARTICLE 4: COMMENCEMENT AND PROGRESS OF THE WORK

SC-4.05 DELAYS IN CONTRACTOR'S PROGRESS

A. Add the following to Paragraph 4.05.C.2:

"Adjustments of Contract Times for weather will not be allowed when Contract Times are set forth as calendar days. Abnormal weather conditions will be considered in the event of hurricanes and tornadoes."

B. Add the following to Paragraph 4.05:

"H. The Contractor agrees to make no claims for damage for delay in the performance of the Contract occasioned by any act or omission to act of the Owner, Engineer, or any of the Owner's or Engineer's agents, and agrees that any such claim shall be fully compensated by an extension of time, as set forth in a Change Order, to complete performance of the Work as provided herein."

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

SC-5.04 DIFFERING SUBSURFACE OR PHYSICAL CONDITIONS

A. Amend Paragraph 5.04.A by deleting "promptly" and inserting "promptly but no later than within 24 hours."

SC-5.05 UNDERGROUND FACILITIES

A. Amend Paragraph 5.05.B by deleting "promptly" and inserting "promptly but no later than within 24 hours."

ARTICLE 6: BONDS AND INSURANCE

SC-6.02 INSURANCE – GENERAL PROVISIONS

A. Add the following paragraph immediately after Paragraph 6.02.B:

"1. Contractor may obtain worker's compensation insurance from an insurance company that has not been rated by A.M. Best, provided that such company (a) is domiciled in the state in which the project is located, (b) is certified or authorized as a worker's compensation insurance provider by the appropriate state agency, and (c) has been accepted to provide worker's compensation insurance for similar projects by the state within the last 12 months."

A. Delete Paragraph 6.02.D entirely.

B. Add the following new paragraph immediately after Paragraph 6.02.J:

"K. Owner shall not be responsible for purchasing and maintaining any insurance to protect the interest of the Contractor, Subcontractors, or others in the Work. The stated limits of insurance required are minimum only. Contractor shall determine the limits that are adequate. These limits may be basic policy limits or any combination of basic limits and umbrella limits. In any event, Contractor is fully responsible for all losses arising out of, resulting from or connected with operations under this Contract whether or not said losses are covered by insurance. The acceptance of certificates or other evidence of insurance by the Owner, Engineer, and/or others listed as additional insured that in any respect do not comply with the Contract requirements does not release the Contractor from compliance herewith."

SC-6.03 CONTRACTOR'S INSURANCE

A. Add the following new paragraph immediately after Paragraph 6.03.J:

"K. The limits of liability for the insurance required by Paragraph 6.03 of the General Conditions shall provide coverage for not less than the following amounts or greater where required by Laws and Regulations:

1. Workers' Compensation, and related coverages under Paragraphs 6.03.A.1 and A.2 of the General Conditions:

Workers' Compensation, etc.,	
State	Statutory
Applicable Federal (e.g., Longshore)	Statutory
Employers' Liability	
Bodily Injury by Accident	$500,000
Bodily Injury by Disease - Each Employee	$500,000
Bodily Injury by Disease - Policy Limit	$500,000
Insurance shall include a waiver of subrogation in favor of the Additional Insured identified in these Supplementary Conditions.	

2. Contractor's Commercial General Liability under Paragraphs 6.03.B and 6.03C of the General Conditions:

Commercial General Liability	
Each Occurrence	$300,000
Fire Damage	$100,000
Personal and Advertising Injury	$600,000
General Aggregate	$600,000
Products/Completed Operations	$300,000
Explosion, Collapse, Underground	$300,000

Note: For contracts that do not require Excess or Umbrella Insurance, the aggregate limits under Commercial General Liability shall be maintained fully available for this Contract by obtaining and maintaining a Designated Construction Project General Aggregate Limit endorsement, or equivalent.	

a. Contractor's Liability Insurance shall also include completed operations and product liability coverage, and eliminate the exclusion with respect to property under the care, custody and control of Contractor. In lieu of elimination of the exclusion, Contractor may provide and maintain Installation Floater insurance for property under the care, custody, or control of Contractor. The Installation Floater insurance shall be a broad form or "All Peril" policy providing coverage for all materials, supplies, machinery, fixture, and equipment which will be incorporated into the Work.

Coverage under the Contractors Installation Floater will include:

i. Faulty or defective workmanship, materials, maintenance or construction.
ii. Cost to remove defective or damaged Work from the Site or to protect it from loss or damage.
iii. Cost to cleanup and remove pollutants.
iv. Coverage for testing and startup.
v. Any loss to property while in transit.
vi. Any loss at the Site.
vii. Any loss while in storage, both on-site and off-site.
viii. Any loss to temporary project works if their value is included in the Contract Price.

b. Coverage cannot be contingent on an external cause or risk or limited to property for which the Contractor is legally liable. Contractor's Installation Floater will provide limits of insurance adequate to cover the value of the installation. The Contractor will be solely responsible for any deductible carried under this coverage and claims on materials, supplies, machinery, fixture, and equipment which will be incorporated into the Work while in transit or in storage. This policy will include a waiver of subrogation for those listed as additional insured in these Supplemental Conditions.

3. Automobile Liability under Paragraph 6.03.D. of the General Conditions:

Bodily Injury	
Combined Single Limit (Bodily Injury and Property Damage)	$300,000

4. Excess or Umbrella Liability:

Excess or Umbrella Liability is not required for contract values less than $1,000,000.

5. Contractor's Pollution Liability

Pollution Liability	
Each Occurrence	$300,000
General Aggregate	$600,000

6. Contractor's Professional Liability:

Contractor's Contractual Liability Insurance	
Each Claim	$1,000,000
Annual Aggregate	$1,000,000

SC-6.04 OWNER'S LIABILITY INSURANCE

A. Delete Paragraph 6.04.A entirely and insert the following in its place:

"A. In addition to the insurance required to be provided by Contractor under Paragraph 6.03, Contractor shall purchase and maintain for Owner, at no additional cost, Owner's Protective Liability insurance naming Owner as the named insured with insurance that will protect said parties against claims which may arise from operations under the Contract Documents. This coverage shall be from the same company that provides Contractor's liability insurance coverage, and in the same minimum amounts. The Engineer and Engineer's consultants are additional insured as their interest may appear including their officers, directors, agents and employees."

SC-6.06 WAIVER OF RIGHTS

A. Delete Paragraph 6.06.B entirely.

ARTICLE 7: CONTRACTOR'S RESPONSIBILITIES

SC-7.09 TAXES

A. Add a new paragraph immediately after Paragraph 7.09A:

"B. Owner is exempt from payment of sales and compensating use taxes of the State of Texas and of cities and counties thereof on all materials to be incorporated into the Work.

1. Owner will furnish the required certificates of tax exemption to Contractor for use in the purchase of supplies and materials to be incorporated into the Work.
2. Owner's exemption does not apply to construction tools, machinery, equipment, or other property purchased by or leased by Contractor, or to supplies and materials not incorporated into the Work."

SC-7.10 LAWS AND REGULATIONS

A. Delete the last sentence of Paragraph 7.10.B.

SC-7.15 EMERGENCIES

A. Amend Paragraph 7.15.A by deleting the last sentence and inserting the following in its place:

"If Engineer determines that the incident giving rise to the emergency action was not the responsibility of the Contractor and that a change in the Contract Documents is required because of the action taken by Contractor in response to such an emergency, a Change Order, Field Order or Work Change Directive will be issued."

SC-7.18 INDEMNIFICATION

A. Delete Paragraph 7.18.C entirely.

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

SC-11.07 EXECUTION OF CHANGE ORDERS

A. Add a new Paragraph 11.07.C as follows:

"C. Contractor assumes and bears responsibility for all costs and time delays associated with any variation from the requirements of the Contract Documents unless the variation is specifically approved by Change Order."

ARTICLE 13: COST OF THE WORK; ALLOWANCES; UNIT PRICE WORK

SC-13.01 COST OF THE WORK

A. Amend Paragraph 13.01.B by deleting the following words in the first sentence:

"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:"

and insert the following in its place:

"those paid for the Work included in the Contract Price, shall include only the following items, and shall not include any of the costs itemized in Paragraph 13.01.C. Contractor shall provide certified payroll records listing personnel classifications and salaries for all individuals involved in additional Work. Salaries for those not included in the certified payroll will be considered as being compensated under Paragraph 13.01.C, and shall include only the following items:"

B. Amend Paragraph 13.01.B.1 by deleting the following words in the second sentence:

"without limitation superintendents, foreman"

and inserting the following in its place:

"one foreman (unless agreed upon prior to beginning Work)"

C. Amend Paragraph 13.01.B.1 by deleting the following words in the last sentence: "be included in the above"

and inserting the following in its place:

"not exceed 1.5 times regular pay and shall be included in the above"

D. Amend Paragraph 13.01.C.1 by adding "superintendents" to the list of excluded personnel in the first sentence.

E. Amend Paragraph 13.01.E by inserting "and at intervals" in the last sentence as shown below:

".....and submit in a form and at intervals acceptable to Engineer ..."

SC-13.03 UNIT PRICE WORK

A. Delete Paragraph 13.03.E in its entirety and insert the following in its place:

"E. The unit price of an item of Unit Price Work shall be subject to reevaluation and adjustment under the following conditions:

1. if the extended price of a particular item of Unit Price Work amounts to 10 percent or more of the Contract Price (based on estimated quantities at the time of Contract formation) and the variation in the quantity of that particular item of Unit Price Work actually furnished or performed by Contractor differs by more than 20 percent from the estimated quantity of such item indicated in the Agreement; and

2. if there is no corresponding adjustment with respect to any other item of Work; and

3. if Contractor believes that Contractor has incurred additional expense as a result thereof, Contractor may submit a Change Proposal, or if Owner believes that the quantity variation entitles Owner to an adjustment in the unit price, Owner may make a Claim, seeking an adjustment in the Contract Price."

ARTICLE 15: PAYMENTS TO CONTRACTOR; SET-OFFS; COMPLETION; CORRECTION PERIOD

SC-15.01 PROGRESS PAYMENTS

A. Amend Paragraph 15.01.D.1 by deleting "Ten" and inserting "Thirty" in its place.

B. Amend Paragraph 15.01.E.1 by adding new paragraphs "m", "n", "o", and "p" as follows:

"m. Owner has been notified of failure to make payments to Subcontractors or Suppliers or for labor;"

"n. failure to submit up-to-date record documents"

"0. failure to submit monthly Progress Schedule updates or revised schedules as requested by the Owner or Engineer"

"p. failure to provide project photographs required by the Specifications."

C. Amend Paragraph 15.01.E.2. by adding "to Owner's satisfaction." to the end of the second sentence.

D. Amend Paragraph 14.01.E.3 by deleting "and subject to interest as provided in the Agreement."

E. Add a new Paragraph 14.01.E.4 as follows:

"4. Owner may permanently withhold payment from Contract Price for:

a. Liquidated damages incurred by Contractor, or

b. Compensation for Engineer for overtime charges of Resident Project Representative, third review of submittals, review of substitutions, re- inspection fees, inspections or designs related to correction of defective Work, or other Services identified as requiring payment by the Contractor.

c. Costs for tests performed by the Owner to verify that Work previously tested and found to be defective has been corrected. Verification testing is to be provided at the Contractor's expense to verify products or constructed works are

in compliance after corrections have been made."

ARTICLE 16: SUSPENSION OF WORK AND TERMINATION

SC-16.02 OWNER MAY TERMINATE FOR CAUSE

A. Add a new Paragraph 16.02.A.5 as follows:

"5. If Contractor fails to provide the replacement bond required by General Conditions, Section 5.01.C or insurance coverage as required by General Conditions Article 5 and as amended by Supplemental Conditions."

B. Add a new Paragraph 15.02.A.6 as follows:

"6. If any petition of bankruptcy is filed by or against Contractor, or if Contractor is adjudged as bankrupt or insolvent or makes a general assignment for the benefit of creditors, or if a receiver is appointed for the benefit of Contractor's creditors, or if a receiver is appointed on account of Contractor's insolvency, upon the occurrence of any such event, Owner shall be entitled to request of Contractor or its successor in interest adequate assurance of future performance in accordance with the terms and conditions hereof. Failure to comply with such request within 7 days of delivery of the request shall entitle Owner to terminate this agreement and to the accompanying rights set forth in Paragraphs 15.02 and
15.03 hereof. In all events pending receipt of adequate assurance of performance and actual performance in accordance therewith, Owner shall be entitled to proceed with the Work with its own forces or with other contractors on a time and material or other appropriate basis. The cost of work by Owner or other contractors will be back charged against the Contract Sum hereof."

C. Delete Paragraph 16.02.G entirely.

SC-16.04 CONTRACTOR MAY STOP WORK OR TERMINATE

A. Add a new Paragraph 16.04.C as follows:

"C. This Contract may not be assigned in whole or in part by the Contractor without the previous written consent of the Owner."

ARTICLE 17: FINAL RESOLUTION OF DISPUTES

SC-16.02 METHODS AND PROCEDURES

A. Add the following new paragraph immediately after Paragraph 17.01.

"17.02 Arbitration

A. All matters subject to final resolution under this Article will be decided by arbitration in accordance with Construction Industry Arbitration Rules and Mediation Procedures of the American Arbitration Association subject to the conditions and limitations of this paragraph. This agreement to arbitrate and any other agreement or consent to arbitrate entered into will be specifically enforceable under the prevailing law of any court having jurisdiction.

B. The demand for arbitration will be filed in writing with the other party to the Contract and with the selected arbitrator or arbitration provider, and a copy will be sent to Engineer for information. The demand for arbitration will be made within the specific time required in this Article, or if no specified time is applicable within a reasonable time after the matter in question has arisen, and in no event shall any such demand be made after the date when institution of legal or equitable proceedings based on such matter in question would be barred by the applicable statute of limitations. The demand for arbitration should include specific reference to Paragraph SC-17.02.D below.

C. No arbitration arising out of or relating to the Contract shall include by consolidation, joinder, or in any other manner any other individual or entity (including Engineer, and Engineer's consultants and the officers, directors, partners, agents, employees or consultants of any of them) who is not a party to this Contract unless:

1. the inclusion of such other individual or entity is necessary if complete relief is to be afforded among those who are already parties to the arbitration; and

2. such other individual or entity is substantially involved in a question of law or fact which is common to those who are already parties to the arbitration and which will arise in such proceedings.

D. The award rendered by the arbitrator(s) shall be consistent with the agreement of the parties, in writing, and include a concise breakdown of the award, and a written explanation of the award specifically citing the Contract provisions deemed applicable and relied on in making the award.

E. The award will be final. Judgment may be entered upon it in any court having jurisdiction thereof, and it will not be subject to modification or appeal, subject to provisions of the Laws and Regulations relating to vacating or modifying an arbitral award.

F. The fees and expenses of the arbitrators and any arbitration service shall be shared equally by Owner and Contractor."

ARTICLE 18: MISCELLANEOUS

A. Add a new Paragraph 18.02.B as follows:

"B. All references and conditions for a "calendar day contract" in the General Conditions and Supplementary Conditions shall apply for a "Fixed Date Contract." A "Fixed Date Contract" is one in which the calendar dates for reaching Substantial Completion and/or final completion are specified in lieu of identifying the actual calendar days involved."

B. Delete Paragraph 18.08 and replace with the following:

"18.08 Headings

The Article and paragraph headings in this Agreement are inserted for convenience only and do not constitute parts of these General Conditions or as a limitation of the scope of the particular section to which they refer. This Agreement will be fairly interpreted in accordance with its terms and conditions and not for or against either Party."

C. Add a new Paragraph 18.09 as follows:

"18.09 Independent Contractor

A. Each Party will perform its duties under this Agreement as an independent contractor. The Parties and their personnel will not be considered to be employees or agents of the other Party. Nothing in this Agreement will be interpreted as granting either Party the right or authority to make commitments of any kind for the other. This Agreement will not constitute, create, or be interpreted as a joint venture, partnership or formal business organization of any kind."

D. Add a new Paragraph 18.10 as follows:

"18.10 Sovereign Immunity

A. The parties agree that the Owner has not waived its sovereign immunity by entering into and performing its obligations under this Agreement."

E. Add a new Paragraph 18.11 as follows:

"18.11 Severability

A. If a court of competent jurisdiction renders any part of this Agreement invalid or unenforceable, that part will be severed and the remainder of this Agreement will continue in full force and effect."

F. Add a new Paragraph 18.12 as follows:

"18.12 No Third Party Beneficiaries

A. Nothing in this Agreement shall be construed to create any right in any third party not a signatory to this Agreement, and the parties do not intend to create any third party beneficiaries by entering into this Agreement."

END OF SECTION

01 1 00 SUMMARY OF WORK

1.00 GENERAL

1.01 WORK COVERED BY CONTRACT DOCUMENTS REQUIREMENTS INCLUDED

A. This Section describes the project in general and provides an overview of the extent of the work to be performed. Detailed requirements and extent of work are stated in the applicable Specification sections and/or shown on the Drawings. The Contractor shall, except as otherwise specifically stated herein or in any applicable parts of these Contract Documents, provide and pay for all labor, materials, equipment, tools, construction equipment, and other facilities and services necessary for proper execution, testing, and completion of the Work.

B. Any part or item of the work which is reasonably implied or normally required to make each installation satisfactorily and completely operable shall be performed by the Contractor and the expense thereof included in the applicable price bid for the item. All miscellaneous appurtenances and other items of work that are incidental to meeting the intent of the plans and these Specifications, are considered to be included in the applicable price bid for this project, even though these appurtenances and items may not be specifically called for in the Specifications or shown on the Drawings.

C. Comply with all applicable state and local codes and regulations pertaining to the nature and character of the work being performed.

D. The Work under this contract consists of clearing and grubbing, hauling and installing fill material, grading and compaction, installation of water and sewer utilities, curb and gutter, sidewalk, driveways, ADA ramps and HMAC Pavement , and various incidental work. Contractor shall provide all materials, tools, equipment, labor, superintendence, transportation, and incidentals necessary for the Work as indicated in the Contract Documents.

E. The Project is located in the Town of Pecos City on streets known as 5th, 6th, 7th , Peach, Sycamore and unnamed alleyways.

1.02 RELATED REQUIREMENTS

A. The General Conditions, the Supplementary Conditions, and Division One Specifications apply to each specification section.

1.03 CONTRACTS

A. Construct the Work under at unit prices, as shown on the Bid Form.

1.04 WORK BY OTHERS (NOT USED)

1.05 FUTURE WORK (NOT USED)

1.06 WORK SEQUENCE

A. Construct the Work in stages to accommodate Private use of the premises during the construction period; coordinate the construction schedule and operations with the Owner's Representative.

1.07 CONTRACTOR'S USE OF PREMISES

A. Contractor shall limit his use of the premises for Work and for storage, to allow for:
    1. Work by other Contractors.
    2. Owner occupancy.
    3. Public use.
B. Coordinate use of premises under direction of Owner's representative.
C. Assume full responsibility for the protection and safekeeping of Products under this Contract that are stored on the site.
D. Move any stored Products under Contractor's control that interfere with operations of the Owner or separate contractor.
E. Obtain and pay for the use of additional storage or work areas needed for operations.

2.00 PRODUCTS (NOT USED)

3.00 EXECUTION

3.01 ATTENTION TO WORK

A. Contractor shall give personal attention to and shall supervise the Work to the end that it shall be prosecuted faithfully. When he/she is not personally on site, a competent superintendent or foreman who shall be the legal representative of the Contractor shall represent him.

3.02 ACCESS TO WORK

A. The Contractor shall provide access for inspection of the Work by the Owner and/or official Governmental agencies.

*** **END OF SECTION** ***

01 26 00 CONTRACT MODIFICATION PROCEDURES

1.00 GENERAL

1.01 REQUIREMENTS INCLUDED

A. Promptly implement Change Order procedures.
   1. Provide full written data required to evaluate changes.
   2. Maintain detailed records of work done on a time-and-material/force account basis.
   3. Provide full documentation to Engineer on request.

B. Designate in writing the member of Contractor's organization:
   1. Person authorized to accept changes in the Work.
   2. Person responsible for informing others in the Contractor's employ of the authorization of changes in the Work.

C. Owner will designate in writing the person who is authorized to execute Change Orders.

1.02 RELATED REQUIREMENTS

A. Agreement: The amounts of established unit prices.

B. Conditions of the Contract:
   1. Methods of determining cost or credit to Owner resulting from changes in Work made on a time and material basis.
   2. Contractor's claims for additional costs.

C. Section 01 29 00: Payment Procedures.

D. Section 01 78 39: Project Record Documents.

E. Section 01 33 00: Submittal Procedures

1.03 DEFINITIONS

A. Change Order: See General Conditions.

B. Field Order: A written directive to make immediate changes that may or may not result in a change order.

C. Work Change Directive: A written order, instructions, or interpretations, signed by Engineer making minor changes in the Work not involving a change in Contract Sum or Contract Time.

1.04 PRELIMINARY PROCEDURES

A. Owner or Engineer may initiate changes by submitting a Proposal Contract Modification (PCM) to Contractor. Request will include:
   1. Detailed description of the Change, Products, and location of the change in the Project.
   2. Supplementary or revised Drawings and Specifications.
   3. The projected time span for making the change and a specific statement as to whether overtime work is, or is not, authorized.
   4. A specific period of time during which the requested price will be considered valid.
   5. Such request is for information only and is not an instruction to execute the changes or to stop Work in progress.

B. Contractor may initiate changes by submitting a Contract Modification Request (CMR) to Engineer containing:

1. Description of the proposed changes.
2. Statement of the reason for making the changes.
3. Statement of the effect on the Contract Sum and the Contract Time.
4. Statement of the effect of the work of separate contractors.
5. Documentation supporting any change in Contract Sum or Contract Time, as appropriate.

C. All proposals will be evaluated by the Engineer.

D. The Contractor may be informed that the proposed modifications are not approved and construction is to proceed in accordance with the Contract Documents.

1.05 DOCUMENTATION OF PROPOSALS AND CLAIMS

A. Support each quotation for a lump sum proposal and for each unit price that has not previously been established with sufficient substantiating data to allow Engineer to evaluate the quotation.

B. On request, provide additional data to support time and cost computations including but not limited to:
   1. Labor required.
   2. Equipment required.
   3. Products required.
      a. Recommended source of purchase and unit cost.
      b. Quantities required.
   4. Taxes, insurance, and bonds.
   5. Credit for work deleted from Contract, similarly documented.
   6. Overhead and profit.
   7. Justification for any change in Contract Time.

C. Support each claim for additional costs and for work done on a time and material/force account basis with documentation as required for a lump-sum proposal, plus additional information.
   1. Name of the Owner's authorized agent who ordered the work and date of the order.
   2. Dates and times work was performed and by whom.
   3. Time record, summary of hours worked, and hourly rates paid.
   4. Receipts and invoices for:
      a. Equipment used, listing dates and times of use.
      b. Products used with list of quantities.
      c. Subcontracts.

1.06 PREPARATION AND EXECUTION OF CHANGE ORDERS

A. Engineer will prepare each Change Order, Field Order, or Work Change Directive per the Articles of the General Conditions.

B. Form for Change Order: Engineers Joint Contract Documents Committee (ECJDC) Document C-941.

C. Change Order will describe changes in the Work, both additions and deletions, with attachments of revised Contract Documents to define details of the change.

D. Change Order will provide an accounting of the adjustment in the Contract Sum and in the Contract Time.

E. The Change Order will be sent to the Contractor for execution with a copy to the Owner recommending approval.
F. Change Orders can only be approved by the Owner.
   1. Work performed on the proposed contract modifications prior to approval of the Change Order will be performed at the Contractor's risk.
2. No payment will be made for work on Change orders until approved by the Owner.

1.07 LUMP SUM/FIXED PRICE CHANGE ORDER

A. Content of Change Orders will be based on either:
   1. Engineer's Proposal Request and Contractor's responsive Proposal as mutually agreed between Owner and Contractor.
   2. Contractor's Proposal for a change, as recommended by Engineer.
B. Owner and Engineer will sign and date the Change Order as authorization for the Contractor to proceed with the changes.
C. Contractor may sign and date the Change Order to indicate agreement with the terms therein.

1.08 UNIT PRICE CHANGE ORDER

A. Content of Change Orders will be based on either:
   1. Engineer's definition of the scope of the required changes.
   2. Contractor's Proposal for a change, as recommended by Engineer.
   3. Survey of completed work.
B. The amounts of the unit prices to shall be:
   1. Those stated in the Agreement.
   2. Those mutually agreed upon between Owner and Contractor.
C. When quantities of each of the items affected by the Change Order can be determined prior to start of the work:
   1. Owner and Engineer will sign and date the Change Order as authorization for Contractor to proceed with the changes.
   2. Contractor may sign and date the Change Order to indicate agreement with the terms therein.
D. When quantities of the items cannot be determined prior to start of the work:
   1. Engineer or Owner will issue a construction change authorization directing Contractor to proceed with the change on the basis of unit prices, and will cite the applicable unit prices.
   2. At completion of the change, Engineer will determine the cost of such work based on the unit prices and quantities used.
      a. Contractor shall submit documentation to establish the number of units of each item and any claims for a change in Contract Time.
   3. Engineer will sign and date the Change Order to indicate his/her agreement with the terms therein.
   4. Owner and Contractor will sign and date the Change Order to indicate their agreement with the terms therein.

1.09 CORRELATION WITH CONTRACTOR'S SUBMITTALS

A. Periodically revise Request for Payment forms to record each change as a separate item of Work and to record the adjusted Contract Sum.
B. Periodically revise the Construction Schedule to reflect each change in Contract Time.
C. Upon completion of work under a Change Order, enter pertinent changes in Record Documents.

2.00 PRODUCTS (NOT USED)

3.00 EXECUTION (NOT USED)

***** END OF SECTION *****

01 29 00 PAYMENT PROCEDURES

1.00 GENERAL

1.01 REQUIREMENTS INCLUDED

A. Submit Application for Payment to Engineer in accord with the schedule established by Conditions of the Contract and Agreement Between Owner and Contractor.

1.02 RELATED REQUIREMENTS

A. Agreement Between Owner and Contractor.
B. Conditions of the Contract: Progress Payments, Retainages, and Final Payment.
C. Section 01 29 73: Schedule of Values.
D. Section 01 77 00: Closeout Procedures.

1.03 FORMAT AND DATA REQUIRED

A. Submit applications typed on EJCDC Document C-620, Contractor's Application for Payment, with itemized data typed on 8-1/2 x 11" white paper continuation sheets.
B. Provide itemized data on continuation sheet
   1. Format, schedules, line items, and values: Those of the Schedule of Values accepted by Engineer.

1.04 PREPARATION OF APPLICATION FOR EACH PROGRESS PAYMENT

A. Application Form
   1. Fill in required information, including that for Change Orders executed prior to date of submittal of application.
   2. Fill in summary of dollar values to agree with respective totals indicated on continuation sheets.
   3. Execute certification with signature of a responsible officer of Contract firm.
B. Continuation Sheets
   1. Fill in total list of all scheduled component items of Work, with item number and scheduled dollar value for each item.
   2. Fill in dollar value in each column for each scheduled line item when work has been performed or products stored.
      a. Round off values to nearest dollar, or as specified for Schedule of Values.
   3. List each Change Order executed prior to date of submission at the end of the continuation sheets.
      a. List by Change Order Number and description, as for an original component item of work.

1.05 SUBSTANTIATING DATA FOR PROGRESS PAYMENTS

A. When the Owner or the Engineer requires substantiating data, Contractor shall submit suitable information with a cover letter identifying:
   1. Project.
   2. Application number and date.
   3. Detailed list of enclosures.

4. For stored products:
    a. Item number and identification as shown on application.
    b. Description of specific material.

B. Submit one copy of data and cover letter for each copy of application.

1.06 PREPARATION OF APPLICATION FOR FINAL PAYMENT

A. Fill in Application form as specified for progress payments.
B. Use continuation sheet to present the final statement of accounting as specified in Section 01 77 00: Closeout Procedures.

1.07 SUBMITTAL PROCEDURE

A. Submit Application for Payment to Engineer at the times stipulated in the Agreement.
B. Number: Five copies of each Application.
C. When Engineer finds Application properly completed and correct, he will transmit certificate for payment to Owner with copy to Contractor.

1.08 MEASUREMENT AND BASIS OF PAYMENT

No separate payment will be made for items not listed in this section. Prices are to include all costs, including overhead, profit, compliance with General Requirements and Technical Specifications and any and all incidentals required to complete the Project as specified in the Contract Documents and as shown on the Schedule of Values.

A. Bid Item No. 1 – MOBILIZATION will be paid as a lump sum to perform preparatory work and operations in mobilizing for beginning work on the project, including, but not limited to, those operations necessary for the movement of personnel, equipment, supplies, and incidentals to the project site and for the establishment of temporary offices, buildings, safety equipment and first aid supplies, and sanitary and other facilities and lead paint testing, necessary for the start of the work, excluding the cost of construction materials and any other preconstruction expense. Mobilization shall not exceed 5% of the total base bid.
B. Bid Item No. 2 – BONDS AND INSURANCE will be paid as a lump sum for the costs of acquiring, furnishing, and maintaining all required bonds and insurance for the durations specified in the Contract Documents.
C. Bid Item No. 3 – MATERIALS TESTING will be paid as a lump for moisture density control of fill, backfill, subgrade and base course and density control of asphalt pavements. This item includes all materials, labor, equipment, reports and incidentals for contract compliance, complete and in place.
D. Bid Item No. 4 – CONSTRUCTION SURVEYING will be paid as a lump sum for the implementation of construction surveying. This item includes all materials, labor, equipment, and incidentals for establishing and maintaining survey control, benchmarks, slope stakes, grading hubs, etc.
E. Bid Item No. 5 – TRAFFIC CONTROL will be paid as a lump sum for the implementation of traffic control measures. This item includes all materials, labor, equipment, and incidentals for establishing and maintaining a safe work zone in compliance with TMUTCD Standards.

F. Bid Item No. 6 – CONTINGENCY will be paid as a force account for unforeseen work items and minor bid item overruns. Force account work shall include all labor, tools, equipment, and incidentals required for the associated work items. Force Account items shall only be paid upon the proper execution of approved field and/or change orders.
G. Bid Item No. 7 – REMOVE 8" WATER LINE – AC PIPE will be measured by the linear foot for length of pipe removed. This item includes all materials, labor, equipment, etc. necessary to expose and remove the water line, including excavation and cutting of pipe. Contractor shall be required to remove and dispose of AC pipe in accordance with all State and Federal requirements. All removed fittings shall remain the property of the Owner. Contractor shall deliver removed fittings to the Public Works Yard located on Walthall Street as part of this pay item.
H. Bid Item No. 8 – REMOVE FIRE HYDRANT will be measured by the each. This item includes all materials, labor, equipment, etc. necessary to remove existing hydrants. Hydrants shall remain the property of the Owner. Contractor shall deliver removed hydrants to the Public Works Yard located on Walthall Street as part of this pay item.
I. Bid Item No. 9 – CLEARING AND GRUBBING will be measured by the Acre and shall include the removal and disposal of all concrete, brush, trash, or other items found on the subject property that are not being incorporated into the project. Removal shall include the removal of all root structures. This item will include all costs to transport the materials offsite to an approved disposal location.
J. Bid Item No. 10 – UNCLASSIFIED EXCAVATION will be measured by the cubic yard for excavation and removal form the project unsuitable fill. Work shall include all labor, tools, equipment, and incidentals required for the associated work items.
K. Bid Item No. 11 – HAULING AND INSTALLATION OF FILL MATERIAL will be measured by the cubic yard and shall include all materials, labor, equipment, etc. necessary to load, haul, distribute and grade fill material to be incorporated into the project. Fill material to be supplied by the Town of Pecos City. The remainder of the fill can be obtained at the Town of Pecos City landfill, located at 4990 TX Hwy 17, Pecos, Texas 79772.
L. Bid Item No. 12 – FLEXIBLE "CALICHE" BASE will be paid by the cubic yard and will include all labor, tools, equipment, fuel, water, materials, and incidentals required to load, haul and install base material to the achieve finished grades and compaction rates as identified in the plans and specifications.
M. Bid Item No. 13 – GRADING AND COMPACTION will be paid as lump sum and will include all surveying, labor, material, equipment and water necessary to achieve finished grades and compaction rates as identified in the plans and specifications.
N. Bid Item No. 14 – CURB & GUTTER/LAYDOWN CURB will be paid for by the linear foot as measured along the flow line and will include all surveying, labor, tools, equipment, forms, fuel, water, materials, and incidentals required to install concrete curb and gutter to the dimensions and locations as identified in the plans and according to specifications.
O. Bid Item No. 15 – 6" THICK CONCRETE DRIVEWAYS – REINFORCED will be measured by the square yard of concrete and will include all labor, tools, equipment, materials, forms, water, materials, and incidentals required to compact base, prepare and install 6" of reinforce concrete pavement for driveways.
P. Bid Item No. 16 – 6" REINFORCED CONCRETE ALLEYWAY TRANSITIONS will be measured by the square yard of concrete and will include all labor, tools, equipment, materials, forms,

water, materials, and incidentals required to compact base, prepare and install 6” of reinforce concrete pavement for alleys.

Q. Bid Item No. 17 – 6” REINFORCED CONCRETE DUMPSTER PAD will be measured by the square yard of concrete and will include all labor, tools, equipment, materials, forms, water, materials, and incidentals required to compact base, prepare and install 6” of reinforce concrete pavement for dumpster pads.

R. Bid Item No. 18 – ADA COMPLIANT SIDEWALK – 4” THICKNESS will be paid for by the square foot of finished surface and will include all labor, tools, equipment, fuel, water, materials, and incidentals required to supply and install reinforced concrete to the dimensions and locations as identified in the plans and according to specifications. Contractor is responsible to ensure that all sidewalk be built to ADA compliance, including cross slopes, elimination of barriers, etc. Any sidewalk found to not be compliant by Engineer shall be removed and replaced at no additional cost to Owner

S. Bid Item No. 19 – 2’x5’ ADA DETECTABLE WARNING SURFACE will be paid for by the each and will include all labor, tools, equipment, fuel, water, materials, and incidentals required to supply and install ADA detectable warning surfaces. Surface shall be “brick red” in color or similar, and subject to approval by Engineer.

T. Bid Item No. 20 – PRIME COAT (SS-1) will be paid for by the gallon applied in accordance with the plans and specifications. Pay requests for this item shall be documented along with daily tank stabbings to verify before and after application rates and quantities. Tank Stabbing information shall be available upon request by the engineer. This item includes all materials, equipment, labor, fuels and other incidentals required to deliver and properly apply materials.

U. Bid Item No. 21 – TxDOT TYPE “D” HMAC will be paid by the ton for the hauling, placement and compaction of hot mix asphalt concrete in accordance with TxDOT specifications. This item includes all materials, labor, equipment, fuels and incidentals for the proper installation of HMAC at the prescribed thicknesses. Plant tickets shall be made available to the engineer upon request.

V. Bid Item No. 22 – TxDOT TYPE “D” HMAC – ASPHALT PATCHING will be paid by the ton for the hauling, placement and compaction of hot mix asphalt concrete in accordance with the plans and specifications to patch those areas affected by trenching activities in existing streets. This item includes all materials, labor, equipment, fuels and incidentals for the proper installation of HMAC at the prescribed thicknesses. Plant tickets shall be made available to the engineer upon request.

W. Bid Item No. 23 – 8" PVC SDR 35 SEWER LINE will be measured by the linear foot of installed, completed in place sewer line in the prescribed diameter and thickness. Work shall include costs of furnishing and installing at materials, surveying, testing, excavation, labor, tools, equipment, and incidentals required for the proper installation of associated work items.

X. Bid Item No. 24 – FIBERGLASS MANHOLE (COMPLETE) will be measured and paid for by the each. Manhole heights can be determined from plan details and elevations. Work shall include all materials, excavation, labor, tools, equipment, and incidentals required for the associated work items.

Y. Bid Item No. 25 – 6" SEWER SERVICE CONNECTION (COMPLETE) will be measured by the each for a complete (as defined on the plans) sewer connection in the diameter prescribed

above. Work shall include costs of furnishing and installing at materials, surveying, excavation, labor, tools, equipment, and incidentals required for the proper installation of associated work items.

Z. Bid Item No. 26 – 8” LATERAL PRESSURE INTERCONNECTION (HOT TAP) W/8" GATE VALVE will be measured by the each for a complete (as defined on the plans) interconnection with gate valve. Work shall include costs of furnishing and installing at materials, surveying, testing, excavation, labor, tools, equipment, and incidentals required for the proper installation of associated work items.

AA. Bid Item No. 27 – 8" AWWA C900 or C909 PVC PIPE CLASS 150, DR-18 will be measured by the linear foot of installed, completed in place water line in the prescribed diameter and thickness. Work shall include costs of furnishing and installing at materials- including but not limited to tracer wire, surveying, testing, sawcutting of pavement, excavation, bedding material, labor, tools, equipment, and incidentals required for the proper installation of associated work items.

BB. Bid Item No. 28 – FIRE HYDRANT ASSEMBLY W/6" GATE VALVE (COMPLETE) will be measured by the each for a complete (as defined on the plans) interconnection with gate valve, hydrant, fittings and 6” pipe. Work shall include costs of furnishing and installing at materials, surveying, testing, excavation, labor, tools, equipment, and incidentals required for the proper installation of associated work items.

CC. Bid Item No. 29 – 3/4" WATER SERVICE CONNECTION (COMPLETE) will be measured by the each for a complete (as defined on the plans) water connection in the diameter prescribed above. Work shall include costs of furnishing and installing at materials, surveying, excavation, labor, tools, equipment, and incidentals required for the proper installation of associated work items.

DD. Bid Item No. 30 – 8" GATE VALVE - MJ will be measured by the each and will include furnishing and installing gate valves along with including all mechanical joint restraints, gland packs, tie rods, and other appurtenances as necessary. Work shall include costs of furnishing and installing at materials, surveying, testing, excavation, labor, tools, equipment, and incidentals required for the proper installation of associated work items.

EE. Bid Item No. 31 – 8"x8” DUCTILE IRON TEE - MJ will be measured by the each for furnished and installed fittings, including all mechanical joint restraints, gland packs, tie rods, and other appurtenances as necessary. Work shall include costs of furnishing and installing at materials, surveying, testing, excavation, labor, tools, equipment, and incidentals required for the proper installation of associated work items.

FF. Bid Item No. 32 – 8"x8” DUCTILE IRON CROSS - MJ will be measured by the each for furnished and installed fittings, including all mechanical joint restraints, gland packs, tie rods, and other appurtenances as necessary. Work shall include costs of furnishing and installing at materials, surveying, testing, excavation, labor, tools, equipment, and incidentals required for the proper installation of associated work items.

GG. Bid Item No. 33 – 8"x8” DUCTILE 90° BEND - MJ will be measured by the each for furnished and installed fittings, including all mechanical joint restraints, gland packs, tie rods, and other appurtenances as necessary. Work shall include costs of furnishing and installing at materials, surveying, testing, excavation, labor, tools, equipment, and incidentals required for the proper installation of associated work items.

HH. Bid Item No. 34 – 8"x8" DUCTILE IRON COUPLER - MJ will be measured by the each for furnished and installed fittings, including all mechanical joint restraints, gland packs, tie rods, and other appurtenances as necessary. Work shall include costs of furnishing and installing at materials, surveying, testing, excavation, labor, tools, equipment, and incidentals required for the proper installation of associated work items.

II. Bid Item No. 35 – VALVE BOX AND RISER will be measured and paid for by the each. Work includes supplying labor, equipment, tools, etc. for all supplying, installation, adjustments, extensions, etc. required to install valve box, lid and riser to finished grade and elevation.

JJ. Bid Item No. 36 – ADJUST MANHOLE/VALVE COVER TO FINISHED GRADE will be measured and paid for by the each. Work includes supplying labor, equipment, tools, etc. for all demolition, adjustments, extensions, etc. required to raise existing manhole covers, valve covers or water valve box/cover to finished grade and elevation.

KK. Bid Item No. 37 – MANHOLE CONCRETE COLLARS will be paid for by the each and will include all labor, tools, equipment, materials, forms, water, materials, and incidentals required to compact base, prepare and install 6" of reinforce concrete pavement (minimum 3500 psi) around each manhole at finished grade and elevation.

LL. Bid Item No. 38 – 4" LATERAL PRESSURE INTERCONNECTION (HOT TAP) W/4" GATE VALVE will be measured by the each for a complete (as defined on the plans) interconnection with gate valve. Work shall include costs of furnishing and installing at materials, surveying, testing, excavation, labor, tools, equipment, and incidentals required for the proper installation of associated work items.

MM. Bid Item No. 39 – DIRECTIONAL BORE - 8" SEWER will be measured by the foot for a complete and successful (at the depth and slope prescribed in the plans) bore. Work shall include all work associated with modification and subsequent sealing of existing concrete manhole. Work shall include costs of furnishing and installing all materials, surveying, testing, excavation, labor, tools, equipment, and incidentals required for the proper installation of associated work items. Measurement for pay of the tailpiece shall be limited to twenty feet (20').

NN. Bid Item No. 40 – REMOVE CONCRETE CURB AND GUTTER will be measured by the linear foot. This item includes all materials, labor, equipment, etc. necessary to sawcut, remove and legally dispose of existing curb and gutter.

OO. Bid Item No. 41 – REMOVE CONCRETE (VARYING THICKNESSES) will be measured by the square foot. This item includes all materials, labor, equipment, etc. necessary to remove and legally dispose of removed concrete.

PP. Bid Item No. 42 – 12" AWWA C900 PVC PIPE CLASS 150, DR-18 (CARRIER PIPE) will be measured by the linear foot of installed, completed in place water line in the prescribed diameter and thickness. Work shall include costs of furnishing and installing at materials- including but not limited to pipe spacers, surveying, testing, excavation, bedding material, labor, tools, equipment, and incidentals required for the proper installation of associated work items.

2.00 PRODUCTS (NOT USED)

3.00 EXECUTION (NOT USED)

*** **END OF SECTION** ***

01 29 73 SCHEDULE OF VALUES

1.00 GENERAL

1.01 REQUIREMENTS INCLUDED

A. Submit to the Engineer a Schedule of Values allocated to the various portions of the Work within 10 days after award of contract.
B. Upon request of Engineer, support the values with data that will substantiate their correctness.
C. The Schedule of Values shall be used as the basis for the Contractor's Applications for Payment.

1.02 RELATED REQUIREMENTS

A. Conditions of the Contract.
B. Section 01 29 00: Payment Procedures.

1.03 FORMAT AND CONTENT OF SCHEDULE OF VALUES

A. Type schedule on 8-1/2 x 11" white paper. Engineer will consider contractor's standard forms and automated printout for approval upon Contractor's request. Identify schedule with:
   1. Title of Project and location.
   2. Engineer and Project number.
   3. Name and address of Contractor.
   4. Contract designation.
   5. Date of submission.
B. For lump sum contracts and items:
   1. Schedule shall list the installed value of the component parts of the Work in sufficient detail to serve as a basis for computing values for progress payments during construction.
   2. Follow the Bid Proposal as the format for listing component items.
      a. Identify each line item with the number and title of the respective major sections of the specifications.
   3. For each major line item, list sub values of major products or operations under the item.
   4. For the various portions of the Work:
      a. Each item shall include a directly proportional amount of the Contractor's overhead and profit.
      b. For items on which progress payments will be requested for stored materials, break down the value into:
         1) The cost of the materials, delivered and unloaded, with taxes paid.
         2) The total installed value.
      c. Submit a subschedule for each separate stage of work specified in Section 01 11 00.
   5. The sum of all values listed in the schedule shall equal the total Contract Sum.
C. For unit price contracts and items:
   1. Submit a subschedule of unit cost and quantities for:
      a. Products on which progress payments will be requested for stored products.

2. The form of submittal shall parallel that of the Bid Proposal, with each item identified the same as the line item in the Proposal.
3. The unit quantity of bulk materials shall include an allowance for normal waste.
4. The unit values for the material shall be broken down into:
   a. Cost of the material, delivered and unloaded at the site, with taxes paid.
   b. Installation costs, including Contractor's overhead and profit.
5. The installed unit value multiplied by the quantity listed shall equal the cost of that item in the Schedule of Values and the Contract Sum.

2.00 PRODUCTS (NOT USED)

3.00 EXECUTION (NOT USED)

END OF SECTION

01 30 00 ADMINISTRATIVE REQUIREMENTS

1.00 GENERAL

1.01 REQUIREMENTS INCLUDED

A. Administer contract requirements to construct the project. Provide documentation per the requirements of this Section. Provide information as requested by the Engineer or Owner concerning this project.

1.02 RELATED REQUIREMENTS

A. Section 01 33 00: Submittal Procedures.

1.03 COMMUNICATION DURING THE PROJECT

A. The Engineer is to be the first point of contract for all parties on matters concerning this project.
B. The Engineer will coordinate correspondence concerning:
    1. Submittals, including requests for payment
    2. Clarification and interpretation of the Contract Documents
    3. Contract modifications
    4. Observation of work and testing
    5. Claims
C. The Engineer will normally communicate only with the Contractor. Any required communication with suppliers or subcontractors will only be with the first involvement of the Contractor.
D. Written communications are to be directed to the Engineer at the address indicated at the pre-construction Conference. Communications should include as a minimum:
    1. Name of the Owner
    2. Project name
    3. Contract title
    4. Project number
    5. Date
    6. A reference statement
E. Submit communications on the forms referenced in this Section or in Section 01 33 00.

1.04 PROJECT MEETINGS

A. Pre-construction Conference
    1. Attend a pre-construction meeting.
    2. The location of the conference will be determined by the Engineer.
    3. The time of the meeting will be determined by the Engineer, but will be after the Notice of Award is issued and not later than fifteen (15) days after the Notice to Proceed is issued.
    4. The Owner, Engineer, representative of utility companies, the Contractor's project manager and superintendent, and representatives from major subcontractors and suppliers may attend the meeting.
    5. Contractor should provide and be prepared to discuss:

a) Preliminary construction and submittal schedule per Section 01 32 26: Construction Progress Reporting.
b) Schedule of values and anticipated schedule of payments per Section 01 29 73: Schedule of Values.
c) List of Suppliers and Subcontractors.
d) Contractor's organizational chat as it relates to this project.
e) Letter indicating the agents of authority for the Contractor and the limit of that authority with respect to the execution of legal documents, contract modifications and payment requests.

B. Progress Meetings
1. Attend meetings with the Engineer and Owner:
a) Meet on a monthly basis or as requested by the Engineer to discuss the project.
b) Meet at the project site or other location as designated by the Engineer.
c) Contractor's superintendent and other key personnel are to attend the meeting. Other individuals may be requested to attend to discuss specific matters.

C. Provide information as requested by the Engineer or Owner concerning this project.
1. Prepare to discuss:
a) Status of overall project schedule.
b) Contractor's detailed schedule for next month.
c) Anticipated delivery dates for equipment
d) Coordination with the Owner.
e) Status of submittals.
f) Information or clarification of the Contract Documents.
g) Claims and proposed modifications to the contract
h) Field observations, problems, or conflicts.
i) Maintenance of quality standards.

D. Notify the Engineer of any specific items to be discussed a minimum of one (1) week prior to the meeting.

E. Review minutes of meetings and notify the Engineer of any discrepancies within ten (10) days of the date of the memorandum.
1. Following the date, the minutes will stand as shown or as corrected.
2. Corrections will be reflected in the minutes of the following meeting.
3. Each issue is to be numbered to indicate the meeting number and the issue number. Issues discussed will be documented and old issues will remain on minutes of subsequent meetings until the issue is resolved.

F. Pre-submittal and Pre-installation meetings
1. Attend pre-submittal and pre-installation meetings as required in the individual technical specifications or as determined necessary by the Engineer (for example, instrumentation, roofing, concrete mix design, etc.).
2. The location of the meeting will be determined by the Engineer.
3. The time of the meeting will be determined by the Contractor when ready to proceed with the associated work, subject to submission of an NBC and acceptance by the Engineer and owner of the proposed time.

4. The Owner, Engineer, the Contractor's project manager and superintendent, and representatives from affected subcontractors and suppliers shall attend the meeting.

1.05 REQUESTS FOR INFORMATION

A. Submit Request for Information (RFI) to the Engineer to obtain additional information or clarification of the Contract Documents.
B. Submit a separate RFI for each item per Section 01 33 00: Submittal Procedures.
C. Attach adequate information to permit a written response without further clarification. Engineer will return requests that do not have adequate information to the Contractor for additional information. Contractor is responsible for all delays resulting from multiple submittals due to inadequate information.
D. A response will be made when adequate information is provided.
E. Response to an RFI is given to provide additional information, interpretation, or clarification of the requirements of the Contract Documents and does not modify the Contract Documents.
F. If the RFI indicated that a contract modification is required, the Engineer will initiate a proposed Contract Modification (PCM) per Section 01 26 57: Change Order Procedures.

1.06 NOTIFICATION BY CONTRACTOR

A. Notify the Engineer of:
    1. Need for testing.
    2. Intent to work outside regular working hours.
    3. Request to shut down facilities or utilities.
    4. Proposed utility connections.
    5. Required observation by Engineer or inspection agencies prior to covering work.
    6. Training.
    7. Provide notification a minimum of two (2) weeks in advance in order to allow Owner and Engineer time to respond appropriately to the notification.
    8. All notifications shall be in writing.

2.00 PRODUCTS (NOT USED)

3.00 EXECUTION (NOT USED)

*** **END OF SECTION** ***

01 32 16 CONSTRUCTION PROGRESS SCHEDULE

1.0 GENERAL

1.01 REQUIREMENTS INCLUDED

A. Prepare and submit a progress schedule for the work and update the schedule on a monthly basis for the duration of the project.
B. Provide schedule in adequate detail to allow Owner to monitor the work progress, to anticipate the time and amount of progress payments, and to relate submittal processing to sequential activities of the work.
C. Incorporate and specifically designate the dates of anticipated submission of submittals and the dates when submittals must be returned to the Contractor into the schedule.
D. Assume complete responsibility for maintaining the progress of the work per the schedule submitted.

1.02 RELATED REQUIREMENTS

A. Conditions of the Contract
B. Section 01 11 00: Summary of Work
C. Section 01 33 00: Submittal Procedures

1.02 FORM OF SCHEDULES

A. Prepare schedules in the form of a horizontal bar chart.
   1. Provide separate horizontal bar for each trade or operation.
   2. Horizontal time scale: Identify the first workday of each week.
   3. Scale and spacing: Allow space for notations and future revisions.
B. Format of listings: The chronological order of the start of each item of work.
C. Identification of listings: By major specification section numbers.

1.03 CONTENT OF SCHEDULES

A. Construction Progress Schedule: construction by activity.
   1. Show the dates for the beginning and completion of each major element of construction. Where applicable, specifically list:
      a. Site clearing.
      b. Site utilities.
      c. Foundation work.
      d. Structural framing.
      e. Subcontractor work.
      f. Equipment installations.
      g. Finishings.
   2. Show projected percentage of completion for each item as of the first day of each month.
B. Submittals Schedule for Shop Drawings, Product Data, and Samples. Show:
   1. The dates for Contractor's submittals.
   2. The dates approved submittals will be required from the Engineer.

C. Prepare and submit subschedules for each separate stage of work specified in Section 01 11 00: Summary of Work or Bid Proposal.
D. Provide subschedules to define critical portions of prime schedules.

1.04 PROGRESS REVISIONS

A. Indicate progress of each activity to date of submission.
B. Show changes occurring since previous submission of schedule:
   1. Major changes in scope.
   2. Activities modified since previous submission.
   3. Revised projections of progress and completion.
   4. Other identifiable changes.
C. Provide a narrative report as needed to define:
   1. Problem areas, anticipated delays, and the impact on the schedule.
   2. Corrective action recommended and its effect.
   3. The effect of changes on schedules of other prime contractors.

1.05 SUBMISSIONS

A. Submit initial schedules within 15 days after award of Contract.
   1. Engineer will review schedules and return review copy within 10 days after receipt.
   2. If required, resubmit within seven days after return of review copy.
B. Submit revised progress schedules with each application for payment. Failure to do so will result in withholding of progress payments.
C. Submit the number of opaque reproductions that the Contractor requires, plus two copies, which will be retained by the Engineer.

1.07 DISTRIBUTION

A. Distribute copies of the reviewed schedules to:
   1. Job site files.
   2. Subcontractors.
   3. Other concerned parties.
B. Instruct recipients to report promptly to the Contractor, in writing, any problems the schedules. Instruct recipients to report promptly to the Contractor, in writing, any problems the schedules.

2.00 PRODUCTS (NOT USED)

3.00 EXECUTION (NOT USED)

***** END OF SECTION *****

01 32 33 PHOTOGRAPHIC DOCUMENTATION

1.00 GENERAL

1.01 REQUIREMENTS INCLUDED

A. Provide a competent photographer to adequately photograph preconstruction conditions, construction progress activities, and post-construction conditions.

B. Construction activity will not commence prior to preconstruction photographic documentation.

C. Failure to submit required photographs will delay processing of progress payments.

1.02 RELATED REQUIREMENTS

A. Section 01 11 00: Summary of Work

B. Section 01 78 39: Project Record Documents

1.03 SUBMITTALS

A. Submit photographic documentation on electronic media (CD, DVD, Flash Drive, etc.) as record data.

1.04 USAGE RIGHTS

A. All photographs become the property of Owner.

B. Photographs are not to be used by Contractor without express written consent.

2.00 PRODUCTS

2.01 PHOTOGRAPHIC MEDIA

A. Provide images in digital format (JPG is preferred) produced by a digital camera with a minimum sensor size of 8 megapixels, and at an image resolution of not less than 1600 by 1200 pixels and 400 dpi.

3.00 EXECUTION

3.01 CONSTRUCTION PHOTOGRAPHS

A. Take photographs using the maximum range of depth of field, and that are in focus, to clearly show the Work. Photographs with blurry or out-of-focus areas will not be accepted.

1. Maintain key plan with each set of construction photographs that identifies each photographic location.

B. Submit digital images exactly as originally recorded in the digital camera, without alteration, manipulation, editing, or modifications using image-editing software.

1. Date and Time: Include date and time in file name for each image.
2. Key Plan: Include digital copy of key plan with each electronic submittal; include point of view identification in each photo file name.
3. Field Office Images: Maintain one set of images accessible in the field office at Project Site, available at all times for reference.

C. Preconstruction Photographs: Before commencement of the Work, take photographs of Project site and surrounding properties, including existing items to remain during construction, from different vantage points.
   1. Provide construction staking before taking construction photographs.
   2. Take sufficient number photographs to show existing conditions adjacent to property before starting the Work.
   3. Take sufficient photographs of existing buildings either on or adjoining property to accurately record physical conditions at start of construction.
   4. Take additional photographs as required to record settlement or cracking of adjacent structures, pavements, and improvements.
D. Periodic Construction Photographs: Take photographs of major construction activities corresponding to Schedule of Values during installation or construction.
E. Final Completion Construction Photographs: Take photographs after date of Substantial Completion for submission as project record documents.

END OF SECTION

01 33 00 SUBMITTAL PRODECURES

1.00 GENERAL

1.01 REQUIREMENTS INCLUDED

A. Submit documentation as required by the Contract Documents and as reasonably requested by the Owner and Engineer to:
   1. Record the products incorporated into the Project for the Owner.
   2. Provide information for operation and maintenance of the Project.
   3. Provide information for the administration of the Contract.
   4. Allow the Engineer to advise the owner if products proposed for the project by the Contractor conform, in general, to the design concepts of the Contract Documents.

B. Contractor's responsibility for full compliance with the Contract Documents is not relieved by the Engineer's review of submittals. Contract modifications can only be approved by Change Order or Field Order.

1.02 RELATED REQUIREMENTS

A. Conditions of the Contract.
B. Section 01 32 26: Construction Progress Reporting.
C. Section 01 78 39: Project Record Documents.
D. Designate in the construction schedule, or in a separate coordinated schedule, the dates for submission and the dates that reviewed Submittals will be needed.

1.03 CONTRACTOR'S RESPONSIBILITIES

A. Review and certify all submittals prior to submission.
B. Determine and verify:
   1. Field measurements
   2. Field construction requirements
   3. Location of all existing structures, utilities, and equipment related to the submittals
   4. Submittals are complete for their intended purpose
   5. Conflicts between the submittals related to the various Subcontractors and Suppliers have been resolved
   6. Quantities and dimensions shown on the submittals
C. Submit information per the procedures described in this section and the detailed specifications.
D. Furnish the following submittals:
   1. As specified in the each Technical Specification.
   2. Schedules, data, and other documentation as described in detail in this section or referenced in the General Conditions and Contract Documents.
   3. Documentation required for the administration of the Contract.
   4. Shop Drawings required for consideration of a contract modification.
   5. Submittals as required in the detailed specifications.
   6. Submittals not required will be retuned without Engineer's review.
E. Submit a schedule indicating the date submittals will be sent to the Engineer and proposed dates that the product will be incorporated into the project. Make submittals promptly in

accordance with the schedule to cause no delay in the Project.

1. Send submittals to the Engineer allowing a reasonable time for delivery, review, and making submittals. Include time for review of a resubmission if necessary. Allow adequate time for the submittal review process, ordering, fabrication, and delivery of the product to not delay progress on the Project.
2. Schedule submittal to provide all information for interrelated work at one time. No review will be performed on submittals requiring coordination with other submittals. Engineer will return submittals for resubmission as a complete package.

F. Submit information for all of the components and related equipment required for a complete and operational system in the same submittal.
   1. Include electrical, mechanical, and other information required to indicate how the various components of the system function.
   2. Provide certifications, warranties, and written guarantees with the submittal package for review when they are required.
   3. Fabrications or installation of any products prior to the approval of Shop Drawings is done at the Contractor's risk. Products not meeting the requirements of Contract Documents are defective and may be rejected at the owner's option.

G. Payment will not be made for products for which submittals are required until the submittals have been received. Payment will not be made for products for which Shop Drawings or Samples are required until these are approved by the Engineer.

1.04 QUALITY ASSURANCE

A. Submit legible, accurate, complete documents presented in a clear, easily understood manner, Submittals not meeting these criteria will be returned without review.
B. Demonstrate that the proposed products are in full and complete compliance with the design criteria and requirements of the Contract Documents including Drawings and Specifications as modifies by Addenda, Field Orders, and Change orders.
C. Furnish and install products that fully comply with the information included in the submittal.

1.05 SUBMITTAL PROCEDURES

A. Transmit all submittals with a properly completed Submittal Transmittal Form. Electronic submittals in PDF format are preferred.
   1. Use a separate transmittal form for each specific product, class of material, and equipment system.
   2. Submit items specified in different sections of the Specifications separately unless they are part of an integrated system.
B. Assign a submittal number to the documents originated to allow tracking of the submittal during the review process.

   1. Assign the number consisting of a prefix, a sequence number, and a letter suffix. Prefixes shall be as follows:

Prefix	Description	Originator
AP	Application for Payment	Contractor
CO	Change Order	Engineer
CMR	Contract Modification Request	Contractor
CTR	Certified Test Report	Contractor
EIR	Equipment Installation Report	Contractor
FO	Field Order	Engineer
NBC	Notification by Contractor	Contractor
O&M	Operation & Maintenance Manuals	Contractor
PD	Photographic Documentation	Contractor
RD	Record Data	Contractor
RFI	Request for Information	Contractor
SAM	Sample	Contractor
SD	Shop Drawing	Contractor
SCH	Schedule of Progress	Contractor

2. Issue sequence numbers in chronological order for each type of submittal.
3. Issue numbers for resubmittals that have the same number as the original submittal followed by an alphabetical suffix indicating the number of times the same submittal has been sent to the Engineer for processing. For example: SD 025 A represents shop drawing number 25 and the letter "A" designates this is the second time this submittal has been sent for review.
4. Clearly note the submittal number on each page or sheet of the submittal.
5. Correct assignment of numbers is essential since different submittal types are processed in different ways.

D. Submit documents with uniform markings.
1. Mark submittals to:
   a. Highlight Contractor's corrections in green.
   b. Highlight items pertinent to the products being furnished in yellow and delete items that are not when the Supplier's standard drawings or information sheets are provided.
   c. Cloud items and highlight in yellow where selections by the Engineer or Owner are required.
   d. Mark dimensions with the prefix FD to indicate field verified dimensions on the Shop Drawings.

e. Provide an 8-by-3-inch blank space for Contractor's and Engineer's stamp. Contractor may use a digital certification if this is preferred. This certification must bear a digital signature.

2. Define abbreviations and symbols used in Shop Drawings.
   a. Use terms and symbols in Shop Drawings consistent with the Contract Drawings.
   b. Provide a list of abbreviations and their meaning as used in the Ship Drawings.
   c. Provide a legend for symbols used on Shop Drawings.

E. Mark submittals to reference the Drawing number and/or section of the Specifications, detail designation, schedule or location that corresponds with the data submitted. Other identification may also be required, such as layout drawings or schedules to allow the reviewer to determine where a particular product is to be used.

F. Deliver samples required by the Specifications to the project site. Provide a minimum of two samples.

G. Construct mock-ups from the actual products to be used in construction per detailed Specifications.

H. Submit color charts and Samples for every product requiring color, texture, or finish selection.
   1. Submit all color charts and Samples at one time.
   2. Do not submit color chats and Samples until all record data have been submitted or Shop Drawings for the products have been approved.
   3. Submit color charts and Samples not less than 30 days prior to when these products are to be ordered or released for fabrication to comply with the schedule for construction of the Project.

I. Submit Contract Modification Request per Section 01 30 00: Administrative Procedures to request modifications to the Contract Documents.

1.05 REVIEW PROCEDURES

A. Shop drawings are reviewed in the order received, unless Contractor request that a different priority be arranged.

B. Mark a submittal as "priority" to place the review for this submittal ahead of submittals previously delivered. Priority submittals will be reviewed before other submittals for this Project which have been received but not reviewed. Use discretion in the use of "Priority" submittals as this may delay the review of submittals previously submitted. Revise the Schedule of Contractor's Submittals for substantial deviations from the previous schedule. Review procedures vary with the type of submittal as described in Paragraph 1.06.

1.06 SUBMITTAL REQUIREMENTS

A. Shop Drawings are required for those products that cannot adequately be described in the Contract Documents to allow fabrication, erection or installation of the product without additional detailed information from the Supplier.
   1. Shop Drawings are requested so that the Engineer can:
      a. Assist the owner in selecting colors, textures or other aesthetic features.
      b. Compare the proposed features of the product with the specified features so as to advise the Owner that the product does, in general, conform to the Contract Documents.

c. Compare the performance features of the proposed product with those specified so as to advise the Owner that it appears that the product will meet the designed performance criteria.
d. Review required certifications, guarantees, warranties, and service agreements for compliance with the Contract Documents.

2. Certify on the Contractor's stamp that the Contractor has reviewed the Shop Drawings and made all necessary corrections as such that the products, when installed, will be in full compliance with the Contract Documents. Shop Drawings submitted without this certification will be returned without review.
3. Submit Shop Drawings for:
   a. Products indicated in the submittal schedule following this section.
   b. When a substitution or equal product is proposed in accordance with paragraph 1.08 of this Section.
4. Include a complete description of the material or equipment to be furnished. Information is to include:
   a. Type, dimensions, size, arrangement, model number, and operational parameters of the components.
   b. Weights, gauges, materials of construction, external connections, anchors, and supports required.
   c. Performance characteristics, capacities, engineering data, motor curves, and other information necessary to allow a complete evaluation of mechanical components.
   d. All applicable standards such as ASTM or Federal specification numbers.
   e. Fabrication and installation drawings, setting diagrams, manufacturing instructions, templates, patterns, and coordination drawings.
   f. Wiring and piping diagrams and related controls.
   g. Mix designs for concrete, asphalt, or other materials proportioned for the Project.
   h. Complete and accurate field measurements for products which must fit existing conditions. Indicate on the submittal that the measurements represent actual dimensions obtained at the site.
5. Provide all required statements of certification, guarantees, extended service agreements, and other related documents with the Shop Drawing. The effective date of these documents shall be the date of acceptance of the work by the Owner.
6. Comments will be made on items called to the attention of the Engineer for review and comment. Any marks made by the Engineer do not constitute a blanket review of the submittal or relieve the Contractor from responsibility for errors or deviations from the Contract requirements.
   a. Submittals that are reviewed will be returned with one or more of the following designations:
      1) Approved: Submittal is found to be acceptable as submitted.
      2) Approved as Noted: Submittal is acceptable with corrections or notations made by Engineer and may be used as corrected.
      3) Revise and Resubmit: Submittal has deviations from the Contract Documents, significant errors, or is inadequate and must be revised and resubmitted for subsequent review.
      4) Not Approved: Products are not acceptable.

b. Drawings with a significant or substantial number of markings by the Contractor may be marked “Approved as Noted” and “Revise and Resubmit.” These drawings are to be revised to provide a clean record of the submittal.
c. Dimensions or other data that do not appear to conform to the Contract Documents will be marked as “At Variance With” (AVW) the Contract Documents or other information provided. The Contractor is to make revisions as appropriate to comply with Contract Documents.

B. Certifications, Warranties and Service Agreements include documents as specifies in the detailed specifications, as shown in the submittal schedule or as follows:
1. Certified Test Report (CTR): A report prepared by an approved testing agency giving results of tests performed on products to indicate their compliance with the specifications.
2. Certification of Local Field Service (CLS): A certified letter stating that field service is available from a factory or supplier approved service organization located within a 300 mile radius of the project site. List names, addresses, and telephone numbers of approved service organizations on or attach it to the certificate.
3. Extended Warranty (EW): A guarantee of performance for the product or system beyond the normal 1 year warranty described in the general Conditions. Issue the warranty certificate in the name of the Owner.
4. Extended Service Agreement (ESA): A contract to provide maintenance beyond that required to fulfill requirements for warranty repairs, or to perform routine maintenance for a definite period beyond the warranty period. Issue the service agreement in the name of the Owner.
5. Certification of Adequacy of Design (CAD): a certified letter from the manufacturer of the equipment stating that they have designed the equipment to be structurally stable and to withstand all imposed loads without deformation, failure, or adverse effects to the performance and operational requirements of the unit. The letter shall state that mechanical and electrical equipment is adequately sized to be fully operational for the conditions specified or normally encountered by the product’s intended use.
6. Certification of Applicator/Subcontractor (CSQ): A certified letter stating that the Applicator or Subcontractor proposed to perform a specified function is duly designated as factory authorized and trained for the application of the specified product.

C. Submit record data to provide information to allow the Owner to adequately identify the products incorporated into the project and allow replacement or repair at some future date.
1. Provide record data for all products per the Specifications. Record data is not required for items for which Shop Drawings and/or operations and maintenance manuals are required.
2. Provide information only on the specified products. Submit a Contract Modification Request for approval of deviations or substitutions and obtain approval by Field Order or Change Order prior to submitting record data.
3. Provide the same information required for Short Drawings.
4. Record data will be received by the Engineer, logged, and provided to Owner for the Project record.

a. Record data may be reviewed to see that the information provided is adequate for the purpose intended. Inadequate drawings may be returned as unacceptable.
b. Record data is not reviewed for compliance with the Contract Documents. Comments may be returned if deviations from the Contract Documents are noted during the cursory review performed to see that the information is adequate.

D. Provide Samples for comparison with products delivered to the Site for use on the Project.
   1. Samples shall be of sufficient size and quantity to clearly illustrate the functional characteristics of the product, with integrally related parts and attachment devices.
   2. Indicate the full range of color, texture, and patterns.
   3. Dispose of Samples when related Work has been completed and approved, and disposal is requested by the Engineer. At owner's option Samples will become the property of the Owner.
E. Construct mock-ups for comparison with the Work being performed.
   1. Construct mock-ups of the size or area indicated in the detailed Specifications.
   2. Construct mock-ups complete with texture and finish to represent the finished product.
   3. Protect mock-ups until Work has been completed and accepted by the Owner.
   4. Dispose of mock-ups when related Work has been completed and disposal is approved by the Engineer.
F. Submit Operation and Maintenance manuals (O&M) for all equipment, mechanical devices, or components described in the Contract Documents. Include copies of approved Shop Drawings in the manual.
G. Submit Request for Information (RFI) in accordance with Section 01 30 00: Administrative Requirements.
H. Submit a Schedule of Values in accordance with Section 01 29 73: Schedule of Values
I. Application for Payment (AP) in accordance with Section 01 29 00: Payment Procedures.
J. Submit Progress Schedules (SCH) in accordance with Section 01 32 26: Construction Progress Reporting.
K. Submit Certified Test reports (CTR) from independent testing laboratories in accordance with Section 01 40 00: Quality Requirements.
   1. Submit test reports for material fabricated for this project with Shop Drawings for that product.
   2. Submit test reports produced at the point of production for standard production products with the record data for that product.
L. Submit a list of Suppliers and Subcontractors as record data in accordance with Section 01 30 00: Administrative Requirements.
M. Submit Equipment Installation Reports (EIR) in accordance with Section 01 75 00: Starting and Adjusting.
N. Submit Notifications by Contractor (NBC) in accordance with Section 01 30 00: Administrative Requirements.
O. Submit Photographic Documentation (PD) in accordance with Section 01 32 33: Photographic Documentation.
P. Submit Process Performance Bonds (PPB) in accordance with the "Supplementary Conditions" and the detailed equipment specifications.

1.07 REQUESTS FOR DEVIATION

A. Submit requests for deviation from the Contract Documents for any product that does not fully comply with the Contract Documents.
B. Submit request by Contract Modification Request (CMR) per Section 01 26 57: Change Order Procedures. Identify the deviations and the reason the change is requested.
C. Include the amount of cost savings to the Owner for deviations that result in a reduction in cost.
D. A Change Order or Field Order will be issues by the Engineer for deviations approved by the Owner. Deviations from the Contract Documents may only be approved by Change order or Field Order.

1.08 SUBMITTALS FOR EQUAL NON SPECIFIED PRODUCTS

A. The products of the listed suppliers are to be furnished where detailed specifications list sever manufacturers but do not specifically list "or equal" or "or approved equal" products. Use of any products other than those specifically listed is a substitution and must be approved per Paragraph 1.09.
B. Contractor may submit other manufacturers' products that are in full compliance with the specification where detailed specifications list one or more manufacturers followed by the phase "or equal" or "or approved equal."
    1. Submit Shop Drawings of adequate detail to documents that the proposed product is equal or superior to the specified product.
    2. Prove that the product is equal. It is not the Engineer's responsibility to prove the product is not equal.
        a. Indicate on a point by point basis for each specified feature that the product is equal to the Contract Document requirements.
        b. Make a direct comparison with the specified manufacturer's published data sheets and available information. Provide this printed material with the submittal.
        c. The decision of the Engineer regarding the acceptability of the proposed product is final.
    3. Provide a typewritten certification that, in furnishing the proposed product as an equal, the Contractor:
        a. Has thoroughly examined the proposed product and has determined that it is equal or superior in all respects to the product specified.
        b. Has determined that the product will perform in the same manner and result in the same process as the specified product.
        c. Will provide the same warranties and/or bonds as for the product specified.
        d. Will assume all responsibility to coordinate any modifications that may be necessary to incorporate the product into the construction and will waive all claims for additional Work which may be necessary to incorporate the product into the project which maybe subsequently become apparent.
        e. Will maintain the same time schedule as for the specified product.
    4. A modification request is not required for any product that is in full compliance with the Contract Documents.

1.09 SUBMITTALS FOR SUBSTITUTIONS

A. Substitutions are defined as any product that the Contractor proposes to provide for the Project in lieu of the specified product.

B. Submit the following for consideration of approval of a Supplier or product which is not specified:

1. Contract Modification Request for deviation from the Contract Documents per paragraph 1.07.
2. Prove that the product is acceptable as a substitute. It is not the Engineer's responsibility to prove the product is not acceptable as a substitute.
   a. Indicate on a point by point basis for each specified feature that the product is acceptable to meet the intent of the Contract Documents requirements.
   b. Make a direct comparison with the specified Suppliers published data sheets and available information. Provide this printed material with the submittal.
   c. The decision of the Engineer regarding the acceptability of the proposed substitute product is final.
3. Provide a written certification that, in making the substitution request, the Contractor:
   a. Has determined that the substituted product will perform in substantially the same manner and result in the same ability to meet the specified performance as the specified product.
   b. Will provide the same warranties and/or bonds for the substituted product as specified or as would be provided by the manufacturer of the specified product.
   c. Will assume all responsibility to coordinate any modifications that may be necessary to incorporate the substituted product into the project and will waive all claims for additional Work which may be necessary to incorporate the substituted product into the project which may subsequently become apparent.
   d. Will maintain the same time schedule as for the specified product.

1.10 WARRANTIES AND GUARANTEES

A. Submit warranties and guarantees required by the Contract Documents with the Shop Drawings or record data.

B. Provide additional copies for equipment and include this additional copy in the Operation and Maintenance Manuals.

C. Provide a separate manual for warranties and guarantees.

1. Provide a log of all products for which warranties or guarantees are provided, and for all equipment. Index the log by Specification section number on forms provided by the Engineer.
2. Indicate the start date, warranty or guarantee period and the date upon which the warranty or guarantee expires for products or equipment for which a warranty or guarantee is required.
3. Indicate the data for the start of the correction period specified in the general Conditions for each piece of equipment and the date on which the specified correction period expires.
4. Provide a copy of the warranty of guarantee under a tab indexed to the log.

1.11 RESUBMISSION REQUIREMENTS

A. Make all corrections or changes in the submittals required by the Engineer and resubmit until approved.
B. For Shop Drawings:
   1. Revise initial drawings or data and resubmit as specified for the original submittal.
   2. Highlight in yellow those revisions which have been made in response to the first review by the Engineer.
   3. Highlight in blue any new revisions which have been made or additional details of information that has been added since the previous review by the Engineer.
C. For Samples:
   1. Submit new Samples as required for the initial Sample.
   2. Remove Samples which have been rejected
D. For mock-ups:
   1. Construct a new mock-up as initially required.
   2. Dispose of mock-ups which have been rejected.
E. Pay for excessive review of Shop Drawings.
   1. Excessive review of Shop Drawings is defined as any review required after the original review has been made and the first resubmittal has been checked to see that corrections have been made.
   2. Pay cost for the additional review to the Owner on a monthly basis as billed by the Owner.
   3. Need for more than one resubmission or any other delay of obtaining Engineer's review of submittals, will not entitle the Contractor to an extension of Contract Time. All costs associated with such delays shall be at the Contractor's expense.

1.12 ENGINEER'S DUTIES

A. Review the submittals and return with reasonable promptness.
B. Affix stamp, indicate approval, rejection, and the need for resubmittal.
C. Distribute documents.

2.00 PRODUCTS (NOT USED)

3.00 EXECUTION (NOT USED)

***** END OF SECTION *****

01 35 53 SECURITY PROCEDURES

1.00 GENERAL

1.01 REQUIREMENTS INCLUDED

A. Provide a project security program to:
   1. Protect Work, stored products, and construction equipment from theft and vandalism.
   2. Protect premises from entry by unauthorized persons.

B. Comply with local and homeland security requirements.

1.02 RELATED REQUIREMENTS

A. Section 01 51 00: Temporary Utilities.

B. Section 01 56 00: Temporary Barriers and Enclosures

1.03 MAINTENANCE OF SECURITY

A. Initiate security program in compliance with Owner's system, prior to job mobilization.

B. Maintain security program throughout construction period until Owner occupancy or Owner acceptance eliminates the need for Contractor security.

C. Contractor is responsible for taking adequate measures to protect the Owner's facilities, the cost of which is included in the Contractor's overhead.

2.00 PRODUCTS (NOT USED)

3.00 EXECUTION (NOT USED)

END OF SECTION

01 40 00 QUALITY REQUIREMENTS

1.00 GENERAL

1.01 REQUIREMENTS INCLUDED

A. Control the quality of the Work and verify that the Work meets the standards of quality established in the Contract Documents.
   1. Inspect the Work of the Contractor, Subcontractors and Suppliers. Correct defective Work.
   2. Inspect products and materials to be incorporated into the project. Ensure that Suppliers of raw materials, parts, components, assemblies, and other products have adequate quality control systems to ensure that quality products are produced. Provide only products that comply with the Contract Documents.
   3. Provide and pay for the services of an approved professional materials testing laboratory acceptable to the Owner to ensure that products proposed for use fully comply with the Contract Documents.
   4. Provide all facilities and calibrated equipment required for quality control tests.
   5. Provide consumable construction materials of adequate quality to provide a finished product that complies with the Contract Documents.
   6. Perform tests as indicated in this and other sections of the specifications. Schedule the time and sequence of testing with the Owner. All quality control testing is to be observed by the Owner or designated representative.
   7. Maintain complete inspection and testing records at the site and make them available to Owner and Engineer.

B. Technical specifications govern if any requirements of this section conflicts with the requirements of the technical specifications.

1.02 QUALITY ASSURANCE ACTIVIES BY THE OWNER

A. Owner will perform its own quality assurance test independent of the Contractor's Quality Control Program or as otherwise described in the Contract Documents. Provide labor, materials, tools, equipment, and related items for testing by the Owner including, but not limited to temporary construction required for testing and operation of new and existing utilities. Assist the Owner and Engineer, and testing organizations in performing quality assurance activities.
   1. Provide access to the Work and to the Supplier's operations at all times Work is in progress.
   2. Cooperate fully in the performance of sampling, inspection, and testing.
   3. Furnish labor and facilities to:
      a. Provide access to the work to be tested.
      b. Obtain and handle samples for testing at the project site or at the source of the product to be tested.
      c. Provide calibrate scales and measuring devices for the Owner's use.
      d. Facilitate inspections and tests.
      e. Provide adequate lighting to allow Owner observations.
      f. Store and cure test samples.

4. Furnish copies of the tests performed on materials and products.
5. Provide adequate quantities of representative product to be tested to the laboratory at the designated location.
6. Give the Engineer adequate notice before proceeding with work that would interfere with testing.
7. Notify the Owner and Engineer and the testing laboratory prior to the time that testing is required. Lead time is to be adequate to allow arrangements to be made for testing.
8. Do not proceed with any work until testing services have been performed and results of tests indicate that the work is acceptable.
9. Provide complete access to the Site and make Contract Documents available.
10. Provide personnel and equipment needed to perform sampling or to assist in making the field tests.
11. Quality assurance testing performed by the Owner will be paid for by the Owner, except for verification testing performed by the Owner, which shall be paid for by the Contractor as described in paragraph 1.06.

B. Quality assurance activities of the Owner or Engineer through their own forces or through contracts with materials testing laboratories and survey crews are for the purpose of monitoring the results of the Contractor's work to see that it is in compliance with the requirements of the Contract Documents.

C. Quality assurance activities of the Owner and Engineer or non-performance of quality assurance activities:
   1. Do not relieve the Contractor of its responsibility to perform Work and furnish materials and products and constructed Work conforming to the requirements of the Contract Documents.
   2. Do not relieve the Contractor of its responsibility for providing adequate quality control measures.
   3. Do not relieve the Contractor of its responsibility for damage to or loss of the material, product, or Work before Owner's acceptance.
   4. Do not constitute or imply Owner's acceptance.
   5. Do not affect the continuing rights of the Owner after Owner's acceptance of the completed Work.

D. The presence or absence of the Owner's Representative does not relieve the Contractor from any contract requirements, nor is the Owner's Representative authorized to change any term or condition of the Contract Documents without the Owner's written authorization in a Field Order or Change Order.

E. Failure on the part of the Owner or Engineer to perform or test products or constructed works in no way relieves the Contractor of the obligation to perform work and furnish materials conforming to the Contract Documents.

F. All materials and products are subject to the Owner's quality assurance observations or testing at any time during preparation or use. Material or products which have been tested or observed or approved by owner at a supply source or staging area may be re-observed or re-tested by owner before or during or after incorporation into the Work, and rejected if they do not comply with the Contract Documents.

1.03 SUBMITTALS

A. Submittals shall be in accordance with Section 01 33 00 and shall include:
   1. Test reports per Paragraph 1.07 of this specification. Reports are to certify that products or constructed Works are in full compliance with the Contract Documents or indicate that they are not in compliance and describe how they are not in compliance.
   2. Provide Certified Test Reports on materials or products to be incorporated into the Project. Reports are to indicate that material or products are in full compliance with the Contract Documents or indicate that they are not in compliance and describe how they are not in compliance.

1.04 STANDARDS

A. Testing laboratories shall comply with the ACIL (American Council of Independent laboratories) "Recommended Requirements for Independent Laboratory Qualifications."
B. Perform testing per recognized test procedures as listed in the various sections of the specifications, standards of the State Department of Highways and Public Transportation, American Society of Testing Materials (ASTM), or other testing associations. Perform tests in accordance with published procedures for testing issues by these organizations.

1.05 DELIVERY AND STORAGE

A. Handle and protect test specimens of products and construction materials at the Site in accordance with recognized test procedures.

1.06 VERIFICATION TESTING

A. Provide verification testing when tests indicate that materials or the results of construction activities are not in conformance with Contract Documents.
B. Verification testing is to be provided at the Contactor's expense to verify products or constructed works are in compliance after correction have been made.
C. Tests must comply with recognized methods or with methods recommended by the testing laboratory and approved by the Engineer.

1.07 TEST REPORTS

A. Test reports are to be prepared for all tests.
   1. Tests performed by testing laboratories may be submitted on their standard test report forms. These reports must include the following:
      a. Name of the Owner, project title and number, equipment installer and general contractor.
      b. Name of the laboratory, address, and telephone number.
      c. Name and signature of the laboratory personnel performing the test.
      d. Description of the product being sampled or tested.
      e. Date and time of sampling, inspection, and testing.
      f. Date the report was issues.
      g. Description of the test performed.
      h. Weather conditions and temperature at time of test or sampling.
      i. Location at the site or structure where the test was taken.
      j. Standard or test procedure used in making the test.
      k. A description of the results of the test.

l. Statement of compliance or non-compliance with the Contract Documents.
m. Interpretations of test results, if appropriate.

2. Submit reports on tests performed by Contractor or his suppliers or vendors per Section 01 33 00.
3. Engineer will prepare test reports on test performed by the Engineer.

B. Distribute copies of the test reports to the Engineer within 24 hours of completing the test. Flag test reports with results that do not comply with Contract Documents for immediate attention. Hard copies of test reports are to be distributed to individuals designated at the pre-construction conference.

C. Payment for Work subject to testing may be withheld until the Contractor's quality control test reports of the Work are submitted to the Owner's Representative.

1.08 NON-CONFORMING WORK

A. Immediately correct any Work that does not comply with the Contract Documents or submit a written explanation of why the Work is not to be corrected immediately and when corrective action to the Work will be performed.
B. Payment for non-conforming Work shall be withheld until Work is brought into compliance with the Contract Documents.

1.09 LIMITATION OF AUTHORITY OF THE TESTING LABORATORY

A. The testing laboratory representatives are limited to providing consultation on the test performed and to an advisory capacity.
B. The testing laboratory is not authorized to:
   1. Alter the requirements of the Contract Documents.
   2. Accept or reject any portion of the Work.
   3. Perform any of the duties of the Contractor.
   4. Stop the work.

2.00 PRODUCTS

2.01 TESTING APPARATUS

A. Furnish testing apparatus and related accessories necessary to perform the tests.

3.00 EXECUTION

3.01 QUALITY CONTROL PROGRAM

A. Perform quality control observations and testing as required in each section of the specifications and where indicated on the drawings.
B. Provide a quality control program that includes the following phases for each definable Work task. A definable Work task is one which is separate and distinct from other tasks, has separate control requirements, maybe be provided by different trades of disciplines, or may be work by the same trade in a different environment.
   1. Planning Phase. Perform the following before beginning each definable Work task:

a. Review the contract drawings.
b. Review submittals and determine that they are complete in accordance with the Contract Documents.
c. Check to assure that all materials and/or equipment have been tested, submitted, and approved.
d. Examine the work area to assure that all required preliminary work has been completed and complies with the Contract Documents.
e. Examine required materials, equipment, and sample work to assure that they are on hand, conform to submittals, and are properly stored.
f. Review requirements for quality control inspection and testing.
g. Discuss procedures for controlling quality of the work. Documents construction tolerances and workmanship standards for the Work task.
h. Check that the portion of the plan for the Work to be performed incorporates submittal comments.
i. Discuss results of planning with the Owner and Engineer. Conduct a meeting attended by quality control personnel as applicable, and the foreman responsible for the Work task. Instruct applicable workers as to the acceptable level of workmanship required in order to meet the requirements of the Contract Documents. Document the results of the preparatory phase actions by separate meeting minutes prepared by the quality control manager and attached to the quality control report.
j. Do not move to the next phase unless results of the investigations required for the planning phase indicate that requirements have been met.

2. Work Phase. Complete this phase after the Planning Phase:
   a. Notify the Owner and Engineer at least 24 hours in advance of beginning the Work and discuss the review of the planning effort to indicate that requirements have been met.
   b. Check the Work to ensure that it is in full compliance with the Contract Documents.
   c. Verify adequacy of controls to ensure full compliance with Contract Documents.
   d. Verify that established levels of workmanship meet acceptable workmanship standards. Compare with required sample panels as appropriate.
   e. Repeat the initial phase for each new crew to work onsite, or any time acceptable specifies quality standards are not being met.
3. Follow-up Phase. Perform daily checks to assure control activities, including control testing, are providing continued compliance with contract requirements:
   a. Make checks daily and record observations in the quality control documentation.
   b. Conduct follow-up checks to correct all deficiencies prior to the start of additional Work tasks that may be affected by the defective Work. Do not build upon nor conceal non-conforming work.
   c. Conduct a review of the Work one month prior to the expiration of the correction period prescribed in the General Conditions with the Owner and Engineer. Correct defects noted during the review.

C. Conduct additional planning and review if:
   1. The quality of on-going work is unacceptable.

2. Changes are made in applicable quality control staff, onsite production supervision or work crew.
3. Work on a task is resumed after a substantial period of inactivity.
4. Other quality problems develop.

END OF SECTION

01 42 16 DEFINITIONS

1.00 GENERAL

1.01 SPECIFICATION TERMINOLOGY

A. "Engineer" or "Construction Manager" means Owner Representative.

B. "Furnish" means to supply, deliver, and unload materials and equipment at the project site ready to install.

C. "Install" means the operations at the project site including unpacking, assembly, erection, placing, anchoring, applying, working to dimensions, finishing, curing, protecting, cleaning, training, and similar operations required to prepare the materials and equipment for use, verify conformance with Contract Documents and prepare for acceptance and operation by the owner.

D. "Provide" means to furnish and install materials and equipment.

E. "Perform" means to complete the operations necessary to comply with the Contract Documents.

F. "Indicated" means graphic representations, notes, or schedules on drawings, or other requirements in Contract Documents. Words such as "show", "noted", "scheduled", are used to help locate the reference. No limitation on the location is intended unless specifically noted.

G. "Specified" means written representations in the bid documents or the technical specifications.

H. "Regulation" means laws, statutes, ordinances, and lawful orders issues by authorities having jurisdictions, as well as, rules, conventions, and agreements within the construction industry that control performance of work, whether they are lawfully imposed by authorities having jurisdiction or not.

I. "Installer" means an entity engaged by Contractor, either as an employee, subcontractor, or sub-subcontractor to install materials and/or equipment. Installers are to have successfully completed a minimum of five projects similar in size and scope to this project, have a minimum of five years of experience in the installation of similar materials and equipment, and comply with the requirements of the authority having jurisdiction.

J. "Manufacturer" means an entity engaged by Contractor, as a subcontractor, or sun-subcontractor to furnish materials and/or equipment. Manufacturers are to have a minimum of five years of experience in the manufacture of materials and equipment similar in size, capacity, and scope to the specified materials and equipment.

K. "Project site" means the space available to perform the work, either exclusively or in conjunction with others performing construction at the project site.

L. "Testing laboratory" means an independent entity engaged to perform specific inspections or tests, either at the project site or elsewhere, and to report and interpret the results of those inspections or tests.

M. "Listed" means equipment is included in a list published by a nationally recognized laboratory which makes periodic inspection of production of such equipment and states that such equipment meets nationally recognized standards or has been tested and found safe for use in a specified manner.

N. “Labeled” means equipment that embodies a valid label, symbol, or other identifying mark of a nationally recognize testing laboratory such as Underwriters laboratories, Inc., and production is periodically inspected in accordance with nationally recognized standards or tests to determine safe use in a specified manner.
O. “Certified” used in context with materials and equipment means the material and equipment has been tested and found by a nationally recognized testing laboratory to meet specification requirements, or nationally recognized standards if requirements are not specified, and is safe for use in the specified manner. Production of the equipment must be periodically inspected by a nationally recognized testing laboratory and the equipment must bear a label, tag, or other record of certification.
P. “Certified” used in context with labor performance or ability to install materials and equipment means that the abilities of the proposed installer have been tested by a representative of the specified testing agency authorized to issue certificates of competency and has met the prescribed standards for certification.
Q. “Certified” used in context with test reports, payment requests, or other statements of fact means that the statements made on the document are a true statement as attested to by the certifying entity.

1.02 SPECIFICATION SENTENCE STRUCTURE

A. Specifications are written in modified brief style. Requirements apply to all work of the same kind, class, and type even though the work “all” is not stated.
B. Simple imperative sentence structure is used which places a verb as the first work in the sentence. It is understood that the words “furnish”, “install”, “provide”, or similar words include the meaning of the phrase “The Contractor shall…” before these words.
C. It is understood that the words “directed”, “designated”, “requested”, “authorized”, “approved”, “selected”, or other similar words include the meaning of the phrase “by the Engineer” after these words unless otherwise stated. Use of these words does not extend the Engineer’s responsibility for construction supervision or responsibilities beyond those defines in the General Conditions.
D. “At no additional cost to Owner”, “With no extra compensation to Contractor”, “At Contractor’s own expense”, or similar words mean that the Contractor will perform or provide specified operation of work without any increase in the Contract Amount. It is understood that the cost for performing all work is included in the amount bid and will be performed at no additional cost to the owner unless specifically stated otherwise.

1.03 DOCUMENT ORGANIZATION

A. The contract requirements described in the General Conditions, Supplementary Conditions, and Division 01 apply to each and all specification sections unless specifically noted otherwise.
B. Organization of Contract Documents is not intended to control or to lessen the responsibility of the Contractor when dividing work among subcontractors, or to establish the extent of work to be performed by any trade, subcontractor, or vendor. Specifications or details do not need to be indicated or specified in each specification or drawing. Items shown in the contract documents are applicable regardless of location in the Contract Documents.

C. Capitalizing words in the text does not mean that these words convey special or unique meanings or have precedence over other parts of the Contract Documents. Specification text governs over titling and it is understood that the specification is to be interpreted as a whole.
D. Drawings and specifications do not indicate or describe all of the work required to complete the project. Additional details required for the correct installation of selected products are to be provided by the Contractor and coordinated with the Engineer. Provide any work, materials, or equipment required for a complete and functional system even if they are not detailed or specified.

1.04 INTERPRETATIONS OF DOCUMENTS

A. Comply with the most stringent requirements where compliance with two (2) or more standards is specified, and they establish different or conflicting requirements for minimum quantities or quality levels, unless Contract Documents indicate otherwise.
   1. Quantity or quality level shown or indicated shall be minimum quality indicated, or it may exceed that minimum within reasonable limits.
   2. Actual installation may comply exactly with minimum quality indicated, or it may exceed that minimum within reasonable limits.
   3. In complying with these requirements, indicated numeric values are minimum or maximum values, as noted, or appropriate for context of requirements.
   4. Refer instances of uncertainty to the Engineer for a decision before proceeding.
B. Provide materials and equipment comparable in quality to similar materials and equipment incorporated in the project or as required to meet the minimum requirements of the application if the materials and equipment are shown in the drawing but are not included in the specifications.

1.05 REFERENCE STANDARDS

A. Comply with applicable construction industry standards as if bound or copied directly into the Contract Documents regardless of lack of reference in the Contract Documents. Apply provisions of the Contract Documents where Contract Documents include more stringent requirements than the referenced standards.
   1. Standards referenced directly in the Contract Documents take precedence over standards that are not referenced but recognized in the construction industry as applicable.
   2. Comply with standards not referenced but recognized in the construction industry as applicable for performance of the work except as otherwise limited by the Contract Documents. The Engineer determines whether code or standard, or which of several are applicable.
B. Consider a referenced standard to be the latest edition with supplements or amendments when a standard is referred to in an individual specification section but is not listed by title and date.
C. Trade association names and title of general standards are frequently abbreviated. Acronyms or abbreviations used in the Contract Documents mean the recognized name of trade association, standards generating organization, authority having jurisdiction, or other

entity applicable in the context of the Contract Documents. Refer to "Encyclopedia of Associations," published by Gale Research Company.

D. Make copies of reference standards available as requested by Engineer or Owner.

1.06 SUBSTITUTIONS AND EQUAL PRODUCTS

A. Provide materials and equipment manufactured by the entities specifically listed in each technical specification section. Submit a Contractor's Modification Request per Section 01 33 00, for substitution of materials and equipment of manufacturers not specifically listed or for materials and equipment that does not strictly comply with the Contract Documents.

1.07 SUBSTITUTIONS AND EQUAL PRODUCTS

A. Contractor may provide "equal" products manufactured by manufacturers other than those specifically listed in the technical specification section unless it is specifically stated that only the materials and equipment of the specified manufacturers shall be provided. Provide Submittals for proposed "equal" non-specific products per Section 01 33 00 for any materials or equipment not specifically listed. Submit a Contractor's Modification Request for substitution of materials and equipment of other manufacturers or for materials and equipment that does not strictly comply with the Contract Documents. A Field Order or Change Order will be issued if the contract modification is approved.

2.00 PRODUCTS (NOT USED)

3.00 EXECUTION (NOT USED)

END OF SECTION

01 45 29 TESTING LABORATORY SERVICES

1.00 GENERAL

1.01 SCOPE

A. Inspections and testing required by laws, ordinances, rules and regulations, or orders of public authorities shall be performed by an independent testing laboratory in cooperation with CONTRACTOR. Contained in the various Specifications are the requirements for certification of products, testing, adjusting and balancing of equipment, and other tests and standards.

1.02 MEASUREMENT AND PAYMENT

A. Services of an independent testing laboratory shall be paid for by CONTRACTOR.
B. Separate measurement and payment will not be made. Include cost of testing paid for by CONTRACTOR in prices of associated work items.
C. Employment of a testing laboratory by OWNER or CONTRACTOR in no way relieves the CONTRACTOR of his obligation to perform the Work according to the Contract Documents.

1.03 RELATED SECTIONS

A. SECTION 00 72 00 – General Conditions
B. SECTION 00 73 00 – Supplementary Conditions

2.00 PRODUCTS (NOT USED)

3.00 EXECUTION

3.01 GENERAL

A. Testing shall be conducted in compliance with the applicable governing authority requirements, to the satisfaction of ENGINEER.

3.02 TESTING LABORATORY

A. Qualifications:
    1. Selection: OWNER will select or approve the selection by CONTRACTOR of an independent testing laboratory to perform the inspection and testing required for the Project.
    2. Standards:
        i. Meet “Recommended Requirements for Independent Laboratory Qualifications,” latest edition, published by American Council of Independent Laboratories.
        ii. Meet basic requirements of the following standards:
            a. ASTM E-329, “Standard Specification for Minimum Requirements for Agencies Engaged in the Testing and/or Inspection of Materials Used in Construction.”

b. ASTM C-1077 “Standard Practice for Laboratories Testing Concrete and Concrete Aggregates for use in Construction and Criteria for Laboratory Evaluation”
c. ASTM D-3666 “Standard Specification for Minimum Requirements for Agencies Testing and Inspecting Bituminous Paving Materials”
d. ASTM D-3740 “Standard Practice for Minimum Requirements for Agencies Engaged in the Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction.
e. ISO/TEC Guide 25 – General Requirements for the Competence of Calibration and Testing Laboratories

iii. Submit copy of report of inspection of facilities made by Materials Reference Laboratory of National Bureau of Standards during most recent tour of inspection, with memorandum of remedies of any deficiencies reported by inspection.

3. Responsibilities:
   i. Cooperate with ENGINEER and CONTRACTOR; provide qualified personnel promptly on notice.
   ii. Perform specified inspections, sampling and testing of materials and methods of construction.
      a. Comply with specified standards, ASTM, and other recognized authorities, and as specified.
      b. Ascertain compliance with requirements of Contract Documents.
   iii. Promptly notify ENGINEER and CONTRACTOR of irregularities or deficiencies of Work which are observed during performance of services. Failing test results shall be provided to ENGINEER no later than close of business on the working day following the day of test completion and review.
   iv. Promptly prepare and distribute reports of inspections and tests as follows:
      a. ENGINEER: Two (2) copies.
      b. CONTRACTOR: One (1) copy.
      c. OWNER: One (1) copy.
   v. Include the following information for each test as well as additional data specified in the applicable Section:
      a. Date of Test
      b. Location of Test
      c. Specified Standards
      d. Test Results
      e. Remarks
4. Requirements of this Section shall also apply to those tests for approval of materials, for mix designs, and for quality control of materials as performed by employed testing laboratories.
5. Limits of Authority: The laboratory is not authorized to:

i. Release, revoke, alter or enlarge on requirements of the Contract Documents.
ii. Approve or accept any portion of the Work.
iii. Perform any of the duties of CONTRACTOR.
iv. Have the authority to stop work.

3.03 CONTRACTOR'S RESPONSIBILITIES

A. Cooperate with laboratory personnel and provide access to the Work or to manufacturer's operations.
B. Provide to laboratory, preliminary representative samples of material to be tested in required quantities.
C. Provide to laboratory a copy of the Construction Schedule and subsequent updates to the Construction
D. Schedule testing services.
E. Furnish labor and equipment:
    1. To provide access to the Work to be tested.
    2. To obtain and handle samples at the Site.
    3. To facilitate inspections and tests.
    4. Areas for laboratories exclusive use for storage and curing of test samples.
F. Notify the laboratory at least forty-eight (48) hours in advance of operations to allow for his assignment of personnel and scheduling of tests.
G. Keep one copy of each laboratory reports distributed at the Site for the duration of the Project.
H. Arrange with the laboratory and pay for additional costs associated with the following:
    1. Re-testing required for failed tests.
    2. Re-testing for nonconforming Work.
    3. Additional sampling and tests requested by CONTRACTOR beyond the specified requirements.
    4. Insufficient notification of cancellation of tests for Work scheduled but not performed.

*** **END OF SECTION** ***

01 51 00 TEMPORARY UTILITIES

1.00 GENERAL

1.01 REQUIREMENTS INCLUDED

A. Furnish, install, and maintain temporary utilities required for construction; remove on completion of Work.

1.02 RELATED REQUIREMENTS

A. Section 01 11 10: Summary of Work.
B. Section 01 52 13: Field Offices and Sheds.

1.03 REQUIREMENTS OF REGULATORY AGENCIES

A. Comply with federal, state, and local codes and regulations and with utility company requirements.

2.00 PRODUCTS

2.01 MATERIALS, GENERAL

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

2.02 TEMPORARY ELECTRICITY AND LIGHTING

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

2.03 TEMPORARY HEAT AND VENTILATION

A. Provide temporary heat and ventilation as required to maintain adequate environmental conditions to facilitate progress of the Work, to meet specified minimum conditions for the installation of materials, and to protect materials and finishes from damage due to temperature or humidity.
B. Provide adequate forced ventilation of enclosed areas for curing of installed materials to disperse humidity and to prevent hazardous accumulations of dust, fumes, vapors, or gases.
C. Portable heaters shall be standard approved units complete with controls.
D. Pay all costs of installation, maintenance, operation, removal, and consumed fuel.

2.04 TEMPORARY WATER

A. Arrange with Owner to provide water for construction purposes; pay all costs for installation, maintenance, removal, and service charges for water used.

B. Install branch piping with taps located so that water is available throughout the construction by the use of hoses. Protect piping and fittings against freezing.

2.05 TEMPORARY SANITARY FACILITIES

A. Provide sanitary facilities in compliance with laws and regulations.
B. Service, clean, and maintain facilities and enclosures.
C. Existing facilities may NOT be used during the construction period.

3.00 EXECUTION

3.01 GENERAL

A. Maintain and operate systems to assure continuous service.
B. Modify and extend systems as work progress requires.

3.02 REMOVAL

A. Completely remove temporary materials and equipment when their use is no longer required.
B. Clean and repair damage caused by temporary installations or use of temporary facilities.
C. Restore existing facilities, if any, used for temporary services to specified or original conditions.
D. Restore permanent facilities, if any, used for temporary services to specified condition.
   1. Prior to final inspection, remove temporary lamps and install new lamps.

END OF SECTION

01 55 26 TRAFFIC CONTROL

1.00 GENERAL

1.01 REQUIREMENTS INCLUDED

A. Provide, operate, and maintain equipment, services, and personnel with traffic control and protective devices as required to expedite vehicular traffic flow on public streets, driveways, property access, haul routes, at site entrances, on onsite access roads, and in parking areas. Maintain traffic control devices by taking corrective action as soon as possible. Corrective action includes but is not limited to cleaning, replacing, straightening, covering, or removing devices. Maintain the devices such that they are properly positioned, spaced, and legible, and that retroreflective characteristics meet requirements during darkness and rain.

B. Before beginning work, designate in writing a Contractor's Responsible Person (CRP) to be the representative of the Contractor who is responsible for taking or directing corrective measures of installation and maintenance deficiencies as soon as possible. The CRP must be accessible by phone and able to respond to emergencies during all construction periods.

C. Provide written traffic control plans as needed, namely in areas of high traffic, difficult configurations, and as required by the State to perform work in state rights of way, or as deemed necessary by the Engineer. Traffic control plans are subject to review by the Engineer, however the contractor assumes responsibility for the proper implementation of traffic control devices.

D. Remove temporary equipment and facilities when no longer required; restore grounds to original or to specified conditions.

1.02 RELATED DOCUMENTS

A. Section 01 56 00: Temporary Barriers and Enclosures.

B. Section 01 57 00: Temporary Controls.

C. Texas Manual on Traffic Control Devices, most current edition

1.03 TRAFFIC SIGNALS AND SIGNS

A. Provide and operate traffic control and directional signals required to direct and maintain an orderly flow of traffic in all areas under Contractor's control or affected by Contractor's operations.

B. Provide traffic control and directional signs, mounted on barricades or standard posts

1. At each change of direction of a roadway and at each crossroads.
2. At detours.
3. At parking areas.

1.04 FLAGMEN

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

B. Shall have radios or be within sight of each other as necessary to convey hand signals for the safe operation of directing traffic.

C. Provide a Contractor representative who has been certified as a flagging instructor through courses offered by the Texas Engineering Extension Service, the American Traffic Safety Services Association, the National Safety Council, or other approved organizations.
   1. Provide the certificate indicating course completion when requested. This representative is responsible for assuring that all on-site flaggers are qualified.
   2. A qualified flagger must be independently certified by one of the organizations listed above or trained by the Contractor's certified flagging instructor.
      a. Provide the Engineer with a current list of qualified flaggers before beginning flagging activities.
      b. Use only flaggers on the qualified list.
      c. Flaggers must be courteous and able to effectively communicate with the public. When directing traffic, flaggers must use standard attire, flags, signs, and signals and follow the flagging procedures set forth in the TMUTCD.

1.05 LIGHTING
   A. Provide flares and lights during periods of low visibility:
      1. For use by flagmen in directing traffic.
   B. Provide illumination of critical traffic and parking areas.
   C. Provide illumination of flagmen for all work conducted during periods of darkness.

1.06 PUBLIC STREETS
   A. A minimum of twelve feet (12') shall be provided for the travelling public at all times.
   B. One-way traffic shall only be allowed when flagmen are utilized.

1.07 ACCESS CONTROL
   A. Access to private property shall be granted as much as is feasible.
   B. Contractor shall abandon work as directed to allow emergency vehicles access.

1.08 CONSTRUCTION PARKING CONTROL
   A. Control vehicular parking to preclude interference with public traffic or parking, access by emergency vehicles, Owner's operations, or construction operations.
   B. Monitor parking of construction personnel's private vehicles
      1. Maintain free vehicular access to and through parking areas.
      2. Prohibit parking on or adjacent to access roads, on private property, or in undesignated areas.

1.09 HAUL ROUTES
   A. Consult with governing authorities; establish public thoroughfares that will be used as haul routes and site access. Confine construction traffic to designated haul routes.
   B. Provide traffic control at critical areas of haul routes to expedite traffic flow and to minimize interference with normal public traffic.

2.00 PRODUCTS

2.01 Traffic Control Devices

A. All traffic control means, methods, and equipment shall comply with “Texas Manual on Uniform Traffic Control Devices”, most recent edition.

3.00 EXECUTION (NOT USED)

END OF SECTION

01 56 00 TEMPORARY BARRIERS AND ENCLOSURES

1.00 GENERAL

1.01 REQUIREMENTS INCLUDED

A. Furnish, install, and maintain suitable barriers as required to prevent public entry and to protect the Work, existing facilities, trees, and plants from construction operations; remove when no longer needed or at completion of work.

1.02 RELATED DOCUMENTS

A. Section 01 11 10: Summary of Work.
B. Section 01 54 00: Construction Aids.
C. Section 01 58 00: Project Identification.

2.00 PRODUCTS

2.01 MATERIALS, GENERAL

A. Materials may be new or used if suitable for the intended purpose but must not violate requirements of applicable codes and standards.

2.02 FENCING

A. Materials to Contractor's option, minimum fence height six feet.

2.03 BARRIERS

A. Materials to Contractor's option, as appropriate to serve required purpose.

3.00 EXECUTION

3.01 GENERAL

A. Install facilities of a neat and reasonable uniform appearance, structurally adequate for required purposes.
B. Maintain barriers during entire construction period.
C. Relocate barriers as required by progress of construction.

3.02 FENCES

A. Prior to start of work at the Project site, install enclosure fence with suitably locked entrance gates. Locate as shown on drawings.

3.03 TREE AND PLANT PROTECTION

A. Preserve and protect existing trees and plants at site that are designated to remain and those adjacent to site.
B. Consult with Engineer and remove agreed-on roots and branches that interfere with construction
    1. Employ qualified tree surgeon to remove and to treat cuts.

C. Provide temporary barriers to a height of six feet around each or each group of trees and plants.
D. Protect root zones of trees and plants.
   1. Do not allow vehicular traffic or parking.
   2. Do not store materials or products.
   3. Prevent dumping of refuse or chemically injurious materials or liquids.
   4. Prevent ponding or continuous running water.
E. Carefully supervise excavating, grading and filling, and subsequent construction operations to prevent damage.
F. Replace, or suitably repair, trees and plants designated to remain that are damaged or destroyed due to construction operations.

3.04 REMOVAL

A. Completely remove barricades, including foundations, when construction has progressed to the point that they are no longer needed and when approved by the Engineer.
B. Clean and repair damage caused by installation, fill and grade areas of the site to required elevations and slopes, and clean the area.

END OF SECTION

01 57 00 TEMPORARY CONTROLS

1.00 GENERAL

1.01 REQUIREMENTS INCLUDED

A. Provide and maintain methods, equipment, and temporary construction as necessary to provide controls over environmental conditions at the construction site and related areas under Contractor's control; remove physical evidence of temporary facilities at completion of work.

B. Construct temporary impounding works, channels, diversions, furnishing and operation of pumps, installing piping and fittings, and other construction for control of conditions at the Site. Remove temporary controls at the end of the Project.

C. Provide a Storm Water Pollution Prevention Plan in accordance with TCEQ General Permit TXR150000, file required legal notices and obtain required permits prior to beginning any construction activity.

D. Provide labor, materials, equipment, and incidentals necessary to prevent storm water pollution for the duration of the Project. Provide and maintain erosion and sediment control structures as required to preventive sediment and other pollutants from the Site from entering any storm water system, including open channels. Remove pollution control structures when no longer required to prevent storm water pollution.

E. Cost for Temporary Controls as described in this section and provided by Suppliers and Subcontractors as described in this section are to be included in the Cost of Work.

1.02 RELATED DOCUMENTS

A. Section 01 11 10: Summary of Work.

B. Section 01 54 00: Construction Aids.

C. Section 01 58 00: Project Identification.

1.03 SUBMITTALS

A. Provide copies of notices, records and reports required the Contract Document or regulations as Record Data in accordance with Section 01 33 00 "Submittal Procedures."

B. Provide documents requiring approval by the Owner or Engineer as Shop Drawings in accordance with Section 01 33 00 "Submittal Procedures."

1.04 DUST CONTROL

A. Provide positive methods and apply dust control materials to minimize raising dust from construction operation, and provide positive means to prevent airborne dust from dispersing into the atmosphere.

1.05 WATER CONTROL

A. Provide methods to control surface water to prevent damage to the Project, the site, or adjoining properties.

1. Control fill, grading, and ditching to direct surface drainage away from excavations, pits, tunnels, and other construction areas and to direct drainage to proper runoff.

B. Provide, operate, and maintain hydraulic equipment of adequate capacity to control surface and ground water.
C. Dispose of drainage water in a manner to prevent flooding, erosion, or other damage to any portion of the site or to adjoining areas.

1.06 DEBRIS CONTROL

A. Maintain all areas under Contractor's control free of extraneous debris.
B. Initiate and maintain a specific program to prevent accumulation of debris at construction site, storage and parking areas, and along access roads and haul routes.
   1. Provide containers for deposit of debris as specified in Section 01 74 00: Cleaning and Waste Management.
   2. Prohibit overloading of trucks to prevent spillage on access and haul routes.
      a. Provide periodic inspection of traffic areas to enforce requirements.
C. Schedule periodic collection and disposal of debris as specified in Section 01 74 00: Cleaning and Waste Management.
   1. Provide additional collections and disposal of debris whenever the periodic schedule is inadequate to prevent accumulation.

1.07 POLLUTION CONTROL

A. Provide methods, means, and facilities required to prevent contamination of soil, water, or atmosphere by the discharge of noxious substances from construction operations.
B. Provide equipment and personnel, perform emergency measures required to contain any spillages and to remove contaminated soils or liquids.
   1. Excavate and dispose of any contaminated earth off-site, and replace with suitable compacted fill and topsoil.
C. Take special measures to prevent harmful substances from entering public waters.
   1. Prevent disposal of wastes, effluents, chemicals, or other such substances adjacent to streams or in sanitary or storm sewers.
D. Provide systems for control of atmospheric pollutants.
   1. Prevent toxic concentrations of chemicals.
   2. Prevent harmful dispersal of pollutants into the atmosphere.

1.08 EARTH CONTROL

A. Remove excess soil, spoil materials and other earth not required for backfill at the time of generation. Control stockpiled materials to eliminate interference with Contractor and Owner's operations.
B. Dispose of excess earth off the Site. Pay cost for disposal unless otherwise noted. Provide written approval by the property owner for all disposal on private property, and approval by the Owner if such disposal affects the use of Site or other easements.

1.09 STORM WATER POLLUTION CONTROL

A. Comply with the current requirements of TPDES General Permit No. TXR15000 (General Storm Water Permit) set forth by the Texas Commission on Environmental Quality for the duration of the Project.

B. Develop Best Management Practices in accordance with local and state and industry guidelines.
C. Submit copies of the reports to the Engineer as Record Data in accordance with Section 01 33 00: Submittal Procedures.
D. Pay all costs associated with complying with the provisions of the General Storm Water Permit. Assume solely responsible for implementing, updating, and modifying the General Storm Water Permit per regulatory requirements the Storm Water Pollution Prevention Plan and Best Management Practices.
E. Return any property disturbed by construction activities to either specified conditions or preconstruction conditions as set forth in the Contract Documents. Provide an overall erosion and sedimentation control system that will protect all undisturbed areas and soil stockpiles/spoil areas. Implement appropriate Best Management Practices and techniques to control erosion and sedimentation and maintain these practices and techniques in effective operating condition during construction. Permanently stabilize exposed soil and fill as soon as practical during the Work.
F. Assume sole responsibility for the means, methods, techniques, sequences, and procedures for furnishing, installing, and maintaining erosion and sedimentation control structures and procedures and overall compliance with the General Storm Water Permit. Modify the system as required to effectively control erosion and sediment.
G. Retain copies of reports required by the General Storm Water Permit for 3 years from date of final completion.

2.00 PRODUCTS

2.01 MATERIALS, GENERAL

A. Materials may be new or used if suitable for the intended purpose but must not violate requirements of applicable codes and standards.
B. Provide materials that meet regulatory requirements.

3.00 EXECUTION

3.01 PROJECT REVIEW

A. Prior to the preconstruction conference, the Contractor shall meet with the Engineer and go over in detail the expected problem areas in regard to erosion control work. Different solutions should be discussed so that the best method might be determined. It is the responsibility of the Contractor to develop an erosion control plan acceptable to the Engineer.

3.02 PRECONSTRUCTION CONFERENCE

A. At the preconstruction conference, the Contractor shall submit for acceptance his schedule for accomplishing temporary and permanent erosion control work as is applicable for clearing and grubbing, grading, bridges and other structures at watercourses, construction and paving. He also shall submit for acceptance his proposed method for erosion control on haul roads and borrow pits and his plan for disposal of waste materials. No work shall be

started until the erosion control schedules are submitted and the Engineer has accepted methods of operations.

3.03 CONSTRUCTION REQUIREMENTS

A. The Engineer has the authority to limit the surface area of erodible earth material exposed by clearing and grubbing, the surface of erodible earth material exposed by excavation and borrow and fill operations and to direct the Contractor to provide immediate permanent or temporary pollution control measures to prevent contamination of adjacent streams or other watercourses, lakes, ponds, or other water impoundment. Such work may involve the construction of temporary berms, dikes, dams, sediment basins, slope drains and use of temporary mulches, mats, seeding or other control devices or methods to control erosion. Cut and fill slopes shall be seeded and mulched as the excavation proceeds to the extent directed by the Engineer.

B. The Contractor shall be required to incorporate all permanent erosion control features into the project at the earliest practicable time as outlined in his accepted schedule. Temporary pollution control measures shall be used to correct conditions that develop during construction that were not foreseen during the design stage, that are needed prior to installation of permanent pollution control features, or that are needed temporarily to control erosion that develops during normal construction practices but that are not associated with permanent control features on the project.

C. Where erosion is likely to be a problem, clearing and grubbing operations should be scheduled and performed so that grading operations and permanent erosion control features can follow immediately thereafter if the project conditions permit; otherwise, erosion control measures may be required between successive construction stages. Under no conditions shall the surface area of erodible earth material exposed at one time by clearing and grubbing exceed 750,000 square feet without approval of the Engineer.

D. The Engineer will limit the area of excavation, borrow and embankment operations in progress commensurate with the Contractor's capability and progress in keeping the finish grading, mulching, seeding, and other such permanent pollution control measures current in accordance with the accepted schedule. Should seasonal limitations make such coordination unrealistic, temporary erosion control measures shall be taken immediately to the extent feasible and justified.

E. Under no conditions shall the amount of surface area or erodible earth material exposed at one time by excavation or fill within the project area exceed 750,000 square feet without prior approval by the Engineer.

F. The Engineer may increase or decrease the amount of surface area of erodible earth material to be exposed at one time by clearing and grubbing, excavation, borrow, and fill operations as determined by his analysis of project conditions.

G. In the event of conflict between these requirements and pollution control laws, rules or regulations, or other federal, state, or local agencies, the more restrictive laws, rules and regulations shall apply.

END OF SECTION

01 57 33 TPDES REQUIREMENTS

1.00 GENERAL

1.01 SCOPE

A. This Section describes documentation to be prepared and signed by CONTRACTOR before conducting construction operations, in accordance with the terms and conditions of the Texas Pollutant Discharge Elimination System (TPDES) Permit, as stated in Construction General Permit Number TXR 150000 effective March 5, 2018. CONTRACTOR shall be responsible for implementing, maintaining and adhering to all requirements in this TPDES Permit.

B. CONTRACTOR shall be responsible for implementation, maintenance, and inspection of storm water pollution prevention control measures including, but not limited to, erosion and sediment controls, storm water management plans, waste collection and disposal, off-site vehicle tracking, and other practices shown on the Drawings or specified elsewhere in this or other Specifications. CONTRACTOR shall re-evaluate the Storm Water Pollution Prevention Plan (SWPPP) after each storm event and recommend changes to ENGINEER. CONTRACTOR shall be responsible for updating the SWPPP to reflect any field changes.

C. CONTRACTOR shall review implementation of the SWPPP in a meeting with ENGINEER prior to start of construction.

1.02 MEASUREMENT AND PAYMENT

A. Unless indicated in the Proposal as a pay item, no separate payment will be made for work performed under this Section. Include cost of work performed under this Section in pay items of which this work is a component.

1.03 RELATED SECTIONS (NOT USED)

1.04 REFERENCES

A. ASTM D3786 -Standard Test Method for hydraulic Bursting Strength for Knitted Goods and Nonwoven Fabrics.

B. ASTM D4632 -Standard Test Method for Grab Breaking Load and Elongation of Geotextiles.

1.05 SUBMITTALS

A. Documentation of Coverage under TPDES Permit (to be submitted at the pre-construction meeting)

B. Proposed Changes to the SWPPP.

2.00 PRODUCTS (NOT USED)

3.00 EXECUTION

3.01 NOTICE OF INTENT (NOI)

A. OWNER will file a Notice of Intent (NOI), TCEQ Form 20022, in order to obtain coverage under the Construction General Permit. CONTRACTOR shall apply for coverage under the Construction General Permit by filling out a separate form 20022, which shall be submitted to the TCEQ with the appropriate fees. If CONTRACTOR completes an NOI under the Construction General Permit, a signed copy of CONTRACTOR's NOI shall be returned to OWNER and ENGINEER. If the form is mailed by CONTRACTOR, it shall be mailed seven (7) days prior to construction beginning. CONTRACTOR shall conduct inspections in accordance with TCEQ requirements.

3.02 CERTIFICATION REQUIREMENTS

A. On the Operator's Information form, CONTRACTOR shall fill out name, address, and telephone number for CONTRACTOR; the names of persons or firms responsible for maintenance and inspection of erosion and sediment control measures and all Subcontractors.
B. CONTRACTOR and Subcontractors named in the Operator's Information form shall read, sign, and date CONTRACTOR's/Subcontractor's Certification form.
C. The persons or firms responsible for maintenance and inspection of erosion and sediment control measures shall read, sign, and date CONTRACTOR's Inspection and Maintenance Certification forms.
D. The Operator's Information form and all certification forms shall be submitted to OWNER and ENGINEER before beginning construction.

3.03 RETENTION OF RECORDS

A. CONTRACTOR shall retain a copy of all records, documentation, and the SWPPP in a readily accessible location at the construction site from the commencement of Construction Activity until submission of the Notice of Termination.
B. At project closeout, CONTRACTOR shall submit to OWNER all NPDES forms and certifications, as well as a copy of the SWPPP, with all revisions. OWNER will retain storm water pollution prevention records and data for a period of 3 years from the date of Project completion. CONTRACTOR shall submit required Notice of Termination (NOT) within 30 days of completion of the CONTRACTOR's responsibilities per the Contract, including final stabilization of the site, operational take over by the owner, and all silt fences have been removed or scheduled to be removed per the SWPPP.

3.04 REQUIRED NOTICES

A. The following notices shall be posted from the date that the SWPPP goes into effect until the date of the NOT.
B. Copies of the Notices of Intent submitted by OWNER and CONTRACTOR shall be posted at the construction site and/or at CONTRACTOR's field office in a prominent place for public viewing.

C. Notice to drivers of equipment and vehicles, instructing them to stop, check, and clean tires of debris and dust before driving onto traffic lanes. Post such notices at every stabilized construction exit area.
D. In an easily visible location on site, post a notice of waste disposal procedures.
E. Notice of hazardous material handling and emergency procedures shall be posted with the NOI on site.
F. Keep copies of Material Safety Data Sheets at a location on site that is known to all personnel.
G. Keep a copy of each signed certification at the construction site or at CONTRACTOR's office.

*** **END OF SECTION** ***

01 60 00 PRODUCT REQUIREMENTS

1.00 GENERAL

1.01 REQUIREMENTS INCLUDED

A. Material and equipment incorporated into the Work
   1. Conform to applicable specifications and standards.
   2. Comply with size, make, type, and quality specified or as specifically approved in writing by the Engineer.
   3. Manufactured and Fabricated Products
      a. Design, fabricate, and assemble in accord with the best engineering and shop practices.
      b. Manufacture like parts of duplicate units to standard sizes and gages to be interchangeable.
      c. Two or more items of the same kind shall be identical and by the same manufacturer.
      d. Products shall be suitable for service conditions.
      e. Equipment capacities, sizes, and dimensions shown or specified shall be adhered to unless variations are specifically approved in writing.
   4. Do not use material or equipment for any purpose other than that for which it is designated or specified.

1.02 RELATED REQUIREMENTS

A. Conditions of the Contract.
B. Section 01 11 10: Summary of Work.
C. Section 01 33 00: Submittal Procedures.
D. Section 01 74 00: Cleaning and Waste Management.

1.03 REUSE OF EXISTING MATERIAL

A. Except as specifically indicated or specified, materials and equipment removed from the existing structure, if any, shall not be used in the completed Work.
B. For material and equipment specifically indicated or specified to be reused in the Work:
   1. Use special care in removal, handling, storage, and reinstallation to assure proper function in the completed Work.
   2. Arrange for transportation, storage, and handling of products that require off-site storage, restoration, or renovation. Pay all costs for such work.

1.04 MANUFACTURER'S INSTRUCTIONS

A. When Contract Documents require that installation of work shall comply with manufacturer's printed instructions, obtain and distribute copies of such instructions to parties involved in the installation, including two copies to Engineer.
   1. Maintain one set of complete instructions at the job site during installation and until completion.
B. Handle, install, connect, clean, condition, and adjust products in strict accord with such instructions and in conformity with specified requirements.

1. Should job conditions or specified requirements conflict with manufacturer's instructions, consult with Engineer for further instructions.
2. Do not proceed with work without clear instructions.

C. Perform work in accord with manufacturer's instructions. Do not omit any preparatory step or installation procedure unless specifically modified or exempted by Contract Documents.

1.05 TRANSPORTATION AND HANDLING

A. Arrange Product deliveries in accord with construction schedules, and coordinate to avoid conflict with work and conditions at the site.
   1. Deliver Products in undamaged condition, in manufacturer's original containers or packaging with identifying labels intact and legible. Note: A Material Safety Data Sheet (MSDS) is required for chemical products. Immediately on delivery, inspect shipments to assure compliance with requirements of Contract Documents and approved submittals and that Products are properly protected and undamaged.

B. Provide equipment and personnel to handle Products by methods that prevent soiling or damage to Products or packaging.

1.06 STORAGE AND PROTECTION

A. Store Products in accord with manufacturer's instructions with seals and labels intact and legible. Note: A Material Safety Data Sheet (MSDS) is required for chemical products.
   1. Store products subject to damage by the elements in weather- tight enclosures.
   2. Maintain temperature and humidity within the ranges required by manufacturer's instructions.

B. Exterior Storage
   1. Store fabricated products above the ground or on blocking or skids to prevent soiling or staining. Cover products that are subject to deterioration with impervious sheet coverings and provide adequate ventilation to avoid condensation.
   2. Store loose granular materials in a well-drained area on solid surfaces to prevent mixing with foreign matter.

C. Arrange storage in a manner to provide easy access for inspection. Make periodic inspections of stored Products to assure that Products are maintained under specified conditions and free from damage and deterioration.

D. Protection After Installation:
   1. Provide substantial coverings as necessary to protect installed Products from damage from traffic and subsequent construction operations. Remove when no longer needed.

1.07 SUBSTITUTIONS AND PRODUCT OPTIONS

A. Products List
   1. Within 30 days after Contract Date, submit to Engineer a complete list of major Products proposed to be used with the name of the manufacturer and the installing Subcontractor.

B. Contractor's Options
   1. For Products specified only by reference standard, select any Product meeting that standard.

2. For Products specified by naming several Products or manufacturers, select any one of the products or manufacturers named that complies with the specifications.
3. For Products specified by naming one or more Products or manufacturers or "or equal," Contractor must submit a request for substitutions for any Product or manufacturer not specifically named.
4. For Products specified by naming only one Product and manufacturer, there is no option.

C. Substitutions
1. For a period of 30 days after Contract Date, Engineer will consider written requests from Contractor for substitution of Products.
2. Submit a separate request for each Product, supported with complete data and with drawings and samples as appropriate, including:
   a. Comparison of qualities of the proposed substitution with that specified.
   b. Changes required in other elements of the Work because of the substitution.
   c. Effect on the construction schedule.
   d. Cost data comparing the proposed substitution with the Product specified.
   e. Any required license fees or royalties.
   f. Availability of maintenance service and source of replacement materials.
3. Engineer shall be the judge of the acceptability of the proposed substitution.

D. Contractor's Representation
1. The request for a substitution constitutes a representation that Contractor
   a. Has investigated the proposed Product and determined that it is equal to or superior in all respects to that specified.
   b. Will provide the same warranties or bonds for the substitution as for the Product specified.
   c. Will coordinate the installation of an accepted substitution into the Work and make such other changes as may be required to make the Work.
   d. Waives all claims for additional costs, under his responsibility, that may subsequently become apparent.

E. Engineer will review requests for substitutions with reasonable promptness and notify Contractor, in writing, of the decision to accept or reject the requested substitution.

2.00 PRODUCTS (NOT USED)

3.00 EXECUTION (NOT USED)

END OF SECTION

01 77 00 CLOSEOUT PROCEDURES

1.00 GENERAL

1.01 REQUIREMENTS INCLUDED

A. Comply with requirements of the General Conditions and specified administrative procedures in closing out the Construction Contract.

1.02 RELATED REQUIREMENTS

A. Conditions of the Contract. Fiscal provisions, legal submittals, and additional administrative
B. Requirements and documents in Division 00.
C. Section 01 74 19: Construction Waste Management and Disposal.
D. Section 01 78 39: Projects Record Documents.
E. The respective sections of specifications: Closeout Submittals Required of Trades.

1.03 SUBSTANTIAL COMPLETION

A. When Contractor considers the Work substantially complete, he shall submit to Engineer
    1. A written notice that the Work, or designated portion therefore, is substantially complete.
    2. A list of items to be completed or corrected.
B. Within a reasonable time after receipt of such notice, Engineer will make an inspection to determine the status of completion.
C. Should Engineer determine that the Work is not substantially complete
    1. Engineer will promptly notify the Contractor in writing, giving the reasons therefore.
    2. Contractor shall remedy the deficiencies in the Work and send a second written notice of substantial completion to the Engineer.
        a. Engineer will re-inspect the Work.
D. When the Engineer finds that the Work is substantially complete he will
    1. Prepare and deliver to Owner a tentative Certificate of Substantial Completion with a tentative list of items to be completed before final payment.
    2. After consideration of any objections made by the Owner as provided in Conditions of the Contract, and when Engineer considers the Work substantially complete, he will execute and deliver to the Owner and the Contractor a definite Certificate of Substantial Completion with a revised tentative list of items to be completed or corrected.

1.04 FINAL INSPECTION

A. When Contractor considers the work complete, he shall submit written certification that
    1. Contract Documents have been reviewed.
    2. Work has been inspected for compliance with Contract Documents.
    3. Work has been completed in accordance with Contract Documents.
    4. Equipment and systems have been tested in the presence of the Owner's representative and are operational.
    5. Work is completed and ready for final inspection.
B. Engineer will make an inspection to verify the status of completion with reasonable promptness after receipt of such certification.
C. Should Engineer consider that the Work is incomplete or defective

1. Engineer will promptly notify the Contractor in writing listing the incomplete or defective work.
2. Contractor shall take immediate steps to remedy the stated deficiencies and send a second written certification to Engineer that the Work is complete.
3. Engineer will re-inspect the Work.

D. When the Engineer finds that the Work is acceptable under the Contract Documents, the Engineer shall request the Contractor to make closeout submittals.

1.05 RE-INSPECTION FEES

A. Should Engineer perform re-inspection due to failure of the Work to comply with the claims of status of completion made by the Contractor
   1. Owner will compensate Engineer for such additional service.
   2. Owner will deduct the amount of such compensation from the final payment to the Contractor

1.06 CLOSEOUT SUBMITTALS TO THE ENGINEER

A. Record drawings per Section 01 78 39: Project Record Documents.
B. Warranties and bonds.
C. Evidence of payment or release of liens as required by the General Conditions.
D. Consent of Surety to Final Payment.
E. Shop drawings, record data, Operation and Maintenance Manuals, and other submittals as required by the Contract Documents.
F. Evidence of final, continuing insurance, and bond coverage as required by the Contract Documents.

1.07 FINAL PAYMENT REQUEST

A. Submit a preliminary final payment request. This request is to include adjustments to the Contract Amount for:
   1. Approved Change Orders.
   2. Allowances not previously adjusted by Change Order.
   3. Unit Prices.
   4. Deductions for defective work that has been accepted by the Owner.
   5. Penalties and bonuses.
   6. Deductions for liquidated damages.
   7. Deductions for re-inspection payments per Paragraph 1.05.
   8. Other adjustments.
B. Engineer shall prepare a final Change Order, reflecting the approved adjustments to the contract amount which have not been covered by previously approved Change Orders.
C. Submit the final application for payment per the General Conditions, including the final Change Order.

1.08 WARRANTIES, BONDS, AND SERVICES AGREEMENTS

A. Provide warranties, bonds, and service agreements required by Section 01 33 00 or by the individual sections of the specifications.

B. The date for the start of warranties, bonds, and service agreements is established per the General Conditions.
C. Compile warranties, bonds, and service agreements and review these documents for compliance with the Contract Documents.
    1. Each document is to be signed by the respective manufacturer, supplier, and subcontractor.
    2. Each document is to include:
        a. The product or work item description.
        b. The firm, with the name of the principal, address, and telephone number.
        c. Scope of warranty, bond, or services agreement.
        d. Date, duration, and expiration date for each warranty, bond, and service agreement.
        e. Procedures to be followed in the event of a failure.
        f. Specific instances that might invalidate the warrant or bond.
    3. Submit two (2) copies of each document to the Engineer for review and transmittal to the Owner.
        a. Submit duplicate sets.
        b. Documents are to be submitted on 8-1/2" x 11" paper, punched for a standard three-ring binder.
        c. Submit each set in a commercial quality three-ring binder with a durable and cleanable plastic cover. The title "Warranties, Bonds, and Services Agreements", the project name and the name of the Contractor are to be typed and affixed to the cover.
D. Submit warranties, bonds, and services agreements:
    1. At the time of final completion and before final payment.
    2. Within 10 days after inspection and acceptance for equipment or components placed in service during the progress of construction.

1.09 CLAIMS AND DISPUTES

A. Claims and disputes must be resolved prior to recommendations of final payment acceptance and final payment by the Contractor will indicate that any outstanding claims or disputed issues have been resolved to the fullest satisfaction of the Contractor.

2 PRODUCTS (NOT USED)

3 EXECUTION (NOT USED)

*** **END OF SECTION** ***

01 78 39 PROJECT RECORD DOCUMENTS

1.00 GENERAL

1.01 REQUIREMENTS INCLUDED

A. Maintain at the site for the Owner one record copy of
   1. Drawings.
   2. Specifications.
   3. Addenda.
   4. Change Orders and other Modifications to the Contract.
   5. Engineer Field Orders or written instructions.
   6. Approved Shop Drawings, Product Data, and Samples.
   7. Field Test records.
   8. Construction photographs.
   9. Reference Standards as Necessary

1.02 RELATED REQUIREMENTS

A. Section 01 33 00: Submittal Procedures.
B. Section 01 32 33: Photographic Documentation

1.03 MAINTENANCE OF DOCUMENTS AND SAMPLES

A. Store documents and samples in Contractor's field office apart from documents used for construction.
   1. Provide files and racks for storage of documents.
   2. Provide locked cabinet or secure storage space for storage of samples.
B. File documents and samples in accordance with CSI/CSC format.
C. Maintain documents in a clean, dry, legible condition and in good order. Do not use record documents for construction purposes.
D. Make documents and samples available at all times for inspection by Engineer.

1.04 MARKING DEVICES

A. Provide felt-tip marking pens for recording information in the color code designated by Engineer.
B. Mark additional work or information in erasable pencil.
C. Use red for new or revised indication.
D. Use purple for work deleted or not installed (lines to be removed).
E. Highlight in yellow the items constructed per the plans.

1.05 RECORDING

A. Label each document "PRODUCT RECORD" in neat, large printed letters.
B. Record information concurrently with construction progress.
   1. Do not conceal any work until required information is recorded.
C. Mark drawings to record actual construction, including the following:
   1. Depths of various elements of the foundation in relation to finished first floor datum or the top of walls.
   2. Horizontal and vertical locations of underground utilities and appurtenances constructed and existing utilities encountered during construction.

3. Location of internal utilities and appurtenances concealed in the construction. Make reference to permanent structure on the surface. Include the following equipment:
4. Piping
5. Ductwork
6. Equipment and control devices requiring periodic maintenance or repair
7. Valves, unions, traps, and tanks
8. Services entrance
9. Feeders
10. Outlets changes of dimension and detail
11. Changes made by Field Order and Change Order
12. Details not on the original Contract Drawings. Include field verified dimensions and clarifications, interpretations, and additional information issued in response to RFI's.

D. Mark specifications and addenda to identify products provided.

E. Record manufacturer name, trade name, catalog number, and each supplier (with address and phone number) of each product and item of equipment actually installed.

F. Record changes made by Field Order and Change Order.

1.06 SUBMITTAL

A. Submit record documents to Engineer for review and acceptance 30 days prior to final completion of the project.
   1. Provide one set of marked up drawings.
   2. Provide one set of specifications.

B. Accompany submittal with transmittal letter in duplicate containing:
   1. Date.
   2. Project title and number.
   3. Contractor's name and address.
   4. Title and number of each Record Document.
   5. Signature of Contractor or his authorized representative.
   6. Partial Payment Requests will not be recommended for payment if record documents are doing to be incomplete or not in order. Final payments will not be recommended without record documents.

2.00 PRODUCTS (NOT USED)

3.00 EXECUTION (NOT USED)

END OF SECTION

02 21 13 SITE SURVEYS

1.00 GENERAL

1.00 SCOPE

A. This Section governs the actions of surveyors to be used on this project.

1.02 RELATED SECTIONS

A. SECTION 01 33 00 – Submittal Procedures
B. SECTION 00 72 00 – General Conditions

2.00 PRODUCTS (NOT USED)

3.0 EXECUTION

3.01 QUALITY CONTROL

A. Conform to State of Texas laws for surveys requiring licensed surveyors. Employ a land surveyor acceptable to OWNER and ENGINEER, if required.

3.02 SUBMITTALS

A. Submit information under provisions of SECTION 01 33 00 – Submittals Procedures.
B. Submit Record Documents under provisions of SECTION 00 72 00 – General Conditions
C. Submit to ENGINEER the name, address, and telephone number of Surveyor before starting survey work.
D. Submit documentation verifying accuracy of survey work on request.
E. Submit certificate signed by surveyor, that the elevations and locations of the Work are in conformance with Contract Documents.
F. Project Record Documents
    1. Maintain a complete and accurate log of control and survey work as it progresses.
    2. Prepare a certified survey setting forth dimensions, locations, angles, and elevations of construction and site work upon completion of foundation walls and major site improvements.
    3. Examination
G. Verify locations of survey control points prior to starting work.
H. Notify ENGINEER immediately of any discrepancies discovered.

3.03 SURVEY REFERENCE POINTS

A. Control datum for survey is the established by OWNER provided survey as required in the General Conditions and indicated on Drawings.
B. Locate and protect survey control points prior to starting site work; preserve permanent reference points during construction.
C. Notify ENGINEER 48 hours in advance of need for relocation of reference points due to changes in grades or other reasons.
D. Report promptly to ENGINEER the loss or destruction of any reference point.

E. CONTRACTOR shall reimburse OWNER for cost of re-establishment of permanent reference points disturbed by CONTRACTOR's operations.

3.04 SURVEYOR REQUIREMENTS

A. Utilize recognized engineering survey practices.
B. Establish a minimum of two permanent benchmarks on site, referenced to established control points.
C. Record locations, with horizontal and vertical data, on Project Record Documents.
D. Establish elevations, lines and levels to provide quantities required for measurement and payment and to provide appropriate controls for the work. Locate and lay out by instrumentation and similar appropriate means:
   1. Site improvements including pavements; stakes for grading; fill and topsoil placement; utility locations, slopes, and invert elevations.
   2. Grid or axis for structures.
   3. Building foundation, column locations, ground-floor elevations.
E. Verify periodically layouts by same means.
F. Construction staking shall be performed in accordance with the following minimum practices:
   1. Alignment and elevation stakes shall be at set at all manhole, angle points, changes in gradient, summits, low points, points of curvatures, points of tangency and other critical locations.
   2. Stakes shall be placed at maximum 100 feet spacing or closer as required.
   3. Staking will be set on offset distances as necessary to provide adequate clearance for construction activities.
   4. Copies of "cut-sheets" noting offset stake elevation, gradient elevation and cut or fill value shall be provided to ENGINEER. Elevations of the natural ground at the location of the proposed improvement shall be noted on the "cut-sheet".

4.0 MEASUREMENT AND PAYMENT

A. Separate measurement and payment for Field Surveying will not be made. Include cost in the cost of related construction items.

***** END OF SECTION *****

02 21 13 CONSTRUCTION SURVEYS

1.00 GENERAL

1.00 SCOPE

A. This Section governs the actions of surveyors to be used on this project.

1.02 RELATED SECTIONS

A. SECTION 01 33 00 – Submittal Procedures
B. SECTION 00 72 00 – General Conditions

2.00 PRODUCTS (NOT USED)

3.0 EXECUTION

3.01 SUBMITTALS

A. Submit information under provisions of SECTION 01 33 00 – Submittals Procedures.
B. Submit Record Documents under provisions of SECTION 00 72 00 – General Conditions
C. Submit documentation verifying accuracy of survey work on request.
D. Submit signed certificate by CONTRACTOR that the elevations and locations of the Work are in conformance with Contract Documents.
E. Project Record Documents
   1. Maintain a complete and accurate log of control and survey work as it progresses.
   2. Prepare a certified survey setting forth dimensions, locations, angles, and elevations of construction and site work upon completion of major site improvements.
F. Verify locations of survey control points prior to starting work.
G. Notify ENGINEER immediately of any discrepancies discovered.

3.03 SURVEY REFERENCE POINTS

A. Control datum for construction is the established by CONTRACTOR using permanent reference point data provided by OWNER.
B. Locate and protect survey control points prior to starting site work; preserve permanent reference points during construction.
C. Notify ENGINEER 48 hours in advance of need for relocation of reference points due to changes in grades or other reasons.
D. Report promptly to ENGINEER the loss or destruction of any reference point.
E. CONTRACTOR shall reimburse OWNER for cost of re-establishment of permanent reference points disturbed by CONTRACTOR's operations.

3.04 SURVEYOR REQUIREMENTS

A. Utilize recognized engineering survey practices.
B. Establish a minimum of two permanent benchmarks on site, referenced to established control points.

C. Record locations, with horizontal and vertical data, on Project Record Documents.
D. Establish elevations, lines and levels to provide quantities required for measurement and payment and to provide appropriate controls for the work. Locate and lay out by instrumentation and similar appropriate means:
   1. Site improvements including pavements; stakes for grading; fill and topsoil placement; utility locations, slopes, and invert elevations.
   2. Grid or axis for structures.
   3. Building foundation, column locations, ground-floor elevations.
E. Verify periodically layouts by same means.
F. Construction staking shall be performed in accordance with the following minimum practices:
   1. Alignment and elevation stakes shall be at set at all manhole, angle points, changes in gradient, summits, low points, points of curvatures, points of tangency and other critical locations.
   2. Stakes shall be placed at maximum 100 feet spacing or closer as required.
   3. Staking will be set on offset distances as necessary to provide adequate clearance for construction activities.
   4. Copies of “cut-sheets” noting offset stake elevation, gradient elevation and cut or fill value shall be provided to ENGINEER. Elevations of the natural ground at the location of the proposed improvement shall be noted on the “cut-sheet”.

4.0 MEASUREMENT AND PAYMENT

A. Separate measurement and payment for Field Surveying will not be made. Include cost in the cost of related construction items.

*** **END OF SECTION** ***

03 31 00 STRUCTURAL CONCRETE

1.00 GENERAL

1.01 SUMMARY

A. This Section governs for furnishing all cast-in-place structural concrete required for this project, and all materials necessary for the concrete work, related inspection materials necessary for the concrete work, related inspection and testing, as shown on the Drawings and specified herein.

1.02 REFERENCE STANDARDS

A. ACI 347, “Recommended Practice for Concrete Formwork.”
B. ACI 315, “Manual of Standard Practice for Detailing Reinforced Concrete Structures
C. ACI 318, “Building Code Requirement for Reinforced Concrete”
D. ACI 301, “Specifications for Structural Concrete for Buildings”
E. ASTM A120, “Black and Hot-Dipped Zinc-Coated (Galvanized) Welded and Seamless Steel Pipe for
F. Ordinary Uses”
G. ASTM A306, “Carbon Steel Bars Subject to Mechanical Property Requirements”
H. ASTM D994, “Preformed Expansion Joint Filler for Concrete (Bituminous Type)”
I. ASTM D1751, “Preformed Expansion Joint fillers for Concrete Paving and Structural Construction
J. (Nonextending and Resilient Bituminous Types)”
K. ASTM D1752, “Preformed Sponge Rubber and Cork Expansion Joint Fillers for Concrete Paving and
L. Structural Construction”
M. ASTM A615, “Deformed and Plain Billet-steel Bars for Concrete Reinforcement”
N. ASTM A185, “Specification for Welded Steel Wire Fabric for Concrete Reinforcement”
O. CRSI 163, “Recommended Practice for Placing Reinforcing Bars”
P. CRSI 165, “Recommended Practice for Placing Bar Supports, Specifications and Nomenclature”

2.00 MATERIALS

A. Cement: Cement shall be Portland Cement, Type I or Type II conforming to ASTM C150. Portland Cement Type III may be used only with permission of ENGINEER or in special cases as defined in the Drawings and Specifications.
B. Admixtures:
    1. Admixtures to be used in concrete, when required or permitted, shall conform to the appropriate specifications listed below:
        i. Air-entraining admixtures. “Specification of Air-Entraining Admixtures for Concrete”
        ii. (ASTM C260).

iii. Water-reducing, retarding, and accelerating admixtures. “Specification for Chemical
iv. Admixtures for Concrete” (ASTM C494).
v. Pozzolanic admixtures. “Specification for Fly Ash and Raw or Calcined Natural Pozzolans
vi. for Use in Portland Cement Concrete” (ASTM C618).
vii. iv. Slag cement, “Specification for Blended Hydraulic Cements” (ASTM C595).

2. Allowable Admixtures: If required or permitted, admixtures shall be subject to the following:
   i. The amount of calcium chloride shall not exceed 2% by weight of cement.
   ii. All admixtures shall be used in accordance with the manufacturer’s instructions except as otherwise specified herein.

C. Water: Mixing water for concrete shall be fresh, clean, and drinkable, except that undrinkable water may be used if it produces from standard two-inch (2”) mortar cubes having 7-day and 28-day strengths equal to at least 90% of the strength of similar specimens made with water from a municipal supply. The strength comparison shall be made on mortars, identical except for the mixing water, prepared and tested in accordance with ASTM C109, method of test for compressive strength of hydraulic cement mortars. In no case shall the ultimate 28-day strength be below 3500 psi.

D. Aggregates:
   1. Aggregates for normal weight concrete shall conform to “Specification for Concrete Aggregates” (ASTM C33). Fine and coarse aggregates shall be regarded as separate ingredients. Each size of coarse aggregate, as well as the combination of sizes when two or more are used, shall conform to the appropriate grading requirements of the applicable ASTM specification.
   2. Maximum Size of Coarse Aggregate: The nominal maximum size of the aggregate shall not be more than one-fifth (1/5) of the narrowest dimension between sides of forms, one-third (1/3) of the depth of slabs, nor three-fourths (3/4) of the minimum clear spacing between reinforcing bars. These limitations may be waived if, in the judgment of ENGINEER, workability and methods of consolidation are such that the concrete can be place without honeycomb or voids.

3 PROPORTIONING

A. General: Concrete for all parts of the work shall be of the specified quality capable of being placed without excessive segregation and, when hardened, of developing all characteristics required by these Drawings and Specifications. Proportioning of design mix shall be governed by ACI 211.1-77 or as currently amended.

B. Selection of Proportions:
   1. General: The proportions of ingredients shall be such as to produce a mixture which will work readily into the corners and angles of the forms and around reinforcement by the methods of placing and consolidation employed on the

Work, but without permitting the materials to segregate or excessive free water to collect on the surface. CONTRACTOR shall engage a testing laboratory, approved by ENGINEER, to compile field tested data on concrete design that has been proven to meet requirements specified in this Section for concrete strength, durability and slump. Ability to produce the required average strength calculated in accordance with this paragraph shall be determined on the basis of the strength test record of thirty (30) or more tests made during the past year which will permit establishing, directly or by interpolation, the water-cement ratio corresponding to the required average strength.

2. Basis for Selecting Proportions:
   i. Where the testing laboratory has a control record, based on at least thirty (30) consecutive strength tests of a similar mix or mixes obtained within the past year representing similar materials and conditions to those expected, the average strength used as the basis for selecting proportions shall exceed the specified strength fc' by at least:
      a. 400 psi if the standard deviation is less than 300 psi
      b. 550 psi if the standard deviation is 300 to 400 psi
      c. 700 psi if the standard deviation is 400 to 500 psi
      d. 900 psi if the standard deviation is 500 to 600 psi
3. If the standard deviation exceeds 600 psi or if a suitable record of strength test performance is not available, proportions shall be selected to produce an average strength at least 1,200 psi greater than specified strength fc'.
   i. The strength test history used to determine standard deviation will be considered to comply with the above requirement for thirty (30) consecutive strength tests if the test represents either a group of thirty (30) consecutive batches for the same class of concrete or the statistical average for two groups totaling thirty (30) or more batches of the same class of concrete or the statistical average for two groups totaling thirty (30) or more batches. The tests used in establishing the standard deviation shall represent concrete produced for a specified strength or strengths within 1,000 psi of that required for the proposed Work; changes in materials and proportions within the population of background tests shall not have been more closely restricted than will be the case for the proposed Work.

C. Mixing and Production: All concrete shall be ready mixed and shall be batched, mixed and transported in accordance with ASTM C94.

3.02 STRENGTH

A. Test specimens are required for every sixty (60) cubic yards or fraction thereof for each mix design placed each day. The minimum 7-day compressive strength shall be 2,800 psi and the minimum 28-day compressive strength shall be 3,500 psi. The 7-day test will be used as an early indication of developing concrete strength. The 28-day 3,500 psi

strength shall be the requirement established as the minimum for accepted structural concrete strength.

B.

3.03 DURABILITY

A. Concrete of normal weight for portions of the structure required to be watertight shall have a water-cement ratio not exceeding 0.48 if exposure will be to fresh water or 0.44 for exposure to seawater.

3.04 SLUMP

A. A minimum of one (1) slump test per set of strength specimens is required. Unless otherwise permitted or specified, the concrete shall be proportioned and produced to have a slump of four inches (4”) or less if consolidation is to be by vibration, and five inches (5”) or less if consolidation is to be by methods other than vibration. A tolerance of up to one inch (1”) above the indicated maximum shall be allowed for individual batches provided the average for all batches or the most recent ten (10) batches tested, whichever is fewer, does not exceed the maximum limit. Concrete of lower than usual slump may be used provided it is properly placed and consolidated. The slump shall be determined by the “Test for Slump of Portland Cement Concrete” (ASTM C143).

3.05 FORMWORK

A. General:
    1. Forms shall be used, wherever necessary, to confine the concrete and shape it to the required dimensions. Forms shall have sufficient strength to withstand the pressure resulting from placement and vibration of the concrete, and shall have sufficient rigidity to maintain specified tolerances.
    2. Earth cuts shall not be used as forms for vertical surfaces unless required or permitted.
    3. Shop drawings for formwork including the location of shoring and reshoring shall be submitted for approval as required by ENGINEER.

B. Design and Installation of Formwork:
    1. The design and engineering of the formwork, as well as its construction, shall be the responsibility of CONTRACTOR.
    2. Forms shall be sufficiently tight to prevent loss of mortar from the concrete. Chamfer strips shall be placed in the corners of forms to produce beveled edges on permanently exposed surfaces. Interior corners on such surfaces and the edges of formed joints will not require beveling unless shown on the Drawings.
    3. Positive means of adjustment (wedges or jacks) of shores and struts shall be provided and all settlement shall be taken up during concrete placing operation. Forms shall be securely braced against lateral deflections.
    4. Temporary openings shall be provided at the base of column forms and wall forms and at other points where necessary to facilitate cleaning and observation immediately before concrete is placed.

5. Form accessories to be partially or wholly embedded in the concrete, such as ties and hangers, shall be of a commercially manufactured type. Non-fabricated wire shall not be used.
    i. Form ties shall be constructed so that the ends or end fasteners can be removed without causing appreciable spalling at the faces of the concrete.
    ii. After the end fasteners of form ties have been removed, the embedded portion of the ties

C. shall terminate not less than two (2) diameters or twice the minimum dimension of the tie from the formed faces of concrete to be permanently exposed to view except that in no case shall this distance be less than three-quarter inches (3/4”). When the formed face of the concrete is not to be permanently exposed to view or exposed to corrosive liquids, form ties may be cut off flush with the formed surfaces.

D. 6. At construction joints, contact surface of the form sheathing for flush surfaces exposed to view shall overlap the hardened concrete in the previous placement by not more than one inch (1”). The forms shall be held against the hardened concrete to prevent offsets or loss of mortar at the construction joint and to maintain a true surface.

E. 7. Wedges used for final adjustment of the forms prior to concrete placement shall be fastened in position after the final check.

F. 8. Formwork shall be so anchored to shores or other supporting surfaces or members that upward or lateral movement of any part of the formwork system during concrete placement will be prevented.

G. 9. Runways for moving equipment shall be provided with struts or legs and shall be supported directly on the formwork or structural member without resting on the reinforcing steel.

B. Formwork Tolerances:
    1. Formwork shall be constructed so that the line and surface of columns, piers, walls and arises shall not vary from plumb more than one-quarter inch (1/4”) in any ten-foot (10’) length and not more than one-half inch (1/2”) over the entire length. Variations from level of slabs, beams, ceilings, and arises shall not be more than one-quarter inch (1/4”) in any ten-foot (10’) length or three-eighths inches (3/8”) over the entire length. Variation in the size or elevation location of sleeves or wall and floor openings shall not be more than plus or minus one-quarter inch (+/- ¼”).
    2. CONTRACTOR shall establish and maintain, in an undisturbed condition and until final completion and acceptance of the Project, sufficient control points and bench marks to be used for reference purposes to check tolerances.

C. Preparation of Form Surface:
    1. All surfaces of forms and embedded materials shall be cleaned of any accumulated mortar or grout from previous concreting and of all other foreign material before concrete is placed in them.
    2. Before placing of either the reinforcing steel or the concrete, the surfaces of the forms shall be covered with an approved coating material that will effectively

prevent absorption of moisture and prevent bond with the concrete and will not stain the concrete surfaces. A field applied form release agent or sealer of approved type or a factory applied non-absorptive liner may be used.

3. Excess form coating material shall not be allowed to stand in puddles in the forms nor shall such coating be allowed to come in contact with hardened concrete against which fresh concrete is to be placed.

D. Removal of Forms:

1. When repair of surface defects or finishing is required at an early age, forms shall be removed as soon as the concrete has hardened sufficiently to resist damage from removal operations.
2. Top forms on sloping surfaces of concrete shall be removed as soon as the concrete has attained sufficient stiffness to prevent sagging. Any needed repairs or treatment required on such sloping surfaces shall be performed at once and be followed by the specified curing.
3. Wood forms for wall openings shall be loosened as soon as this can be accomplished without damage to the concrete.
4. Formwork for columns, walls, sides of beams, and other parts not supporting the weight of the concrete may be removed as soon as the concrete has hardened sufficiently to resist damage from removal operations.
5. Forms and shoring in formwork used to support the weight of concrete in beams, slabs, columns and other structural members shall remain in place until the concrete has reached the following curing time:
   i. Outside temperature 32° F – 50° F Above 50° F
   ii. Type I Cement 7-days 5-days
   iii. Type II Cement 9-days 6-days
   iv. Type III Cement 4-days 3-days
6. Should field cured test specimens prepared on the concrete mix confirm a strength in excess of 65% of the design ultimate strength then, with the approval of ENGINEER, CONTRACTOR may remove forms, in less time than that indicated above. For temperature below 32° F the curing time shall be as specified by ENGINEER.
7. When shores and other vertical supports are so arranged that the non-load-carrying form-facing material may be removed without loosening or disturbing the shores and supports, the facing material may be removed at an earlier age as specified or permitted.

3.06 REINFORCEMENT

A. General: Shop Drawings, showing all fabrication dimensions and locations for placing of the reinforcing steel and accessories shall be submitted for approval. Approval shall be obtained before fabrication. Details of concrete reinforcement and accessories not covered herein shall be in accordance with “Manual of Standard Practice for Detailing Reinforced Concrete Structures” (ACI 315-74).

B. Reinforcing Steel

1. Deformed and plain billet steel reinforcing bars shall conform to ASTM A615 and shall be grade 60 ksi steel except #3 bars may be grade 40 ksi steel. All bars shall be bent cold, unless otherwise permitted by ENGINEER. No bars partially embedded in concrete shall be field bent, except as permitted by ENGINEER. Bends of bars through #8 shall have a minimum diameter of six (6) bar diameters and bars #9 through #11 shall have a minimum diameter of ten (10) bar diameters. All lap lengths will be thirty-six (36) diameters. Bars shall be bundled and tagged for proper identification. Tags shall be waterproof, securely attached, showing the number of bars, size, length and job number.
2. Wire for concrete reinforcement shall conform to Specification for Deformed Steel Wire (ASTM A496). Welded wire fabric shall conform to the gage and mesh size of plain or deformed wire required or shown in the Contract Documents, and shall conform to the appropriate one of the following:
    i. ‘Specification for Welded Steel Wire Fabric for Concrete Reinforcement” (ASTM A185), except that welded intersections shall be spaced not farther apart than twelve inches (12”) in the direction of the principal reinforcement.
    ii. “Specification for Welded Deformed Steel Wire Fabric for Concrete Reinforcement” (ASTM A497), except that welded intersections shall be spaced not farther apart than sixteen inches (16”) in the direction of the principal reinforcement.

B. Placing of Reinforcement:
1. The minimum concrete protective covering for reinforcement shall be three inches (3”) on formed surfaces exposed to weather, water or in contact with the ground. Interior surfaces for beams, columns, slabs, and walls shall have a minimum of two inches (2”) of protective concrete cover.
2. All reinforcement shall be supported and fastened together to prevent displacement by construction loads of the placing of concrete. Where necessary supporting metal, plastic or other approved bar chairs and spacers shall be used.
3. All splices not shown in the Drawings shall be subject to approval. Mechanical connectors for reinforcing bars may be used subject to approval.
4. Unless permitted by ENGINEER, reinforcement shall not be bent after being embedded in hardened concrete.
5. Welding of reinforcing steel or cutting and bending of reinforcing steel with a cutting torch is strictly forbidden.

3.07 JOINTS AND EMBEDDED ITEMS

A. General:
1. Joints not shown on the Drawings shall be so made and located to least impair the strength of the structure and shall be approved by ENGINEER.
2. All reinforcement shall be continued across joints. Keys and inclined dowels shall be provided as directed by ENGINEER. Longitudinal keys at least one and one-

half inches (1-1/2”) deep shall be provided in all joints in walls and between walls and slabs or footings.

3. The surface of the concrete at all joints shall be thoroughly cleaned and all laitance removed prior to placing adjoining concrete.
4. When required or permitted, bond shall be obtained by one of the following methods:
    i. The use of an approved adhesive applied in accordance to manufacturer’s recommendations.
    ii. The use of an approved chemical retarder which delays but does not prevent setting of the surface mortar. Retarded mortar shall be removed within twenty-four (24) hours after placing to produce a clean exposed aggregate bonding surface.
    iii. Roughening the surface of the concrete is an approved manner that will expose the aggregate uniformly and will not leave laitance, loosened particles of aggregate or damaged concrete at the surface.

C. Expansion Joints:
1. Reinforcement or other embedded metal items bonded to the concrete (except dowels in floors bonded on only one side of joints) shall not be permitted to extend continuously through any expansion joint.
2. Pre-molded expansion joint filler shall be of the type required by the contract documents and shall conform to one of the following:
    i. “Specification for Preformed Expansion Joint Filler for Concrete (Bituminuous Type)” (ASTM D994).
    ii. “Specification for Preformed Expansion Joint Fillers for Concrete Paving and Structural Construction (Non-extruding and Resilient Bituminous Types)” (ASTM D1751).
    iii. “Specification for Preformed Sponge Rubber and Cork Expansion Joint Fillers for Concrete Paving and Structural Construction” (ASTM D1752).

D. Waterstops:
1. The material, design, and location of waterstops in joints shall be indicated on the Drawings.
2. Each piece of pre-molded waterstop shall be of maximum practicable length in order that the number of end joints will be held to a minimum.
3. Joints at intersections and at ends of pieces shall be made in the manner most appropriate to the material being used. Joints shall develop effective watertightness fully equal to that of the continuous waterstop material, shall permanently develop not less than 50% of the mechanical strength of the parent section, and shall permanently retain their flexibility.

E. Other Embedded Items:
1. All sleeves, inserts, anchors, and embedded items required for adjoining work or its support shall be placed prior to placing concrete.

2. All contractors whose work is related to the concrete, or must be supported by it, shall be given ample notice and opportunity to introduce and/or furnish embedded items before the concrete is placed.
3. Placing Embedded Items: Expansion joint material, waterstops, and other embedded items shall be positioned accurately and supported against displacement. Voids in sleeves, inserts, and anchor slots shall be filled temporarily with readily removable material to prevent the entry of concrete into the voids.

2.01 PRODUCTION OF CONCRETE

A. Ready-Mixed Concrete: Ready-mixed concrete shall be batched, mixed and transported in accordance with "Specification for Ready-Mixed Concrete" (ASTM C94). Plant equipment and facilities shall conform to the "Check List for Certification of Ready Mixed Concrete Production Facilities" of the National Ready Mixed Concrete Association. The maximum time interval between addition of cement to batch and placement of concrete in forms shall be forty-five (45) minutes when the temperature is above 90° F, sixty (60) minutes when the temperature is 71° F to 90° F, and ninety (90) minutes when the temperature is 70° F or below.
B. Control of Admixtures:
   1. Air-entraining admixtures, calcium chloride, and other chemical admixtures shall be charged into the mixer as solutions and shall be measured by means of an approved mechanical dispensing device. The liquid shall be considered a part of the mixing water. Admixtures that cannot be added in solution may be weighed or may be measured by volume as recommended by the manufacturer.
   2. Addition of retarding admixtures shall be completed within one (1) minute after addition of water to the cement has been completed, or prior to the beginning of the last three-fourths (3/4) of the required mixing, whichever occurs first.
C. Tempering and Control of Mixing Water:
   1. Concrete shall be mixed only in quantities for immediate use. Concrete which has begun to set shall not be re-tempered, but shall be discarded.
   2. When concrete arrives at the project with slump below that suitable for placing, as indicated by the specifications, water may be added only if neither the maximum permissible water-cement ratio nor the maximum slump is exceeded. The water shall be incorporated by additional mixing equal to at least half of the total mixing required. An addition of water above that permitted by the limitation on water-cement ratio shall be accompanied by a quantity of cement sufficient to maintain the proper water-cement ratio. Such addition shall be authorized by ENGINEER or his/her representative.
D. Weather Conditions: Except upon specific written authorization by ENGINEER, concrete shall not be placed when the temperature is below 40° F. and falling; but, it may be placed when the temperature is above 35° F. and rising; the temperature being taken in the shade and away from artificial heat.

3.09 PLACING CONCRETE

A. Preparation:
   1. Hardened concrete and foreign materials shall be removed from the inner surfaces of the conveying equipment.
   2. Form work shall have been completed; water shall have been removed; reinforcement shall have been secured in place; expansion joint material, anchors, and other embedded items shall have been positioned; and the entire preparation shall have been approved.
   3. Semiporous subgrades shall be sprinkled sufficiently to eliminate suction and porous subgrades shall be sealed.
B. Conveying Concrete:
   1. Concrete shall be handled from the mixer to the place of final deposit as rapidly as practicable by methods which will prevent segregation or loss of ingredients and in a manner which will assure that the required quality of the concrete is maintained.
   2. Truck mixers, agitators, and non-agitating units and their manner of operation shall conform to the applicable requirements of "Specification for Ready-Mixed Concrete" (ASTM C94).
   3. Chutes shall be metal or metal-lined and shall have a slope not exceeding one vertical to two horizontal (2:1) and not less than one vertical to three horizontal (3:1). Chutes more than twenty feet (20') long and chutes not meeting the slope requirements may be used provided they discharge into a hopper before distribution.
   4. Pumping or pneumatic conveying equipment shall be of suitable kind with adequate pumping capacity.
C. Pneumatic placement shall be controlled so that segregation is not apparent in the discharge concrete.
D. The loss of slump in pumping or pneumatic conveying equipment shall not exceed two inches (2").
E. Concrete shall not be conveyed through pipe made of aluminum or aluminum alloy.
F. Depositing:
   1. Concrete shall be deposited continuously, or in layers of such thickness that no concrete will be deposited on concrete which has hardened sufficiently to cause the formation of seams or planes of weaknesses within the section. If a section cannot be placed continuously, construction joints shall be located as shown in the Drawings or as approved. Placing shall be carried on at such a rate that the concrete that is being integrated with fresh concrete is still plastic. Concrete that has partially hardened or has been contaminated by foreign materials shall not be deposited. Temporary spreaders in forms shall be removed when the concrete placing has reached an elevation rendering their service unnecessary. They may remain embedded in the concrete only if made of metal or concrete and if prior approval has been obtained.
   2. Placing of concrete in supported elements shall not be started until the concrete previously placed in columns and walls is no longer plastic and has been in place at

least two (2) hours, and has achieved sufficient strength to support itself and any additional loads that the supported elements may require at the time of placement.

3. Concrete shall be deposited as nearly as practicable in its final position to avoid segregation due to rehandling or flowing. Concrete shall not be subjected to any procedure which will cause segregation.
4. All concrete shall be consolidated by vibration, spading, rodding or forking so that the concrete is thoroughly worked around the reinforcement, around embedded items, and into corners of forms, eliminating all air or stone pockets which may cause honey-combing, pitting, or planes of weakness. Internal vibrators shall have a minimum frequency of 8,000 vibrations per minute and sufficient amplitude to consolidate the concrete effectively. They shall be operated by competent workman. Use of vibrators to transport concrete within forms shall not be allowed. Vibrators shall be inserted and withdrawn at points approximately eighteen inches (18”) apart. At each insertion, the duration shall be sufficient to consolidate the concrete but not sufficient to cause segregation, generally from five (5) to fifteen (15) seconds. A spare vibrator shall be kept on the job site during all concrete placing operation.

G. Where the concrete is to have an as-cast finish, a full surface of mortar shall be brought against the form by the vibration process, supplemented if necessary by spading to work the coarse aggregate back from the formed surface.

3.10 CURING AND PROTECTION

A. General: Beginning immediately after placement, concrete shall be protected from premature drying and excessively hot or cold temperatures, and shall be maintained with minimal moisture loss at a relatively constant temperature for the period necessary for hydration of the cement and hardening of the concrete.
B. The materials and methods of curing shall be subject to approval.
C. Preservation of Moisture:
   1. For concrete surfaces not in contact with forms, one of the following procedures shall be applied immediately after completion of placement and finishing:
      i. Ponding or continuous sprinkling.
      ii. Application of absorptive mats or fabric kept continuously wet.
      iii. Application of sand kept continuously wet.
      iv. Continuous application of steam (not exceeding 150° F.) or mist spray.
      v. Application of waterproof sheet materials, conforming to “Specifications for Waterproof Sheet Materials for Curing Concrete” (ASTM C171).
      vi. Application of other moisture-retaining covering as approved.
      vii. Application of a pigmented curing compound conforming to “Specification for Liquid
   2. Membrane Forming Compounds for Curing Concrete” (ASTM C309). The compound shall be applied in accordance with the recommendations of the manufacturer immediately after any water sheen which may develop after finishing has

disappeared from the concrete surface. It shall not be used on any surface against which additional concrete or other material is to be bonded unless it is proven that the curing compound will not prevent bond, or unless positive measures are taken to remove it completely from areas to receive bonded applications.

3. Moisture loss from surfaces placed against wooden forms or metal forms exposed to heating by the sun shall be minimized by keeping the forms wet until they can be safely removed. After form removal, the concrete shall be cured until the end of the time prescribed in Section 12.0.B.3 by one of the methods of Section 12.0.B.1.
4. Curing in accordance with Section 12.0.B. shall be continued for at least seven (7) days in the case of all concrete except high-early-strength concrete for which the period shall be at least three (3) days.
5. Alternatively, if tests are made of cylinders kept adjacent to the structure and cured by the same methods, moisture retention measures may be terminated when the average compressive strength has reached 70% of the specified strength, fc'. If one of the curing procedures of 12.0.B is used initially, it may be replaced by one of the other procedures of Section 12.0.B any time after the concrete is one day old provided the concrete is not permitted to become surface dry during the transition.

D. Temperature, Wind and Humidity:
   1. Cold Weather: When the mean daily outdoor temperature is less than 45° F, the temperature of the concrete shall be maintained between 50° and 70° F for the required curing period of Section 12.0B. When necessary, arrangements for heating, covering, insulating, or housing the concrete work shall be made in advance of placement and shall be adequate to maintain the required temperature without injury due to concentration of heat. Combustion heaters shall not be used during the first twenty-four (24) hours unless precautions are taken to prevent exposure of the concrete to exhaust gases which contain carbon dioxide.
   2. Hot Weather: When necessary, provision for windbreaks, shading, fog spraying, sprinkling, ponding, or wet covering with a light colored material shall be made in advance of placement, and such protective measure shall be taken as quickly as concrete hardening and finishing operations will allow.
   3. Rate of Temperature Change: Changes in temperature of the air immediately adjacent to the concrete during and immediately following the curing period shall be kept as uniform as possible and shall not exceed 5° F. in any one (1) hour or 50° F in any twenty-four (24) hour period.

3.11 REPAIR OF SURFACE DEFECTS

A. General: Surface defects, including tie holes, unless otherwise specified by the Contract Documents, shall be repaired immediately after form removal.
B. Repair of Defective Areas: All honeycombed and other defective concrete shall be removed down to sound concrete. If chipping is necessary, the edges shall be perpendicular to the surface or slightly undercut.

C. No feather edges will be permitted. The area to be patched and an area at least six inches (6”) wide surrounding it shall be dampened to prevent absorption of water from the patching mortar. A bonding grout shall be prepared using a mix of approximately one (1) part cement to one (1) part fine sand passing a No. 30 mesh sieve, mixed to the consistency of thick cream, and then well brushed into the surface.
D. Proprietary Materials: With ENGINEER’s approval, proprietary compounds for adhesion or as patching ingredients may be used in lieu of or in addition to the foregoing patching procedures. Such compounds shall be used in accordance with the manufacturer’s recommendations.

3.12 FINISHING OF FORMED SURFACES

A. General: After removal of forms, the surfaces of concrete shall be given one or more of the finishes specified below in locations designated by the Drawings, ENGINEER or his/her representative.
B. As-Cast Finishes:
    1. No selected form facing materials shall be specified for rough form finish surfaces. Tie holes and defects shall be patched. Fins exceeding one-quarter inch (1/4”) in height shall be chipped off or rubbed off. Otherwise, surfaces shall be left with the texture imparted by the forms.
    2. Forms incorporating a smooth form facing material shall produce a smooth, hard, uniform texture on the concrete. It may be plywood, tempered concrete-form-grade hardboard, metal, plastic, or other approved material capable of producing the desired finish. The arrangement of the facing material shall be orderly and symmetrical, with the number of seams kept to the practical minimum. It shall be supported by studs or other backing capable of preventing excessive deflection. Materials with raised grain, torn surfaces, worn edges, patches, dents, or other defects which will impair the texture of the concrete surface shall not be used. Tie holes and defects shall be patched. All fins shall be completely removed.
C. Rubbed Finishes: Smooth rubbed finish shall be produced on newly hardened concrete no later than the day following form removal. Surfaces shall be wetted and rubbed with carborundum brick or other abrasive until uniform color and texture are provided. No cement grout shall be used other than the cement paste drawn from the concrete itself by the rubbing process.
D. Unspecified Finnish: If the finish is not designated on the Drawings then the concrete finish for surfaces not exposed to public view shall be the rough form finish and for concrete exposed to public view shall be a smooth form smooth rubbed finish.

3.13 CONSTRUCTION JOINTS

A. Vertical Construction Joints:
    1. No vertical construction joints shall be allowed in any other structures unless submitted and approved in writing by ENGINEER.

2. Details and locations as proposed by CONTRACTOR, to meet his/her construction techniques, must be submitted in a Shop Drawing for approval by ENGINEER.

B. Horizontal Construction Joints: Horizontal construction joints shall be as shown on the Drawings or as directed by ENGINEER.

C. Structural Slabs: Location of joints shall be submitted and approved by ENGINEER.

3.14 GROUTS AND ADHESIVES

A. Where non-shrink grout is indicated on the Drawings for plugging holes in concrete and filling concrete pipe sleeves and blockouts, CONTRACTOR shall provide high strength, non-shrink, non-metallic, grout with compressive strength not less than 5,000 psi at three (3) days and 8,000 psi at twenty-eight (28) days.

B. Furnish products as manufactured by Five Star Products, Burke Company, or approved equal. Where grouting is required for anchor bolts, imbedded items, equipment and machinery bases, CONTRACTOR shall provide high strength, high impact resistant, non-shrink, epoxy grout with compressive strength not less than 12,000 psi and tensile strength not less than 2,000 psi. Furnish Ceilcote, 648 Improved Grout, Five Star Epoxy Grout, or approval equal.

4.00 PAYMENT

A. All Work required as described in this Section shall not be paid for separately, but shall be considered subsidiary work pertaining to the structures and such costs shall be included in the lump sum price and in the applicable item in the schedule of costs.

***** END OF SECTION *****

31 22 13.1 ROUGH GRADING

1.00 GENERAL

1.01 SUMMARY

A. Section Includes:
   1. Excavating topsoil.
   2. Excavating subsoil.
   3. Cutting, grading, filling, rough contouring, compacting.
   4. Exploratory Excavation

1.02 RELATED SECTIONS

A. Section 32 05 10 – Soils and Aggregates
B. Section 31 23 16 – Excavation

1.03 REFERENCES

A. American Association of State Highway and Transportation Officials:
   i. AASHTO T180 - Standard Specification for Moisture-Density Relations of Soils using a 10-lb Rammer and a 18-in. Drop.
B. ASTM International:
   i. ASTM C 117 – Standard Test Method for Materials Finer than 75-µm (No. 200) Sieve in Mineral Aggregates by Washing
   ii. ASTM C136 - Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
   iii. ASTM D698 - Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft3).
   iv. ASTM D1556 - Standard Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method.
   v. ASTM D1557 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft3).
   vi. ASTM D2167 - Standard Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method.
   vii. ASTM D2419 - Standard Test Method for Sand Equivalent Value of Soils and Fine Aggregate.
   viii. ASTM D2434 - Standard Test Method for Permeability of Granular Soils (Constant Head).
   ix. ASTM D2922 - Standard Test Method for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).
   x. ASTM D3017 - Standard Test Method for Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth).

1.04 QUALITY ASSURANCE

A. Perform Work in accordance with TxDOT Standard Construction Specifications.

2.00 PRODUCTS

2.01 Suitable on site material may be utilized as fill with approval of engineer.

3.0 EXECUTION

3.01 PREPARATION

A. Call One-Call Utility locate not less than two full working days before performing any portion of the Work that involves any soil disturbance.
    1. Request underground utilities to be located and marked within and surrounding construction areas.
    2. Verify all utility companies have responded before commencing Work.
B. Identify required lines, levels, contours, and datum.
C. Protect utilities indicated to remain from damage.
D. Protect plant life, lawns, and other features remaining as portion of final landscaping.
E. Protect bench marks, survey control points, existing structures, fences, sidewalks, paving, and curbs from excavating equipment and vehicular traffic.

3.02 TOPSOIL EXCAVATION

A. Excavate topsoil from areas to be further excavated, re-landscaped, or re-graded, without mixing with foreign materials for use in finish grading.
B. Stockpile in area designated on site and protect from erosion.
C. Remove excess topsoil not intended for reuse, from site, after Owner permission.

3.03 SUBSOIL EXCAVATION

A. Excavate subsoil from areas to be further excavated, re-landscaped, or re-graded.
B. Excavate and process wet material to obtain optimum moisture content.
C. When excavating through roots, perform Work by hand and cut roots with sharp axe.
D. Stockpile excavated material in area designated on site.
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.

3.04 FILLING

A. Place fill to contours and elevations with specified materials.
B. Place fill in continuous layers as follows:
    1. Maximum 8 inches compacted depth.
    2. Compact uniformly to minimum 95 percent of maximum density as determined in accordance with ASTM D 1557.
C. Maintain optimum moisture content of fill materials to attain required compaction density.
D. Make grade changes gradual. Blend slope into level areas.
E. Repair or replace items indicated to remain which are damaged by excavation or filling.

3.05 EXPLORATORY EXCAVATION

A. Obtain authorization from Engineer prior to performing exploratory excavation.
B. Excavate to the extent directed by Engineer to uncover the necessary conditions to allow work to proceed.

C. Perform repairs as directed by Engineer to all underground facilities damaged during exploratory excavation.
D. Backfill according to Section.31 23 17.

3.06 TOLERANCES
A. Top Surface of Subgrade: Plus or minus one inch from original elevations.

3.07 FIELD QUALITY CONTROL
A. Owner's representative will perform in place compaction tests in accordance with the following:
    1. Density Tests: ASTM D2922.
    2. Moisture Tests: ASTM D3017.
B. Frequency of testing to be determined by Engineer.
C. When tests indicate Work does not meet specified requirements, remove Work, replace and retest.

3.08 PROTECTION OF FINISHED WORK
A. Reshape and re-compact fills subjected to vehicular traffic during construction.

*** **END OF SECTION** ***

31 23 13.1 SUBGRADE PREPARATION

1.00 GENERAL

1.01 WORK INCLUDED

A. Finish grading of roadway subgrade and subgrade preparation
B. Dust alleviation and control
C. Cleanup and disposal
D. Provision of all materials, equipment, and apparatus not specifically mentioned herein or noted on the plans, but which are obviously necessary to complete the work specified

1.02 RELATED WORK (Not used)

1.03 MEASUREMENT AND PAYMENT

A. Except as provided, roadway subgrade preparation shall be paid for under other items of work and no additional compensation shall be made therefor.

1.04 REFERENCES

A. The following is a list of standards which may be referenced in this section:
    1. TxDOT Standard Specifications – 200 Sections shall govern all work.

1.05 QUALITY ASSURANCE

A. Notify Engineer when subgrade is ready for compaction or proof-rolling or whenever compaction or proof-rolling is resumed after a period of extended inactivity.

1.06 ENVIRONMENTAL REQUIREMENTS

A. Prepare subgrade when unfrozen.

2.00 PRODUCTS (NOT USED)

3.00 EXECUTION

3.01 GENERAL

A. Perform Moisture-Density Control within top six inches (6”) of finished elevations and grades.
B. Keep subgrade free of water, debris, and foreign matter during compaction or proof-rolling.
C. Bring subgrade to proper grade and cross-section and uniformly compact surface.
D. Do not use sections of prepared ground surface as haul roads. Protect prepared subgrade from traffic.
E. Maintain prepared ground surface in finished condition until next course is placed.

3.02 COMPACTION

A. Achieve a minimum 98% of the maximum density determined by TxDOT Tex-113-E.

3.03 MOISTURE CONDITIONING

A. Dry Subgrade: Add water, then mix to make moisture content uniform throughout.

B. Wet Subgrade: Aerate material by blading, discing, harrowing, or other methods, to hasten drying process.

3.04 TESTING

A. Perform in-field testing in accordance with TxDOT Tex-115-E
B. Proof-roll subgrade with equipment to detect soft or loose subgrade or unsuitable material, as determined by Engineer.

3.05 CORRECTION

A. Soft or Loose Subgrade:
    1. Adjust moisture content and recompact, or
    2. Over excavate as specified in Section 31 23 16, Excavation, and replace with suitable material, as specified in Section 31 23 23, Fill and Backfill.
B. Unsuitable Material: Over excavate as specified in Section 31 23 16, Excavation, and replace with suitable material, as specified in Section 31 23 23, Fill and Backfill.

*** **END OF SECTION** ***

31 23 16 EXCAVATION

1.00 GENERAL

1.01 SUMMARY

A. Excavation and disposal of excavated materials.
B. Protection of existing facilities, utilities, and structures affected by excavation.

1.02 DEFINITIONS

A. Incidental Excavation: Excavation done for CONTRACTOR'S benefit, excavation error, dewatering of Excavation, slough, or over-break.
B. Unclassified Excavation: The excavation of all materials encountered regardless of the nature, size, or manner in which they are removed. Presence of isolated boulders or Rock fragments will not be sufficient cause to change classification of surrounding materials.

1.03 STORAGE AND HANDLING

A. Stockpile excavated material to cause a minimum of inconvenience to public and provide for emergency services as necessary.
B. Provide free access to all existing fire hydrants, water and gas valves, and meters.
C. Provide free flow of storm water in all gutters, conduits, and natural water courses.
D. Utilize traffic control signs, markers, and procedures in product storage and handling activities.
E. Promptly remove other material from site.

1.04 1.4 SITE CONDITIONS

A. Prior to excavation, photograph existing surfaces along which work may take place in order to determine, after construction is completed, whether any damage to existing improvements occurred prior to construction operations.
B. Perform Incidental Excavation at no additional cost City

1.05 WATER QUALITY

A. Obtain all discharge permits, easements, or other necessary approvals from regulatory agencies for disposal of waters from excavations. Comply with all laws and requirements related to water quality.
B. Institute erosion control measures as necessary

2.00 PRODUCTS

2.00 Not Used

3.00 EXECUTION

3.01 PREPARATION

A. Call One-Call prior to performing excavation
B. Contact other affected utilities who do not belong to one-call center.

3.02 PROTECTION

A. Support and protect from damage any existing facility and structure that is adjacent to, exists in, passes through, or passes under the site.

3.03 TOPSOIL

A. Excavate topsoil only to depth that will preserve topsoil quality.
B. Do not mix topsoil with subsoil during stockpiling or spreading.

3.04 LANDSCAPE SPRINKLER SYSTEMS

A. Protect existing landscape sprinkler systems.
B. When disturbance of existing sprinkler system is required, interrupt and repair system so operation of system is maintained.

3.05 SHORING

A. Slope, shore, sheet, brace or otherwise support Excavations over 4 feet deep
B. When soil conditions are unstable, Excavations shallower than 4 feet deep must also be sloped, supported or shored.

3.06 DEWATERING

A. Keep Excavation free from surface and ground water. Should groundwater be encountered, the CONTRACTOR shall provide sufficient well points, sumps, pumps, hoses, generators, and other necessary equipment to maintain a static water level 1 foot below the bottom of the excavation depths shown on the plans or directed by the City representative at no additional cost to City
B. If ground water table is in the intended construction operations, dewater Excavations. Bring the presence of groundwater to the attention of the City representative immediately.
C. If there are no olfactory or visual indications of contamination in the water, discharge according to requirements of Federal, State or local agency having jurisdiction.

3.07 GENERAL EXCAVATION REQUIREMENTS

A. Excavate topsoil from areas to be re-landscaped or re-graded and other marked areas.
B. Excavate site to line and grade indicated.
C. Carefully excavate soils in vicinity of buried utility marks placed by the one-call center.
D. Where soil has been softened or eroded by flooding or hardened by drying during unfavorable weather, rework all damaged areas or replace with approved material at no additional cost to City.
E. Notify City representative of unexpected subsurface conditions.
F. Underpin adjacent structure, service utilities and pipe chases that may be damaged by Excavation work.
G. Protect Excavation walls as required. If conditions permit, slope Excavation Sides to maintain a safe and clean working area. Remove loose materials.
H. Where the City representative deems Subgrade material to be susceptible to be unsatisfactory, excavate additional depth. Excavating additional depths up to 1 foot shall be at no additional cost to City.

3.08 ROADWAY EXCAVATION

A. Standard procedures:
   1. Finish excavation to reasonably smooth and uniform surface.
   2. Provide and maintain satisfactory access to roads, streets, and adjacent property during all phases of construction according to the Traffic Control Plan.
   3. Remove material in all cut sections to the depth indicated. When necessary to obtain compaction, scarify to a 6 inch depth and compact to at least 98% of maximum laboratory density.
   4. Excavate and waste unsuitable material.
   5. Use suitable granular material encountered in excavation to construct the top layers of embankment, for finishing the roadbed, of for backfill when directed by the City representative.
   6. When practical, haul the granular material directly from the excavation to the final position on the roadbed.

3.09 TRENCH EXCAVATION

A. Conform to current OSHA requirements in all trenches.
B. Grade bottom of Trenches to provide uniform bearing surface.
C. If necessary, make bellholes and depressions required to complete joining of pipe or box.
D. Limit width of Trench excavations to the dimensions suitable for worker access per pipe manufacturer's recommendation. Provide enough space for compaction equipment. Notify City representative if excavation operations exceed any indicated line and grade limits.
E. Do not place trench spoils, bedding materials, or pipe in locations or adjacent to improvements which will damage or stain improvements.
F. In public thoroughfares and regardless of Trench depth, limit length of open Trenches to 40 lineal feet whenever excavation is not taking place, except as approved by City representative. Provide barricading, Section 01 55 26. Protect Trenches over night.

3.10 EXTRA EXCAVATION (OVER EXCAVATION)

A. If unstable material is encountered at the bottom of any Excavation, the CONTRACTOR shall excavate additional material and backfill with suitable material until the excavation is stabilized.
B. The Volume of Extra Excavation will be determined by the method of average-end-areas in the original position.

3.11 TOLERANCE

A. Grading: Top surface of Subgrade = plus or minus 1 inch.

***** END OF SECTION *****

31 23 16.26 REMOVING STABILIZED BASE AND/OR ASPHALTIC PAVEMENT

1.00 GENERAL

1.01 SCOPE

A. This Section includes breaking, removing, and disposing of existing asphalt pavement and/or asphalt, cement, lime, or lime-fly ash stabilized base materials at the locations and depths shown on the Drawings.

PART 2 PRODUCTS (NOT USED)

3.00 EXECUTION

3.01 CONSTRUCTION METHODS

A. General: Remove existing stabilized base or asphaltic pavement from locations shown on the Drawings. Where only a portion of the material is to be removed, special care shall be exercised to avoid damage to that portion of the material to remain in place. CONTRACTOR shall replace, at his expense and as directed by ENGINEER, any material which is damaged or destroyed beyond the limits established for removal.

B. Asphaltic Pavement Removal: Break asphaltic pavement into pieces not greater than twenty-four inches (24”) in any direction. When shown on the Drawings, the asphaltic pavement to be salvaged shall be loaded, hauled and neatly stored at the designated sites. Salvaged asphaltic pavement shall be kept as free as possible from contamination by non-asphaltic materials during its removal, transportation, and storage. Asphaltic pavement to be removed but not specified for salvage, shall be disposed of by CONTRACTOR at his cost.

C. May be reused in locations approved by ENGINEER with approved Request for Information (RFI). The provision that the removed material be broken into pieces specified above shall not apply to material that is not used on the project.

D. Treated Base Removal: Break treated base into pieces not greater than twenty-four inches (24”) in any direction. When shown on the Drawings, the treated base to be salvaged shall be loaded, hauled and neatly stored at the designated sites. Treated base to be removed but not specified for salvage, shall be used or disposed of by CONTRACTOR at locations approved by ENGINEER. The provision that the removed material be broken into pieces not greater than that specified above shall not apply to material that is not used on the Project.

4.00 MEASUREMENT AND PAYMENT

4.01 UNIT PRICE CONTRACTS

A. Measurement

1. One unit price payment will be made for removal of both pavement and base.

2. Measure existing stabilized base and asphaltic pavement by the square yard as one unit in its original position.
3. If base extends outside pavement, full payment will be made for entire surface area of base.

B. Payment: The Work performed and materials furnished in accordance with this Section shall be paid for at the unit price bid for "Removing Stabilized Base and/or Asphaltic Pavement", of the class and depth specified. This price shall be full compensation for breaking the material, loading, hauling, unloading, and satisfactorily stockpiling the material, and for all manipulations, labor, tools, equipment and incidentals necessary to complete the Work.

4.02 LUMP SUM CONTRACTS

A. Measurement will not be made. The Work included in this Section will be paid at the lump sum price bid.

*** **END OF SECTION** ***

31 23 19 DEWATERING

1.00 GENERAL

1.01 DESCRIPTION:

A. This section specifies performance of dewatering required to lower and control ground water table levels and hydrostatic pressures to permit excavation, backfill, and construction to be performed in dry conditions. Control of surface water shall be considered as part of the work under this specification.

1.02 SUMMARY

A. The work to be completed by the Contractor includes, but is not necessarily limited to the following:
   1. Implementation of the Erosion and Sedimentation Control Plan.
   2. Dewater excavations, including seepage and precipitation.
   3. The Contractor shall be responsible for providing all materials, equipment, labor, and services necessary for care of water and erosion control. Excavation work shall not begin before the Erosion and Sedimentation Control Plan is in place.

1.03 REQUIREMENT:

A. Dewatering system shall be of sufficient size and capacity necessary to lower and maintain ground water table to an elevation at least 1 foot below lowest foundation subgrade or bottom of pipe trench and to allow material to be excavated, piles to be driven, and concrete placed, in a reasonably dry condition. Materials to be removed shall be sufficiently dry to permit excavation to grades shown and to stabilize excavation slopes where sheeting is not required. Operate dewatering system continuously until backfill work has been completed.
B. Reduce hydrostatic head below any excavation to the extent that water level in the construction area is a minimum of 1 foot below prevailing excavation surface.
C. Prevent loss of fines, seepage, boils, quick conditions or softening of foundation strata.
D. Maintain stability of sides and bottom of excavation.
E. Construction operations are performed in dry conditions.
F. Control of surface and subsurface water is part of dewatering requirements. Maintain adequate control so that:
   1. The stability of excavated and constructed slopes are not adversely affected by saturated soil, including water entering prepared subbase and subgrades where underlying materials are not free draining or are subject to swelling or freeze-thaw action.
   2. Erosion is controlled.
   3. Flooding of excavations or damage to structures does not occur.
   4. Surface water drains away from excavations.
   5. Excavations are protected from becoming wet from surface water, or insure excavations are dry before additional work is undertaken.
G. Permitting Requirements: The contractor shall comply with and obtain the required State and County permits where the work is performed.

1.04 RELATED WORK:

A. Materials testing and inspection during construction: Section 01 45 29, TESTING LABORATORY SERVICES.
B. Safety Requirements: Section 00 72 00, GENERAL CONDITIONS, Article, ACCIDENT PREVENTION.
C. Submittal requirements as specified in Section 01 33 23 SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.
D. Protection of existing utilities, fire protection services, existing equipment, roads, and pavements: Section 01 00 00, GENERAL REQUIREMENTS.
E. Subsurface Investigation: Section 01 00 00, GENERAL REQUIREMENTS, Article 1.11, PHYSICAL DATA.
F. Excavation, backfilling, site grade and utilities: Section 31 20 00, EARTH MOVING.

1.05 SUBMITTALS:

A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.
B. Drawings and Design Data:
    1. Submit drawings and data showing the method to be employed in dewatering excavated areas 30 days before commencement of excavation.
    2. Material shall include: location, depth and size of wellpoints, headers, sumps, ditches, size and location of discharge lines, capacities of pumps and standby units, and detailed description of dewatering methods to be employed to convey the water from site to adequate disposal.
    3. Include a written report outlining control procedures to be adopted if dewatering problem arises.
    4. Capacities of pumps, prime movers, and standby equipment.
    5. Design calculations proving adequacy of system and selected equipment. The dewatering system shall be designed using accepted and professional methods of design and engineering consistent with the best modern practice. The dewatering system shall include the deep wells, wellpoints, and other equipment, appurtenances, and related earthwork necessary to perform the function.
    6. Detailed description of dewatering procedure and maintenance method.
    7. Materials submitted shall be in a format acceptable for inclusion in required permit applications to any and all regulatory agencies for which permits for discharge water from the dewatering system are required due to the discharge reaching regulated bodies of water.
C. Inspection Reports.
D. All required permits.

2.00 PRODUCTS (NOT USED)

3.00 EXECUTION

3.01 INSTALLATION:

A. Install a dewatering system to lower and control ground surface water in order to permit excavation, construction of structure, and placement of backfill materials to be performed

under dry conditions. Make the dewatering system adequate to pre-drain the water-bearing strata above and below the bottom of structure foundations, utilities and other excavations.

B. In addition, reduce hydrostatic pressure head in water-bearing strata below structure foundations, utility lines, and other excavations, to extent that water levels in construction area are a minimum of // 300 mm (1 foot) // below prevailing excavation surface at all times.

3.02 OPERATION:

A. Prior to any excavation below the ground water table, place system into operation to lower water table as required and operate it continuously 24 hours a day, 7 days a week until utilities and structures have been satisfactorily constructed, which includes the placement of backfill materials and dewatering is no longer required.

B. Place an adequate weight of backfill material to prevent buoyancy prior to discontinuing operation of the system.

3.03 WATER DISPOSAL:

A. Dispose of water removed from the excavations in such a manner as:
    1. Will not endanger portions of work under construction or completed.
    2. Will cause no inconvenience to Government or to others working near site.
    3. Will comply with the stipulations of required permits for disposal of water.
    4. Will Control Runoff: The Contractor shall be responsible for control of runoff in all work areas including but not limited to: excavations, access roads, parking areas, laydown, and staging areas. The Contractor shall provide, operate, and maintain all ditches, basins, sumps, culverts, site grading, and pumping facilities to divert, collect, and remove all water from the work areas. All water shall be removed from the immediate work areas and shall be disposed of in accordance with applicable permits.

B. Excavation Dewatering:
    1. The Contractor shall be responsible for providing all facilities required to divert, collect, control, and remove water from all construction work areas and excavations.
    2. Drainage features shall have sufficient capacity to avoid flooding of work areas.
    3. Drainage features shall be so arranged and altered as required to avoid degradation of the final excavated surface(s).
    4. The Contractor shall utilize all necessary erosion and sediment control measures as described herein to avoid construction related degradation of the natural water quality.

C. Dewatering equipment shall be provided to remove and dispose of all surface and ground water entering excavations, trenches, or other parts of the work during construction. Each excavation shall be kept dry during subgrade preparation and continually thereafter until the structure to be built, or the pipe to be installed therein, is completed to the extent that no damage from hydrostatic pressure, flotation, or other cause will result.

3.04 STANDBY EQUIPMENT:

A. Provide complete standby equipment, installed and available for immediate operation, as may be required to adequately maintain de-watering on a continuous basis and in the event that all or any part of the system may become inadequate or fail.

3.05 CORRECTIVE ACTION:

A. If dewatering requirements are not satisfied due to inadequacy or failure of the dewatering system (loosening of the foundation strata, or instability of slopes, or damage to foundations or structures), perform work necessary for reinstatement of foundation soil and damaged structure or damages to work in place resulting from such inadequacy or failure by Contractor, at no additional cost to CITY.

3.06 DAMAGES:

A. Immediately repair damages to adjacent facilities caused by dewatering operations.

3.07 REMOVAL:

A. Insure compliance with all conditions of regulating permits and provide such information to the Resident Engineer. Obtain written approval from Resident Engineer before discontinuing operation of dewatering system.

4.00 MEASUREMENT AND PAYMENT

A. No additional payment shall be made for dewatering efforts or equipment. No geotechnical report is provided. Contractor is advised to familiarize themselves with all surface and subsurface conditions prior to bidding.

***** END OF SECTION *****

31 23 23 FILL

1.00 GENERAL

1.01 SECTION INCLUDES
A. Backfilling and compacting for utilities.

1.02 RELATED SECTIONS
A. Section 31 23 16, EXCAVATION
B. Section 31 23 33, TRENCHING AND BACKFILLING

1.03 REFERENCES
A. American Association of State Highway and Transportation Officials (AASHTO):
1. AASHTO T180–10.....Standard Method of Test for Moisture-Density Relations of Soils Using a 4.54 kg (10 lb) Rammer and a 457 mm (18 in) Drop

B. ASTM International (ASTM):
1. ASTM C136–06 .....Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates
2. ASTM D698–07e1 .....Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft^3 (600 kN-m/m^3))
3. ASTM D1556–07 .....Standard Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method
4. ASTM D1557–09 .....Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft^3 (2,700 kN-m/m^3))
5. ASTM D2167–08 .....Standard Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method
6. ASTM D2487–11 .....Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System)
7. ASTM D6938–10 .....Standard Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth)

1.04 SUBMITTALS
A. See Section 01 34 00, SUBMITTAL PROCEDURES; for submittal procedures.
B. Samples: 10 lb (4.5 kg) sample of each type of fill; submit in air-tight containers to testing laboratory.
C. Materials Sources: Submit name of imported materials source.
D. Fill Composition Test Reports: Results of laboratory tests on proposed and actual materials used.
E. Compaction Density Test Reports.

2.00 PRODUCTS

2.01 FILL MATERIALS
A. General Fill – Fill Type: Subsoil excavated on-site.

B. Graded.
   1. Free of lumps larger than 3 inches (75 mm), rocks larger than 2 inches (50 mm), and debris.
C. Structural Fill – Fill Type 1–1/2" minus crushed rock
   1. Concrete for Fill: Lean concrete.
D. Granular Fill – Gravel: Pit run washed stone; free of shale, clay, friable material and debris.
   1. Graded in accordance with ASTM C136, within the following limits:
      Two inch (50 mm) sieve: 100 percent passing.
      One inch (25 mm) sieve: 95 percent passing.
      3/4-inch (19 mm) sieve: 95 to 100 percent passing.

E. Granular Fill – Pea Gravel: Natural stone; washed, free of clay, shale, and organic matter.
   1. Grade in accordance with ASTM D2487, Group Symbol GM.
F. Sand – Fill Type: Natural river or bank sand; washed; free of silt, clay, loam, friable or soluble materials, and organic matter.
   1. Graded in accordance with ASTM C136; within the following limits:
      No. 4 (4.75 mm) sieve: 100 percent passing.
      No. 14 (1.40 mm) sieve: 10 to 100 percent passing.
      No. 50 (300 micro m) sieve: 5 to 90 percent passing.
G. Topsoil: See Section 32 91 19.

2.02 SOURCE QUALITY CONTROL
A. See Section 01 45 00, QUALITY REQUIREMENTS; for general requirements for testing and analysis of soil material.
B. Where fill materials are specified by reference to a specific standard, test and analyze samples for compliance before delivery to site.
C. If tests indicate materials do not meet specified requirements, change material and retest.

3.00 EXECUTION

3.01 PREPARATION
A. Scarify subgrade surface to a depth of 6 inches to identify soft spots.
B. Cut out soft areas of subgrade not capable of compaction in place. Backfill with general fill.
C. Compact subgrade to density equal to or greater than requirements for subsequent fill material.
D. Until ready to fill, maintain excavations and prevent loose soil from falling into excavation.

3.02 FILLING
A. Fill to contours and elevations indicated.
B. Fill up to subgrade elevations unless otherwise indicated.
C. Employ a placement method that does not disturb or damage other work.
D. Maintain optimum moisture content of fill materials to attain required compaction density.
E. Granular Fill: Place and compact materials in equal continuous layers not exceeding 6 inches compacted depth.
F. Soil Fill: Place and compact material in equal continuous layers not exceeding 8 inches depth.

G. Correct over-excavated areas.
H. Compaction to density.

3.03 TOLERANCES

A. Top Surface of FillingUnder Paved Areas: Plus or minus 1/2 inch from required elevations.

3.04 FIELD QUALITY CONTROL

A. Perform compaction density testing on compacted fill in accordance with TxDOT standard tests
B. If tests indicate work does not meet specified requirements, remove work, replace and retest.
C. Frequency of Tests: 1 per 10,000 square feet.
D. Proof roll compacted fill

*** **END OF SECTION** ***

31 32 19.13 GEOGRID SOIL STABILIZATION

1.00 GENERAL

1.01 SCOPE

A. Work includes furnishing and installing Geogrid reinforcement at the lines and grades designated on the construction drawings and as specified herein.

1.02 APPLICABLE SECTION OF RELATED WORK

A. 31 05 16 Aggregates for Earthwork
B. 31 05 19 Geosynthetics for Earthwork
C. 31 23 13 Subgrade Preparation
D. 31 23 23 Fill

1.03 REFERENCE STANDARDS

A. See specific Geogrid manufacturer's reference standards

1.04 DELIVERY, STORAGE AND HANDLING

A. Contractor shall check the Geogrid upon delivery to assure that the proper material has been received.
B. Geogrid shall be stored above -10° F (-23° C).
C. Contractor shall prevent excessive mud, cementitious material, or other foreign materials from coming in contact with the Geogrid material.
D. Material shall be stored in a secure location.

2.00 PRODUCTS

2.01 PRODUCTS

A. Geogrid shall be "Triax" Triaxial Geogrid as manufactured by Tensar International Corporation.

3.00 EXECUTION

3.01 INSTALLATION

A. Triaxial geogrid shall be placed flat against grade and secured to prevent buckling, shifting, or other displacement
B. JOINTS
   1. Geogrid shall be secured at joints utilizing plastic zip ties or other approved material
   2. Alternatively, joints may have a minimum of one foot (1') overlap.

*** **END OF SECTION** ***

31 50 10 TRENCH SAFETY SYSTEMS

PART 1 GENERAL

1.01 SCOPE

A. This Section provides for furnishing, installing, and maintaining trench safety systems that meet the minimum of OSHA 29 CFR Safety and Health Regulations, Part 1926, Subpart P. The sections that are incorporated into these Specifications by reference include, but are not limited to, 29CFR Sections 1226- 650 through 29 CFR 1926-652.

B. Legislation enacted by the Texas Legislature regarding Trench Safety Systems is hereby incorporated into these Specifications by reference. CONTRACTOR shall comply with the requirements of Texas Health and Safety Code Ann., §756.021 (Vernon 1991) and any subsequent amendments.

1.02 RELATED SECTIONS

A. SECTION 01 33 00 – Submittal Procedures

B. SECTION 01 33 23 – Shop drawings, Product Data and Samples

1.03 RELATED INFORMATION

A. Soil borings or other geotechnical information used for the design of the utilities or structure may be included with the Specifications. If soil borings are included, they are for CONTRACTOR information only, and do not replace any geotechnical explorations required by State or Federal regulations. CONTRACTOR is advised that they are responsible to verify surface and subsurface conditions prior to bidding.

1.04 QUALITY ASSURANCE

A. Trench safety system shall meet the current standards established by the Occupational Safety and Health Administration (OSHA) Safety and Health Regulations, Part 1926, Subpart P. – Excavations, Trenching and Shoring.

B. ENGINEER's Field Representative will inform CONTRACTOR, OWNER, and/or OSHA immediately should the Field Representative observe actions not in accordance with CONTRACTOR's submitted Trench Safety Plan. Any construction not in accordance with OSHA regulations may not be eligible for payment, and any delays in construction to bring the Project within OSHA regulations are the responsibility of CONTRACTOR.

1.05 DEFINITIONS

A. A trench shall be defined as a narrow excavation (in relation to its depth) made below the surface of the ground. In general, the depth is greater than the width, but the width of the trench (measured at the bottom) is not greater than fifteen feet (15').

B. The trench safety systems requirements apply to larger open excavation if the erection of structures or other installations limits the space between the excavation slope and the installation to dimensions equivalent to a trench as defined. Trench Safety Systems include but are not limited to sloping, sheeting, trench boxes or trench shields, sheet piling, cribbing, bracing, or shoring.

C. Dewatering, or diversion of water to provide adequate drainage is covered elsewhere in these Specifications and is not subject to payment through Trench Safety Systems.

2.00 PRODUCTS (NOT USED)

3.00 EXECUTION

3.01 SUBMITTALS

A. Submittals shall conform to the requirements of SECTION 01 33 00 – Submittal Procedures and SECTION 01 33 23 – Shop Drawings, Product Data and Samples.
B. CONTRACTOR shall submit a Trench Safety Plan specifically for the construction, installation and maintenance of trench excavation or structural excavation. Design the trench safety program in accordance with OSHA 29 CFR regulation governing the presence and activities of individuals working in and around trench excavations. The Trench Safety Plan must be prepared and sealed by a Professional Engineer.
C. Submittals and Shop Drawings which contain deviations from OSHA standards or contain special designs shall be sealed by a Professional Engineer registered in the State of Texas. Cost for Professional Engineer's design shall be paid by CONTRACTOR.
D. Review of the Trench Safety Plan by ENGINEER will only be in regard to compliance with these Specifications and will not constitute approval by ENGINEER nor will the review relieve CONTRACTOR of obligations under State and Federal trench safety laws.

3.02 INDEMNIFICATION

A. CONTRACTOR shall indemnify and hold harmless OWNER and ENGINEER, its employees and agents, from any and all damages, costs (including, without limitation, legal fees, court costs, and the cost of investigation), judgments or claims by anyone for injury or death of persons resulting from the collapse or failure of trenches or structural excavations covered under this Contract.
B. CONTRACTOR acknowledges and agrees that this indemnity provision provides indemnity for OWNER and ENGINEER in case OWNER or ENGINEER is negligent either by act or omission in providing for trench safety, including, but not limited to, safety program and design reviews, inspections, failures to issue stop orders, and the hiring of CONTRACTOR.

3.03 INSTALLATION

A. Provide, install and maintain trench safety system in accordance with provisions of OHSA 29CFR and per submitted engineered Trench Safety Plan.
B. Specially designed Trench Safety Plan shall be installed in accordance with the trench safety drawings produced for the locations and conditions identified on the Shop Drawings and Submittals.
C. A competent person, as identified in CONTRACTOR's Trench Safety Plan, shall verify that trench boxes and other pre-manufactured systems are certified for actual installation conditions and are in a properly maintained condition.

3.04 INSPECTION

A. CONTRACTOR, or qualified consultant retained independently by CONTRACTOR, shall make daily inspections of the trench safety system to ensure that the installed system and operations meet OSHA 29CFR, State of Texas regulations, and other personnel protection regulation requirements.
B. If evidence of possible cave-ins or slides is apparent, CONTRACTOR shall immediately stop work in the trench and move personnel to safe locations until the necessary precautions have been taken by CONTRACTOR to safeguard personnel entering the trench.
C. Maintain a permanent record of daily inspections.

3.05 FIELD QUALITY CONTROL

A. CONTRACTOR shall verify specific applicability of the selected or specially designed trench safety system to each field condition encountered on the Project.
B. Should field conditions change during the progress of the Work, CONTRACTOR shall revise the Trench Safety Plan accordingly.

4.00 MEASUREMENT AND PAYMENT

A. Separate payment for trench safety used on utility excavation will not be made. Include cost of shoring in the cost of the utility line.
B. Measurement and payment for special shoring requirements use in trench excavations, if included in the unit price bid schedule, is per square foot of the vertical face of the special shoring installed.
C. Separate payment for trench safety system for structural excavation will not be made. Include cost of shoring in the cost of the structure.

***** END OF SECTION *****

31 50 20 TRENCH DEWATERING SYSTEM

PART 1 GENERAL

1.01 SCOPE

A. This Section shall govern for the temporary dewatering of trenches for the installation of utilities. Work, in general, shall include:
   1. Designing, furnishing, installing, testing, operating, monitoring and maintaining a system to control ground water and surface water as required to comply with the performance requirements specified.
   2. Controlling and removing seepage and surface water from the excavation, including excavation slope erosion control.
   3. Prevention of surface water from entering the trench and diverting the surface water away from the Site.
   4. Removal of the temporary dewatering system after completion of the specified portion of the Work.
   5. Removal of ground water and surface water from all remaining excavation, after removal of the temporary dewatering system, until construction has reached finished grades.

1.02 QUALITY ASSURANCE

A. The dewatering system Work shall be performed by a firm which has at least five (5) years of successful experience in field of dewatering.
B. CONTRACTOR or well pointing firm shall engage a qualified surveyor, to perform all layouts and measurements. The surveyor shall layout the Work to the lines and grades required before installation and shall determine the location of each well point, piezometer and other data, as required.
C. The surveyor shall record and maintain all information pertinent to each well point and piezometer.
D. The temporary dewatering system as specified in these Specifications shall be the minimum system required for controlling groundwater, regardless of source. The installed system shall be capable of lowering and maintaining the groundwater to at least 3-feet below the bottom of the excavation and until the required utilities are installed. Within these limits, CONTRACTOR shall be responsible for the design of the entire temporary dewatering system and shall make whatever modifications and additions to the system as may be required for the system to fulfill its requirements.

2.00 PRODUCTS (NOT USED)

3.00 EXECUTION

3.01 PERFORMANCE REQUIREMENTS

A. Design, furnish, install, test, operate, monitor and maintain the minimum well point system as specified herein, including all discharge piping and connections at point of discharge, sufficient to lower the ground water level or hydrostatic head below the bottom of the excavation, or lower, so as to prevent seepage of water into the excavation and permit installation of all utilities “in the dry”.
B. Design, furnish and install, test, operate, monitor and maintain whatever additional system that may be necessary to supplement the minimum well point system as specified herein, and to maintain the excavation free of groundwater seepage and surface water, regardless of source.
C. The periphery of the entire excavation shall be suitably diked and the dikes maintained to prevent surface water from entering the excavation.
D. All water seeping, falling or running into the excavation as it is dug, and until the temporary dewatering system is removed as specified, shall be promptly pumped out.
E. Dispose of all seepage and surface water removed from the project, regardless of source, by methods approved by ENGINEER.
F. Take appropriate and approved measures to prevent erosion of the excavated soils and ramp slopes.

3.02 MAINTENANCE

A. CONTRACTOR shall provide system maintenance including, but not limited to, at least daily supervision by someone skilled in the operation, maintenance, and replacement of system components and shall provide one (1) spare (connected) diesel powered pump; and all other equipment and work required by ENGINEER to maintain the excavation in a dewatered and hydrostatically relieved condition. Dewatering and pressure relief shall be a continuous operation and interruptions due to power outages, or any other reason, shall not be permitted. A responsible operator capable of starting, finishing and maintaining the dewatering system and starting standby equipment shall be on duty at all times. Some responsible person shall continuously monitor the dewatering and surface water central systems, until CONTRACTOR has received approval from ENGINEER that he may discontinue surface and/or groundwater control.

3.03 CORRECTION OF WORK

A. CONTRACTOR shall be fully responsible for the failure of all components of the temporary dewatering Work and for all damages to the Work in the excavation area caused by the failure to provide, maintain, and operate the temporary dewatering system, as specified. CONTRACTOR shall restore all damaged work, including failed components of the Work in this Section to a condition as good as or better than existed prior to failure of components.

3.04 JOB CONDITIONS

A. CONTRACTOR shall provide protection of persons and property by at least:
    1. Barricading open excavations occurring as part of this work and post with warning lights. Operate warning lights during the hours from dusk to dawn, each day. All

barricades, signs and other types of devices shall be installed in accordance with the "Texas Manual on Uniform Traffic Control Devices".

2. Protect structures, utilities, sidewalks, pavements and other facilities from damage caused by settlement, lateral movement, undermining, washout and other hazards created by temporary dewatering system installation and operation.
3. CONTRACTOR shall restore all streets, driveways, curbs, sidewalks and other existing items to a condition as good as or better than existed before work was commenced, at no additional cost.

4.00 MEASUREMENT AND PAYMENT

4.01 MEASUREMENT

A. If identified as a pay item, well point systems or dewatering system shall be measured along the centerline of the trench by the linear foot of trench being dewatered.
B. If not identified as a pay item, well point systems or dewatering system shall be incidental to installation of the utility line.

4.02 PAYMENT

A. Payment shall be made at the contract unit price bid for "trench dewatering system" measured as outlined in this Section. Such payment shall be full compensation for all materials, equipment and labor necessary to furnish, install, operate and maintain the well point system, including any necessary traffic warning systems or any Work necessary to restore the Site to its original condition, including any damaged facilities.

*** **END OF SECTION** ***

32 11 13 SUBGRADE PREPARATION

1.00 GENERAL

1.01 DESCRIPTION

A. When the area is to be surfaced or paved, after the earthwork has been substantially completed and after all storm sewer and drains have been laid, the subgrade shall be brought to the lines, grades and typical cross section shown on the Drawings and in accordance with these Specifications.

2.00 EXECUTION

2.01 CONSTRUCTION METHODS

A. Whenever unsuitable natural material is encountered and cannot be handled by the excavation or embankment requirements, then the following requirements shall apply. The unsuitable material shall be excavated to a depth deemed sufficient by ENGINEER and the excavated material shall be disposed of off the jobsite at the expense of CONTRACTOR. The excavated area shall be filled to its original level with suitable material meeting the requirements of borrow. This imported material shall be compacted to ninety-five percent (95%) Standard Proctor Density, (ASTM Method D698) using a moisture content ranging from optimum to plus three percent (3%) above optimum. Soils shall not be compacted at less than the optimum moisture content.

B. After all holes and depressions are filled with approved material, the subgrade shall be brought up to the lines and grades required and if it is not to be stabilized, it shall be compacted to ninety-five percent (95%) Standard Proctor Density, (ASTM Method D698), using a moisture content ranging from optimum to plus three percent (3%) above optimum. The subgrade, without stabilization, shall be compacted to a depth of nine inches (9”).

C. After the subgrade has been prepared it shall be allowed to stand, or "cure", under traffic until, in the opinion of ENGINEER it is in a satisfactory condition to receive a surface course. During this curing period, the roadbed shall be maintained by CONTRACTOR, unless otherwise agreed.

D. The subgrade shall be kept free from all ruts and weak spots. Any ruts and weak spots that develop under traffic shall be picked up and repaired with suitable material as they develop.

2.02 SPECIAL SUBGRADE FINISH FOR CONCRETE PAVEMENT, FOR SLIP FORM PAVING OPERATION

A. Testing: After the subgrade has been prepared, as specified, and has been compacted as specified and immediately before the base or surfacing material is to be placed on the subgrade, it shall be tested as to crown and elevation by the use of a template, furnished by the CONTRACTOR. In the lower edge of the template, there shall be inserted bolts, six inches apart and to such depth that the heads will just come to the

true elevation of the subgrade, when the template is riding on the forms longitudinally. Testing the elevation of the subgrade shall be done by moving the template back and forth on the forms.

B. Corrections
    1. Base is High: If the subgrade, when tested, is found to be as much as one-fourth of an inch (1/4”) high, additional excavation shall be made until the required depth is obtained and the excavated material shall be deposited on the shoulders.
    2. Base is Low: Unless otherwise provided in the specifications, those areas below the true elevation shall be filled with concrete, making it an integral part of the slab.
    3. Payment for Correction: All expenses for this extra concrete material shall be borne by CONTRACTOR.

C. Before placing the concrete, the subgrade shall be cleaned of all loose material and thoroughly sprinkled.

3.00 MEASUREMENT AND PAYMENT

A. The Work prescribed under this Section, shall not be paid for directly, but shall be considered as incidental to associated Work.

*** **END OF SECTION** ***

32 11 23 AGGREGATE BASE COURSES

1.00 GENERAL

1.01 SUMMARY

A. Section Includes:
   1. Aggregate base course.

1.02 RELATED SECTIONS:

A. Section 31 22 13 – Rough Grading.
B. Section 31 23 17 – Trenching.
C. Section 31 23 19 – Dewatering.
D. Section 31 25 13 – Erosion Controls.
E. Section 32 11 23 – Prepared Subbase.
F. Section 32 12 16 – Asphalt Paving.
G. Section 32 13 13 – Concrete Paving

1.03 REFERENCES

A. ASTM International:
   1. ASTM C 117 – Standard Test Method for Materials Finer than 75-µm (No. 200) Sieve in Mineral Aggregates by Washing
   2. ASTM C136 - Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
   3. ASTM D1557 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft3).
   4. ASTM D2922 - Standard Test Method for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).
   5. ASTM D3017 - Standard Test Method for Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth).

1.04 SUBMITTALS

A. Section 01 33 00 - Submittal Procedures: Requirements for submittals.
B. Materials Source: Submit name and location of aggregate materials suppliers.
C. Manufacturer's Certificate: Certify materials meet or exceed specified requirements.

1.05 QUALITY ASSURANCE

A. Furnish each material from single source throughout the Work.

2.00 PRODUCTS

2.01 AGGREGATE MATERIALS

B. Base Aggregate: The class shall be as specified on the project plans and pay items.

3.00 EXECUTION

3.01 EXAMINATION

A. Section 01 30 00 - Administrative Requirements: Verification of existing conditions before starting work.
B. Verify subbase has been inspected, gradients and elevations are correct.

3.02 PREPARATION
A. Complete the work of section 32 11 16 Subbase Courses.
B. Correct irregularities in subbase gradient and elevation by scarifying, reshaping, and re-compacting.
C. Do not place fill on soft, muddy, or frozen surfaces.

3.03 AGGREGATE PLACEMENT
A. Place aggregate in equal thickness layers to total compacted thickness indicated on Drawings. Maximum Layer Compacted Thickness: 6 inches.
B. Roller compact aggregate to 98 percent maximum density as defined in accordance with ASTM D 1557.
C. Level and contour surfaces to elevations, profiles, and gradients indicated.
D. Maintain optimum moisture content of fill materials to attain specified compaction density.
E. Use mechanical tamping equipment in areas inaccessible to compaction equipment.
F. No displacement (pumping) of subgrade soils shall be visually observed when loaded by heavy equipment traffic.

3.04 TOLERANCES
A. Section 01 40 00 - Quality Requirements: Tolerances.
    1. Maximum Variation From Flat Surface: 1/2 inch measured with 10 foot straight edge.
    2. Maximum Variation From Thickness: 1/2 inch.
    3. Maximum Variation From Elevation: 1/2 inch.

3.05 FIELD QUALITY CONTROL
A. Section 01 40 00 - Quality Requirements.
B. CONTRACTOR's representative will perform laboratory testing of material to determine gradation in accordance with ASTM C117 and ASTM C136.
C. CONTRACTOR's representative will perform testing to determine maximum density in accordance with ASTM D 1557.
D. CONTRACTOR's representative will perform in place compaction tests in accordance with the following:
    1. Density Tests: ASTM D2922.
    2. Moisture Tests: ASTM D3017.
E. When tests indicate Work does not meet specified requirements, remove Work, replace and retest.
F. Frequency of Tests: One test every 2,500 square feet or portion thereof, at locations directed by Engineer.

*** **END OF SECTION** ***

32 12 13.16 ASPHALTIC TACK COATS

1.00 GENERAL

1.01 SUMMARY

A. Description: This Section includes the furnishing and application of asphaltic tack coats as shown on the drawings and as specified herein.

1.02 REFERENCES

A. AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO)
B. AASHTO M 82 (1975; R 2008) Standard Specification for Cut- Back Asphalt (Medium-Curing Type)
C. AASHTO T 102 (2009) Spot Test of Asphaltic Materials
D. AASHTO T 40 (2002; R 2006) Sampling Bituminous Materials
E. ASTM INTERNATIONAL (ASTM)
F. ASTM D 140/D 140M (2009) Sampling Bituminous Materials
G. ASTM D 2027 (2010) Cutback Asphalt (Medium-Curing Type)
H. ASTM D 2995 (1999; R 2009) Determining Application Rate of Bituminous Distributors
I. ASTM D 977 (2005) Emulsified Asphalt

1.03 SYSTEM DESCRIPTION

A. General Requirements
   1. Plant, equipment, machines and tools used in the work are subject to approval and shall be maintained in a satisfactory working condition at all times. Calibrated equipment such as asphalt distributors, scales, batching equipment, spreaders and similar equipment, should have been recalibrated by a calibration laboratory within 12 months prior to commencing work.
B. Bituminous Distributor
   1. Provide a distributor with pneumatic tires of such size and number that the load produced on the base surface does not exceed 650 psi of tire width to prevent rutting, shoving or otherwise damaging the base surface or other layers in the pavement structure. Design and equip the distributor to spray the bituminous material in a uniform coverage at the specified temperature, at readily determined and controlled rates from 0.05 to 2.0 gallons per square yard, with a pressure range of 25 to 75 psi and with an allowable variation from the specified rate of not more than plus or minus 5 percent, and at variable widths. Include with the distributor equipment a separate power unit for the bitumen pump, full-circulation spray bars, tachometer, pressure gauges, volume-measuring devices, adequate heaters for heating of materials to the proper application temperature, a thermometer for reading the temperature of tank contents, and a hand hose attachment suitable for applying bituminous material manually to areas inaccessible to the distributor. Equip the distributor to circulate and agitate the bituminous material during the heating process.
C. Heating Equipment for Storage Tanks
   1. The equipment for heating the bituminous material shall be steam, electric, or hot oil heaters. Provide steam heaters consisting of steam coils and equipment for producing

steam, so designed that the steam cannot get into the material. Fix an armored thermometer to the tank with a temperature range from 40 to 400 degrees F so that the temperature of the bituminous material may be determined at all times.

D. Power Brooms and Power Blowers
   1. Use power brooms and power blowers suitable for cleaning the surfaces to which the bituminous coat is to be applied.

1.04 SUBMITTALS
A. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:
   1. Product Data
   2. Weigh tickets and delivery tickets, during progress of the work.
   3. Documentation indicating distance between manufacturing facility and the project site.
   4. Sampling and Testing
   5. Copies of all test results for emulsified asphalt, and bituminous materials, within 24 hours of completion of tests. Certified copies of the manufacturer's test reports indicating temperature viscosity relationship for cutback asphalt, compliance with applicable specified requirements, not less than 30 days before the material is required in the work.

1.05 DELIVERY, STORAGE, AND HANDLING
A. Inspect the materials delivered to the site for contamination and damage. Unload and store the materials with a minimum of handling.

1.06 ENVIRONMENTAL REQUIREMENTS
A. Apply bituminous coat only when the surface to receive the bituminous coat is dry. Apply bituminous coat only when the atmospheric temperature is 60 degrees F or above.

2.00 PRODUCTS

2.01 TACK COAT
A. Provide asphalt conforming to ASTM D 2027 or AASHTO M82 Grade MC-70.

2.02 CUTBACK ASPHALT
A. Provide cutback asphalt conforming to ASTM D 2027, Grade MC-70.

2.03 EMULSIFIED ASPHALT
A. Provide emulsified asphalt conforming to ASTM D 977, Type SS-1. Dilute the emulsified asphalt with equal parts of water. The base asphalt used to manufacture the emulsion shall show a negative spot when tested in accordance with AASHTO T 102 using standard naphtha.

3.00 EXECUTION

3.01 PREPARATION OF SURFACE
A. Immediately before applying the bituminous coat, remove all loose material, dirt, clay, or other objectionable material from the surface to be treated by means of a power broom or blower supplemented with hand brooms. The surface shall be dry and clean at the time of treatment.

3.02 APPLICATION RATE

A. The exact quantities within the range specified, which may be varied to suit field conditions, will be determined by the Engineer.
   1. Tack Coat
      i. Apply bituminous material for the tack coat in quantities of not less than 0.15 gallon nor more than 0.30 gallon per square yard of pavement surface.
      ii. Surface shall have a minimum of 90% coverage. Streaks or impartial coverage will require re-application, not to exceed the maximum gallons per square yard.

B. APPLICATION TEMPERATURE
   1. Viscosity Relationship
      i. Asphalt application temperature shall provide an application viscosity between 10 and 60 seconds, Saybolt Furol, or between 20 and 120 centistokes, kinematic. Furnish the temperature viscosity relation to the Engineer.

3.03 APPLICATION

A. GENERAL
   1. Following preparation and subsequent inspection of the surface, apply the bituminous tack coat with the Bituminous Distributor at the specified rate with uniform distribution over the surface to be treated. Properly treat all areas and spots missed by the distributor with the hand spray. Until the succeeding layer of pavement is placed, maintain the surface by protecting the surface against damage and by repairing deficient areas at no additional cost to the City. If required, spread clean dry sand to effectively blot up any excess bituminous material. No smoking, fires, or flames other than those from the heaters that are a part of the equipment are permitted within 25 feet of heating, distributing, and transferring operations of bituminous material other than bituminous emulsions. Prevent all traffic, except for paving equipment used in constructing the surfacing, from using the underlying material, whether primed or not, until the surfacing is completed. The bituminous coat shall conform to all requirements as described herein.

B. TACK COAT
   1. Apply tack coat at the locations shown on the drawings. Apply the tack coat when the surface to be treated is dry. Immediately following the preparation of the surface for treatment, apply the bituminous material by means of the bituminous distributor, within the limits of temperature at the rates described above. Apply the bituminous material so that uniform distribution is obtained over the entire surface to be treated. Treat lightly coated areas and spots missed by the distributor with the bituminous material. Following the application of bituminous material, allow the surface to cure without being disturbed for period of time necessary to permit setting of the tack coat. Apply the bituminous tack coat only as far in advance of the placing of the overlying layer as required for that day's operation. Maintain and protect the treated surface from damage until the succeeding course of pavement is placed.

3.04 CURING PERIOD

A. Following application of the bituminous material and prior to application of the succeeding layer of pavement, allow the bituminous coat to cure and to obtain evaporation of any volatiles or moisture. Maintain the coated surface until the succeeding layer of pavement

is placed, by protecting the surface against damage and by repairing and recoating deficient areas.

3.05 SAMPLING AND TESTING

A. Perform sampling and testing by an approved commercial testing laboratory or by facilities furnished by the Contractor. No work requiring testing will be permitted until the facilities have been inspected and approved.

B. SAMPLING

1. The samples of bituminous material, unless otherwise specified, shall be in accordance with ASTM D 140/D 140M or AASHTO T 40. Sources from which bituminous materials are to be obtained shall be selected and notification furnished the Engineer within 15 days after the award of the contract.

C. CALIBRATION TEST

1. Furnish all equipment, materials, and labor necessary to calibrate the bituminous distributor. Calibration shall be made with the approved job material and prior to applying the bituminous coat material to the prepared surface. Calibrate the bituminous distributor in accordance with ASTM D 2995.

3.06 TRAFFIC CONTROLS

A. Keep traffic off surfaces freshly treated with bituminous material. Provide sufficient warning signs and barricades so that traffic will not travel over freshly treated surfaces.

*** **END OF SECTION** ***

32 12 16 ASPHALTIC CONCRETE PAVEMENT

1.00 GENERAL

1.01 SCOPE

A. This Section governs furnishing labor, material, and equipment necessary to complete the paving application of asphaltic concrete as specified herein and as shown on the Drawings.

2.00 PRODUCTS

2.01 MATERIALS

A. All materials shall conform to Item 340 to the Texas Department of Transportation 1993 Specifications. Paving mixture shall be Type D (fine grade surface course), placed by a mechanical laydown machine. Surfacing shall meet the requirements of the typical cross section or not less than a thickness of one and one-half inches.

3.00 EXECUTION

3.01 PREPARATION

A. Immediately before the asphaltic surface mixture is overlaid, it shall be swept with a mechanical broom and a tack coat shall be applied.

3.02 HAULING AND SPREADING

A. The asphaltic concrete mixture, heated and prepared as specified, shall be hauled to the work in tight vehicles previously cleaned of all foreign material, and if considered necessary by ENGINEER, covered with canvas of sufficient size to protect the entire load. The dispatching of the vehicle shall be so arranged so that all material delivered may be placed and shall have received its initial rolling in course, which has been tack coated as specified and shall be free from all foreign materials. All contact surfaces of curbs and structures and all joints shall be painted with a think uniform coating of cut-back or emulsified asphalt as required for tack coating. The mixture shall be at a temperature of 250° to 375° F when laid, and shall be dumped and spread on the prepared surface with a spreading and finishing machine.

3.03 ROLLING

A. While still hot, and as soon as it will bear the roller without undue displacement or hair cracking, the surface shall first be compressed thoroughly and uniformly with an acceptable power-driven 3-wheel roller weighing not less than ten (10) tons. The weight on the two rear wheels of this roller shall be obtained by a power-driven tandem roller weighing not less than eight (8) tons.

3.04 HAND TAMPING

A. Hand tamping will be required along curbs, headers, inlets, etc., or in any area that does not allow thorough compaction by the roller. The asphaltic mixture shall be compacted with the use of lightly oiled hand tampers.

3.05 SURFACE TESTS

A. The surface of the pavement after compression shall be smooth and true to the established line and grade and typical cross sections shown on the Drawings and when tested with a standard sixteen-foot (16') straight-edge laid parallel to the center line of the roadway shall have no deviation in excess on one-sixteenth-inch (1/16") per foot from the nearest point of contact, and the maximum ordinate measured from the face of the straight-edge shall not exceed one-fourth inch (1/4") at any point. Any areas of the surface not meeting these requirements shall be immediately corrected as directed. After final compaction, the surface course at not point shall have a density of less than ninety-three percent (93%) of a voidless pavement composed of the same materials in like proportions, disregarding the internal voidage of the particles of mineral aggregate.

3.06 CONSTRUCTION JOINTS

A. Placing of the surface course shall be as nearly continuous as possible, and the roller shall pass over the unprotected end of the freshly laid mixture only when the laying of the course is discontinued for such length of time as to permit the mixture to become chilled. In all such cases, when the work is resumed, the material laid shall be either cut back so as to produce a slightly beveled edge for the full thickness of the course or a suitable lap joint shall be made.

3.07 OLD MATERIAL

A. The old material which has been cut away shall be removed from the work and the new mix laid against the fresh cut, compressed thoroughly and uniformly, and finished to grade to produce a smooth surface.

3.08 OPENING TO TRAFFIC

A. Except in an emergency, or where shown on the Drawings, no portion of the finished wearing course shall be opened to traffic until twelve (12) hours after completion of the rolling.

4.00 MEASUREMENT AND PAYMENT

4.01 MEASUREMENT

A. Surface Course: The Work covered by this Section shall be measured by the square yard of Hot Mix Asphaltic Concrete Surfacing of the type or types constructed to the thickness specified on the Drawings.

B. Tack Coat: Cut-back or emulsified asphalt used in the tack coat will be measured by the gallon of material actually used on the street for this purpose and shall be based on measurements taken at the point of delivery on the street.

4.02 PAYMENT

A. Unit Price Per Square Yard: Asphaltic concrete pavement, measured as described above, shall be paid for at the unit contract price bid per square yard as set forth in the BID for "Hot Mix Asphaltic Concrete Surfacing", which price will be full compensation for quarrying, furnishing all materials for heating, mixing, hauling, placing, asphaltic mixture, rolling and finishing, and for all labor, tools, equipment and incidentals necessary to complete the work, including work and materials involved in the application of the prime and tack coats.

B. Thickness: When the Drawings and/or the Bid Proposal call for the asphaltic concrete surfacing to be paid for by the square yard, payment will be made on the thickness indicated, provided the average thickness determined by test cores is within five percent (5%) of the thickness specified.

C. Thickness Variation: Should the average thickness as determined by test cores be more or less than the thickness specified (beyond the limits above set forth) CONTRACTOR shall be paid for at a price per square yard which bears the same ratio to the thickness bid upon provided that this square yard price adjustment shall be limited to a lower limit of ninety percent (90%) and an upper limit on one hundred and five percent (105%) of the Bid Price. Thickness resulting in a ratio below ninety percent (90%) shall require the placement of another asphalt lift and the upper limit shall no longer apply in the affected paved area.

D. Lump Sum: When the Proposal is a lump sum contract the payment for "Asphalt Pavement" shall be part of the lump sum price. No price adjustment shall be made for thickness (within the limits noted in paragraph 4.02 A.1)

*** **END OF SECTION** ***

32 12 16.13 PLANT-MIX ASPHALT PAVING

1.00 GENERAL

1.01 SUMMARY

A. Materials, testing and Equipment for the installation of Hot Mix Asphalt Pavement (HMAC).

1.02 RELATED REQUIREMENTS

A. The General Conditions, the Supplementary Conditions, and Division 01 Specifications apply to each specification section.
B. Division 31 of these specifications
C. Division 32 of these specifications
D. Applicable Standards:
   1. Texas Department of Transportation (TxDOT): 2014 Standard Specifications for Construction of Highways, Streets and Bridges.
      i. Item 247 Flexible Base.
      ii. Item 276 Cement Treatment (Plant-Mixed).
      iii. Item 292 Asphalt Treatment (Plant-Mixed).
      iv. Item 300 Asphalt, Oils, and Emulsions.
      v. Item 310 Prime Coat.
      vi. Item 340 Dense-Graded Hot-Mix Asphalt.
   2. Test Procedures:
      i. TEX-120-E Soil-Cement Testing.
      ii. TEX-204-F Design of Bituminous Mixtures.
   3. ASTM International (ASTM):
      i. D7113 Density of Bituminous Paving Mixtures In Place by the Electromagnetic Surface Contact Methods
      ii. D2950 Density of Bituminous Concrete in Place by Nuclear Methods c.D2726 Bulk Specific Gravity and Density of Non-Absorptive Compacted Bituminous Mixtures

1.03 DEFINITIONS

A. Hot Mix Asphalt Paving Terminology: Refer to ASTM D 8 for definition of terms.

2.00 GENERAL

2.01 SECTION REQUIREMENTS

A. Submittals: Product Data and hot-mix asphalt design mixes for each mix to be used
B. Asphalt-Paving Publication: Comply with AI MS-22, "Construction of Hot Mix Asphalt Pavements," unless more stringent requirements are indicated.
C. Qualification Data: for each qualified Manufacturer and Installer.

3.00 PRODUCTS

3.01 MATERIALS

A. Flexible Base: TxDOT Item 247, Type A, Grade 2.
B. Asphalt Treated Base: TxDOT Item 292, Grade 1.
C. Cement Treated Base: TxDOT Item 276, Strength M.
D. Prime Coat: TxDOT Item 310.TxDOT Item 300, MC-30.
E. Tack Coat: TxDOT Item 300, RC 250 cutback asphalt, or
   i. Asphalt emulsion: SS-lh or CSS-lh per TxDOT Item 300.
F. Asphaltic Concrete: TxDOT Item 340, Type D HMAC.
   1. The hot mix asphaltic concrete pavement coarse aggregate shall be so crushed that a minimum of 80% of particles retained on #4 sieve shall have more than one crushed face when tested in accordance with test method Tex-413A (Particle Count). For Type "D" surface material, the asphaltic material shall form from 5to 8 percent of the mixture by weight. For Type "C" surface material, the asphaltic material shall form from 4 to 7 percent of the mixture by weight. For Type "B" base material, the asphaltic material shall form from 3.5 to 7 percent of the mixture by weight. For both surface and base material, the asphalt content used shall be that percent required to obtain optimum density. This percent asphalt shall be obtained from a mix design performed according to Texas Department of Transportation 2004 Standard Specifications. The actual asphaltic material contained in the delivered mix shall be within a ± 0.50% tolerance of the content specified in the mix design.

3.02 QUALITY ASSURANCE

A. Manufacturer Qualifications: Paving-mix manufacturer must be registered with and approved by authorities from TxDOT
B. Submit a TxDOT approved mix design for asphaltic concrete (TxDOT Test Method TEX-204-F) to the engineer a minimum of three days prior to paving. Do not use more than 20% Reclaimed Asphalt Pavement (RAP) in mix.
C. Regulatory Requirements: Comply with materials, workmanship, and other applicable requirements of the 2014 Edition TxDOT Standard Specifications for asphalt paving work.

3.03 MEASUREMENT AND PAYMENT

A. Measurement and payment provisions, as well as safety program submittals included in standard specifications do not apply to this work.

4.00 EXECUTION

4.01 PROJECT CONDITIONS

A. Environmental Conditions: Do not apply asphalt materials if subgrade is wet or excessively damp, if rain is imminent or expected before the time required for adequate cure, or if the following conditions are not met:
   1. Prime Coat: Minimum surface temperature of 60 deg F.
   2. Tack Coat: Minimum surface temperature of 60 deg F.

3. Asphalt Base Course: Minimum surface temperature of 40 deg F and rising at time of placement
4. Asphalt Surface Course: Minimum surface temperature of 60 deg F at time of placement

4.02 EQUIPMENT

A. General- All equipment shall be kept in proper working conditions. All equipment is subject to approval before use.
B. Rollers shall be of sufficient size and weight to obtain proper compaction without overworking the asphalt and causing the asphaltic matrix to deteriorate. Steel wheel and pneumatic tire rollers will be permitted. Pneumatic tire rollers shall be discontinued if excessive pickup of fines by roller tires occurs.
C. Paver shall be self-propelled and capable of performing this work in three or fewer passes. Asphalt shuttle-buggies are permitted, however asphalt windrows are prohibited. Paver shall have a heated screed and shall be capable of adjusting pavement thickness while in motion.
D. Trucks shall be of sufficient quality and quantity to continuously haul and supply asphalt to the paver during paving operations. Overweight loads are prohibited. Local roads shall not be used as a haul route.

4.03 PAVING

A. The contractor shall arrange their paving to provide hot joints wherever possible. Where it is necessary to leave a cold joint, the edge will be squared vertically and horizontally and compacted. Joints shall be staggered so that they fall at least 12" from the previous joint. At the seams where the new HMAC meets the existing HMAC, concrete headers, valley gutters, or curb & gutter, a tack coat (RC-250) shall be applied to the seams at a rate of 0.05 Gal/SY.
B. Asphalt laid adjacent to gutter lines shall meet the existing grade unless the engineer waives this requirement. All driveway and intersections shall have asphalt laid in such a way as to prevent bumps or dragging.
C. Turn-out paving at driveways and intersections shall be allowed as indicated by the city representative.
D. Transitions to existing pavement shall be constructed according to the plans.
E. Milling work at intersections with other hard surface roadways will include the entire width of the traveled area.
F. Uniformly compact the pavement to the density requirements of the specification. Use the control strip method given in Tex-207-F, Part IV, to establish the rolling pattern. Do not use pneumatic-tire rollers if excessive pickup of fines by roller tires occurs. Unless otherwise directed, use only water or an approved release agent on rollers, tamps, and other compaction equipment. Where specific air void requirements are waived, furnish and operate compaction equipment as approved. Use tamps to thoroughly compact the edges of the pavement along curbs, headers, and similar structures and in locations that will not allow thorough compaction with rollers. The Engineer may require rolling with a trench roller on widened areas, in trenches, and in other limited areas.
G. Complete all compaction operations before the pavement temperature drops below 160°F, unless otherwise allowed. The Engineer may allow compaction with a light finish roller operated in static mode for pavement temperatures below 160°F.

H. Allow the compacted pavement to cool to 160°F or lower before opening to traffic, unless otherwise directed. When directed, sprinkle the finished mat with water or limewater to expedite opening the roadway to traffic.

I. When installing Type "D" surface on a Type "C" coarse surface, or when installing Type "C" coarse surface on Type B" base, a tack coat (RC-250) shall be applied on the previously constructed HMAC if the HMAC has been in place for over 3 days, or if required by the Engineer. The tack coat shall be applied at a rate not to exceed 0.05 Gal/SY and rolled with a pneumatic roller. Tack coat shall be considered incidental to other bid items. When installing Type "C" HMAC on a flexible base, or when installing Type "B" HMAC on subgrade, a prime coat (MC-30 or AE-P (EPRI or equal)) shall be applied at a rate of 0.25 Gal/SY to the base material or subgrade material.

J. Type "D", Type "C", and Type "B" HMAC will be installed with an approved HMAC laying machine, unless otherwise approved by the Engineer. A motor grader is not approved to install HMAC. The Contractor shall use 2" thick, compacted Type "D" HMAC when constructing Hot Mix pavements unless shown otherwise on the Plans. Refer to TxDOT Item 340 for HMAC.

K. Storage of the completed mix upon the ground will not be permitted at the mixing plant or the job site. Any mix that comes into contact with earth or other objectionable foreign matter shall be rejected.

L. Tickets shall be supplied to the Owner and or Engineer upon request and must show the following: Date and Time of Material Origin, Name and Location of Plant and type of material installed.

M. Do NOT pave over utility covers. Any utilities which are covered during paving operations and not corrected prior to the cooling of the mat shall result in liquidated damages of $500.00 per incident.

N. Should conflicts arise between standard specifications of government agencies mentioned herein and Contract Documents, Contract Documents shall govern.

O. All work under this contract shall be done within street right-of-way. Upon completion of the project, the contractor shall leave all areas within the right-of-way free from tack coat spills, surplus asphaltic concrete from the paving operation or from cleaning of paving machine, and/or any other debris associated with the paving operation. It will be the responsibility of the contractor to restore any items (i.e. curbs, sidewalks, driveways, shrubbery, mailboxes, utility facilities, etc.) within the right-of-way damaged due to the paving process.

P. Contractor shall provide all traffic control necessary for the safety of the public.

4.04 INSTALLATION TOLERANCES

A. Thickness: Compact the base material and each pavement course to achieve the thickness specified within the following tolerances.
   1. Base Material: plus or minus 3/4 IN.
   2. Base Course of Asphaltic Concrete: plus or minus 1/2 IN.
   3. Surface Course: plus or minus 1/4 IN.
   4. Surface Smoothness: Compact the base material and each pavement course to produce a surface smoothness within the following tolerances:
   5. Base Material: plus or minus 1/2 IN.

6. Base Course: plus or minus 1/4 IN.
7. Surface Course: plus or minus 1/8 IN.
8. Crowned Surface: plus or minus 1/4 IN when measured with a crown template set centered and at a right angle to the crown.

4.05 FIELD QUALITY CONTROL

A. General:
   1. All testing must be performed under observation of CITY.
B. Provide all testing that are referred to in TxDOT items as being performed by Engineer.
C. Test compaction density and moisture content of Flexible Base and Cement Treated Base in place according to ASTM Dl556, ASTM D2167, ASTM D2937, and ASTM D6938 as applicable.
D. Testing Interval: one test per 1,000 SY per lift of base in place.
   1. Remove and replace base materials where test results indicate that it does not comply with specified requirements.
E. In-Place Asphalt paving mixture Testing:
   1. Interval: One test per 1,000 SY minimum per lift installed and compacted.
F. Thickness: In-place compacted thickness of hot-mix asphalt courses will be determined according to ASTM D3549.
G. Surface Smoothness: Finished surface of each hot-mix asphalt course will be tested for compliance with smoothness tolerances. Spot checks may be conducted by using a 10-foot straightedge applied transversely or longitudinally to paved areas.
H. Remove and replace or install additional hot-mix asphalt at no additional cost to CITY where test results or measurements indicate that it does not comply with specified requirements.

*** **END OF SECTION** ***

32 16 13 CONCRETE CURBS, GUTTERS, SIDEWALKS AND DRIVEWAYS

1.00 DESCRIPTION

1.01 SCOPE

A. This item includes curb, gutter, combined curb and gutter, sidewalks and/or driveways, with or without reinforcing steel composed of Portland cement concrete constructed on approved subgrade, foundation material or finished surface in accordance with the lines and grades established by the ENGINEER and in conformance with the details shown on the plans.

B. As used in this item, the work "curb" refers to concrete curb, concrete gutter and combined concrete curb and gutter.

1.02 RELATED SECTIONS

A. SECTION 03 31 00- Structural Concrete

2.00 PRODUCTS

2.01 PRODUCTS

A. Concrete used in conventionally formed and extruded construction shall meet the requirements of Specification 03 31 00, Structural Concrete.

B. Reinforcing steel, if required, shall conform to the requirements of Specification 03 31 00, Structural Concrete.

C. Membrane curing materials shall meet the requirements of Specification 03 31 00, Structural Concrete.

3.00 EXECUTION

3.01 GENERAL

A. All concrete placed when ambient temperatures are 50 degreed Fahrenheit or lower shall contain 7% +/- 1-1/2% entrained air. The completed work shall be cured for a period of not less than 72 hours in accordance with the requirements Specification 03 31 00, Structural Concrete. Blankets or other means of protecting the core heat of the concrete shall be used in these conditions. Salts will not be allowed to raise the internal temperature of the concrete.

B. Wheelchair ramps shall be provided as shown in the plans and shall meet the requirements of the Texas Architectural Barriers Act. See drawings for additional details.

3.02 RESTORATION OF SURFACES

A. Replace or repair sidewalks, driveway culverts, inlets, curbing, gutters, shrubbery, trees, fences, sod and other like obstructions removed or disturbed, to the condition equivalent to or better than that existing prior to commencement of this work. Use concrete having a compressive strength of not less than 3,000 psi in 28 days for the replacement of curbing, gutters, inlets and sidewalks.

B. Use reasonable care in the removal and replacement of shrubbery and trees designated to be replaced at original locations. Where at all possible, ditch alignment will be such as to minimize this work. The restoration of asphalt-topped flexible base and concrete streets shall be as specified under other items of the specifications.

3.03 CONVENTIONALLY FORMED CONSTRUCTION

A. The subgrade, foundation, or pavement surface shall be shaped to the line, grade and cross-section and if considered necessary by the ENGINEER, had tamped and sprinkled. If dry, the subgrade or foundation material shall be sprinkled lightly immediately before concrete is deposited thereon.
B. Outside forms shall be of wood or metal, of a section satisfactory to the ENGINEER, straight, free of warp and of a depth equal to the depth required. They shall be securely staked to line and grade, and maintained in a true position during the depositing of concrete. Inside forms for curbs shall be of approved material, shall be of such design as to provide the curb required and shall be rigidly attached to the outside forms.
C. The reinforcing steel, if required, shall be placed in the position shown by the plans. Care shall be exercised to keep all steel in its proper location.
D. After the concrete has been struck off and after it has become sufficiently set, the exposed surfaces shall be thoroughly worked with a wooden float. The exposed edges shall be rounded by the use of an edging tool to the radius indicated on the plans. Unless otherwise specified on the plans, when the concrete has become sufficiently set, the inside form for curbs shall be carefully removed and the surface shall be plastered with a mortar consisting of one part of Portland cement and two parts of fine aggregate. The mortar shall be applied with a template made to conform to the dimensions as shown on the plans. All exposed surfaces shall be brushed to a smooth and uniform surface.

3.04 SIDEWALKS

A. Sidewalks shall be constructed in sections of the lengths shown on the plans. Unless otherwise provided by the plans, no section shall be of a length less than 8 feet. Any section less than 8 feet shall be removed by the CONTRACTOR at CONTRACTOR's expense. The different sections shall be separated by a pre-molded or board joint of the thickness shown on the plans, placed vertically and at right angles to the longitudinal axis of the sidewalk. Where the sidewalks or driveways abut a curb or retaining wall, approved expansion material shall be placed along their entire length. Similar expansion material shall be placed around all obstructions protruding through sidewalks or driveways. Sidewalks shall be marked into separate sections, each 4 feet in length, by the use of approved jointing tools.
B. Curbs, gutters and curb and gutters shall be placed in sections of 50 foot maximum length unless otherwise shown on the plans. Joints shall be constructed at such locations and of the type as directed and specified on the plans.

3.05 EXTRUDED CONSTRUCTION

A. The concrete shall be placed by an extrusion machine approved by the ENGINEER. When placement is directly on subgrade or foundation materials the foundation shall be hand tamped and sprinkled if considered necessary by the ENGINEER. If the concrete is placed directly on the surface material or pavement, such surface shall be thoroughly cleaned. If required by plan details, the cleaned surface shall then be coated with an approved or other coating as specified at the rate of application shown.
B. The line shall be maintained from a guideline set by the CONTRACTOR. The outline shall strictly conform to the details shown on the plans. The forming tube of the extrusion machine shall be readily adjustable vertically, during the forward motion of the machine to provide variable heights necessary to conform to the established grade line. To provide a continued check on the grade, a pointer or gauge shall be attached to the machine in such a manner that a comparison can be made between the extruded work and the guideline. Other methods may be used if approved by the ENGINEER.
C. The mix shall be fed into the machine in such a manner and at such consistency that the finished work will present a well compacted mass with a surface free from voids and honeycomb and true to the established shape, line and grade.
D. Any additional surface finishing specified and/or required shall be performed immediately after extrusion. Joints shall be constructed at such location as directed by the ENGINEER and to the details shown on the plans.
E. When sidewalks are to be placed adjacent to a curb or a curb and gutter, the sidewalk and curb or curb and gutter may be placed monolithically in one pass of the machine, provided the work is satisfactory to the ENGINEER.

4.00 MEASUREMENT AND PAYMENT

4.01 MEASUREMENT

A. Work and accepted material as prescribed by this item for concrete curb, concrete gutter or concrete curb and gutter will be measured by the linear foot, complete in place.
B. Work and accepted material as prescribed by this item for concrete sidewalk shall be measured by the square yard of surface area, complete in place, as indicated on the plans.
C. Work and accepted material as prescribed by this item for concrete driveway, shall be measured by the square yard of surface area, complete in place.

4.02 PAYMENT

A. The work performed and the materials furnished as prescribed by this item and measured as provided under measurement will be paid for at the unit price bid for "Concrete Curb", "Concrete Gutter" of the type indicated on the plans or for "Concrete Sidewalks" of the width when indicated on the plans, or "Concrete Driveways".
B. The price for each item shall be full compensation for cleaning and coating the base; furnishing and applying all water, mortar, adhesives or other material, including reinforcing steel and dowel bars, if required; for furnishing, loading and unloading,

storing, hauling and handling all ingredients including all freight and royalty involved; for mixing, placing, finishing, sawing, cleaning and sealing joints and curing all concrete; for furnishing all materials for sealing joints and placing joints and joint filler material in proper position; and for all manipulations, labor, equipment, appliances, tools, traffic provisions and incidentals necessary to complete the work.

*** **END OF SECTION** ***

33 05 16 CONSTRUCTION OF UNDERGROUND UTILITIES

1.00 GENERAL

1.01 SUMMARY

A. This item includes all excavation required for the construction of sanitary sewers, storm sewers, water lines, sewer structures, pipe culverts, appurtenances and connections and for the backfilling around completed utilities to the level of the original ground, all in conformity with the locations, lines and grades shown on the plans or as given by the ENGINEER and in accordance with these specifications. This item also governs any necessary pumping or bailing and drainage and all sheeting and bracing of trench walls. Also governed by this item are the cutting and restoration of pavement and base courses, the furnishing and replacing of cement stabilized backfill, the hauling and disposing of surplus materials and the bridging of trenches and other provisions for maintenance of traffic or access as provided herein.

1.02 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 unit prices 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 incidental and subsidiary to unit cost items within the Bid Proposal and no additional payment shall be made for subsidiary items.

1.03 RELATED SECTIONS

A. SECTION 31 32 13- Cement Stabilized Sand Backfill

2.00 PRODUCTS (not used)

3.00 EXECUTION

3.01 EXCAVATION AND TRENCH PREPARATION

A. Excavate trench to the alignment and depth required. Brace the trench and drain, as required, so that the work may be accomplished safely and efficiently. If necessary, install a dewatering system to provide a dry trench bottom. Pumps shall discharge into natural drainage channels or to drains. Shoring for excavations and trenches shall meet the requirements of the latest edition of OSHA Regulation 1926, Subpart P, and the Item, Trench Safety Systems.

B. Trench widths shall be in accordance with the Trench Safety Plan.

C. Side sloping or benching of the trench, where permitted, will begin at one foot above the top of the pipe and will not encroach upon private property or endanger existing or future structures or underground utilities. Depth of trench, without sheeting or bracing shall comply with OSHA Regulation 1926.650 and all other applicable state and federal regulations.
D. The full width of the trench shall be excavated to a depth below the invert elevation of the pipe so as to permit placing the bedding material specified by Plan Details. Any additional depth excavated by the CONTRACTOR shall be replaced with an equal depth of cement stabilized sand. The cost of this additional material, in place shall be at the expense of the CONTRACTOR.
E. Where necessary, excavations shall have sheeting and bracing to prevent caving. At these locations, increase the trench width as required and leave the sheathing in place until the pipe has been laid and the backfill compacted to a depth of 2 feet over the pipe. All sheeting and bracing shall be designed and installed to the requirements of the latest edition of the OSHA Standard 1926, Subpart P.
F. Utilities shall not be constructed or sewer pipe laid in the presence of water. All water shall be removed from the excavation sufficiently prior to the sewer placing operation to insure a dry, firm bed on which to place the sewer and shall be maintained in such unwatered condition until all concrete and mortar is set. Removal of water may be accomplished by bailing, pumping or by a well-point system as conditions warrant.
G. In the event that the excavation cannot be dewatered to the point where the pipe subgrade is free of mud, wet sand construction methods may be used, as directed by the ENGINEER.
H. For unstable conditions requiring outside forms, seals, sheeting, and bracing, or where groundwater is encountered, any additional excavation in width and backfill required shall be done at the CONTRACTOR's expense.
I. Portable trench boxes may be used in lieu of sheeting. The trench box must be in accordance with OSHA Regulation 1926.650.
J. Use of the trench box does not relieve the CONTRACTOR of any liability for damages to person or property. When a trench box is moved, the jointed pipe or in-place backfill shall not be disturbed.
K. All materials from excavation operations not required for backfilling, if considered suitable shall be placed in embankments or wasted, in accordance with Section 31 10 10 – Earthwork. All material not suitable for use in embankments will be declared surplus by the ENGINEER and shall become the responsibility of the CONTRACTOR to dispose of in a legal manner. Such surplus material shall be promptly removed from the work following the completion of the portion of the utility involved. No separate payment shall be made for disposal of this surplus material.
L. ENGINEER may limit the amount of trench opened or partially opened at any time in advance of the completed pipe laying operation and the amount of trench left unfilled. Open no more than 500 feet of trench on any street at any one time.

3.02 PIPE LAYING

A. No pipe shall be laid in water or when the trench conditions or weather is unsuitable for such work, unless specifically approved by the ENGINEER.
B. Non-pressure concrete and vitrified clay pipe shall be laid with the ends abutting and true to line and grade. Fit and lay the pipe to form a smooth and uniform invert. Laying of pipe shall commence at the lowest point, so that the spigot ends point in the direction of flow. Lay all sewer pipe on firm cement sand foundation with bell ends facing the direction of laying.
C. All other types of pipe shall be laid in accordance with the applicable provisions of this specification, or in accordance with the Special Provisions preceding this item.
D. Cut cast iron pipe with wheel-type cutters or cold chisel. Cut ductile iron pipe with wheel-type cutters. Flame cutting of cast iron or ductile iron pipe is not allowed. Make cuts in a neat and workman-like manner without damage to pipe and so as to leave a smooth end at right angles to axis of pipe. Field cutting of Polyvinyl Chloride or A.B.S. type resin pipe shall be in accordance with the pipe manufacturer's recommendations.
E. Minor deflections may be obtained in pipe joints. CONTRACTOR must obtain approval when the degree of deflection is necessary to deflect from a straight line.
F. Where major deflections in concrete pipe are necessary, use sections of pipe with beveled ends for deflections not greater than five degrees. For deflections greater than five degrees, use fabricated fittings for concrete pressure pipe, use cast iron fittings for cast iron pipe, and use PVC or cast iron fittings for polyvinyl chloride pipe.
G. When the pipe laying operation is halted, seal the open end of the pipe with a Temporary plug. Plug is to remain in place until the pipe laying operation re-commences.
H. Standard plugs shall be inserted into bells of all dead end pipe.
I. For gravity pipelines, bedding shall be installed per Plan Details.

3.03 BACKFILLING

A. As soon as practicable after completion of laying and jointing of pipe, backfill the trench. Not more than 500 feet of the trench shall be left open after laying the pipe.
B. Trenches shall be backfilled in accordance with the Contract Details. Cement stabilized sand shall be in accordance with Section 31 32 13- Cement Stabilized Backfill.

3.04 RESTORATION OF SURFACES

A. Replace or repair sidewalks, driveway culverts, inlets, curbing, gutters, shrubbery, trees, fences, sod and other like obstructions removed or disturbed, to the condition equivalent to or better than that existing prior to commencement of this work. Use concrete having a compressive strength of not less than 3,000 psi in 28 days for the replacement of curbing, gutters, inlets and sidewalks.
B. Use reasonable care in the removal and replacement of shrubbery and trees designated to be replaced at original locations. Where at all possible, ditch alignment will be such as to minimize this work. The restoration of asphalt-topped flexible base and concrete streets shall be as specified under other items of the specifications.

3.05 CLEAN-UP

A. The CONTRACTOR shall remove from the site of the work and from public and private property temporary structures, rubbish, and waste materials, including excess excavated materials. The CONTRACTOR is responsible for disposing of all surplus earth. The pipe laying operation shall be temporarily suspended if the clean-up is further behind than 2,000 feet.

3.06 QUALITY ASSURANCE

A. The Materials ENGINEER will determine the moisture density relationship in accordance with ASTM D698 on material secured from the trench excavation or from the supplier of cement stabilized sand. Samples secured from the cement stabilized sand supplier shall be blended with Portland cement in accordance with Section 31 32 13- Cement Stabilized Sand Backfill.

B. The Materials ENGINEER will determine the in place density in accordance with ASTM Methods D2922 or D1556. The minimum level of testing will consist of at least one test for each 200 linear feet of trench per lift of backfill.

4.00 MEASUREMENT AND PAYMENT

A. Payment. There will be no separate measurement and payment for work performed under this section. Cost of work will be included in contract price bid for the various types of utility installation.

***** END OF SECTION *****

33 11 00 WATER DISTRIBUTION FACILITIES

1.0 GENERAL

1.01 SUMMARY

A. This Section covers the construction of potable water distribution facilities including water mains, fire hydrants, flushing valves, and service connections. In addition to these standards, all public drinking water systems will be provided in accordance with the current Rules and Regulations of the Texas Commission on Environmental Quality ("TCEQ") and American Water Works Association ("AWWA") Standards.

1.02 MEASUREMENT AND PAYMENT

A. MEASUREMENT:
   1. Water Mains: Water mains, installed and accepted as prescribed, will be measured by the linear foot in place without deductions for valves, fittings and intersections.
   2. Tapping Sleeves & Valves: Tapping sleeves and valves, installed and accepted as prescribed, will be measured as each assembly to include sleeve and valve.
   3. Gate Valves & Boxes: Gate valves, installed and accepted as prescribed, will be measured as each valve including the valve box and cover.
   4. Blowoff Valves: Blowoffs, installed and accepted as prescribed, will be measured as each assembly to include pipe and valve.
   5. Fittings: Cast iron fittings will not be measured for payment. Include cost in the contract prices for the various component parts.
   6. Wet Connections: Wet connections will be measured as each connection to an existing line.
   7. Excavation and Backfill: Excavation or backfill performed under this Section will be not be measured for payment. Include cost in the contract prices of the various component parts.
   8. Cement Stabilized Backfill: Cement stabilized sand backfill performed under this Section will not be measured for payment. Include cost in the contract prices of the various component parts.

B. PAYMENT. General: Work performed and materials furnished as prescribed by this Section, measured as specified, will be paid for as follows:
   1. Water Mains: Water mains will be paid for at the unit price bid for "Water Main" of the size and type specified; which price shall be full compensation for all pipe, fittings and jointing materials, thrust blockings for all excavation and disposal of excavated material, for all testing and chlorination and for all labor, tools, equipment and incidentals necessary to complete the Work.
   2. Fire Hydrants: Fire hydrant assembly, gate valves, fittings, tapping sleeves and valves, blowoffs and wet connections of the various types, sizes and classes shown in the proposal will be paid for at the unit prices bid for each of the various items; which prices shall be full compensation for furnishing all material, for installation, for

thrust blocking where required, and for all labor, tools and incidentals necessary to complete the Work.

3. Concrete Thrust Blocking: No direct payment will be made for concrete for thrust blocking and other incidental Work for which pay items are not shown in the proposal except as provided for "Changes and Alterations" and "Extra Work" in the "General Conditions of Agreement."
4. Welded Steel Specials: No direct payment will be made for bends, tees, gaskets and other specials required for welded steel water main.
5. Boring & Jacking: Extra Work and materials involved in jacking or boring water mains and other special Work where specific pay items are shown in the Bid Proposal will be paid for at the unit prices bid for such items, which prices shall be full compensation for all extra Work, materials and incidentals required.

1.03 REFERENCES

A. All potable water distribution systems shall be installed and constructed in accordance with current TCEQ, and AWWA Standards, and current applicable governing authority's Design Standards, Standard Specifications, and Standard Construction Details for Water Lines.

1.04 RELATED SECTIONS

A. SECTION 01 33 00 – Submittal Procedures
B. SECTION 31 32 13 – Cement Stabilized Sand Backfill

1.05 SUBMITTALS

A. Submittals shall conform to requirements of SECTION 01 33 00 – Submittal Procedures.
B. Submittals shall provide sufficient data for ENGINEER to evaluate the information properly.
C. Submit Shop Drawings showing design of new pipe and fittings indicating dimensions, fabrication, fittings, flanges, joint details and other special details.
D. Provide manufacturer's certification that pipe and fittings has been factory tested and meets applicable standards and provisions of this Section.

2.00 PRODUCTS

2.01 GENERAL

A. All pipe installed within dedicated public rights-of-way or easements shall be PVC water pipe AWWA C900 (DR 18) or AWWA C909 (DR 18) for sizes four inches (4") through twelve inches (12"), PVC water pipe AWWA C905 (DR 18) for sizes fourteen inches (14") through twenty inches (20"), or ductile iron pipe AWWA C151/A21.51 (Class 52) for sizes four inches (4") through forty-eight inches (48"), in conformance with material Specification of this Section. All service connections three-quarter inches (3/4") through two inches (2") shall be copper or polyethylene tubing in conformance with material

specifications set out herein. All internal coatings must conform to American National Standards Institute/National Sanitation Foundation ("ANSI"/"NSF") Standard 61 and must be certified by an organization accredited by ANSI.

B. The use of manufacturer's names and catalog numbers as may be used to describe various products is not intended to be proprietary, but merely to indicate clearly the respective type of material that can be accepted. Submittals for product acceptance must be directed to ENGINEER by CONTRACTOR.
C. OWNER reserves the right to engage, at any time during the progress of the Work, a Material Testing laboratory to test and inspect all pipe and accessories.
D. Pipe manufacturer shall have a performance history of a minimum of five (5) years of successful field installations with the proposed pipe diameter and type of joints.
E. Provide a minimum of three-eighths-inch (3/8") inside joint recess between ends of pipe in straight pipe sections.
F. Where required by the Drawings provide approved restrained joint mechanisms for buried service as approved by ENGINEER.
G. Make curves and bends by deflecting joints. Do not exceed maximum deflection recommended by pipe manufacturer for pipe joints or restrained joints.
H. Provide flange adaptor with insulating kit as required when connecting new piping to existing piping and piping of different materials.

2.02 DUCTILE IRON PIPE

A. Provide ductile iron pipe centrifugally cast in accordance with the latest revision of AWWA C115/A21.15 (for flanged pipe) or the latest revision of AWWA C151/A21.51 (for push-on or other pipe).
    1. Ductile iron pipe shall have 60,000 psi tensile strength, 42,000 psi yield strength, and 10% minimum elongation.
    2. Threaded or flanged ductile iron pipe shall be thickness class 53 (minimum).
B. Ductile iron pipe with compression-type push-on connections shall be thickness class 52B.
C. Joints: Provide all pipe with joints of the type and size shown on the Drawings. Iron pipe shall be bell and spigot jointed where possible. Other jointing may be necessary for special applications when approved by ENGINEER.
    1. Provide and install flanged connections in accordance with the latest revision of AWWA C115/A21.15.
    2. Provide and install push-on type connections in accordance with the latest revision of AWWA C111/A21.11.
D. Interior Coating: The interior surfaces of all ductile iron pipe shall be cement mortar lined to standard thickness and sealed in accordance with the latest revision of AWWA C104/A21.4. The exterior surface of all ductile iron pipe shall be coated with coal tar or asphaltic base bituminous coating approximately one mil minimum thickness.
E. Gaskets: All gaskets shall be of natural or synthetic rubber conforming to AWWA C111/A21.11. Gaskets shall be provided by the manufacturer of the particular pipe being used.

F. Joint Lubricant: A joint lubricant shall be used, and applicable recommendation of the manufacture shall be followed.
G. Bolts & Nuts: Bolts for flanges or mechanical joints shall be corrosion resistant, low alloy, high strength steel bolts equal to “cor-ten”. In sizes for which “cor-ten” bolts may be used coated as follows: Bolts and nuts shall be immersed in Koppers super tank solution or approved equal, inserted and tightened in the joint while still wet, and all exposed parts touch up with a brush coat immediately after tightening. After an interval of at least one (1) hour, the entire joint shall be coated with Bitumastic #50, as specified under protective coatings.

2.03 STEEL CARRIER PIPE

A. General:
    1. Steel carrier pipe and fittings shall be used for special installations only. Pipe shall be new and manufactured in compliance with UL current specifications for “Steel Pipelines for Underground Water Service” and shall be acceptable, without penalty, to the “Texas Fire Insurance Commission” for use in water works distribution systems.
    2. All steel pipe intended for use as carrier pipe in the distribution system sizes four inches (4”) through twenty-four inches (24”) shall conform to the latest revision of AWWA C200, AWWA C203 and AWWA C206. Pipe shall be supplied in double random lengths unless otherwise specified. The ends of pipe shall be beveled for field butt welding.
B. Coatings for Buried Service: Pipe shall be coated interior with an ANSI/NSF Std. 61 approved epoxy coating of 8 mils DFT, and exterior in accordance with the latest revision of AWWA C203.
C. Coatings for Above-Ground Use: Where pipe is to be installed above ground the exterior is to receive a near white blast with two coats of ACRO 4460 epoxy covered with a third coat of ACRO 4428 polyurethane. See coatings section.
D. Minimum Wall Thickness: Minimum wall thickness shall be in accordance with the following:

Nominal Pipe Size	Outside Diameter	Minimum Wall Thickness	Weight Per Linear Foot
4”	4.50”	0.250”	11.35
6”	6.625”	0.280”	18.97
8”	8.625”	0.322”	28.55
10”	10.750”	0.365”	40.48
12”	12.750”	0.375”	49.56
16”	16.00”	0.375”	62.58
20”	20.00”	0.375”	78.60
24”	24.00”	0.375”	94.62

E. Steel Pipe Fittings: All steel pipe fittings four inches (4”) through twenty-four inches (24”) shall be factory forged fittings. All bends shall be long radius fittings unless otherwise specified. Ends shall be beveled for field butt welding. Wall thickness shall be equal to or greater than the pipe to which fitting is to be welded.
F. Steel Pipe Flanges: Steel pipe flanges shall conform to the latest revision of AWWA C207 for Class D flanges (same diameter and drilling as Class 125 cast iron flanges ASA B 16.1). All flanged joints made up between steel and cast iron flanges shall be maintained electrically isolated by means of the use of epoxy coated bolts, nuts and washers and an isolating type gasket unless otherwise stipulated.

2.04 POLYVINYL CHLORIDE (PVC) PIPE

A. General:
    1. All polyvinyl chloride (PVC) pipe smaller than four inches (4”) shall be of the rigid (unplasticized) type pressure rated at least 150 psi conforming to ASTM D2241 (Class 160) or ASTM D1785 (Schedule 40) And must bear the National Sanitation Foundation seal of approval for potable water pipe. Pipe laying lengths shall normally be twenty feet (20’).
    2. All polyvinyl chloride (PVC) pipe four inches (4”) through twelve inches (12”) shall be of the rigid (unplasticized) type pressure rated at least 150 psi conforming to AWWA C909 (CL 235) and must bear the National Sanitation Foundation seal of approval for potable water pipe. Pipe laying lengths shall normally be twenty feet (20’).
    3. All polyvinyl chloride (PVC) pipe fourteen inches (14”) through twenty inches (20”) shall be of the rigid (unplasticized) type pressure rated at least 150 psi conforming to AWWA C909 (CL 235), and must bear the National Sanitation Foundation seal of approval for potable water pipe. Pipe laying lengths shall normally be twenty feet (20’).
B. Joints:
    1. Each joint of pipe shall consist of a single continuous extrusion; bells or other components attached by solvent welding are not acceptable. Pipe shall have push-on, rubber gasket joints of the bell and spigot type with thickened integral bells, or of the double spigot type with thickened coupling sleeves with rubber gasket joints.
    2. The wall thickness of each pipe bell and joint coupling must be greater than the standard pipe barrel thickness. Clearance must be provided in every gasket joint for both lateral pipe deflection and for linear expansion and contraction. Rubber gaskets shall be of such a cross section that compression of the gasket within the pipe joint and water pressure within the pipe will cause a reaction by the gasket which tends to seal the joint. Gaskets shall conform to retaining grooves in the bell or coupling, shaped to position the gasket and aid in sealing the joint.

2.05 STEEL CASING PIPE

A. All pipe intended for use as casing pipe shall be manufactured in accordance with the specifications for steel carrier pipe except that the wall thickness may be reduced, and the compliance with UL and TFIC is not required.

Nominal Pipe Size	Outside Diameter	Minimum Wall Thickness	Weight Per Linear Foot
8”	8.625”	0.219”	19.64
10”	10.750”	0.219”	24.60
12”	12.750”	0.219”	29.28
14”	14.00”	0.219”	32.00
16”	16.00”	0.219”	36.86
20”	20.00”	0.250”	52.73
24”	24.00”	0.250”	63.41
30”	30.00”	0.250”	79.43

2.06 COPPER TUBING

A. General: All copper service tubing shall be annealed seamless Type K water tube rated at 150 psi working pressure, the tubing shall be homogeneous throughout and free from cracks, holes, crimping, foreign inclusions or other defects. It shall be uniform in density and other physical properties.

B. Reference Specification: This material will be supplied in conformance with ASTM specification B-88-62, Federal Specifications #WW-T-799, and applicable governing authority’s Specifications.

2.07 POLYETHYLENE TUBING

A. Description: All polyethylene (PE) plastic tubing shall be high density, high molecular weight plastic tubing pressure rated at 200 psi working pressure, and must bear the NSF seal of approval for potable water service.

B. PE tubing shall be manufactured to meet ASTM D2737 for Water Service Tubing, ASTM D2239 ID Controlled for Iron Pipe Sizes, and ASTM D3035 for OD Controlled Iron Pipe Sizes.

C. PE tubing shall be high density made from PE4710 resin, providing the highest strength pipe at the lightest weight.

D. The PE tubing shall be homogeneous throughout and free of cracks, holes, foreign inclusions or other injurious defects.

E. The manufacturer warranty shall be no less than 40 years against rot, rust, electrolytic corrosion, and defects in workmanship and materials.

2.08 SERVICE CONNECTING FITTING

A. General: All fittings used in Customer Service connections (tapping mains, connecting meters, etc.); must be approved by ENGINEER.

B. Couplings: Couplings shall be ductile iron epoxy coated, rating up to 300 psi, gasket ranges embossed on each gasket for identification, low alloy bolts and heavy hex nuts.
C. Corporation Stops: Corporation stops shall be new and made of brass conforming to Item 2.09, inlet ends shall be standard corporation stop thread as per the latest revision of AWWA C800, iron pipe thread, or locking insert type. Valve body shall be taper plug type, "O" ring seat ball type, or rubber seat ball type. Outlet end shall be flared copper connection for use with Type K soft copper or compression type fitting.
D. Curb Stops: Curb stops shall be new and conform to applicable governing authority's specifications. Inlet end shall be flared copper connection or compression type fitting. Valve body shall be straight through or angled meter stop design equipped with padlock wings and shall be of either of the "O" ring seal straight plug type or rubber seat ball type. Outlet shall be female iron pipe thread or swivel nut meter spud thread on three-quarter-inch (3/4") and one-inch (1") stops and two-hole flange on one-inch (1"), one-and-onehalf-inch (1-1/2") and two-inch (2") sizes.
E. Service Saddles: The saddle body must meet or exceed ASTM A536, Grade 65-45-12. Straps shall be Type 304 (180-8) heavy gauge brass per ASTM A240. Straps are two inches wide to spread out clamping forces on the pipe. GMAW and GTAW welds. Passivized for corrosion resistance. Casting shall be coated with fusion bonded black nylon, 10-12mils thick, with a dielectric strength of 1,000v/mil. Pressure ratings shall be as follows: Ductile iron, cast iron and steel pipe: rating or pipe up to 350 psi maximum, pipe sizes up through 24 inch, larger than 24 inch Commodity Code: 340-60; 658-00; 659-00; 670-00; 890-00 IFB# 12- 001. Water & Wastewater Fittings and Supplies 15 up to 30 inch pressure rating is 150 psi, PVC and asbestos cement pipe; rating of pipe, PVC up to 350 psi. Accepted manufacturer includes Cambridge equal or better.
F. Repair Clamps: Clamps shall be stainless steel full circle double band clamps with correct labeling on the clamp and box for identification. The lugs shall be ductile iron, epoxy coated, and gridded. Bolts and nuts shall be high strength low alloy steel track head bolts with at least one 7" starter bolt with 1" tall nut. Gasket material shall be or virgin SBR rubber compounded for water and sewer service in accordance with ASTM D 2000 MAA 610. Accepted manufacturers include Smith Blair equal or better.

2.09 BRASS GOODS

A. General: All brass stops, couplings, ends, connections, nipples, and miscellaneous brass pipe fittings and accessories used in meter connections, copper service lines, air release piping assemblies and wherever needed in the water distribution system, will be heavy wall design made of no lead material and shall conform to the standards set within the latest revision of AWWA C800. Parts not in contact with potable water may be made of other material suited for buried water services as specified in AWWA C800.
B. Treading and tolerances will be in accordance with latest revision of AWWA C800. All ball valve, couplings and adaptors will be pressure rated for 300 psi. Ball valves will be supplied with blowout proof stainless steel stems with double SBR, NBR or EPDM o-ring stem seal. Stem and cap assembly will be two-piece design and will withstand minimum 200 ftp of torque. Ball seats will be made with unfilled Teflon for resilience and minimal

friction. Ball will be uncoated lead free cast bass design. All ball valves will be factory tested in the open and closed position.

C. All waterworks fittings and ball valves will be guaranteed for a minimal 40 years against factory defects. All fitting will have a lifetime guarantee against lead leachate from the casting. “Washed” brass will not be acceptable. No lead fitting will be Cambridge Brass or approved equal.

D. Functional Requirements:
    1. Corporation stop thread (where used) shall conform to Table 1, Figure 1, AWWA C800 (corporation stops with iron pipe threads are also permitted). Iron pipe threads shall conform to ANSI B2.1-1960 and Table 9, Figure 9, of the latest revision of AWWA C 800.
    2. Copper fittings threads shall conform to Table 2 and 3, Figure 2 and 3 of the latest revision of AWWA C800 and ANSI B1.1960 with tolerance of Class 2 flanges shall conform to ANSI 6.1 Class 125 (or Class 250 where noted), as dimensions, drillings, etc.
    3. Fittings shall be suitable for use at hydrostatic working pressure up to 150 psi.

2.10 GRAY IRON AND DUCTILE IRON FITTINGS

A. General:
    1. Normally, all fittings are “All Bell” push-on joints; mechanical and/or flange joints may be necessary for special applications when approved by the City Engineer. All fittings shall be cement lined and seal coated with an asphaltic material inside and outside in accordance with the latest revision of AWWA C104.
    2. Use fittings of same size as pipe. Reducers are not permitted to facilitate an off-size fitting.

B. Cast Iron/Ductile Iron Flanged Fittings:
    1. Material:
        i. Cast Iron: ASTM A48, Grade 25B (2”-14”)
        ii. Ductile Iron: ASTM A536
    2. Pressure:
        i. 250 psi water working pressure for Cast Iron sizes 2”-12”
        ii. 250 psi water working pressure for Ductile Iron size 2”-48”
    3. Testing: In accordance with ANSI/AWWA C110/A21.10
    4. Laying Length: In accordance with ANSI/AWWA C110/A21.10
    5. Cement Lining: In accordance with ANSI/AWWA C104/A21.4
    6. Coating:
        i. Inside- tar coated (bituminous) in accordance with ANSI/AWWA C104/A21.4
        ii. Outside – Red or Black primer
    7. Approvals: 2”-16” UL listed and FM approved.
    8. Standards: ANSI/AWWA C110/A21.10

C. Ductile Iron Mechanical Joint Fittings Class 350
    1. Material: Ductile Iron ASTM A536

2. Pressure: 350 psi water working pressure (Class 350) for sizes 3”-24”
3. Testing: In accordance with ANSI/AWWA C153/A21.53 & UL – FM requirements
4. Laying Length: Short body design – straight section of body deleted to provide a compact and lighter fitting without reducing strength or flow characteristics, in accordance with ANSI/AWWA C153/A21.53
5. Cement Lining: In accordance with ANSI/AWWA C104/A21.4
6. Coating: Tar coated (bituminous) inside and out in accordance with ANSI/AWWA C104/A21.4
7. Gaskets: SBR in accordance with ANSI/AWWA C111/A21.11
8. T-Bolts: Low Alloy corrosion resistant high strength steel in accordance with ANSI/AWWA C111/A21.11
9. Approvals: 3”-16” UL listed and FM approved.

D. Ductile Iron Compact Fittings: Ductile iron compact fittings shall be cast in accordance with the latest revision of AWWA C153/A21.53.The working pressure rating shall be 350 psi.

2.11 GATE VALVES

A. General:
1. Unless otherwise approved, all valves four inches (4”) through twenty inches (20”) shall be resilient seated gate valves, manufactured to meet or exceed the requirements of the latest revision of AWWA C509.
2. Valves shall open counterclockwise as directed by OWNER. Verify correct configuration prior to ordering and installing the valves.
3. The wedge shall be fully encapsulated, inside and out, with EPDM rubber.
4. The stem shall have two O-ring seals above the thrust collar and one blow. The upper two O-rings must be replaceable with the valve under full working pressure.
5. The stem material shall be stainless steel, and must not contain any zinc, aluminum, or lead.
6. The waterway shall be full nominal size, without depressions, projections, or cavities.
7. All ferrous parts of the valve shall be coated and lined with a fusion bonded epoxy coating applied at the manufacturer’s location. All epoxy coatings shall be in accordance with the latest version of AWWA C550 and ANSI/NSF-61 Certified. All bolts and washers shall be stainless steel.
8. Bonnet bolts shall be installed by the Manufacturer so as to not be exposed to the environment. All gaskets shall be of the O-ring style. The bonnet gasket shall fully encapsulate the bonnet bolts so that the threads between the bonnet and the body are neither exposed to the environment or the water inside the gate valve. All valves shall be hydraulically tested and both sides of the closed wedge to full rated working pressure and against the body to twice the rated working pressure.
9. Where applicable, all valves shall be UL listed, ULC listed, and FM approved.

10. All valves shall be covered by a manufacturer's 10-year limited warranty. All valves shall be as manufactured by Mueller, equal or better.

2.12 BUTTERFLY VALVES

A. General: Unless otherwise approved, all valves twenty-four inches (24") and larger shall be butterfly valves manufactured to meet or exceed the requirements of the latest revision of AWWA C504, Standards for Rubber-Seated Butterfly Valves, Class 150 B for buried service.
B. Valves shall have flange connections on both ends unless otherwise called for. Valves shall have vertical operating stems underground operator and end covers shall be permanently sealed against ground water infiltration.
C. Valve seating shall be a true bubble tight sealing desired in a resilient seated valve. A 360° offset continuous seating surface shall be provided by a disc edge of synthetic rubber. The mating surface in the valve body, to this resilient seat, is a 304 stainless steel body ring. The disc shall be ductile iron with through shaft connections, stainless steel drive.
D. The rubber seat shall be so mounted that it can be replaced and/or adjusted without disassembling the valve or removing the valve from the pipeline. Valve body material shall be ASTM A126 Grade B cast iron.

2.13 VALVE BOXES

A. Provide buried valves with cast iron valve boxes of the extension sleeve type suitable for depth of cover over pipe as shown on the drawings. Furnish valve boxes at least five inches (5") in diameter, three-sixteenths inches (3/16") thick, with suitable Cast iron bases and covers. Coat all parts of valve boxes, bases and covers by dipping in hot bituminous varnish. Provide Mueller H-10360, two-piece screw-type valve box with base, top section and cover as required, or approved equal. Identify cover with the casting: WATER.

2.14 TAPPING SLEEVES

A. Mechanical joint cast iron tapping sleeve shall be used for four-inch (4") or larger connections to an existing water main. Tapping sleeve shall be suitable for use at hydrostatic working pressures of 200 psi. Outlet flange shall conform to class 135 ANSI B 16.1. Minimum lengths of tapping sleeves are recommended by the Uni-Bell PVC Pipe Association. Assembly and installation shall be in accordance to manufactures recommendation.

2.15 RESTRAINED JOINTS

A. Restrained Joints where required on DIP and PVC pipe shall meet the following requirement. Integral restrained joint systems may be allowed with approval by ENGINEER.

1. Restraint Devices: Manufacture of high strength ductile iron, ASTM A536 up to twenty-four inches (24”), and ASTM A36 for sizes greater than thirty inches (30”). Working pressure rating twice that of design test pressure.
2. Bolts & Connecting Hardware: High strength low alloy material in accordance with ANSI A21.11/AWWA C111.

3.00 EXECUTION

3.01 GENERAL

A. All pipe, fittings and accessories shall be shipped, stored, handled and installed in accordance with the manufacturer’s recommendations.
B. All ductile iron pipe and fittings shall be wrapped with 8 mils (minimum) polyethylene film meeting the latest revision of AWWA C105/A21.5 with all edges and laps taped securely to provide a continuous watertight wrap.

3.02 PIPE INSTALLATION

A. Preparation:
    1. Use pipe and materials for water mains of types specified, unless otherwise shown on the Drawings.
    2. Do not lay the pipe in water, or when trench or weather are unsuitable for Work, except with permission of ENGINEER. Keep water out of the trench until jointing is complete. When Work is not in progress, close end fittings securely so no trench water, earth or other substance will enter pipes or fittings.
    3. Keep the inside of the pipe free of foreign matter during operations by plugging or other approved method.
    4. Place pipe so the full length of each section rests solidly on the pipe bed, with recesses excavated to accommodate bells and joints. Take up and relay pipe when the grade or joint is disturbed after laying.
    5. Locate no joint less than nine feet (9’) from sanitary sewer main crossovers or manholes. Adhere to all TCEQ guidelines per TAC Chapters 217 and 290. Notify ENGINEER if clearances cannot be met and do not proceed with construction until an alternate design has been provided to meet all TCEQ requirements.
    6. Where pipe ends are left for future connections, install valves, plugs or caps as shown.
    7. Thoroughly clean and inspect each joint of pipe and fitting for damage or defects. Reject defective, damaged or unsound pipe and fittings and remove them from the site.
    8. Cut pipe twelve inches (12”) and smaller with standard wheel pipe cutters. Cut pipe larger than twelve inches (12”) in manner approved by ENGINEER. Make cuts smooth and at right angles to axis of pipe. Bevel plain end with heavy file or grinder to remove sharp edges.
    9. Lubricate gaskets with nontoxic water soluble lubricant before pipe units are joined. Fit pipe units together in manner to avoid twisting or otherwise

displacing or damaging rubber gasket. After pipe sections are joined, check gaskets to ensure that no displacement of gasket has occurred. If displacement has occurred, remove pipe section and remake joint as for new pipe. Remove old gasket, inspect for damage and replace if necessary before remaking joint.

10. Place concrete thrust restraints for blocking at each change in direction of existing water lines, to brace pipe against undisturbed trench walls. Finish placement of concrete blocking four (4) days prior to hydrostatic testing of pipeline.

3.03 BEDDING

A. Bank Run Sand: Bank run sand must be used for bedding as called for in these specifications and shall consist of soil classified as SP, SW or SM by the Unified Soil Classification System (USCS). The sand shall have a plasticity index when tested of less than 7% and shall have a liquid limit of 25 or less. Bank run sand shall have no more than 15% passing the No. 200 sieve when tested. The material shall be free of any roots, organic material, trash, clay lumps or other deleterious or other objectionable materials. For ease of construction, bank run sand may be used in place of native soil if approved by ENGINEER.

B. Gem Sand: Gem sand may be used as bedding material for water mains and shall generally conform to specifications for Course Aggregates specified for No. 8 size in ASTM Standard C33. Specifically, the aggregates shall be graded within the following limits.

Sieve Size	% Passing
3/8 inch	95-100
1/4-inch	60-80
No. 4	15-40
No. 10	0-5

1. The aggregates shall not consist of any roots, organic material, trash, clay lumps or other deleterious or other objectionable materials in excess of limits prescribed in the ASTM C33 Standard.

C. Crushed Limestone & Pea Gravel: Crushed limestone and pea gravel may not be used for bedding.

3.04 BACKFILL

A. Cement Stabilized Sand:
   1. Cement stabilized sand shall be used for backfill as called for in these Specifications, on the Drawings, or as directed by ENGINEER.
   2. The materials shall conform to SECTION 31 32 13 – Cement Stabilized Sand.

B. Earth or Native Soil: Earth or native soil backfill shall consist of soil containing no deleterious material to include trash, wood fragments, organics, or other objectionable material. The material may be from either the material removed from the excavation or

off-site sources. The material may consist of soil classified by the Unified Soil Classification System ("USCS") as ML, CH, CL, CL-ML, SC, SP, SM, SW or GC. Earth backfill proposed to be used shall meet the compaction requirements specified herein and shall not cause any settlement.

C. Tamping:
    1. Backfill material shall be near optimum workability and moisture content when tamped, with no discernible free water, puddling or drainage.
    2. The backfill shall be placed in uniform layers of not more than eight inches (8") loose measurement, extending completely across the excavation between the undisturbed trench walls, and tamped evenly and uniformly to 95% Standard Proctor Density or as shown on the Drawings by hand tamping or by mechanical tampers. Extreme care must be exercised to prevent movement or injury of the pipe while tamping; the pipe position, grade or alignment shall not be disturbed.
    3. Flooding or water jetting is not allowed.
    4. Backfill Material:
        i. Outside Paved Areas: In existing or proposed rights-of-way and easements and outside of the paving sub-grade zone, the backfill may ordinarily include the select excavated soil material. All material above the pipe zone shall be compacted to obtain a minimum of 95% of Max Density as determined by the Texas Highway Soil Testing Procedure TEX-110 E (Compactive Effort).
        ii. Inside Paved Areas: Where sidewalks, driveways, and/or pavement have been cut; material shall be in accordance with SECTION 31 32 13 – Cement Stabilized Sand Backfill.
        iii. Inside Railroad Right-of-Way: Backfill within railroad right-of-way boundaries must satisfy the specifications and conditions in the railroad permit, issued for Work.
        iv. Inside State Right-of-Way: Backfill within the State Highway right-of-way must satisfy the specifications and conditions in the State Highway Permit issued for Work.

3.05 TESTING

A. General:
    1. After the pipe has been installed, backfilled, and all service connections (if required), fire hydrants and other appurtenances installed, connected and adjusted, and all surface pavement, lot grading and other related construction activities are complete within the area of line to be accepted; a pressure and leakage test will be conducted by CONTRACTOR. CONTRACTOR shall furnish the pump, meter and gauges for the tests. The specified test pressures will be based on the elevation of the lowest point on the line under test. Before applying the specified test pressure, all air shall be expelled from the pipe. Location of test pump may require additional corporation cocks. At the conclusion of the

pressure test, the corporation cocks shall be properly plugged and secured to prevent leakage.

2. Hydrostatic test will not be performed until the system has been disinfected and passed bac-T tests.

B. Leakage Test: The leakage test will be conducted on the entire project, or each valved section, concurrently with the pressure test. The leakage test shall be at 150 psi for four (4) hours or 125 psi for eight (8) hours. Leakage shall be defined as the quantity of water that must be supplied into any test section of pipe, to maintain the specified leakage test pressure after the air in the pipeline has been expelled and the pipe has been filled with water.

C. Applicable Standard: No PVC pipe installation will be considered acceptable if the leakage is greater than that determined by the latest revision of AWWA C605 standard for allowable leakage. Allowable leakage will be determined by the formula

Q =($LxDxP^{1/2}$)/148,000
as outlined in the AWWA standard. Visible leaks are to be repaired regardless of the amount of leakage.

Where:
Q = quantity makeup water, in gallons per hour
L = length of pipe section tested, in feet.
D = nominal diameter of the pipe, in inches.
P = average test pressure during the leakage test, in pounds per square inch (gauge). (at lowest point in test section)

3.06 SANITARY PRECAUTIONS AND DISINFECTION

A. General: Sanitary precautions, flushing, and disinfection procedures and bacteriological sampling as prescribed in the latest revision of AWWA Standard C651 for disinfecting water mains, shall be followed in laying waterlines.

B. Protection from Contamination: Pipe shall not be laid in water or placed where it can be flooded with water or sewage during storage or installation. The effectiveness of disinfection depends in large measure on maintaining clean pipes and avoiding major contamination during construction.

C. Disinfection: All newly installed mains shall be disinfected in accordance with the latest revision of AWWA C651 and flushed and sampled before being placed in service. After satisfactory completion of the hydrostatic testing, CONTRACTOR will flush and collect samples for bacteriological analysis to check the efficiency of the disinfection procedure, which shall be repeated if contamination persists. A minimum of one sample for each 1,000 feet (1,000’) of completed main will be required.

3.07 CONNECTIONS TO EXISTING SYSTEM

A. General: Connections to an existing system shall be accomplished without interrupting normal service, wherever possible. Unless otherwise approved, connections to an

existing system shall be pressure taps. A pressure tap shall consist of connecting new piping to the existing water system by drilling into the existing pipe while it is carrying water under normal pressure, without taking the existing piping out of service. CONTRACTOR shall perform all excavations, furnish and install tapping sleeve, valves and accessories in conformance with these specifications and provide the tapping machine and drill the tap and shall block, cradle and backfill the piping, valve and all accessories.

B. Interruption of Service: In-line installations and extensions that require the operation of valves within the serviced system, shall be scheduled in advance and must be approved by ENGINEER. CONTRACTOR shall be responsible for the advance notification to individuals affected by the interruption of service. Notifications must be written and include the date, time and the proposed duration of interrupted service.

***** END OF SECTION *****

33 11 10 FIRE HYDRANT ASSEMBLY

1.00 GENERAL

1.01 SUMMARY

A. This section covers the construction and installation of fire hydrant assemblies.

1.02 RELATED SECTIONS

A. SECTION 33 11 00 – Water Distribution Facilities

2.00 PRODUCTS

2.01 FIRE HYDRANTS

A. General Description
   1. Fire hydrants shall conform to requirements and tests of the latest revision of AWWA C503, Standard for Wet-Barrel Fire Hydrants, pertaining to the design, component materials, construction and manufacture except as modified or supplemented hereinafter.
   2. Hydrants shall be covered by a manufacturer's 10 year limited warranty and a 10 year unconditional warranty on the main valve. All hydrants shall be model 2700/2780 Series as manufactured by Mueller, Kennedy, American Darling, equal or better.
   3. Hydrants shall be three-way, having two 2 1/2" hose nozzles with National Standard Threads and one 4" nominal pumper nozzles with threads conforming to the City Standard. Nozzles shall thread counterclockwise into barrel with "O" ring pressure seals. A suitable nozzle lock shall be provided.
   4. Hydrants shall be traffic model having upper and lower barrels joined approximately 2" above the final grade line by a separate and breakable swivel flange providing 360 degree rotation of the upper barrel. This flange shall include a minimum of eight bolts. The pressure seal between the barrels shall be cloth impregnated rubber gasket, an "O" ring not acceptable. The ground line shall not be less than eighteen inches below the centerline of the lowest nozzle and shall be clearly embossed on the lower barrel. A breakable stem coupling shall join the two piece stem adjacent to the ground line flange and shall be of similar metal. Screws, pins, fasteners or bolts used in the coupling shall be stainless steel. The weakened portion of the stem coupling shall be below the coupling pins.
   5. Upper and lower barrels shall be fabricated of cast iron so as to minimize the possibility of shoe damage upon traffic impact.

B. Operating Nut

1. The operating nut shall be non-rising, pentagonal shape measuring 1 1/2" from point of opposite flat. Pentagon shall have a depth of at least 1 1/4". A weather cap shall be affixed which conceals the hold down nut and on which is embossed an arrow indicating the opening direction. The direction of opening shall be counterclockwise.

C. Lubrication Reservoir
   1. A lubrication reservoir shall be provided, sealed top and bottom by "O" rings and filled with a viscous, non-toxic lubricant. The design shall be such that the bearing surfaces and threaded parts are automatically lubricated when the hydrant is operated. There shall not be less than two "O" rings separating the waterway from the oil reservoir and that portion of the stem making this seal shall be sleeved with bronze. An anti-friction washer shall be in place above the thrust collar to minimize operation torque.

D. Bonnet
   1. The bonnet shall be attached to the upper barrel by not less than eight bolts utilizing a cloth impregnated rubber gasket as a pressure seal.

E. Main Valves
   1. Main valves shall be compression type, closing with the pressure, and shall be not less than 5 1/4" in diameter. Composition of the main valve shall be rubber or neoprene having a durometer hardness of 90 + 5 and shall be not less than 1/2" thick.

F. Drain Valves
   1. Hydrant shall be equipped with drain valves that drain the barrel when the hydrant is closed and seal shut when the hydrant is in the open position. These drain valves shall be an integral part of the upper valve plat and shall operate without employing springs, tubes, levers, toggles or other intricate mechanism. The upper valve plat, seat ring and drain ring (shoe bushing) must be bronze and work in conjunction of form an all bronze drain way. Drain holes drilled in the shoe must be bronze lined. Two drain openings are required the bronze seat ring must thread into a bronze seat ring or shoe bushing providing bronze to bronze connection. Seat ring seals shall be "O" ring. Zinc content of bronze parts shall not exceed 16%.

G. Shoe Connection
   1. The 6" shoe connection shall be having ample blocking pads for sturdy setting and two strapping lugs to secure hydrants to piping.
   2. A minimum of six bolts is required to fasten the shoe to the lower barrel.
   3. The interior of the shoe, including the lower valve plate and cap nut shall have a protective epoxy coating of a least 4 mils. If cap nut is utilized, it must be locked in place with a stainless steel lock washer or similar non-corrosive device.

H. Coatings
   1. All above ground parts of the fire hydrant shall be field coated after installation with an approved rust inhibiting paint.

3.00 EXECUTION

3.01 GENERAL

A. Materials shall be stored, handled and used as described in these specifications.
B. All pipe, fittings and accessories shall be shipped, stored, handled and installed in accordance with the manufacturer's recommendations.

3.02 SETTING VALVES, VALVE BOXES, AND FIRE HYDRANTS

A. Prior to installing valves or fire hydrants, remove foreign matter from within the valve or hydrant. Inspect the valve in the open and closed position to verify the proper operation of the valve mechanism. Verify the proper type of opening, whether counter clockwise or clockwise.
B. Install valves, valve boxes and fire hydrants where shown or as directed by ENGINEER. Set valves and fire hydrants plumb and as detailed on the drawings. Locate valves away from roads or streets. Carefully tamp earth around each valve box for a minimum radius of four feet (4’), or to undisturbed trench face, if face of trench is less than four feet from valve. Set fire hydrants three feet (3’) from the edge of a curb and gutter street, at the point of curvature of the intersection curb radius and at such elevation that connecting pipe will not have less cover than distribution main.
C. Place a concrete thrust block opposite pipe connections, set against the vertical face of the trench to prevent the valve from blowing off the line. If the character of the soil is such that the fire hydrant can not be securely wedged in this manner, provide bridle rods and rod collars of not less than 3/4” stock protected by a coat of acid-resisting paint.
D. Compact thoroughly around the valve or fire hydrant to grade.

3.03 ADJUSTING WATER DISTRIBUTION FACILITIES TO GRADE

A. Materials. Reuse removed valves, fire hydrants, etc if they are in good condition as determined by the Engineer. Provide additional materials according to the above specifications when necessary.
B. Construction.
    1. Adjusting the Top of a Valve.
        i. Raise or lower the valve box, as necessary. If necessary, replace valve box at no additional cost. If necessary, use valve box extensions at no additional cost.
    2. Relocating a Fire Hydrant.
        i. Remove & salvage existing hydrant. Inspect the hydrant with all valves in the open and closed positions.
        ii. Install fire hydrant where shown or as directed by ENGINEER. Set fire hydrant plumb and as detailed on the drawings. Set fire hydrant three feet (3’) from the edge of a curb and gutter street, at the point of curvature of the intersection curb radius and at such elevation that connecting pipe will not have less cover than distribution main.

iii. Place a concrete thrust block opposite pipe connections, set against the vertical face of the trench to prevent the valve from blowing off the line. If the character of the soil is such that the fire hydrant can not be securely wedged in this manner, provide bridle rods and rod collars of not less than 3/4” stock protected by a coat of acid-resisting paint.
iv. Compact thoroughly around the fire hydrant to grade.

4.00 MEASUREMENT AND PAYMENT

A. Fire hydrant assembly; installed and accepted as prescribed, will be measured as fire hydrant, lead and gate valve as specified. Price shall be full compensation for furnishing all material, for installation, for thrust blocking where required, and for all labor, tools and incidentals necessary to complete the work.
B. Adjusted & relocated water distribution facilities shall be measured as each valve, fire hydrant, etc. Price shall be full compensation for work performed and materials furnished.

*** **END OF SECTION** ***

33 11 13 PUBLIC UTILITY PIPING

1.00 GENERAL

1.01 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

1.02 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 unit prices 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 incidental and subsidiary to unit cost items within the Bid Proposal and no additional payment shall be made for subsidiary items.

1.03 REFERENCES

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 36 – Standard Specification for Carbon Structural Steel
   2. ASTM A123 – Standard Specification for Zinc (Hot-Dipped 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 (DP-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. (100mm) and Larger – Shop Applied
11. AWWA C206 – Field Welding of Steel Water Pipe
12. AWWA C207 – Steel Pipe Flanges for Waterworks Services – 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 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, ½ in. (13mm) through 3 in. (76mm) 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

1.04 SUBMITTALS

A. Section 01 33 00 – Submittal Procedures: Requirements for Submittals
B. Product Data: Submit data on pipe materials, pipe fittings, valves and accessories
C. Shop Drawings: Indicate piping layout, include piping specialties
D. Manufacturer's certificate: Certify that products meet or exceed specified requirements
E. Field Quality-Control Submittals: Indicate results of Contractor-furnished test and inspections
F. Preconstruction Photographs:

1. Submit digital files of colored photographs of work areas and material storage areas

1.05 CLOSEOUT SUBMITTALS

A. Section 01 70 00 – Execution and Closeout Requirements: Requirements for submittals
B. Project Record Documents: record actual locations of piping mains, valves, connections, thrust restraints, and invert elevations.
C. Identify and describe unexpected variations to subsoil conditions or discovery of uncharted utilities

1.06 QUALITY ASSURANCE

A. Valves: Mark valve body with manufacturers name and pressure rating
B. Perform work according to city standards

1.07 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 stockpile 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

1.08 EXISTING CONDITIONS

A. Field Measurements:
   1. Verify field measurements prior to fabrication
   2. Indicate field measurements on Shop Drawings

2.00 PRODUCTS

2.01 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: Comply with AWWA C104
   5. Joints
      a. Mechanical and Push-on joints: Comply with AWWA C111
      b. Flanged joints: Comply with AWWA C115 and 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 for waterline less than 4" diameter

1. Schedule 40
2. Blue color
3. Fittings: Duction Iron AWWA C110
4. Joints: Gasketed

C. PVC for waterlines 4” diameter and greater
1. Comply with AWWA C900 and/or AWWA C905, Class (Schedule 40 for 2”)
2. Blue color
3. Fittings: Ductile Iron AWWA C110
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

D. PVC for gravity and force main sewer
   a. Force main comply with D2241 160 PSI pressure rating minimum
   b. Gravity sewer comply with ASTM D3034 SDR-26 for 160psig pressure rating
   c. Gravity services shall be a minimum 4” diameter
   d. Fittings: Ductile Iron AWWA C110
   e. Green Color
   f. Joints:
      1) Comply with ASTM D3139 and ASTM F477
      2) Seals” PVC flexible elastomeric
      3) 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 Cemetn 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: Prestreesed 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

2.02 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: Conform to ASTM C443 rubber compression gasket
B. Polyethylene Pipe: N-12 WT and ST 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

2.03 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

2.04 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

2.05 AIR RELEASE VALVES

A. Description: cast iron body, stainless steel float. Sized and manufactured according to plan drawings

2.06 UNDERGROUND PIPE MARKERS

A. Tracer Wire:
   1. 0.5” wide layer of aluminum foil bonded between two pieces of polyethylene film
   2. Dimensions shall not be less than 5.5 mils thick or 2” wide
   3. Sanitary sewer shall be green and shall have the wording “Caution: Sanitary Sewer Line Buried Below”
   4. Water lines shall be blue and shall have the wording “Caution: Water Line Buried Below”

2.07 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

2.08 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

2.09 FINISHES

A. Steel: Hot-dipped galvanized after fabrication, according to ASTM A123

2.10 ACCESSORIES

A. Concrete for thrust restraints: As specified in section 03 30 00 – Cast-in-place concrete
B. Blots, lugs and brackets: Stainless Steel

3.00 EXECUTION

3.01 GENERAL

A. All public water system materials and construction on city facilities shall comply with State Health, Water Commission and Town of Pecos City Water Distribution System Standards in addition to these specifications. City standards shall govern if a conflict occurs.

3.02 HANDLING OF MATERIAL

A. Handling and Care: Pipe and other materials shall be unloaded at the point of delivery, hauled to and distributed at the project site by the Contractor. They shall at all times be handled with care and in conformance with the manufacturer's recommendations. Whether moved by hand, skidways or hoists, material shall not be dropped or bumped against other material or objects already on the ground. Care shall be taken not to scratch the surface of P.V.C. pipe. Excessive scratching shall be considered cause for rejection of P.V.C. pipe.
B. Distribution at Site of Work: Material may be unloaded opposite or near the place where it is to be used in construction provided it is to be incorporated into the work within 10 days. The Contractor shall distribute the material in such a manner so as not to cause the public

any undue inconvenience. The interior of all pipe and accessories shall be kept free from dirt and foreign matter at all times.

C. Storing Material: Any material delivered to the project site that is not to be incorporated into the work within 10 days shall be stored on suitable blocks or platforms off the ground. Stacking of materials shall be done in such a manner that the material is not damaged.

3.03 ALIGNMENT AND GRADE

A. General: All pipe shall be laid and maintained to the required lines and grades. Fittings and valves shall be at the required locations and with joints centered, spigots home and all valve stems plumb.

B. Deviation with Engineer's Consent: No deviation shall be made from the required line or grade except with the written consent of the Engineer.

C. Depth of cover: Depth of cover shall be measured from the established street grade or the surface of the permanent improvement to the top of the pipe barrel. Unless otherwise shown on the construction plans, it is the intent of these specifications that waterlines shall have minimum cover (to top of pipe) as follows:

Under proposed or existing pavement	42 inches
Under proposed non-pavement	30 inches
Under Natural ground	30 inches

If the established grades violate any of the before stated conditions notify the Engineer immediately so that remedial instructions can be given the Contractor.

3.04 PIPE TRENCH EXCAVATION AND BACKFILL

A. See Subsection 31 23 17.

3.05 SAND AND ENCASEMENT

A. All pipe and fittings which are not enclosed in concrete valve vault or laid in encasement pipe, shall be completely encased with a minimum of eight (8") inches of sand. This encasement includes the bottom, sides and top of pipe and fittings including bells, so that all portions will be encased with a minimum of eight inches of sand to insulate the pipe from the natural ground and from the backfill. The sand shall be a finely divided sand as follows:

<u>Sand Specifications:</u>
Passing 7/8" Sieve: ..... 100% by weight
Passing No. 4 Sieve:..... 80% by weight
Clay Lumps not to Exceed: ..... 20% by weight
Plasticity Index:..... NP-10 max

Sand shall be screened and free of foreign material. Sand shall be placed in a manner that will not injure the polyethylene wrapping and shall be compacted under, around the sides, and over the pipe in a manner that will reduce settlement to a minimum and as approved by the ENGINEER.

3.06 LOWERING PIPE AND ACCESSORIES INTO TRENCH

A. General: Proper implements, tools, and facilities satisfactory to the Engineer shall be provided and used by the Contractor for the safe and efficient execution of the work. All pipe, fittings, valves, hydrants, and accessories shall be carefully lowered into the trench by means of derrick, ropes or other suitable equipment in such manner as to prevent damage. Under no circumstances shall pipe or accessories be dropped or dumped into the trench. The Contractor shall not lay any pipe in the trench until the bedding and condition of the trench has been approved by the Engineer. The trench shall be free of water and maintained in that condition until pipe has been laid and the joints completed.
B. Inspection of Pipe and Accessories: The pipe and accessories shall be inspected for defects prior to lowering into trench. Any defective, damaged or unsound pipe shall be replaced.
C. Pipe Kept Clean: All foreign matter or dirt shall be removed from the interior of pipe before lowering into the trench. Pipe shall be kept clean by means approved by the Engineer during and after laying. Contractor shall not leave any trench unmanned until trench is covered, or until barricades are placed and pipe is at least temporarily plugged to prevent varmints from entering.

3.07 JOINTING PIPE

A. Joints shall be made up in strict conformance with manufacturer's recommendations, including the use of any primer or lubricant.

3.08 CONCRETE THRUST BLOCKING

A. Concrete thrust blocking shall be provided at the ends of all lines and changes in direction including tees and incomplete crosses and blow-offs. Thrust blocking shall be poured against undisturbed soil solid between ground and the fitting to be anchored. Thrust blocks shall be of sufficient size to keep the pipe in place when subjected to accessible for repair.
B. Metal Harness: Metal harness or tie rods and clamps shall be used to prevent movement when soil conditions will not withstand thrust blocking. Steel rods and clamps shall be galvanized or otherwise rust proofed or coated with hot coal tar enamel then wrapped with two layers of polyethylene wrapping.

3.09 STERILIZING WATER PIPE

A. As each joint of the pipe is laid, powdered calcium hypochlorite shall be placed in the pipe to produce a chlorine residual of 50 PPM. One pound of chlorine hypochlorite for each 1,680 gallons of water will give 50 PPM. The pipe shall be slowly filled with water and allowed to stand at least 28 hours. After sterilization period is completed, Contractor will flush lines and thoroughly clean. The City will take a bacteriological sample test 2 hours after refilling. If sample does not pass State Health Department purification standards, then repeat above procedure. The entire sterilization process shall be coordinated with and under the supervision of the City.

3.10 WATER CONNECTIONS

A. Inspection: All connections to the water mains will be made by the contractor under supervision of CITY. The Contractor shall supply all required materials, labor and match grade of the existing water line.

3.11 TEST PROCEDURES

A. All water for testing will be furnished by the Contractor. The Contractor shall make complete and satisfactory arrangements with the City's Water Department and make all necessary

connections at his own expense. After the pipe has been laid and partially backfilled, it shall be subjected to a hydrostatic pressure test. Before applying the specified test pressure, all air shall be expelled from the pipe. If necessary, the Contractor shall provide taps at points of highest elevation to bleed off pockets of air. Any taps made shall be provided with a corporation stop or tightly plugged when the line is full of water. The line may be tested in valved sections.

B. CONDITIONS FOR TESTING: A hydrostatic test shall be performed on the proposed water distribution system when all of the following conditions have been met.
   1. All valves are accessible and open,
   2. All fire hydrants are properly set (i.e. plumb, at the right height, and the correct horizontal placement),
   3. The area above the water main has been graded to finished grade five feet on either side of the center line of the water main and for the entire length of the line;
   4. The owner signs an agreement to the effect that approval of the system is conditional upon completion of any items found deficient on a second inspection which will be conducted upon completion of the total project. Completion of the total project shall be as defined by ENGINEER.

C. TEST PRESSURE DURATION AND LEAKAGE
   1. All pipes shall be subjected to two hydrostatic tests. The first hydrostatic test shall be a two hour test at a pressure of 150 P.S.I. The allowable leakage during this portion of the test shall be the sum of the leakage allowances used in the system as shown below:
      i. 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.
         1. 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).

            $$Q = (LD\sqrt{P})/148{,}000$$

            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).

         2. 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).

            $$L = (SD\sqrt{P})/148{,}000$$

            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).

2. The second hydrostatic test shall be made no less than 48 hours after the successful completion of the first hydrostatic test. The second hydrostatic test will be for 24 hours at City pressure. There will be a zero leakage allowance during this test. During the test, all exposed pipe, fittings, valves, hydrants, and joins shall be carefully examined. If found to be leaking, they shall be corrected immediately by the contractor. If the leaking is due to cracked or defective material, the defective material shall be removed and replaced by the contractor with sound material. The test then shall be repeated until the pipe line is accepted. A $100 base fee will be paid by the contractor to the City for each retest that is required. No pipe installation will be accepted until the above conditions have been met.

*** **END OF SECTION** ***

33 12 16 WATER UTILITY DISTRIBUTION VALVES

1.00 GENERAL

1.01 SUMMARY

A. This specification shall govern for all work necessary to provide all gate valves for potable water lines required to complete this project. This specification is a performance specifications and the performance of the completed work is the responsibility of the Contractor.

2.00 PRODUCTS

2.01 GATE VALVES

A. All valves 4" and larger shall meet the following requirements. Gate valves shall be of an acceptable manufacture and shall conform to A.W.W.A. Standard Specification C-500, latest revision thereof, except for changes or additions as follows:

1. The gate valves shall be double disc with parallel or tapered seats and non-rising stems.
2. Valve ends shall be flanged or mechanical joint type or a combination of these as indicated or specified. A complete set of joint materials shall be furnished with each valve, except for flanges.
3. Valves 16" and larger shall be furnished for horizontal installation.
4. Stem seals shall be the O-Ring type on valves through 12". Valves 16" and larger shall be equipped with stuffing boxes.
5. Valves shall open left (counter clockwise). Valves 20" and larger shall have the main valve stem furnished with a combination hand wheel and operating nut.
6. Tapping valves to be used with tapping saddles shall have one end mechanical joint.
7. The minimum number of turns to open as applied to the operating nut for valves through 12" shall be as set out in A.W.W.A. C-500, latest revision thereof, and for valves 16" and larger as follows:
    a. 16 inch - 96 turns to open
    b. 20 inch - 128 turns to open
    c. 24 inch - 152 turns to open
    d. 30 inch - 186 turns to open
    e. 36 inch - 222 turns to open
8. All gears shall be oil filled, extended type gear cases.
9. Valves shall be furnished without position indicator.
10. Bypass valves shall be installed on valves 20" in diameter and larger.
11. All valves 16 inches in diameter and above shall be equipped with bevel gears.
12. The manufacturer shall upon request furnish two (2) certified sets of prints showing complete details and dimensions and materials used. The manufacturer shall also upon request furnish a certified letter of compliance stating that their

valve meets these specifications. Also, the manufacturer shall upon request furnish one (1) certified copy of the physical tests of all metals used in the manufacture of the valve.

2.03 VALVE BOXES

A. Each gate valve shall be provided with an adjustable, cast iron, road-type valve box with a minimum opening of 5 inches. Valve boxes shall be complete with base, extensions, top section and cover. The base shall be of the proper size and shape to fit the valve on which the base is installed. The word "WATER" shall be cast into the cover. The extension pipe of the valve box shall be PVC (DR 18) pipe. Valve boxes shall be CLOW, Series F2000, Mueller H-10380 or approved equal.

*** **END OF SECTION** ***

33 12 33 VALVE BOXES, METER BOXES, AND METER VAULTS

1.00 GENERAL

1.01 SUMMARY

A. Valve boxes for water service.
B. Meter boxes for water service.
C. Meter vaults for water service.

1.02 UNIT PRICES

A. No separate payment will be made for valve boxes under this section. Include payment in unit price for connection to waterline.
B. Payment will be made by lump sum for the complete installation of Water Meter Vaults, meter, and appurtenances.

1.03 SUBMITTALS

A. Submittals shall conform to requirements of SECTION 01 33 00 – Submittal Procedures.

2.00 PRODUCTS

2.01 VALVE BOXES

A. Provide Type "A", cast-iron, slide-type, valve boxes as manufactures by Bass and Hays Foundry, Inc., or approved equal. Design of valve box shall minimize stresses on valves imposed by loads on box lid.
B. Cast a letter "W" into lid, ½ inch in height and raised 3/32 inch, for valves serving potable water lines.
C. Coat boxes, bases, and lids by dipping in hot bituminous varnish.
D. Provide 6-inch PVC, Class 150, DR18, riser pipes.
E. Concrete for valve box placement:
    1. For locations in new concrete pavement, use strength and mix design of new pavement.
    2. For other locations, use class "A" concrete, with minimum compressive strength of 3000 psi.

2.02 METER VAULTS

A. Meter vaults to be prefabricated concrete, as manufactured by Park Equipment Company or approved equal unless a specific type of construction is required by Drawings.
B. Concrete for meter vaults: Class A concrete with minimum compressive strength of 4000 psi at 28 days.
C. Reinforcing steel for meter vaults: Conform to requirements as specified.
D. Grates and Covers: To be manufactured by Park Equipment Company or approved equal.

3.00 EXECUTION

3.01 INSTALLATION

A. Obtain approval from City for location of meter vault.
B. Verify lines and grades are correct.
C. Verify compacted subgrade will support loads imposed by vaults.

3.02 VALVE BOXES

A. Provide riser pipe with suitable length for depth of cover indicated on Drawings or to accommodate actual finish grade.
B. Install valve box and riser piping plumbed in a vertical position. Provide 6-inches telescoping freeboard space between riser pipe top butt end, and interior contact flange of valve box, for vertical movement damping. Riser may rest on valve flange, or provide suitable foot piece to support riser pipe.
C. After valve box has been set, aligned, and adjusted so that lid is level with final grade, pour a 24-inch by 8-inch thick concrete block around valve box. Center valve box horizontally within concrete block.

3.03 METER VAULTS

A. Precast Meter Vaults:
    1. Install precast vaults in accordance with manufacturer's recommendations. Set level on a minimum 3- inch thick bed of sand conforming to the requirements of Section 31 32 13, Cement Stabilized Sand Backfill.
    2. Seal lifting holes with cement-sand mortar or non-shrink grout.

3.04 FRAME AND COVER FOR METER VAULTS

A. Set cast iron frame in a mortar bed and adjust elevation of cover as follows:
    1. In unpaved areas, set top of meter box or meter vault cover 2 to 3 inches above natural grade.
    2. Meter vaults are not allowed in sidewalk areas.

3.05 BACKFILL

A. Provide bank run sand backfill and compact.
B. In unpaved areas, place top of meter boxes and vaults at natural grade.

3.06 METER EASEMENT CONSTRAINTS

A. No improvements other than the meter vault and water line are allowed within the 10 foot by 20 foot meter easement.

4.00 MEASUREMENT AND PAYMENT

A. There will be no separate measurement or payment for work performed or materials furnished in this section. Include cost in contract price bid for work of which it is a component.

*** **END OF SECTION** ***

33 12 50 TRACER WIRE

1.00 GENERAL

1.01 SUMMARY

A. This section covers the installation of conductive trace wire for the location of non-metallic water pipes.

1.02 RELATED SECTIONS

A. SECTION 33 11 00 – Water Distribution Facilities

1.03 SUBMITTALS

A. In accordance with SECTION 01 33 00 – Submittals and SECTION 01 34 10 – Shop Drawings, Product Data and Samples, the CONTRACTOR shall submit for approval complete and dimensioned working DRAWINGS of all piping layouts, which shall include the the sizes and locations of each trace wire, and the location of each trace wire test station.
B. In accordance with SECTION 01 33 00 – Submittals and SECTION 01 34 10 – Shop Drawings, Product Data and Samples, the CONTRACTOR shall submit for approval manufacturer's product data on materials furnished.

2.00 PRODUCTS

2.01 TRACE WIRE
A. Trace wire shall be fourteen (14) gauge minimum solid copper with thermoplastic insulation recommended for direct burial.

2.02 WIRE CONNECTORS
A. Wire connectors shall be 3M DBR, or approved equal, and shall be watertight to provide electrical continuity.

2.03 TRACE WIRE ACCESS POINTS
A. Each trace wire access point shall be composed of one Copperhead® SnakePit® Magnetized Tracer Box, Test and Monitoring Station or approved equal installed in each proposed valve box.

3.00 EXECUTION

3.01 INSTALLATION

A. Trace wire shall be installed on all water mains. The wire shall be installed in such a manner as to be able to properly trace all water mains without loss or deterioration of signal or without the transmitted signal migrating off the tracer wire.
B. Trace wire shall be installed in the same trench and inside bored holes and casing with pipe during pipe installation. It shall be secured to the pipe as required to insure that the wire remains adjacent to the pipe.The trace wire shall be securely bonded together at all wire joints with an approved watertight connector to provide electrical continuity, and it shall be accessible at all trace wire access points.
C. Trace wire access points shall in general be no more than one-thousand (1,000) feet and at every proposed valve box. Concentrations of multiple proposed valves near pipe intersections, i.e. tees or crosses, may require more than one access point assembly in each concrete valve box collar. Trace wire access points shall be within public right-of-way or public utility easements.
D. At the point of connection between cast or ductile iron water mains, with any non iron water main, the tracer wire shall be properly connected to the iron pipe with a cad weld or approved equivalent. Tracer wire welds shall be completely sealed with the use of an approved mastic type sealer specifically manufactured for underground use. Mastic shall be applied in a thick coat a minimum of 2 inches thick and shall be protected from contamination by the backfill material with the use of a plastic membrane.
E. Tracer wire shall be laid flat and securely affixed to the pipe at 10 foot intervals. The wire shall be protected from damage during the execution of the works. No breaks or cuts in the tracer wire or tracer wire insulation shall be permitted. At water service saddles, the tracer wire shall not be allowed to be placed between the saddle and the water main.
F. Except for approved spliced-in connections, tracer wire shall be continuous and without splices from each trace wire access point. Where any approved spliced-in connections occur, 3M DBR water tight connectors, or approved equal, shall be used to provide electrical continuity.
G. At all water main end caps, a minimum of 6 feet of tracer wire shall be extended beyond the end of the pipe, coiled and secured for future connections. The end of the tracer wire shall be spliced to the wire of a six pound zinc anode and is to be buried at the same elevations as the water main.
H. For directional drilling, auguring or boring installations, tracer wires shall be installed with the pipe and connected to the tracer wire at both ends, or cad welded to the existing iron pipe at both ends.
I. Spliced connections between the main line tracer wire and branch connection tracer wire shall only be allowed at water main tees, crosses or at iron or copper water services where a portion of the branch connection water main or water service is replaced with a non-iron or non-copper material. The branch connection tracer wire shall be a single tracer wire properly spliced to the main line tracer wire. Where the existing branch connection is neither iron nor copper, then the new branch connection tracer wire shall be properly spliced to the existing tracer wire on the branch connection.

J. At all repair locations where there is existing tracer wire, the tracer wire shall be properly reconnected and spliced as outlined above.

4.00 MEASUREMENT AND PAYMENT

A. Separate measurement and payment will not be made for items covered in this specification. Include cost in price of associated work.

*** **END OF SECTION** ***

33 13 00 DISINFECTION OF WATER LINES AND WATER PLANTS

1.00 GENERAL

1.01 SCOPE

A. This item includes the Disinfection Procedures for water lines and mains, plant piping, pumping equipment, storage tanks, hydropneumatic pressure tanks and other appurtenances to be filled with water intended for public consumption. The intent of this SPECIFICATION is to insure that the Water System meets the standards established by the American Water Works Association (AWWA) and regulations of the Texas Commission on Environmental Quality (TCEQ).

1.02 REFERENCE STANDARDS

A. All disinfection methods shall be in accordance with current AWWA Standards and TECQ Regulations. Storage facilities (ground storage tanks, hydropneumatic tanks, elevated tanks) shall be disinfected in accordance with the latest revision of AWWA C652. Water lines shall be disinfected in accordance with the latest revision of AWWA C651.

1.03 SUBMITTALS

A. CONTRACTOR shall submit all copies of bacteriological testing results to ENGINEER.

2.00 PRODUCTS

2.01 MATERIALS

A. The CONTRACTOR shall furnish all labor, equipment and materials necessary for complete disinfection of the water system as herein provided. The OWNER shall furnish the water used for the initial filling of the mains, lines and/or tanks. The chlorinating agent to be furnished by the CONTRACTOR may be a chlorine gas-water mixture, calcium hypochlorite in water or chlorinate lime of known chlorine content in water.

3.00 EXECUTION

3.01 CHLORINE

A. A chlorine solution shall be injected with an approved feed device into the water system at or very near the point from which the system is being filled. A corporation cock tapped into the system fill line shall be the point of connection for the feed device. The supply water flow rate used to fill the system shall be controlled to insure that the application rate of the chlorine agent shall be proportional to provide a minimum chlorine dosage.

B. Disinfect each section of the completed distribution system with liquid chlorine, sodium hypochlorite or calcium hypochlorite. Flush lines and system thoroughly before introducing chlorination materials. Chlorine concentration must be at least 50 mg/l at the beginning of the contact period. Open and close valves and hydrants in lines several

times during the contact period. After twenty-four (24) hours, the minimum chlorine residual shall be 25 mg/l.

C. Following the disinfection period the CONTRACTOR shall flush the system with clean water until the residual chlorine content is 1.0 mg/l or less before use in the distribution system.

3.02 BACTERIOLOGICAL TESTING

A. The CONTRACTOR shall collect bacteriological samples and have them analyzed by a testing laboratory acceptable to the State of Texas.
B. A bacteriological sample shall be collected and submitted for three consecutive days.
C. If both consecutive samples are negative i.e. no coliform organisms are present, the facility may be placed into service.
D. If either sample is positive, the facility must be re-disinfected and the bacteriological testing repeated. Should the second or third sample be found positive, the facility shall be removed from service and disinfection and testing procedures be repeated until two satisfactory samples are found negative.

4.00 MEASUREMENT AND PAYMENT

A. There shall be no separate payment for work performed under these SPECIFICATIONS. The cost shall be included in the contract price for the related unit item of work.

***** END OF SECTION *****

33 31 00 SANITARY UTILITY SEWERAGE PIPING

1.00 GENERAL

1.01 SUMMARY

A. This specification shall govern for all work necessary for furnishing all polyvinyl chloride pipe and fittings required to complete the PVC sewer pipe and roof drains for site utilities. This specification is a performance specification and the performance of the completed work is the responsibility of the Contractor.

2.00 PRODUCTS

2.01 PIPE

A. Pipe and fittings shall be manufactured from clean, virgin, Type I, Grade I polyvinyl chloride compound, conforming to ASTM Specification D-1784. 2.1 4" Thru 15" Diameter Pipe: Pipe shall be SDR 26 and conform to ASTM Specification D3034.

B. Pipe Stiffness: Minimum pipe stiffness at 5% deflection shall be in accordance with the schedule shown below:

Pipe Diameter	Pipe Stiffness	
Inches	kPa	p.s.i.
4	790	115
6 Thru 15	790	115

Minimum pipe stiffness at 5% deflection shall be calculated in accordance with ASTM Specification D-2411.

C. Joints for pipe and fittings shall be compression rubber gasket joints conforming to the material and performance of ASTM Specification D-3212. The pipe joint shall consist of bell that in an integral part of the pipe wall with compression rubber rings. The joint shall be capable of withstanding an internal hydrostatic pressure of 25 p.s.i. for one (1) hour without any leakage.

D. Marking: Pipe shall be marked to show nominal pipe size, type of PVC, SDR number, ASTM designated number and manufacturer's name and code.

2.02 FITTINGS

A. Fittings and accessories shall be manufactured of the same material as specified for pipe, shall be at least **SDR 26** and shall have joint configurations identical to that of the pipe.

2.03 CONCRETE

A. Concrete shall have a minimum compressive strength of 3000 p.s.i. at 28 days and shall be in accordance with Section 03 30 00.

3.00 EXECUTION

3.01 HANDLING OF MATERIALS

A. Handling and Care: Pipe and other material shall be unloaded at the point of delivery, hauled to and distributed at the project site by the Contractor. They shall at all times be handled with care and in conformance with the manufacturer's recommendations. Whether moved by hand, skidway or hoist, material shall not be dropped or bumped against other material or objects already on the ground.
B. Distribution at Site of Work: Material may be unloaded opposite or near the place where it is to be used in the construction, provided it is to be incorporated into the work within10 days. The Contractor shall distribute the material in such a manner so as not to cause the public any undue inconvenience.
C. Storing Material: Any material delivered to the project site that is not to be incorporated into the work within 10 days shall be stored on suitable blocks or platforms off the ground. Stacking of material shall be done in such a manner that the material is not damaged. Particular care shall be taken to keep the preformed joint material on the spigot end of the pipe from becoming dented or damaged.

3.02 ALIGNMENT AND GRADE

A. General: All pipe shall be laid and maintained to the required lines and grades.
B. Deviations With Engineer's Consent: No deviation shall be made from the required line or grade except with the written consent of the Engineer.
C. Batter Boards: The Contractor shall furnish and place in position as directed by the Engineer all the necessary batter boards for controlling the work. The batter boards shall be of such size timber as the Engineer directs and shall be substantially supported. The boards and all location stakes must be protected from damage or change of location. The Contractor shall also furnish good sound twilled lines for use in giving lines and grades, and the necessary plummets and graduated poles of a form approved by the Engineer.
D. Laser Equipment: The Contractor may use laser equipment to maintain proper grade for laying pipe in lieu of batter boards as described above.

3.03 PIPE TRENCH EXCAVATION AND BACKFILL

A. See Subsection 31 23 17.

3.04 TRENCH EXCAVATION SAFETY

A. See Subsection 31 23 17.

3.05 LOWERING PIPE INTO TRENCH

A. General: Proper implements, tools and facilities satisfactory to the Engineer shall be provided and used by the Contractor for the safe and efficient execution of the work. All pipes shall be carefully lowered into the trench by means of derrick, ropes, or other

suitable equipment in such manner as to prevent damage. Under no circumstances shall pipe be dropped or dumped into the trench. The Contractor shall not lay any pipe into the trench until the bedding and condition of the trench has been approve by the Engineer. The trench shall be free of water and maintained in that condition until the pipe has been laid and the joints have been completed.

B. Inspection of Pipe: The pipe shall be inspected for defects prior to lowering into trench. Any defective or unsound pipe shall be removed and replaced.

C. Pipe Kept Clean: All foreign matter or dirt shall be removed from the interior of pipe before lowering into trench. Pipe shall be kept clean by means approved by the Engineer during and after laying.

3.02 LAYING PIPE

A. Unless otherwise authorized by the Engineer, the laying of pipe on the prepared bedding shall be started at the outlet end with the spigot end pointing downstream and shall proceed toward the inlet end with the abutting sections properly matched, true to the required lines and grades. The pipe shall be fitted and matched so that when laid on the bed it shall form a smooth uniform conduit.

3.03 CONCRETE EMBEDMENT

A. Provide concrete embedment only when shown on the drawings or as directed by the Engineer. Concrete shall be placed only in a dry trench unless specifically approved by the Engineer. The Contractor shall provide no more than two (2) temporary supports per length of pipe (one at bottom of barrel adjacent to shoulder of socket - one at new spigot end). Use only concrete brick for temporary support. Concrete shall have a slump which will permit its flow, without excessive rodding, to all required points around pipe. Contractor shall take the necessary precautions to prevent floating or raising pipe above required grade. Concrete embedment shall be used on VCP only.

3.08 JOINTING PIPE

A. Polyvinyl Chloride Pipe: The bell and spigot mating surfaces shall be wiped free of dirt or other foreign matter. A lubricant recommended by the coupling manufacturer shall be applied to the bell and spigot mating surfaces just before they are joined together. The spigot end shall then be centered on grade into the bell end of the pipe previously laid and shall be shoved home to compress the joint and to assure a tight fit between the inner surfaces. When the pipe being thusly installed, bell holes shall be excavated in the bedding material. When the joint has been made, the bell hole shall be carefully filled with bedding material to provide for adequate support of the pipe.

3.09 STOPPERS OR BULKHEADS

A. The Contractor shall furnish and install suitable stoppers at the dead end of all pipes, wyes, tees, etc. Stoppers shall be water tight. At the end of each day or when temporary stopping of construction for more than 4 hours, a tight fitting bulkhead shall be placed across the open end of all pipe. Bulkheads do not need to be water tight.

3.10 TESTING

A. The Contractor shall provide all equipment, materials, (including water, if required) and do all work necessary to conduct tests to determine any leakage on the installed gravity sewer line. Contractor shall conduct a test as outlined in either (1) or (2) herein after:

1. The Contractor shall perform infiltration or exfiltration tests. Infiltration shall not exceed more than 100 gallons per inch diameter of pipe per mile per 24 hours. Exfiltration shall not exceed more than 100 gallons per inch diameter of pipe per mile for 24 hours for 2 feet of hydrostatic head. For each additional 2 foot increment of head and additional 10% in exfiltration is allowed. The lines may be tested in sections. The duration of test for any section shall be 24 hours.
2. The Contractor shall perform low pressure air testing of completed sections of installed sewer pipe. After the section of pipe to be tested has been plugged, air pressure shall be applied until the pressure inside the pipe reaches 4 psig. Time shall be allowed so the temperature and pressure can stabilize, then bleed back to 3.5 psig. If the time in seconds, for the air pressure to decrease from 3.5 to 2.5 psig is greater than that shown in the following table, the pipe shall be presumed to be free from defect. When these rates are exceeded, pipe breakage or leaking plugs are indicated and an inspection must be made to determine the cause. If so designated by the Engineer, another test may be required on a section that has failed to pass the air test after repairs have been made.

ALLOWABLE TIME TABLE

Pipe Size	Time Minutes	Time Seconds
4".....	2	0
6".....	3	0
8".....	4	0
10".....	5	0
12".....	5	30
15".....	7	5

B. The Contractor shall check (by use of a mandrel) that the deflection of PVC pipe does not exceed 5%, no sooner than 30 days after all backfill and compaction have been completed.

*** **END OF SECTION** ***