

**SPECIFICATIONS, CONTRACT DOCUMENTS,
AND CONSTRUCTION PLANS**

FOR

**CITY OF DAYTON, TEXAS
CLAYTON WATER WELL IMPROVEMENTS PROJECT
TRANSMISSION LINE**



Prepared by:

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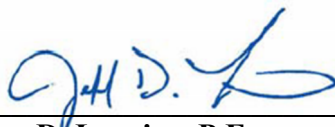
LEAVINS ENGINEERING & DESIGN, LLC

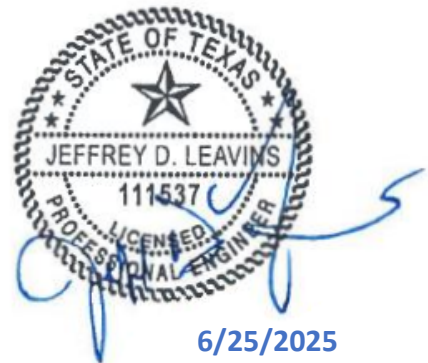
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**CITY OF DAYTON, TEXAS
CLAYTON WATER WELL IMPROVEMENTS PROJECT
TRANSMISSION LINE**

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INVITATION TO BIDDERS

The City of Dayton, Texas will accept sealed bids for furnishing necessary materials, equipment, superintendence and labor for the **City of Dayton, Texas, Clayton Water Well Improvements Project, Transmission Line**.

The Project is generally described as the installation of approximately 4,021 linear feet of new 14" C900 PVC water transmission line from Clayton Water Well No. 5 (currently in construction) to the existing Clayton Ground Storage Tank Site, including but not limited to, all applicable water valves, fittings, and all improvements necessary for a complete installation, per technical specifications in the contract documents. **Bids will be received until 2:00 p.m., CST on Wednesday, July 16, 2025 at the City of Dayton, City Hall, 117 Cook Street, Dayton, Texas 77535. The bids will be publicly opened and read aloud at the time set forth.**

The right is reserved by the City of Dayton, as the City's interest may require, to accept or reject any or all bids, and to waive any informality in the bids received.

There will be a **Non-Mandatory Pre-Bid conference** with the Engineer, Owner, and Prospective Bidders at **10:00 a.m. on Wednesday, July 9, 2025** at the City of Dayton, City Hall, 117 Cook Street, Dayton, Texas 77535.

Bidding Documents are on file at www.civcastusa.com. There is no cost to view the plans, and printing can be done through the website. Hard copies of Bidding Documents will not be sold. 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. 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 confer a license or grant for any other purpose.

Bid Security, only in the form of 1) a certified or cashier's check drawn on a Texas bank and made payable to the City of Dayton; or 2) a bond executed by a surety company authorized to do business in Texas, in the amount of not less than five (5%) percent of the total bid, must accompany each bid at the time it is submitted. Bids must be submitted on the form shown in the Contract Documents. A Contractor Qualification Statement must also accompany each bid.

Bids may be held by the City of Dayton for a period not to exceed 60 days from the date of the bid opening for the purpose of reviewing the bids and investigating the bidder's qualifications prior to the contract award.

The City of Dayton is an Affirmative Action/Equal Opportunity Employer. Section 3 Residents, Minority Business Enterprises, Small Business Enterprises, Women Business Enterprises, and labor surplus area firms are encouraged to submit bids.

Upon award, the successful bidder will be required to furnish payment and performance bonds.

The Vindicator Newspaper

1st Publication: Thursday, June 26th, 2025

2nd Publication: Thursday, July 3rd, 2025

City of Dayton, Texas
Martin Mudd, City Mayor

INSTRUCTIONS TO BIDDERS

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ARTICLE 1 – DEFINED TERMS

- 1.01 Terms used in these Instructions to Bidders have the meanings indicated in the General Conditions and Supplementary Conditions. Additional terms used in these Instructions to Bidders have the meanings indicated below:
- A. *Issuing Office* – The office from which the Bidding Documents are to be issued and where the bidding procedures are to be administered. (Leavins Engineering & Design, LLC, 3250 Eastex Freeway, Beaumont, Texas 77703).
 - B. *Bidder* - one who submits a Bid directly to OWNER as distinct from a sub-bidder, who submits a bid to a Bidder.
 - C. *Successful Bidder* - the lowest, responsible and responsive Bidder to whom OWNER (on the basis of OWNER's evaluation as hereinafter provided) makes an award.

ARTICLE 2 – COPIES OF BIDDING DOCUMENTS

- 2.01 Complete sets of the Bidding Documents in the number and for the deposit sum, if any, stated in the advertisement or invitation to bid may be obtained from the Issuing Office. The deposit is non-refundable.
- 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 written evidence such as financial data, previous experience, present commitments, and such other data as called for in the Statement of Bidder Qualifications. Each Bid must contain evidence of Bidder's qualification to do business in the state where the Project is located or covenant to obtain such qualification prior to award of the contract.
- 3.02 Bidder is advised to carefully review those portions of the Bid Form requiring Bidder's representations and certifications.

ARTICLE 4 – EXAMINATION OF BIDDING DOCUMENTS, OTHER RELATED DATA, AND SITE

- 4.01 *Subsurface and Physical Conditions*
- A. The Supplementary Conditions identify:

1. Those reports known to Owner of explorations and tests of subsurface conditions at or contiguous 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).
- B. Copies of reports and drawings referenced in Paragraph 4.01.A will be made available by Owner to any Bidder on request. Those reports and drawings are not part of the Contract Documents, but the “technical data” contained therein upon which Bidder is entitled to rely as provided in Paragraph 4.02 of the General Conditions has been identified and established in Paragraph 4.02 of 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. Bidder will be solely responsible for any cost related to obtaining copies of reports and drawings in 4.01B.

4.02 *Underground Facilities*

- A. Information and data shown or indicated in the Bidding Documents with respect to existing Underground Facilities at or contiguous to the Site is based upon information and data furnished to Owner and Engineer by owners of such Underground Facilities, including Owner, or others.

4.03 *Hazardous Environmental Condition*

- A. The Supplementary Conditions identify any reports and drawings known to Owner relating to a Hazardous Environmental Condition identified at the Site.
- B. Copies of reports and drawings referenced in Paragraph 4.03.A will be made available by Owner to any Bidder on request. Those reports and drawings are not part of the Contract Documents, but the “technical data” contained therein upon which Bidder is entitled to rely as provided in Paragraph 4.06 of the General Conditions has been identified and established in Paragraph 4.06 of 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. Bidder will be solely responsible for any cost related to obtaining copies of reports and drawings in 4.03B.

- 4.04 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 4.02, 4.03, and 4.04 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 4.06 of the General Conditions.

- 4.05 On request, Owner will provide Bidder access to the Site to conduct such examinations, investigations, explorations, tests, and studies as Bidder deems necessary for submission of a Bid.

Bidder shall fill all holes and clean up and restore the Site to its former condition upon completion of such explorations, investigations, tests, and studies. Bidder shall comply with all applicable Laws and Regulations relative to excavation and utility locates.

- 4.06 A. Reference is made to Article 7 of the Supplementary Conditions for the identification of the general nature of other work that is to be performed at the Site by Owner or others (such as utilities and other prime contractors) that relates to the Work contemplated by these Bidding Documents. On request, Owner will provide to each Bidder for examination access to or copies of contract documents (other than portions thereof related to price) for such other work.
- B. Paragraph 6.13.C of the General Conditions indicates that if an Owner safety program exists, it will be noted in the Supplementary Conditions.
- 4.07 It is the responsibility of each Bidder before submitting a Bid to:
- A. examine and carefully study the Bidding Documents, and the other related data identified in the Bidding Documents;
- B. visit the Site and become familiar with and satisfy Bidder as to the general, local, and Site conditions that may affect cost, progress, and performance of the Work;
- C. become familiar with and satisfy Bidder as to all federal, state, and local 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 contiguous to the Site and all drawings of physical conditions relating to existing surface or subsurface structures at the Site (except Underground Facilities) that have been identified in Paragraph 4.02 of the Supplementary Conditions as containing reliable "technical data," and (2) reports and drawings of Hazardous Environmental Conditions, if any, at the Site that have been identified in the Paragraph 4.06 of the Supplementary Conditions as containing reliable "technical data";
- E. consider the information known to Bidder; 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, including applying any specific means, methods, techniques, sequences, and procedures of construction expressly required by the Bidding Documents; and (3) Bidder's safety precautions and programs;
- F. agree at the time of submitting its Bid that 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(s) 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; and
 - I. determine that the Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for the performance of the Work.
- 4.08 The submission of a Bid will constitute an incontrovertible representation by Bidder that Bidder has complied with every requirement of this Article 4, that without exception the Bid is premised upon performing and furnishing the Work required by the Bidding Documents and applying any specific means, methods, techniques, sequences, and procedures of construction that may be shown or indicated or expressly required by the Bidding Documents, that Bidder has given Engineer written notice of all conflicts, errors, ambiguities, and discrepancies that Bidder has discovered in the Bidding Documents and the written resolutions thereof by Engineer are acceptable to Bidder, and that the Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performing and furnishing the Work.

ARTICLE 5 – PRE-BID CONFERENCE

- 5.01 **A non-mandatory pre-bid conference will be held at the time and date shown on the invitation to bidders.** Representatives of Owner and Engineer will be present to discuss the Project. Bidders are encouraged to attend and participate in the conference. Engineer will transmit to all prospective Bidders of record such Addenda as Engineer considers necessary in response to questions arising at the conference. Oral statements may not be relied upon and will not be binding or legally effective.

ARTICLE 6 – SITE AND OTHER AREAS

- 6.01 The Site is identified in the Bidding Documents. Easements for permanent structures or permanent changes in existing facilities are to be obtained and paid for by Owner unless otherwise provided in the Bidding Documents. All additional lands and access thereto required for temporary construction facilities, construction equipment, or storage of materials and equipment to be incorporated in the Work are to be obtained and paid for by Contractor.

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 mailed or delivered to all parties recorded by Engineer as having received the Bidding Documents. Questions received less than ten 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, or change the Bidding Documents as deemed advisable by Owner or Engineer.

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 and in the form of a certified check, bank money order, or a Bid Bond (on the form attached) issued by a surety meeting the requirements of Paragraphs 5.01 and 5.02 of the General Conditions.
- 8.02 The Bid security of the Successful Bidder will be retained until 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 returned. 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. The Bid security of other Bidders whom 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 Agreement or 61 days after the Bid opening, whereupon Bid security furnished by such Bidders will be returned.
- 8.03 Bid security of other Bidders whom Owner believes do not have a reasonable chance of receiving the award will be returned within seven days after the Bid opening.

ARTICLE 9 – CONTRACT TIMES

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

ARTICLE 10 – LIQUIDATED DAMAGES

- 10.01 Provisions for liquidated damages, if any, are set forth in the Agreement.

ARTICLE 11 – SUBSTITUTE AND “OR-EQUAL” ITEMS

- 11.01 The Contract, if awarded, will be on the basis of materials and equipment specified or described in the Bidding Documents without consideration of possible substitute or “or-equal” items. Whenever it is specified or described in the Bidding Documents that a substitute or “or-equal” item of material or equipment may be furnished or used by Contractor if acceptable to Engineer,

application for such acceptance will not be considered by Engineer until after the Effective Date of the Agreement.

ARTICLE 12 – SUBCONTRACTORS, SUPPLIERS AND OTHERS

- 12.01 If the Supplementary Conditions require the identity of certain Subcontractors, Suppliers, individuals, or entities to be submitted to Owner in advance of a specified date prior to the Effective Date of the Agreement, the apparent Successful Bidder, and any other Bidder so requested, shall within five days after Bid opening, submit to Owner a list of all such Subcontractors, Suppliers, individuals, or entities proposed for those portions of the Work for which such identification is required. 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, individual, or entity if requested by Owner. 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 a substitute, in which case apparent Successful Bidder shall submit an acceptable substitute, Bidder's Bid price will be increased (or decreased) by the difference in cost occasioned by such substitution, and Owner may consider such price adjustment in evaluating Bids and making the Contract award.
- 12.02 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, 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 revocation of such acceptance after the Effective Date of the Agreement as provided in Paragraph 6.06 of the General Conditions.
- 12.03 Contractor shall not be required to employ any Subcontractor, Supplier, individual, or entity against whom Contractor has reasonable objection.

ARTICLE 13 – PREPARATION OF BID

- 13.01 The Bid Form is included with the Bidding Documents. Additional copies may be obtained from the Issuing Office.
- 13.02 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 Bid item, alternative, adjustment unit price item, and unit price item listed therein. In the case of optional alternative(s) the words "No Bid," "No Change," or "Not Applicable" may be entered.
- 13.03 A Bid by a corporation shall be executed in the corporate name by the president or a vice-president or other corporate officer accompanied by evidence of authority to sign. The corporate seal shall be affixed and attested by the secretary or an assistant secretary. The corporate address and state of incorporation shall be shown.

- 13.04 A Bid by a partnership shall be executed in the partnership name and signed by a partner (whose title must appear under the signature), accompanied by evidence of authority to sign. The official address of the partnership shall be shown.
- 13.05 A Bid by a limited liability company shall be executed in the name of the firm by a member 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.
- 13.06 A Bid by an individual shall show the Bidder's name and official address.
- 13.07 A Bid by a joint venture shall be executed by each joint venturer in the manner indicated on the Bid Form. The official address of the joint venture shall be shown.
- 13.08 All names shall be printed in ink below the signatures.
- 13.09 The Bid shall contain an acknowledgment of receipt of all Addenda, the numbers of which shall be filled in on the Bid Form.
- 13.10 Postal and e-mail addresses and telephone number for communications regarding the Bid shall be shown.
- 13.11 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; COMPARISON OF BIDS

14.01 *Lump Sum*

- A. Bidders shall submit a Bid on a lump sum basis as set forth in the Bid Form.

14.02 *Unit Price*

- A. Bidders shall submit a Bid on a unit price basis for each item of Work listed in the Bid schedule.
- B. The total of all estimated prices will be the sum of the products of the estimated quantity of each item and the corresponding unit price. The final quantities and Contract Price will be determined in accordance with Paragraph 11.03 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 11.02.B of the General Conditions.

14.04 *Completion Time Comparisons*

- A. Bid prices will be compared after adjusting for differences in the time designated by Bidders for Substantial Completion. The adjusting amount will be determined at the rate set forth in the Contract Documents for liquidated damages for failing to achieve Substantial Completion for each day before or after the desired date appearing in Article 9 above.

ARTICLE 15 – SUBMITTAL OF BID

15.01 With each copy of the Bidding Documents, a Bidder is furnished one bound copy of the Bid Form, and the Bid Bond Form. An unbound copy of the Bid Form is to be completed and submitted with the Bid security and the following documents:

- A. Required Bid security in the form of Bid Bond or Cashier's Check in the amount of 5% of the total bid amount;
- B. List of Proposed Subcontractors;
- C. List of Proposed Suppliers;
- D. List of Project References;
- E. Evidence of authority to do business in the state of the Project; or a written covenant to obtain such license within the time for acceptance of Bids;
- F. *[If applicable]* Contractor's License No.: _____ *[or]* Evidence of Bidder's ability to obtain a State Contractor's License and a covenant by Bidder to obtain said license within the time for acceptance of Bids;
- G. Required Bidder Qualification Statement with Supporting Data;
- H. Non-Collusion Affidavit of Prime Bidder;
- I. Bonding company information form.

15.02 Bids shall be submitted in duplicate 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:

Jennifer Perkins, City Secretary
City of Dayton
117 Cook Street
Dayton, Texas 77535

ARTICLE 16 – MODIFICATION AND WITHDRAWAL OF BID

16.01 A Bid may be modified or 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.

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

ARTICLE 17 – OPENING OF BIDS

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

ARTICLE 18 – BIDS TO REMAIN SUBJECT TO ACCEPTANCE

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

ARTICLE 19 – EVALUATION OF BIDS AND AWARD OF CONTRACT

19.01 Owner reserves the right to reject any or all Bids, including without limitation, nonconforming, nonresponsive, unbalanced, or conditional Bids. Owner further reserves the right to reject the Bid of any Bidder whom it finds, after reasonable inquiry and evaluation, to not be responsible. Owner may also reject the Bid of any Bidder if Owner believes that it would not be in the best interest of the Project to make an award to that Bidder. Owner also reserves the right to waive all informalities not involving price, time, or changes in the Work and to negotiate contract terms with the Successful Bidder.

19.02 More than one Bid for the same Work from an individual or entity under the same or different names will not be considered. Reasonable grounds for believing that any Bidder has an interest in

more than one Bid for the Work may be cause for disqualification of that Bidder and the rejection of all Bids in which that Bidder has an interest.

- 19.03 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.
- 19.04 In evaluating Bidders, Owner will consider the qualifications of Bidders and may consider the qualifications and experience of Subcontractors, Suppliers, and other individuals or entities proposed for those portions of the Work for which the identity of Subcontractors, Suppliers, and other individuals or entities must be submitted as provided in the Supplementary Conditions.
- 19.05 Owner may conduct such investigations as Owner deems necessary to establish the responsibility, qualifications, and financial ability of Bidders, proposed Subcontractors, Suppliers, individuals, or entities proposed for those portions of the Work in accordance with the Contract Documents.
- 19.06 If the Contract is to be awarded, Owner will award the Contract to the Bidder whose Bid is in the best interests of the Project.

ARTICLE 20 – CONTRACT SECURITY AND INSURANCE

- 20.01 Article 5 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 executed Agreement to Owner, it shall be accompanied by such bonds.

ARTICLE 21 – SIGNING OF AGREEMENT

- 21.01 When Owner issues a Notice of Award to the Successful Bidder, it shall be accompanied by six (6) unsigned counterparts of the Agreement along with the other Contract Documents which are identified in the Agreement as attached thereto. Within 15 days thereafter, Successful Bidder shall sign and deliver the required number of counterparts of the Agreement and attached documents to Owner. Within ten days thereafter, Owner shall deliver one fully signed counterpart to Successful Bidder with a complete set of the Drawings with appropriate identification.

ARTICLE 22 – SALES AND USE TAXES

- 22.01 The OWNER qualifies as an exempt agency, and is not subject to State, County, or City sales taxes only to the extent allowable by law. CONTRACTOR is advised to contact the State Comptroller's

Office or other knowledgeable source in order to apprise himself of the possible impact of the current law. Only equipment and materials incorporated into the permanent project are tax exempt.

ARTICLE 23 – RETAINAGE

23.01 Provisions concerning Contractor's retainage are set forth in the Agreement.

ARTICLE 24 – EQUAL OPPORTUNITY IN EMPLOYMENT

24.01 All qualified applicants will receive consideration for employment without regard to race, color, religion, sex, age, handicap, or national origin. Bidders on this work will be required to comply with the President's Executive Order No. 11246, as amended by Executive Order 11375, and as supplemented in Department of Labor regulations 41 CFR Part 60.

ARTICLE 25 – BONDING COMPANY

25.01 The bidder shall submit with his bid the name, address, and telephone number of a person, firm, or corporation who has agreed to execute the required payment and performance bonds in the event that this contract is awarded to the bidder. A form is included in these contract documents for that purpose.

25.02 Such surety company shall be authorized to operate in Texas, shall have all necessary authorization and resources required to issue payment and performance bonds required for the amount of the contract, and shall have a rating of at least A from Best's Key Rating Guide.

ARTICLE 26 – TEXAS ETHIC COMMISSION

26.01 By January 1, 2016, the commission will make available on its website a new filing application that must be used to file Form 1295. A business entity must use the application to enter the required information on Form 1295 and print a copy of the completed form, which will include a certification of filing that will contain a unique certification number. An authorized agent of the business entity must sign the printed copy of the form and have the form notarized. The completed Form 1295 with the certification of filing must be filed with the governmental body or state agency with which the business entity is entering into the contract.

26.02 The governmental entity or state agency must notify the commission, using the commission's filing application, of the receipt of the filed Form 1295 with the certification of filing not later than the 30th day after the date the contract binds all parties to the contract. The commission will post the completed Form 1295 to its website within seven business days after receiving notice from the governmental entity or state agency.

26.03 The following link has tutorials and frequently asked questions that will guide you through the process: https://www.ehtics.state.tx.us/whatsnew/elf_info_form1295.htm

**CITY OF DAYTON, TEXAS
CLAYTON WATER WELL IMPROVEMENTS PROJECT
TRANSMISSION LINE**

SCOPE OF WORK

GENERAL

It is the intent of the Contract Documents to provide the requirements and specifications for the construction associated with the **City of Dayton, Texas, Clayton Water Well Improvements Project, Transmission Line.**

This contract shall provide for the installation of approximately 4,021 linear feet of new 14" C900 PVC water transmission line from Clayton Water Well No. 5 (currently in construction) to the existing Clayton Ground Storage Tank Site, including but not limited to, all applicable water valves, fittings, and all improvements necessary for a complete installation, per technical specifications in the contract documents.

Transmission Line:

1. Mobilization;
2. Construct approximately 4,021 LF of 14" PVC C900 Class 150 DR 18 OR 16" (14.67" I.D) HDPE DIPS DR-13.5 water transmission line and related fittings by open cut, boring, or directional drilling;
3. Furnish and construct beginning of line connection of proposed 14" water line to an existing 8" header piping at the Clayton Ground Storage Tank including all necessary fittings;
4. Furnish, install, maintain and remove traffic control devices, barricading and signing measures in accordance with TMUTCD;

This contract shall include all necessary superintendence, labor, materials, equipment, tools, piping, field jointing, cleaning, grouting, excavation, trenching, shoring, fill, grading, backfill, surface restoration, testing, hauling and disposal of excess soils, and incidental items necessary for the construction of the proposed facilities as shown in the plans and documented in the specifications.

The Contractor is responsible for the restoration of all disturbed surfaces, including pavement. All surfaces shall be returned to original condition or better.

Prior to the start of construction, the Contractor shall submit a construction schedule to the engineer detailing his anticipated activities with estimated dates for the completion of each activity and section.

The Contractor shall be responsible for the startup and testing of each system embraced in this Contract. All systems shall be demonstrated to be functioning at design conditions prior to being considered complete. Where requested or required by the Engineer, the Contractor shall submit test data and certify in writing that the systems tested performed as required by the plans and

specifications at design conditions.

BID ITEM NOTES

Contractor's bid shall include all labor, material and equipment and overhead costs to perform work described in the plans and specifications. Any other work necessary for the intended work as described in the plans and specification not specifically detailed in the unit price description or in the plans and specifications shall be made subsidiary to the bid items provided. The City of Dayton shall award a contract for any bid to achieve the maximum benefit to the District within the allowable budget.

GENERAL NOTES

1. In all construction, the Contractor shall be responsible for providing all fittings and appurtenances necessary for a complete installation even if not specifically mentioned.
2. The Contractor shall verify all dimensions and existing conditions of the job site. Any variation from dimensions or details as shown on the structural drawings shall be reported to the engineer.
3. The Contractor shall confine his operations to the indicated easements and rights of way. He shall keep all work sites in a neat, orderly, and safe manner during the course of the construction. All excess materials shall be disposed of on a regular basis or whenever, in the opinion of the engineer, they constitute a hazard or nuisance. Disposal of excess soils shall be in accordance with all local, state, and federal laws and shall be solely at the Contractor's expense.
4. All work areas and surfaces disturbed by the Contractor shall be cleaned and restored to their original condition prior to the contract being considered complete unless specifically stated otherwise in these plans and specifications. All excess soils and materials shall be removed, litter and temporary trash disposal facilities shall be removed, all materials designated to be salvaged to the owner shall be deposited in an owner approved site, and all surface restoration, including seeding, shall be completed.
5. The location of all utilities (water, sewer, telephone, cable, electrical, gas, etc.) is the responsibility of the Contractor. The utilities shown on the plans are for informational purposes only and are not intended to show the exact location of these utilities. The Contractor shall give each utility owner the required notice prior to beginning construction near the utility. The Contractor shall be responsible for resolving any disputes with the utility owners regarding damage to the utilities. The City of Sour Lake shall not be responsible for damage to existing utilities.
6. Trench protection, in accordance with the specifications, shall be used where excavations are deeper than five (5) feet deep or where the trench is less than five (5) feet deep and in a dangerous condition. This item will not be paid for directly, but shall be considered subsidiary.
7. The Contractor shall be responsible for the restoration of all property markers disturbed during construction.

8. The Contractor shall take necessary precautions to prevent large amounts of soil, rock, and other excavation materials from being washed into the ditches and drainage ways. The streets shall be kept free of dirt and mud that results from the Contractor's work. The engineer and owner shall have the right to require that the Contractor immediately remedy any situation which they consider detrimental to public health or safety, the environment, or any other problematic disturbances that are caused by the Contractor's work.

9. All above ground piping and fittings shall be painted according to the paint specification. All underground ductile iron piping shall be encased in 8 mils thick polywrap. Nuts and bolts used above ground may be zinc coated, and those used below ground shall be stainless steel.

10. Megalug restraining flanges shall be used at all mechanical joint ductile iron fittings. Transition gaskets shall be used where necessary to connect to existing piping. Payment shall be subsidiary to appropriate bid items.

11. Construction methods, erection procedures, and safety procedures are the responsibility of the Contractor. Structural drawings represent the finished state of structural elements. Contractor is to provide temporary bracing for accurate plumbing and to resist all wind, soil backfill, and construction loads. Engineered structural design for temporary bracing, form work, soil retention, and shoring are to be provided by the Contractor.

12. The Contractor shall be responsible for the control of groundwater in trenches and in pits. This shall include water lines and the well sites. Control of groundwater shall include, but not be limited to, dewatering, wellpoint systems, and trench stabilization. Payment for such shall be incidental to the appropriate bid items.

13. The Contractor shall be responsible for the maintenance and upkeep of the access roads to the well site during the course of the project.

WORK SEQUENCE

It shall be the responsibility of the Contractor to coordinate all work with the Engineer, Owner, utility owners, and any other party affected by this project. Normal site operations must be maintained during this project. The Contractor must coordinate all his efforts with the Owner and the Engineer to avoid interrupting operations. At no time will the Contractor be allowed to cause any unit that is in operation to be taken out of service without the approval of the Owner and the Engineer.

The Contractor shall submit to the Engineer in writing at least ten (10) days before beginning construction, a construction sequence detailing the anticipated schedule for constructing the major portions of this project for the Engineer's approval. The Contractor shall notify the Engineer prior to deviating from this schedule. The schedule must comply with the requirements set forth in the plans, specifications, and contract documents.

CONDITIONS AT THE SITE

The proposed improvements may be adjacent to or in the vicinity of various gas lines, telephone cables, and other utilities. The locations of some of these lines have been shown on the plans for informational purposes only and are not intended to depict the exact location of the utilities. No field verification was made on existing underground utilities. The locations shown on the plans are assumed locations. Some underground utilities may be directly over the existing water line or in proximity of the water line, bridge and other water items. The location of these utilities are the sole responsibility of the Contractor. Any damage to these utilities are the responsibility of the Contractor and the owner of the utilities.

The water lines will cross or parallel existing sewer lines. Vertical and/or horizontal clearance shall comply with the Texas Commission on Environmental Quality requirements. See the specifications for these requirements.

Bidders should visit the proposed project sites to acquaint themselves with the site conditions and access limitations prior to bidding on the project. Bidding on the project shall be considered the Contractor's assurance that He is familiar with the site conditions and that His bid provides for reasonable unanticipated conditions.

The proposed water lines will be adjacent to or in the vicinity of concrete/asphalt or paved roads in City Right of Ways. The Contractor shall restore all damaged pavement sections to their original condition or better at no extra cost to the Owner.

BID FORM
CITY OF DAYTON, TEXAS
CLAYTON WATER WELL IMPROVEMENTS PROJECT
TRANSMISSION LINE

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ARTICLE 1 – BID RECIPIENT

1.01 This Bid is submitted to:

**City of Dayton
117 Cook Street
Dayton, Texas 77535**

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, other related data identified in the Bidding Documents, and the following Addenda, receipt of which is hereby acknowledged:

<u>Addendum No.</u>	<u>Addendum Date</u>
_____	_____
_____	_____
_____	_____

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

D. Bidder has carefully studied all: (1) reports of explorations and tests of subsurface conditions at or contiguous to the Site and all drawings of physical conditions relating to existing surface or subsurface structures at the Site (except Underground Facilities) that have been identified in SC-4.02 as containing reliable "technical data".

E. Bidder has considered the information known to Bidder; 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, including applying the specific means, methods, techniques, sequences, and procedures of construction expressly required by the Bidding Documents; and (3) Bidder's safety precautions and programs.

- F. Based on the information and observations referred to in Paragraph 3.01.E above, Bidder does not consider that further examinations, investigations, explorations, tests, studies, or data are necessary for the determination of this Bid for performance of the Work at the price(s) 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 the written resolution thereof by Engineer is acceptable to Bidder.
- 1. The Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for the performance of the Work for which this Bid is submitted.

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 anything of value likely to influence the action of a public official in the bidding process;
 - 2. "fraudulent practice" means an intentional misrepresentation of facts made (a) to influence the bidding process to the detriment of Owner, (b) to establish bid prices at artificial non-competitive levels, or (c) to deprive Owner of the benefits of free and open competition;
 - 3. "collusive practice" means a scheme or arrangement between two or more Bidders, with or without the knowledge of Owner, a purpose of which is to establish bid prices at artificial, non-competitive levels; and

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

ARTICLE 5 – BASIS OF BID

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

BASE BID

A) TRANSMISSION LINE

ITEM NO.	ESTIMATED QUANTITIES	DESCRIPTION	UNIT PRICE	TOTAL AMOUNT BID
1	1 LS	MOBILIZATION costs including transportation, moving on site, payment bond, performance bond, insurance, submittals, NOT TO EXCEED 5% of project total, all in accordance with the Plans and Specifications, for _____ do llars and _____ cents per Lump Sum.	\$ _____	\$ _____
2	4,021 LF	Furnish and construct 14” PVC C900 Class 150 DR-18 water line <u>OR</u> 16” (14.67” I.D) HDPE DIPS DR-13.5 by Contractor’s Choice of Boring or Directional Drilling or Open Cut installed in trench , complete in place, all depths, including fittings, boring, necessary embedment, backfill, thrust blocking, surface restoration, seeding, testing, installing end of line cap and marker, and all appurtenances, all in strict accordance with the Plans and Specifications, for _____ dollars and _____ cents per Linear Foot.	\$ _____	\$ _____

ITEM NO.	ESTIMATED QUANTITIES	DESCRIPTION	UNIT PRICE	TOTAL AMOUNT BID
3	1 EA	Construct Beginning of Line connection of proposed 14" water line to an existing 8" header piping at the Clayton Ground Storage Tank Site , complete in place, at the locations shown on the plans, including all necessary fittings, gate valve, Megalug flanges, coatings, polywrap, backfill, surface restoration, testing, and all necessary appurtenances, all in strict accordance with the Plans and Specifications, for _____ dollars and _____ cents per Each.	\$ _____	\$ _____
4	1 LS	Furnish, install, maintain and remove traffic control devices, barricading and signing measures , and appurtenances for construction of project in accordance with Texas Manual on Uniform Traffic Control Devices, complete in place, all in strict accordance with the Plans and Specifications, for _____ dollars and _____ cents per Lump Sum.	\$ _____	\$ _____

TOTAL BASE BID: \$ _____.

Unit Prices have been computed in accordance with Paragraph 11.03.B of the General Conditions. The above unit prices shall include all labor, materials, bailing, shoring, removal, overhead, profit, insurance, etc., to cover the finished work of the several kinds called for.

Amounts are to be shown in both words and figures. Discrepancies in the multiplication of units of work and unit prices shall be resolved in favor of the correct total. Discrepancies between the indicated sum of any column of figures and the correct sum thereof will be resolved in favor of the correct sum. Discrepancies between words and figures will be resolved in favor of the words.

Alternate Bid Items may be included on an alternate basis. These items may or may not be considered in the determination of the apparent lowest bidder. These items may or may not be awarded, at the discretion of the Owner.

Bidder understands that the Owner reserves the rights to reject any and all bids and to waive any informalities in the bidding. Bidder acknowledges that quantities are not guaranteed, and final payment will be based on actual quantities determined as provided in the Contract Documents and Specifications, if applicable.

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

If the contract is to be awarded, it will be awarded to the Best Bid, the Lowest Bidder or the Bidder whose evaluation by the OWNER or whose Bid indicates to the OWNER that the award will be in the best interest of the Project.

ARTICLE 6 – TIME OF COMPLETION

6.01 Bidder agrees that the Work will be substantially complete and will be completed and ready for final payment in accordance with Paragraph 14.07 of the General Conditions on or before the dates or within the number of working days indicated in the Agreement.

_____ **Working Days**

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

ARTICLE 7 – ATTACHMENTS TO THIS BID

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

- A. Required Bid security in the form of _____, and in the amount of \$ _____;
- B. List of Proposed Subcontractors;
- C. List of Proposed Suppliers;
- D. List of Project References;
- E. Evidence of authority to do business in the state of the Project; or a written covenant to obtain such license within the time for acceptance of Bids;
- F. Required Bidder Qualification Statement with Supporting Data

ARTICLE 8 – DEFINED TERMS

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

ARTICLE 9 – BID SUBMITTAL

9.01 This Bid is submitted by:

If Bidder is:

An Individual

Name (typed or printed): _____

By: _____
(Individual’s signature)

Doing business as: _____

A Partnership

Partnership Name: _____

By: _____
(Signature of general partner -- attach evidence of authority to sign)

Name (typed or printed): _____

A Corporation

Corporation Name: _____ (SEAL)

State of Incorporation: _____

Type (General Business, Professional, Service, Limited Liability): _____

By: _____
(Signature -- attach evidence of authority to sign)

Name (typed or printed): _____

Title: _____
(CORPORATE SEAL)

Attest _____

Date of Qualification to do business in _____ is ____ / ____ / ____.

A Joint Venture

Name of Joint Venture: _____

First Joint Venturer Name: _____ (SEAL)

By: _____
(Signature of first joint venture partner -- attach evidence of authority to sign)

Name (typed or printed): _____

Title: _____

Second Joint Venturer Name: _____ (SEAL)

By: _____
(Signature of second joint venture partner -- attach evidence of authority to sign)

Name (typed or printed): _____

Title: _____

(Each joint venturer must sign. The manner of signing for each individual, partnership, and corporation that is a party to the joint venture should be in the manner indicated above.)

Bidder's Business Address _____

Phone No. _____ Fax No. _____

E-mail _____

SUBMITTED on _____, 20____.

State Contractor License No. _____ . *[If applicable]*.

STATEMENT OF BIDDER'S QUALIFICATIONS

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

Date: _____

Bidder (Legal Name of Firm): _____

Date Organized: _____

Address : _____
: _____

Date Incorporated: _____

Federal ID Number: _____

Number of Years in contracting business under present name: _____

List all other names under which your business has operated in the last 10 years:

Work Presently Under Contract:

Contract	Amount \$	Completion Date
_____	_____	_____
_____	_____	_____
_____	_____	_____

Type of work performed by your company: _____

Total Staff employed by Firm (Break down by Managers and Trades on separate sheet):

Have you ever failed to complete any work awarded to you? Yes No

(If yes, please attach summary of details on a separate sheet. Include brief explanation of cause and resolution)

Have you ever defaulted on a contract? Yes No

(If yes, please attach summary of details on a separate sheet.)

Has your organization had any disbarments or suspensions that have been imposed in the past five years or that was still in effect during the five year period or is still in effect? Yes No
(If yes, list and explain; such list must include disbarments and suspensions of officers, principals, partners, members, and employees of your organization.)

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

Project	Amount \$	Mo/Yr Completed
_____	_____	_____
_____	_____	_____
_____	_____	_____

Major equipment available for this contract: _____

Are you in compliance with all applicable EEO requirements? Yes No
(If no, please attach summary of details on a separate sheet.)

Bank References

Address: _____ Contact Name: _____
City & State: _____ Zip: _____ Phone Number: _____
Credit available: \$ _____

Has the firm or predecessor firm been involved in a bankruptcy or reorganization? Yes No
(If yes, please attach summary of details on a separate sheet.)

List on a sheet attached hereto all judgements, claims, arbitration proceedings, or suits pending or outstanding against bidder over the last five (5) years with amount of claim and brief description.

List on a sheet attached hereto all lawsuits or requested arbitration with regard to construction contracts which bidder has initiated within the last five (5) years and brief explanation of claim and outcome.

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

Signed this _____ day of _____, 20____.

Signature

Printed Name and Title

Company Name

Notary Statement:

_____, being duly sworn, says that he/she is the

Position/Title _____ of _____ (Firm Name), and hereby
swears that the answers to the foregoing questions and all statements therein contained are true
and correct. He/she hereby authorizes and requests any person, firm, or corporation to furnish any
information requested City/County of _____ in verification of the recitals
comprising this Statement of Bidder's Qualifications.

Subscribed and sworn before me this _____ day of _____, 20____.

Notary Public

Signature

Printed Name

My Commission Expires: _____,

The penalty for making false statements is prescribed in the U. S. Criminal Code, 18 U.S.C.
1001.

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)*:

City of Dayton
117 Cook Street
Dayton, Texas 77535

BID

Bid Due Date: _____
Description *(Project Name and Include Location)*:
City of Dayton, Texas
Clayton Water Well Improvements Project
Transmission Line

BOND

Bond Number: _____
Date (Not earlier than Bid due 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

Bidder's Name and Corporate Seal (Seal)

Surety's Name and Corporate Seal (Seal)

By: _____
Signature

By: _____
Signature (Attach Power of Attorney)

Print Name

Print Name

Title

Title

Attest: _____
Signature

Attest: _____
Signature

Title

Title

Note: Above 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 any difference between the total amount of Bidder's Bid and the total amount of the Bid of the next lowest, responsible Bidder who submitted a responsive Bid as determined by Owner for the work required by the Contract Documents, provided that:
 - 1.1 If there is no such next Bidder, and Owner does not abandon the Project, then Bidder and Surety shall pay to Owner the penal sum set forth on the face of this Bond, and
 - 1.2 In no event shall Bidder's and Surety's obligation hereunder exceed the penal sum set forth on the face of this Bond.
 - 1.3 Recovery 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 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 Bid due date.
7. Any suit or action under this Bond shall be commenced only in a court of competent jurisdiction located in the state in which the Project is located.
8. Notices required hereunder shall be in writing and sent to Bidder and Surety at their respective addresses shown on the face of this Bond. Such notices may be sent by personal delivery, commercial courier, or by United States Registered or Certified Mail, return receipt requested, postage pre-paid, and shall be deemed to be effective upon receipt by the party concerned.
9. Surety shall cause to be attached to this Bond a current and effective Power of Attorney evidencing the authority of the officer, agent, or representative who executed this Bond on behalf of Surety to execute, seal, and deliver such Bond and bind the Surety thereby.
10. This Bond is intended to conform to all applicable statutory requirements. Any applicable requirement of any applicable statute that has been omitted from this Bond shall be deemed to be included herein as if set forth at length. If any provision of this Bond conflicts with any applicable statute, then the provision of said statute shall govern and the remainder of this Bond that is not in conflict therewith shall continue in full force and effect.
11. The term "Bid" as used herein includes a Bid, offer, or proposal as applicable.

BONDING COMPANY INFORMATION

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

Name of Surety: _____

Mailing Address: _____

City, State, Zip: _____

Telephone Number: _____

Is surety authorized to operate in Texas? _____

Is surety aware of size of project? _____

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

Rating from Best's Key Rating Guide _____

Project: City of Dayton, Texas
Clayton Water Well Improvements Project
Transmission Line

Owner: City of Dayton, Texas

Name of Bidder

PERFORMANCE BOND

KNOW ALL MEN BY THESE PRESENTS that:

(Name of Contractor or Company)

(Address)

a _____, hereinafter called Principal,
(Corporation / Partnership)

(Name of Surety Company)

(Address)

hereinafter called Surety, are held and firmly bound unto

City of Dayton, Texas

(Name of Grant Recipient)

117 Cook Street, Dayton, Texas 77535

(Grant Recipient's Address)

hereinafter called OWNER, in the penal sum of \$ _____
Dollars, \$ _____ in lawful money of the United States, for the payment of
which sum well and truly to be made we bind ourselves, successors, and assigns, jointly and severally,
firmly in these presents.

THE CONFIDENTIALITY OF THIS OBLIGATION is such that whereas, the Principal entered into a
certain contract with the OWNER, dated the _____ day of _____,
a copy of which is hereto attached and made a part hereof for the construction of:

City of Dayton, Texas
Clayton Water Well Improvements Project
Transmission Line

NOW THEREFORE, if the Principal shall well, truly and faithfully perform its duties in all the
undertakings, covenants, terms, conditions, and agreements of said contract during the original term thereof,
and any extensions thereof which may be granted by the OWNER, with or without notice to the Surety and
during the one year guaranty period, and if he shall satisfy all claims and demands incurred under such
contract, and shall fully indemnify and save harmless the OWNER from all costs and damages which it
may suffer by reason of failure to do so, and shall reimburse and repay the OWNER all outlay and expense
which the OWNER may incur in making good any default, then this obligation shall be void, otherwise to
remain in full force and effect.

PROVIDED FURTHER, that the said Surety, for value received hereby stipulates and agrees that no
change, extension of time, alteration or addition to the terms of the contract or to WORK to be performed

thereunder or the SPECIFICATIONS accompanying the same shall in any way affect its obligation on this BOND, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the contract or to the WORK or to the SPECIFICATIONS.

PROVIDED, FURTHER, that no final settlement between the OWNER and the Principal shall abridge the right of any beneficiary hereunder, whose claim may be unsatisfied.

IN WITNESS WHEREOF, this instrument is executed in _____ counterparts, each on of which shall be deemed an original, this the _____ day of _____.

ATTEST:

(Principal)

(Principal Secretary) By _____ (s)

(SEAL)

(Witness as to Principal) (Address)

(Address)

ATTEST:

(Surety)

(Witness as to Surety) By _____
(Attorney in Fact)

(Address) (Address)

NOTE: Date of BOND must not be prior to date of Contract. If PRINCIPAL/CONTRACTOR is Partnership, all partners should execute BOND.

PAYMENT BOND

KNOW ALL MEN BY THESE PRESENTS that:

(Name of Contractor or Company)

(Address)

a _____, hereinafter called Principal,
(Corporation / Partnership)

and _____
(Name of Surety Company)

(Address)

hereinafter called Surety, are held and firmly bound unto

City of Dayton, Texas
(Name of Recipient)

117 Cook Street, Dayton, Texas 77535
(Recipient's Address)

hereinafter called OWNER, in the penal sum of \$ _____

Dollars, \$ _____ in lawful money of the United States, for this payment of which sum well and truly to be made, we bind ourselves, successors, and assigns, jointly and severally, firmly by these presents.

THE CONFIDENTIALITY OF THIS OBLIGATION is such that whereas, the Principal entered into a certain contract with the OWNER, dated the _____ day of _____, a copy of which is hereto attached and made a part hereof for the construction of:

City of Dayton, Texas
Clayton Water Well Improvements Project
Transmission Line

NOW, THEREFORE, if the Principal shall promptly make payment to all persons, firms, SUB-CONTRACTORS, and corporations furnishing materials for or performing labor in the prosecution of the WORK provided for in such contract, and any authorized extension or modification thereof, including all amounts due for materials, lubricants, oil, gasoline, coal and coke, repairs on machinery, equipment and tools, consumed or used in connection with the construction of such WORK, and all insurance premiums on said WORK, and for all labor, performed in such WORK whether by SUB-CONTRACTOR or otherwise, then this obligation shall be void; otherwise to remain in full force and effect.

PROVIDED, FURTHER, that the said Surety, for value received hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the contract or to WORK to be performed thereunder or the SPECIFICATIONS accompanying the same shall in any way affect its obligation on this

BOND, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the contract or to the WORK or to the SPECIFICATIONS.

PROVIDED, FURTHER, that no final settlement between the OWNER and the CONTRACTOR shall abridge the right of any beneficiary hereunder, whose claim may be unsatisfied.

IN WITNESS WHEREOF, this instrument is executed in _____ counter-parts, each on of ____ (Number) which shall be deemed an original, this the _____ day of _____.

ATTEST: _____
(Principal)

_____ By _____ (s)
(Principal Secretary)

(SEAL)

(Witness as to Principal) (Address)

(Address)

ATTEST: _____
(Surety)

_____ By _____
(Witness as to Surety) (Attorney in Fact)

(Address) (Address)

NOTE: Date of BOND must not be prior to date of Contract. If CONTRACTOR is Partnership, all partners should execute BOND.

NONCOLLUSION AFFIDAVIT OF PRIME BIDDER

State of Texas

City of Dayton

_____, being first duly sworn, deposes and says that:

(1) He/She is _____ of _____, the Bidder that has submitted the attached Bid;

(2) He/She is fully informed respecting the preparation and contents of the attached Bid and of all pertinent circumstances respecting such Bid;

(3) Such Bid is genuine and is not a collusive or sham Bid;

(4) Neither the said Bidder nor any of its officers, partners, owners, agents, representatives, employees or parties in interest, including this affiant, has in any way colluded, conspired, connived or agreed, directly or indirectly with another Bidder, firm or person to submit a collusive or sham Bid in connection with the Contract for which the attached Bid has been submitted or to refrain from bidding in connection with such Contract, or has in any manner, directly or indirectly, sought by agreement or collusion or communication or conference with any other Bidder, firm or person to fix the price or prices in the attached Bid or of any other Bidder, or to fix an overhead, profit or cost element of the Bid price or the Bid price of any other Bidder, or to secure through any collusion, conspiracy, connivance or unlawful agreement any advantage against the **City of Dayton, Texas** or any person interested in the proposed Contract; and

(5) The price or prices quoted in the attached Bid are fair and proper and are not tainted by any collusion, conspiracy, connivance or unlawful agreement on the part of the Bidder or any of its agents, representatives, owners, employees, or parties in interest, including this affiant.

(Signed) _____

Title

Subscribed and sworn to me this _____ day of _____.

By: _____

Notary Public

My commission expires _____

CERTIFICATE OF INSURANCE

(To be inserted into the contract upon award)

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 and printed with initial capital letters, the terms listed below will have the meanings indicated which are applicable to both the singular and plural thereof. 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 which is evidence of the agreement between Owner and Contractor covering the Work.
 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. *Asbestos*—Any material that contains more than one percent asbestos and is friable or is releasing asbestos fibers into the air above current action levels established by the United States Occupational Safety and Health Administration.
 5. *Bid*—The offer or proposal of a Bidder submitted on the prescribed form setting forth the prices for the Work to be performed.
 6. *Bidder*—The individual or entity who submits a Bid directly to Owner.
 7. *Bidding Documents*—The Bidding Requirements and the proposed Contract Documents (including all Addenda).
 8. *Bidding Requirements*—The advertisement or invitation to bid, Instructions to Bidders, Bid security of acceptable form, if any, and the Bid Form with any supplements.
 9. *Change Order*—A document recommended by Engineer 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, issued on or after the Effective Date of the Agreement.
 10. *Claim*—A demand or assertion by Owner or Contractor seeking an adjustment of Contract Price or Contract Times, or both, or other relief with respect to the terms of the Contract. A demand for money or services by a third party is not a Claim.
 11. *Contract*—The entire and integrated written agreement between the Owner and Contractor concerning the Work. The Contract supersedes prior negotiations, representations, or agreements, whether written or oral.

12. *Contract Documents*—Those items so designated in the Agreement. Only printed or hard copies of the items listed in the Agreement are Contract Documents. Approved Shop Drawings, other Contractor submittals, and the reports and drawings of subsurface and physical conditions are not Contract Documents.
13. *Contract Price*—The moneys payable by Owner to Contractor for completion of the Work in accordance with the Contract Documents as stated in the Agreement (subject to the provisions of Paragraph 11.03 in the case of Unit Price Work).
14. *Contract Times*—The number of days or the dates stated in the Agreement to: (i) achieve Milestones, if any; (ii) achieve Substantial Completion; and (iii) complete the Work so that it is ready for final payment as evidenced by Engineer’s written recommendation of final payment.
15. *Contractor*—The individual or entity with whom Owner has entered into the Agreement.
16. *Cost of the Work*—See Paragraph 11.01 for definition.
17. *Drawings*—That part of the Contract Documents prepared or approved by Engineer which graphically shows the scope, extent, and character of the Work to be performed by Contractor. Shop Drawings and other Contractor submittals are not Drawings as so defined.
18. *Effective Date of the Agreement*—The date indicated in the Agreement on which it becomes effective, but if no such date is indicated, it means the date on which the Agreement is signed and delivered by the last of the two parties to sign and deliver.
19. *Engineer*—The individual or entity named as such in the Agreement.
20. *Field Order*—A written order issued by Engineer which requires minor changes in the Work but which does not involve a change in the Contract Price or the Contract Times.
21. *General Requirements*—Sections of Division 1 of the Specifications.
22. *Hazardous Environmental Condition*—The presence at the Site of Asbestos, PCBs, Petroleum, Hazardous Waste, or Radioactive Material in such quantities or circumstances that may present a substantial danger to persons or property exposed thereto.
23. *Hazardous Waste*—The term Hazardous Waste shall have the meaning provided in Section 1004 of the Solid Waste Disposal Act (42 USC Section 6903) as amended from time to time.
24. *Laws and Regulations; Laws or Regulations*—Any and all applicable laws, rules, regulations, ordinances, codes, and orders of any and all governmental bodies, agencies, authorities, and courts having jurisdiction.
25. *Liens*—Charges, security interests, or encumbrances upon Project funds, real property, or personal property.
26. *Milestone*—A principal event specified in the Contract Documents relating to an intermediate completion date or time prior to Substantial Completion of all the Work.

27. *Notice of Award*—The written notice by Owner to the Successful Bidder stating that upon timely compliance by the Successful Bidder with the conditions precedent listed therein, Owner will sign and deliver the Agreement.
28. *Notice to Proceed*—A written notice given 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 under the Contract Documents.
29. *Owner*—The individual or entity with whom Contractor has entered into the Agreement and for whom the Work is to be performed.
30. *PCBs*—Polychlorinated biphenyls.
31. *Petroleum*—Petroleum, including crude oil or any fraction thereof which is liquid at standard conditions of temperature and pressure (60 degrees Fahrenheit and 14.7 pounds per square inch absolute), such as oil, petroleum, fuel oil, oil sludge, oil refuse, gasoline, kerosene, and oil mixed with other non-Hazardous Waste and crude oils.
32. *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.
33. *Project*—The total construction of which the Work to be performed under the Contract Documents may be the whole, or a part.
34. *Project Manual*—The bound documentary information prepared for bidding and constructing the Work. A listing of the contents of the Project Manual, which may be bound in one or more volumes, is contained in the table(s) of contents.
35. *Radioactive Material*—Source, special nuclear, or byproduct material as defined by the Atomic Energy Act of 1954 (42 USC Section 2011 et seq.) as amended from time to time.
36. *Resident Project Representative*—The authorized representative of Engineer who may be assigned to the Site or any part thereof.
37. *Samples*—Physical examples of materials, equipment, or workmanship that are representative of some portion of the Work and which establish the standards by which such portion of the Work will be judged.
38. *Schedule of Submittals*—A schedule, prepared and maintained by Contractor, of required submittals and the time requirements to support scheduled performance of related construction activities.
39. *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.

40. *Shop Drawings*—All drawings, diagrams, illustrations, schedules, and other data or information which are specifically prepared or assembled by or for Contractor and submitted by Contractor to illustrate some portion of the Work.
41. *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 for access thereto, and such other lands furnished by Owner which are designated for the use of Contractor.
42. *Specifications*—That part of the Contract Documents consisting of written requirements for materials, equipment, systems, standards and workmanship as applied to the Work, and certain administrative requirements and procedural matters applicable thereto.
43. *Subcontractor*—An individual or entity having a direct contract with Contractor or with any other Subcontractor for the performance of a part of the Work at the Site.
44. *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.
45. *Successful Bidder*—The Bidder submitting a responsive Bid to whom Owner makes an award.
46. *Supplementary Conditions*—That part of the Contract Documents which amends or supplements these General Conditions.
47. *Supplier*—A manufacturer, fabricator, supplier, distributor, materialman, or vendor having a direct contract with Contractor or with any Subcontractor to furnish materials or equipment to be incorporated in the Work by Contractor or Subcontractor.
48. *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 those that convey electricity, gases, steam, liquid petroleum products, telephone or other communications, cable television, water, wastewater, storm water, other liquids or chemicals, or traffic or other control systems.
49. *Unit Price Work*—Work to be paid for on the basis of unit prices.
50. *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, and furnishing, installing, and incorporating all materials and equipment into such construction, all as required by the Contract Documents.
51. *Work Change Directive*—A written statement to Contractor issued on or after the Effective Date of the Agreement and signed by Owner and recommended by Engineer ordering an addition, deletion, or revision in the Work, or responding to differing or unforeseen subsurface or physical conditions under which the Work is to be performed or to emergencies. A Work

Change Directive will not change the Contract Price or the Contract Times but is evidence that the parties expect that the change ordered or documented by a Work Change Directive will be incorporated in a subsequently issued Change Order following negotiations by the parties as to its effect, if any, on the Contract Price or Contract Times.

1.02 *Terminology*

A. The words and terms discussed in Paragraph 1.02.B through F 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 Paragraph 9.09 or any other provision of the Contract Documents.

C. *Day:*

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

D. *Defective:*

1. The word “defective,” when modifying the word “Work,” refers to Work that is unsatisfactory, faulty, or deficient in that it:
 - a. does not conform to the Contract Documents; or
 - b. does not meet the requirements of any applicable inspection, reference standard, test, or approval referred to in the Contract Documents; or
 - c. has been damaged prior to Engineer’s recommendation of final payment (unless responsibility for the protection thereof has been assumed by Owner at Substantial Completion in accordance with Paragraph 14.04 or 14.05).

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. When “furnish,” “install,” “perform,” or “provide” is not used in connection with services, materials, or equipment in a context clearly requiring an obligation of Contractor, “provide” is implied.
- 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. 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 Insurance:* Before any Work at the Site is started, Contractor and Owner shall each deliver to the other, with copies to each additional insured identified in the Supplementary Conditions, certificates of insurance (and other evidence of insurance which either of them or any additional insured may reasonably request) which Contractor and Owner respectively are required to purchase and maintain in accordance with Article 5.

2.02 Copies of Documents

- A. Owner shall furnish to Contractor up to ten printed or hard copies of the Drawings and Project Manual. Additional copies will be furnished upon request at the cost of reproduction.

2.03 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 Agreement 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 Agreement. 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 Agreement, whichever date is earlier.

2.04 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 the date on which the Contract Times commence to run.

2.05 *Before Starting Construction*

- A. *Preliminary Schedules:* Within 10 days after the Effective Date of the Agreement (unless otherwise specified in the General Requirements), 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 Documents;
 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.

2.06 *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 2.05.A, procedures for handling Shop Drawings and other submittals, processing Applications for Payment, 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 instructions, receive information, render decisions relative to the Contract, and otherwise act on behalf of each respective party.

2.07 *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 2.05.A. Contractor shall have an additional 10 days to make corrections and adjustments and to complete and resubmit the schedules. No progress payment shall be made to Contractor until acceptable schedules are submitted to Engineer.
1. The Progress Schedule will be acceptable to Engineer if it provides an orderly progression of the Work to completion within the Contract Times. Such acceptance will not impose on Engineer responsibility for the Progress Schedule, for sequencing, scheduling, or progress of the Work, nor interfere with or relieve Contractor from Contractor's full responsibility therefor.
 2. Contractor's Schedule of Submittals will be acceptable to Engineer if it provides a workable arrangement for reviewing and processing the required submittals.

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

ARTICLE 3 – CONTRACT DOCUMENTS: INTENT, AMENDING, 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. Any labor, documentation, services, materials, or equipment that reasonably may be inferred from the Contract Documents or from prevailing custom or trade usage as being required to produce the indicated result will be provided whether or not specifically called for, at no additional cost to Owner.
- C. Clarifications and interpretations of the Contract Documents shall be issued by Engineer as provided in Article 9.

3.02 *Reference Standards*

- A. Standards, Specifications, Codes, Laws, and Regulations
 1. Reference to standards, specifications, manuals, or codes of any technical society, organization, or association, or to Laws or Regulations, whether such reference be specific or by implication, shall mean the standard, specification, manual, code, or Laws or Regulations in effect at the time of opening of Bids (or on the Effective Date of the Agreement if there were no Bids), except as may be otherwise specifically stated in the Contract Documents.
 2. No provision of any such standard, specification, manual, or code, or any instruction of a Supplier, shall be effective to change the duties or responsibilities of Owner, Contractor, or Engineer, or any of their subcontractors, consultants, agents, or employees, from those set forth in the Contract Documents. No such provision or instruction shall be effective to assign to Owner, 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 Contract Documents.

3.03 *Reporting and Resolving Discrepancies*

- A. *Reporting Discrepancies:*
 1. *Contractor's Review of Contract Documents Before Starting Work:* Before undertaking each part of the Work, Contractor shall carefully study and compare the Contract Documents and check and verify pertinent figures therein and all applicable field measurements. Contractor shall promptly report in writing to Engineer any conflict, error, ambiguity, or discrepancy which Contractor discovers, or has actual knowledge of, and shall obtain a written interpretation or clarification from Engineer before proceeding with any Work affected thereby.

2. *Contractor's Review of Contract Documents During Performance of Work:* If, 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) any standard, specification, manual, or code, or (c) 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 6.16.A) until an amendment or supplement to the Contract Documents has been issued by one of the methods indicated in Paragraph 3.04.
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 Contract Documents shall take precedence in resolving any conflict, error, ambiguity, or discrepancy between the provisions of the Contract Documents and:
 - a. the provisions of any standard, specification, manual, or code, or the instruction of any Supplier (whether or not specifically incorporated by reference in the Contract Documents); 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 *Amending and Supplementing Contract Documents*

- A. The Contract Documents may be amended to provide for additions, deletions, and revisions in the Work or to modify the terms and conditions thereof by either a Change Order or a Work Change Directive.
- B. The requirements of the Contract Documents may be supplemented, and minor variations and deviations in the Work may be authorized, by one or more of the following ways:
 1. A Field Order;
 2. Engineer's approval of a Shop Drawing or Sample (subject to the provisions of Paragraph 6.17.D.3); or
 3. Engineer's written interpretation or clarification.

3.05 *Reuse of Documents*

- A. Contractor and any Subcontractor or Supplier 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

2. 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.
- 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.

3.06 *Electronic Data*

- A. Unless otherwise stated in the Supplementary Conditions, the data furnished by Owner or Engineer to Contractor, or by Contractor to Owner or Engineer, that may be relied upon are limited to the printed copies (also known as hard copies). Files in electronic media format of text, data, graphics, or other types are furnished only for the convenience of the receiving party. Any conclusion or information obtained or derived from such electronic files will be at the user's sole risk. If there is a discrepancy between the electronic files and the hard copies, the hard copies govern.
- B. Because data stored in electronic media format can deteriorate or be modified inadvertently or otherwise without authorization of the data's creator, the party receiving electronic files agrees that it will perform acceptance tests or procedures within 60 days, after which the receiving party shall be deemed to have accepted the data thus transferred. Any errors detected within the 60-day acceptance period will be corrected by the transferring party.
- C. When transferring documents in electronic media format, the transferring party makes no representations as to long term compatibility, usability, or readability of documents resulting from the use of software application packages, operating systems, or computer hardware differing from those used by the data's creator.

ARTICLE 4 – AVAILABILITY OF LANDS; SUBSURFACE AND PHYSICAL CONDITIONS; HAZARDOUS ENVIRONMENTAL CONDITIONS; REFERENCE POINTS

4.01 *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. Owner will obtain in a timely manner and pay for easements for permanent structures or permanent changes in existing facilities. If Contractor and Owner are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the Contract Price or Contract Times, or both, as a result of any delay in Owner's furnishing the Site or a part thereof, Contractor may make a Claim therefor as provided in Paragraph 10.05.
- 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 the Work is to be performed 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.

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

B. *Limited Reliance by Contractor on Technical Data Authorized:* Contractor may rely upon the accuracy of the “technical data” contained in such reports and drawings, but such reports and drawings are not Contract Documents. Such “technical data” is identified in the Supplementary Conditions. Except for such reliance on such “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.

4.03 *Differing Subsurface or Physical Conditions*

A. *Notice:* If Contractor believes that any subsurface or physical condition that is uncovered or revealed 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 4.02 is materially inaccurate; or
2. is of such a nature as to require a change in the Contract Documents; 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 6.16.A), notify Owner and Engineer in writing about such condition. Contractor shall not further disturb such condition or perform any Work in connection therewith (except as aforesaid) until receipt of written order to do so.

B. *Engineer's Review*: After receipt of written notice as required by Paragraph 4.03.A, Engineer will promptly review the pertinent condition, determine the necessity of Owner's obtaining additional exploration or tests with respect thereto, and advise Owner in writing (with a copy to Contractor) of Engineer's findings and conclusions.

C. *Possible Price and Times Adjustments*:

1. The Contract Price or the Contract Times, or both, will be equitably adjusted to the extent that the existence of such differing subsurface or physical condition 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 meet any one or more of the categories described in Paragraph 4.03.A; and
 - 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 Paragraphs 9.07 and 11.03.
2. Contractor shall not be entitled to any adjustment in the Contract Price or Contract Times if:
 - a. Contractor knew of the existence of such conditions at the time Contractor made a final 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
 - b. the existence of such condition could reasonably have been discovered or revealed as a result of any examination, investigation, exploration, test, or study of the Site and contiguous areas required by the Bidding Requirements or Contract Documents to be conducted by or for Contractor prior to Contractor's making such final commitment; or
 - c. Contractor failed to give the written notice as required by Paragraph 4.03.A.
3. If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the Contract Price or Contract Times, or both, a Claim may be made therefor as provided in Paragraph 10.05. However, neither Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors shall be liable to Contractor for any claims, costs, losses, or damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) sustained by Contractor on or in connection with any other project or anticipated project.

4.04 *Underground Facilities*

- A. *Shown or Indicated*: The information and data shown or indicated in the Contract Documents with respect to existing Underground Facilities at or contiguous 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 shall not be responsible for 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 such information and data;
 - b. locating all Underground Facilities shown or indicated in the Contract Documents;
 - c. coordination of the Work with the owners of such Underground Facilities, including Owner, during construction; and
 - d. the safety and protection of all such Underground Facilities and repairing any damage thereto resulting from the Work.

B. *Not Shown or Indicated:*

1. If an Underground Facility is uncovered or revealed at or contiguous to the Site which was not shown or indicated, or not shown or indicated with reasonable accuracy in the Contract Documents, 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 6.16.A), identify the owner of such Underground Facility and give written notice to that owner and to Owner and Engineer. Engineer will promptly review the Underground Facility and determine the extent, if any, to which a change is required in the Contract Documents to reflect and document the consequences of the existence or location of the Underground Facility. During such time, Contractor shall be responsible for the safety and protection of such Underground Facility.
2. If Engineer concludes that a change in the Contract Documents is required, a Work Change Directive or a Change Order will be issued to reflect and document such consequences. An equitable adjustment shall be made in the Contract Price or Contract Times, or both, to the extent that they are attributable to the existence or location of any Underground Facility that was not shown or indicated or not shown or indicated with reasonable accuracy in the Contract Documents and that Contractor did not know of and could not reasonably have been expected to be aware of or to have anticipated. If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any such adjustment in Contract Price or Contract Times, Owner or Contractor may make a Claim therefor as provided in Paragraph 10.05.

4.05 *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.

4.06 *Hazardous Environmental Condition at Site*

- A. *Reports and Drawings:* The Supplementary Conditions identify those reports and drawings known to Owner relating to Hazardous Environmental Conditions that have been identified at the Site.
- B. *Limited Reliance by Contractor on Technical Data Authorized:* Contractor may rely upon the accuracy of the “technical data” contained in such reports and drawings, but such reports and drawings are not Contract Documents. Such “technical data” is identified in the Supplementary Conditions. Except for such reliance on such “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 any Hazardous Environmental Condition uncovered or revealed at the Site which was not shown or indicated in Drawings or Specifications or identified in the Contract Documents to be within the scope of the Work. Contractor shall be responsible for a Hazardous Environmental Condition created with any materials brought to the Site by Contractor, Subcontractors, Suppliers, or anyone else for whom Contractor is responsible.
- D. If Contractor encounters a Hazardous Environmental Condition or if Contractor or anyone for whom Contractor is responsible creates a Hazardous Environmental Condition, Contractor shall immediately: (i) secure or otherwise isolate such condition; (ii) stop all Work in connection with such condition and in any area affected thereby (except in an emergency as required by Paragraph 6.16.A); and (iii) 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 4.06.E.
- E. Contractor shall not be required to resume Work in connection with such condition or in any affected area until after Owner has obtained any required permits related thereto and delivered written notice to Contractor: (i) specifying that such condition and any affected area is or has been rendered safe for the resumption of Work; or (ii) specifying any special conditions under which such Work may be resumed safely. 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, either party may make a Claim therefor as provided in Paragraph 10.05.

- F. 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. If Owner and Contractor cannot agree as to entitlement to or on the amount or extent, if any, of an adjustment in Contract Price or Contract Times as a result of deleting such portion of the Work, then either party may make a Claim therefor as provided in Paragraph 10.05. Owner may have such deleted portion of the Work performed by Owner's own forces or others in accordance with Article 7.
- G. 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: (i) was not shown or indicated in the Drawings or Specifications or identified in the Contract Documents to be included within the scope of the Work, and (ii) was not created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 4.06.G shall obligate Owner to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.
- H. 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 a Hazardous Environmental Condition created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 4.06.H shall obligate Contractor to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.
- I. The provisions of Paragraphs 4.02, 4.03, and 4.04 do not apply to a Hazardous Environmental Condition uncovered or revealed at the Site.

ARTICLE 5 – BONDS AND INSURANCE

5.01 *Performance, Payment, and Other Bonds*

- A. Contractor shall furnish performance and payment bonds, 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 Documents. 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 13.07, whichever is later, except as provided otherwise by Laws or Regulations or by the Contract Documents. Contractor shall also furnish such other bonds as are required by the Contract Documents.
- B. All bonds shall be in the form prescribed by the Contract Documents except as provided otherwise by Laws or Regulations, and shall be executed by such sureties as are named in the list of "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as

Acceptable Reinsuring Companies” as published in Circular 570 (amended) by the Financial Management Service, Surety Bond Branch, U.S. Department of the Treasury. All bonds signed by an agent or attorney-in-fact must be accompanied by a 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 each bond.

- C. If the surety on any bond furnished by Contractor is declared bankrupt or becomes insolvent or its right to do business is terminated in any state where any part of the Project is located or it ceases to meet the requirements of Paragraph 5.01.B, 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 requirements of Paragraphs 5.01.B and 5.02.

5.02 *Licensed Sureties and Insurers*

- A. All bonds and insurance required by the Contract Documents to be purchased and maintained by Owner or Contractor shall be obtained from surety or insurance companies that are duly licensed or authorized in the jurisdiction in which the Project is located to issue bonds or insurance policies for the limits and coverages so required. Such surety and insurance companies shall also meet such additional requirements and qualifications as may be provided in the Supplementary Conditions.

5.03 *Certificates of Insurance*

- A. Contractor shall deliver to Owner, with copies to each additional insured and loss payee identified in the Supplementary Conditions, certificates of insurance (and other evidence of insurance requested by Owner or any other additional insured) which Contractor is required to purchase and maintain.
- B. Owner shall deliver to Contractor, with copies to each additional insured and loss payee identified in the Supplementary Conditions, certificates of insurance (and other evidence of insurance requested by Contractor or any other additional insured) which Owner is required to purchase and maintain.
- C. Failure of Owner to demand such certificates or other evidence of Contractor's full compliance with these insurance requirements or failure of Owner to identify a deficiency in compliance from the evidence provided shall not be construed as a waiver of Contractor’s obligation to maintain such insurance.
- D. Owner does not represent that insurance coverage and limits established in this Contract necessarily will be adequate to protect Contractor.
- E. The insurance and insurance limits required herein shall not be deemed as a limitation on Contractor’s liability under the indemnities granted to Owner in the Contract Documents.

5.04 *Contractor’s Insurance*

- A. Contractor shall purchase and maintain such insurance as is appropriate for the Work being performed and as will provide protection from claims set forth below which may arise out of or result from Contractor’s performance of the Work and Contractor’s other obligations under the Contract Documents, whether it is to be performed by Contractor, any Subcontractor or Supplier,

or by anyone directly or indirectly employed by any of them to perform any of the Work, or by anyone for whose acts any of them may be liable:

1. claims under workers' compensation, disability benefits, and other similar employee benefit acts;
2. claims for damages because of bodily injury, occupational sickness or disease, or death of Contractor's employees;
3. claims for damages because of bodily injury, sickness or disease, or death of any person other than Contractor's employees;
4. claims for damages insured by reasonably available personal injury liability coverage which are sustained:
 - a. by any person as a result of an offense directly or indirectly related to the employment of such person by Contractor, or
 - b. by any other person for any other reason;
5. 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; and
6. 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.

B. The policies of insurance required by this Paragraph 5.04 shall:

1. with respect to insurance required by Paragraphs 5.04.A.3 through 5.04.A.6 inclusive, be written on an occurrence basis, include as additional insureds (subject to any customary exclusion regarding professional liability) Owner and Engineer, and any other individuals or entities identified in the Supplementary Conditions, all of whom shall be listed as additional insureds, and include coverage for the respective officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of all such additional insureds, and the insurance afforded to these additional insureds shall provide primary coverage for all claims covered thereby;
2. include at least the specific coverages and be written for not less than the limits of liability provided in the Supplementary Conditions or required by Laws or Regulations, whichever is greater;
3. include contractual liability insurance covering Contractor's indemnity obligations under Paragraphs 6.11 and 6.20;
4. contain a provision or endorsement that the coverage afforded will not be canceled, materially changed or renewal refused until at least 30 days prior written notice has been given to Owner and Contractor and to each other additional insured identified in the Supplementary Conditions to whom a certificate of insurance has been issued (and the certificates of insurance furnished by the Contractor pursuant to Paragraph 5.03 will so provide);

5. remain in effect at least until final payment and at all times thereafter when Contractor may be correcting, removing, or replacing defective Work in accordance with Paragraph 13.07; and
6. include completed operations coverage:
 - a. Such insurance shall remain in effect for two years after final payment.
 - b. Contractor shall furnish Owner and each other additional insured identified in the Supplementary Conditions, to whom a certificate of insurance has been issued, evidence satisfactory to Owner and any such additional insured of continuation of such insurance at final payment and one year thereafter.

5.05 *Owner's Liability Insurance*

- A. In addition to the insurance required to be provided by Contractor under Paragraph 5.04, 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.

5.06 *Property Insurance*

- A. Unless otherwise provided in the Supplementary Conditions, Contractor shall purchase and maintain property insurance upon the Work at the Site in the amount of the full replacement cost thereof (subject to such deductible amounts as may be provided in the Supplementary Conditions or required by Laws and Regulations). This insurance shall:
 1. include the interests of Owner, Contractor, Subcontractors, and Engineer, and any other individuals or entities identified in the Supplementary Conditions, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, each of whom is deemed to have an insurable interest and shall be listed as a loss payee;
 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, extended coverage, theft, vandalism and malicious mischief, earthquake, collapse, 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.
 3. include expenses incurred in the repair or replacement of any insured property (including but not limited to fees and charges of engineers and architects);
 4. cover materials and equipment stored at the Site or at another location that was agreed to in writing by Owner prior to being incorporated in the Work, provided that such materials and equipment have been included in an Application for Payment recommended by Engineer;
 5. allow for partial utilization of the Work by Owner;
 6. include testing and startup; and

7. be maintained in effect until final payment is made unless otherwise agreed to in writing by Owner, Contractor, and Engineer with 30 days written notice to each other loss payee to whom a certificate of insurance has been issued.
- B. Owner shall purchase and maintain such equipment breakdown insurance or additional property insurance as may be required by the Supplementary Conditions or Laws and Regulations which will include the interests of Owner, Contractor, Subcontractors, and Engineer, and any other individuals or entities identified in the Supplementary Conditions, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them, each of whom is deemed to have an insurable interest and shall be listed as a loss payee.
 - C. All the policies of insurance (and the certificates or other evidence thereof) required to be purchased and maintained in accordance with this Paragraph 5.06 will contain a provision or endorsement that the coverage afforded will not be canceled or materially changed or renewal refused until at least 30 days prior written notice has been given to Owner and Contractor and to each other loss payee to whom a certificate of insurance has been issued and will contain waiver provisions in accordance with Paragraph 5.07.
 - D. Owner shall not be responsible for purchasing and maintaining any property insurance specified in this Paragraph 5.06 to protect the interests of Contractor, Subcontractors, or others in the Work to the extent of any deductible amounts that are identified in the Supplementary Conditions. The risk of loss within such identified deductible amount will be borne by Contractor, Subcontractors, or others suffering any such loss, and if any of them wishes property insurance coverage within the limits of such amounts, each may purchase and maintain it at the purchaser's own expense.
 - E. If Contractor requests in writing that other special insurance be included in the property insurance policies provided under this Paragraph 5.06, Owner shall, if possible, include such insurance, and the cost thereof will be charged to Contractor by appropriate Change Order. Prior to commencement of the Work at the Site, Owner shall in writing advise Contractor whether or not such other insurance has been procured by Owner.

5.07 *Waiver of Rights*

- A. Owner and Contractor intend that all policies purchased in accordance with Paragraph 5.06 will protect Owner, Contractor, Subcontractors, and Engineer, and all other individuals or entities identified in the Supplementary Conditions as loss payees (and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them) in such policies and will provide primary coverage for all losses and damages caused by the perils or causes of loss covered thereby. All such policies shall contain provisions to the effect that in the event of payment of any loss or damage the insurers will have no rights of recovery against any of the insureds or loss payees thereunder. Owner and Contractor waive all rights against each other and their 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 Subcontractors and Engineer, and all other individuals or entities identified in the Supplementary Conditions as loss payees (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 as trustee 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 utilization pursuant to Paragraph 14.05, after Substantial Completion pursuant to Paragraph 14.04, or after final payment pursuant to Paragraph 14.07.
- C. Any insurance policy maintained by Owner covering any loss, damage or consequential loss referred to in Paragraph 5.07.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, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them.

5.08 *Receipt and Application of Insurance Proceeds*

- A. Any insured loss under the policies of insurance required by Paragraph 5.06 will be adjusted with Owner and made payable to Owner as fiduciary for the loss payees, as their interests may appear, subject to the requirements of any applicable mortgage clause and of Paragraph 5.08.B. Owner shall deposit in a separate account any money so received and shall distribute it in accordance with such agreement as the parties in interest may reach. If no other special agreement is reached, the damaged Work shall be repaired or replaced, the moneys so received applied on account thereof, and the Work and the cost thereof covered by an appropriate Change Order.
- B. Owner as fiduciary shall have power to adjust and settle any loss with the insurers unless one of the parties in interest shall object in writing within 15 days after the occurrence of loss to Owner's exercise of this power. If such objection be made, Owner as fiduciary shall make settlement with the insurers in accordance with such agreement as the parties in interest may reach. If no such agreement among the parties in interest is reached, Owner as fiduciary shall adjust and settle the loss with the insurers and, if required in writing by any party in interest, Owner as fiduciary shall give bond for the proper performance of such duties.

5.09 *Acceptance of Bonds and Insurance; Option to Replace*

- A. If either Owner or Contractor has any objection to the coverage afforded by or other provisions of the bonds or insurance required to be purchased and maintained by the other party in accordance with Article 5 on the basis of non-conformance with the Contract Documents, the objecting party shall so notify the other party in writing within 10 days after receipt of the certificates (or other evidence requested) required by Paragraph 2.01.B. Owner and Contractor shall each provide to the other such additional information in respect of insurance provided as the other may reasonably

request. If either party does not purchase or maintain all of the bonds and insurance required of such party by the Contract Documents, 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. Without prejudice to any other right or remedy, the other party may elect to obtain equivalent bonds or insurance to protect such other party's interests at the expense of the party who was required to provide such coverage, and a Change Order shall be issued to adjust the Contract Price accordingly.

5.10 *Partial Utilization, Acknowledgment of Property Insurer*

- A. If Owner finds it necessary to occupy or use a portion or portions of the Work prior to Substantial Completion of all the Work as provided in Paragraph 14.05, no such use or occupancy shall commence before the insurers providing the property insurance pursuant to Paragraph 5.06 have acknowledged notice thereof and in writing effected any changes in coverage necessitated thereby. The insurers providing the property insurance shall consent by endorsement on the policy or policies, but the property insurance shall not be canceled or permitted to lapse on account of any such partial use or occupancy.

ARTICLE 6 – CONTRACTOR'S RESPONSIBILITIES

6.01 *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. Contractor shall not be responsible for the negligence of Owner or Engineer in the design or specification of a specific means, method, technique, sequence, or procedure of construction which is shown or indicated in and expressly required by the Contract Documents.
- 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.

6.02 *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. Contractor will not permit the performance of Work on a Saturday, Sunday, or any legal holiday without Owner's written consent (which will not be unreasonably withheld) given after prior written notice to Engineer.

6.03 *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.
- B. All materials and equipment incorporated into the Work shall be as specified or, if not specified, shall be of good quality and new, except as otherwise provided in the Contract Documents. All special warranties and guarantees required by the Specifications shall expressly run to the benefit of 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.

6.04 *Progress Schedule*

- A. Contractor shall adhere to the Progress Schedule established in accordance with Paragraph 2.07 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 2.07) proposed adjustments in the Progress Schedule that will not result in changing the Contract Times. Such adjustments will comply with any provisions of the General Requirements applicable thereto.
 - 2. Proposed adjustments in the Progress Schedule that will change the Contract Times shall be submitted in accordance with the requirements of Article 12. Adjustments in Contract Times may only be made by a Change Order.

6.05 *Substitutes and "Or-Equals"*

- A. Whenever an item of material or equipment is specified or described in the Contract Documents by using the name of a proprietary item or the name of a particular Supplier, the specification or description is intended to establish the type, function, appearance, and quality required. Unless the specification or description contains or is followed by words reading that no like, equivalent, or "or-equal" item or no substitution is permitted, other items of material or equipment or material or equipment of other Suppliers may be submitted to Engineer for review under the circumstances described below.
 - 1. *"Or-Equal" Items:* If in Engineer's sole discretion an item of material or equipment proposed by Contractor is functionally equal to that named and sufficiently similar so that no change in related Work will be required, it may be considered by Engineer as an "or-equal" item, in which case review and approval of the proposed item may, in Engineer's sole discretion, be accomplished without compliance with some or all of the requirements for approval of proposed substitute items. For the purposes of this Paragraph 6.05.A.1, 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; and
 - 3) it has a proven record of performance and availability of responsive service.
- 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.

2. *Substitute Items:*

- a. If in Engineer's sole discretion an item of material or equipment proposed by Contractor does not qualify as an "or-equal" item under Paragraph 6.05.A.1, it will be considered a proposed substitute item.
- b. Contractor shall submit sufficient information as provided below to allow Engineer to determine if the item of material or equipment proposed is essentially equivalent to that named and an acceptable substitute therefor. Requests for review of proposed substitute items of material or equipment will not be accepted by Engineer from anyone other than Contractor.
- c. The requirements for review by Engineer will be as set forth in Paragraph 6.05.A.2.d, as supplemented by the General Requirements, and as Engineer may decide is appropriate under the circumstances.
- d. 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:
 - 1) shall certify that the proposed substitute item will:
 - a) perform adequately the functions and achieve the results called for by the general design,
 - b) be similar in substance to that specified, and
 - c) be suited to the same use as that specified;
 - 2) will state:
 - a) the extent, if any, to which the use of the proposed substitute item will prejudice Contractor's achievement of Substantial Completion on time,

- b) 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
 - c) whether incorporation or use of the proposed substitute item in connection with the Work is subject to payment of any license fee or royalty;
 - 3) will identify:
 - a) all variations of the proposed substitute item from that specified, and
 - b) available engineering, sales, maintenance, repair, and replacement services; and
 - 4) shall contain an itemized estimate of all costs or credits that will result directly or indirectly from use of such substitute item, including costs of redesign and claims of other contractors affected by any resulting change.
- B. *Substitute Construction Methods or Procedures:* If a specific means, method, technique, sequence, or procedure of construction is expressly required by the Contract Documents, Contractor may furnish or utilize a substitute means, method, technique, sequence, or procedure of construction approved by Engineer. Contractor shall submit sufficient information to allow Engineer, in Engineer's sole discretion, to determine that the substitute proposed is equivalent to that expressly called for by the Contract Documents. The requirements for review by Engineer will be similar to those provided in Paragraph 6.05.A.2.
- C. *Engineer's Evaluation:* Engineer will be allowed a reasonable time within which to evaluate each proposal or submittal made pursuant to Paragraphs 6.05.A and 6.05.B. Engineer may require Contractor to furnish additional data about the proposed substitute item. Engineer will be the sole judge of acceptability. No "or equal" or substitute will be ordered, installed or utilized until Engineer's review is complete, which will be evidenced by a Change Order in the case of a substitute and an approved Shop Drawing for an "or equal." Engineer will advise Contractor in writing of any negative determination.
- D. *Special Guarantee:* Owner may require Contractor to furnish at Contractor's expense a special performance guarantee or other surety with respect to any substitute.
- E. *Engineer's Cost Reimbursement:* Engineer will record Engineer's costs in evaluating a substitute proposed or submitted by Contractor pursuant to Paragraphs 6.05.A.2 and 6.05.B. 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.
- F. *Contractor's Expense:* Contractor shall provide all data in support of any proposed substitute or "or-equal" at Contractor's expense.

6.06 *Concerning Subcontractors, Suppliers, and Others*

- A. Contractor shall not employ any Subcontractor, Supplier, or other individual or entity (including those acceptable to Owner as indicated in Paragraph 6.06.B), whether initially or as a replacement, against whom Owner may have reasonable objection. Contractor shall not be required to employ any Subcontractor, Supplier, or other individual or entity to furnish or perform any of the Work against whom Contractor has reasonable objection.
- B. If the Supplementary Conditions require the identity of certain Subcontractors, Suppliers, or other individuals or entities to be submitted to Owner in advance for acceptance by Owner by a specified date prior to the Effective Date of the Agreement, and if Contractor has submitted a list thereof in accordance with the Supplementary Conditions, Owner's acceptance (either in writing or by failing to make written objection thereto by the date indicated for acceptance or objection in the Bidding Documents or the Contract Documents) of any such Subcontractor, Supplier, or other individual or entity so identified may be revoked on the basis of reasonable objection after due investigation. Contractor shall submit an acceptable replacement for the rejected Subcontractor, Supplier, or other individual or entity, and the Contract Price will be adjusted by the difference in the cost occasioned by such replacement, and an appropriate Change Order will be issued. 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 any right of Owner or Engineer to reject defective Work.
- C. 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. 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 moneys due any such Subcontractor, Supplier, or other individual or entity except as may otherwise be required by Laws and Regulations.
- D. Contractor shall be solely responsible for scheduling and coordinating the Work of Subcontractors, Suppliers, and other individuals or entities performing or furnishing any of the Work under a direct or indirect contract with Contractor.
- E. Contractor shall require all Subcontractors, Suppliers, and such other individuals or entities performing or furnishing any of the Work to communicate with Engineer through Contractor.
- F. 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.
- G. All Work performed for Contractor by a Subcontractor or Supplier will be pursuant to an appropriate agreement between Contractor and the Subcontractor or Supplier which specifically binds the Subcontractor or Supplier to the applicable terms and conditions of the Contract

Documents for the benefit of Owner and Engineer. Whenever any such agreement is with a Subcontractor or Supplier who is listed as a loss payee on the property insurance provided in Paragraph 5.06, the agreement between the Contractor and the Subcontractor or Supplier will contain provisions whereby the Subcontractor or Supplier waives all rights against Owner, Contractor, Engineer, and all other individuals or entities identified in the Supplementary Conditions to be listed as insureds or loss payees (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 such policies and any other property insurance applicable to the Work. If the insurers on any such policies require separate waiver forms to be signed by any Subcontractor or Supplier, Contractor will obtain the same.

6.07 *Patent Fees and Royalties*

- A. Contractor shall pay all license fees and royalties and assume all costs incident to the use in the performance of the Work or the incorporation in the Work of any invention, design, process, product, or device which is the subject of patent rights or copyrights held by others. If a particular invention, design, process, product, or device is specified in the Contract Documents for use in the performance of the Work and if, to the actual knowledge of Owner or Engineer, its use is subject to patent rights or copyrights calling for the payment of any license fee or royalty to others, the existence of such rights shall be disclosed by Owner in the Contract Documents.
- B. To the fullest extent permitted by Laws and Regulations, Owner shall indemnify and hold harmless Contractor, and its officers, directors, members, partners, employees, agents, consultants, and subcontractors from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals, and all court or arbitration or other dispute resolution costs) arising out of or relating to any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product, or device specified in the Contract Documents, but not identified as being subject to payment of any license fee or royalty to others required by patent rights or copyrights.
- C. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product, or device not specified in the Contract Documents.

6.08 *Permits*

- A. Unless otherwise provided in the Supplementary Conditions, 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 opening of Bids, or, if there are no Bids, on the Effective Date of the Agreement. Owner shall pay all charges of utility owners for connections for providing permanent service to the Work.

6.09 *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 knowing or having reason to know that it is contrary to Laws or Regulations, Contractor shall bear all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such Work. However, it shall not be Contractor's responsibility to make certain that the Specifications and Drawings are in accordance with Laws and Regulations, but this shall not relieve Contractor of Contractor's obligations under Paragraph 3.03.
- C. Changes in Laws or Regulations not known at the time of opening of Bids (or, on the Effective Date of the Agreement if there were no Bids) having an effect on the cost or time of performance of the Work shall be the subject of an adjustment in Contract Price or Contract Times. If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any such adjustment, a Claim may be made therefor as provided in Paragraph 10.05.

6.10 *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.

6.11 *Use of Site and Other Areas*

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

- 1. Contractor shall confine construction equipment, the storage of materials and equipment, and the operations of workers to the Site and other areas permitted by Laws and Regulations, and shall not unreasonably encumber the Site and other areas with construction equipment or other materials or equipment. Contractor shall assume full responsibility for any damage to any such land or area, or to the owner or occupant thereof, or of any adjacent land or areas resulting from the performance of the Work.
- 2. Should any claim be made by any such owner or occupant because of the performance of the Work, Contractor shall promptly settle with such other party by negotiation or otherwise resolve the claim by arbitration or other dispute resolution proceeding or at law.
- 3. 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 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 by or based upon Contractor's performance of the Work.

- B. *Removal of Debris During Performance of the Work:* During the progress of the Work Contractor shall keep the Site and other areas free from accumulations of waste materials, rubbish, and other debris. Removal and disposal of such waste materials, rubbish, and other debris shall conform to applicable Laws and Regulations.
- C. *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 all tools, appliances, construction equipment and machinery, and surplus materials and shall restore to original condition all property not designated for alteration by the Contract Documents.
- D. *Loading Structures:* Contractor shall not load nor permit any part of any structure to be loaded in any manner that will endanger the structure, nor shall Contractor subject any part of the Work or adjacent property to stresses or pressures that will endanger it.

6.12 *Record Documents*

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

6.13 *Safety and Protection*

- A. Contractor shall be solely responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the Work. Such responsibility does not relieve Subcontractors of their responsibility for the safety of persons or property in the performance of their work, nor for compliance with applicable safety Laws and Regulations. Contractor shall take all necessary precautions for the safety of, and shall provide the necessary protection to prevent damage, injury or loss to:
 - 1. all persons on the Site or who may be affected by the Work;
 - 2. all the Work and materials and equipment to be incorporated therein, whether in storage on or off the Site; and
 - 3. other property at the Site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures, utilities, and Underground Facilities not designated for removal, relocation, or replacement in the course of construction.
- B. Contractor shall comply with all applicable Laws and Regulations relating to the safety of persons or property, or to the protection of persons or property from damage, injury, or loss; and shall erect and maintain all necessary safeguards for such safety and protection. Contractor shall notify

owners of adjacent property and of Underground Facilities and other utility owners when prosecution of the Work may affect them, and shall cooperate with them in the protection, removal, relocation, and replacement of their property.

- C. Contractor shall comply with the applicable requirements of 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 6.13.A.2 or 6.13.A.3 caused, directly or indirectly, in whole or in part, by Contractor, any Subcontractor, Supplier, or any other individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, shall be remedied by Contractor (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 for protection of the Work shall continue until such time as all the Work is completed and Engineer has issued a notice to Owner and Contractor in accordance with Paragraph 14.07.B that the Work is acceptable (except as otherwise expressly provided in connection with Substantial Completion).

6.14 *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.

6.15 *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.

6.16 *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.

6.17 *Shop Drawings and Samples*

- A. Contractor shall submit Shop Drawings and Samples to Engineer for review and approval in accordance with the accepted Schedule of Submittals (as required by Paragraph 2.07). Each submittal will be identified as Engineer may require.
1. *Shop Drawings:*
 - a. Submit number of copies specified in the General Requirements.
 - 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 6.17.D.
 2. *Samples:*
 - a. Submit number of Samples specified in the Specifications.
 - b. 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 6.17.D.
- B. 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. *Submittal Procedures:*
1. Before submitting each Shop Drawing or Sample, Contractor shall have:
 - a. reviewed and coordinated each Shop Drawing or Sample with other Shop Drawings and Samples and with the requirements of the Work and the Contract Documents;
 - 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 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 and approval of that 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 both a written communication separate from the Shop Drawings or Sample submittal; and, in addition, by a specific notation made on each Shop Drawing or Sample submitted to Engineer for review and approval of each such variation.

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 (except where a particular means, method, technique, sequence, or procedure of construction is specifically and expressly called for by the Contract Documents) or to safety precautions or programs incident thereto. The review and approval of a separate item as such will not indicate approval of the assembly in which the item functions.
3. Engineer's review and approval shall not relieve Contractor from responsibility for any variation from the requirements of the Contract Documents unless Contractor has complied with the requirements of Paragraph 6.17.C.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's review and approval shall not relieve Contractor from responsibility for complying with the requirements of Paragraph 6.17.C.1.

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.

6.18 *Continuing the Work*

- A. 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, except as permitted by Paragraph 15.04 or as Owner and Contractor may otherwise agree in writing.

6.19 *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 representation of Contractor's warranty and guarantee.

- B. Contractor's warranty and guarantee hereunder excludes defects or damage caused by:
1. abuse, modification, or improper maintenance or operation by persons other than Contractor, Subcontractors, Suppliers, or any other individual or entity for whom Contractor is responsible; or
 2. normal wear and tear under normal usage.
- C. Contractor's obligation to perform and complete the Work in accordance with the Contract Documents shall be absolute. None of the following will constitute an acceptance of Work that is not in accordance with the Contract Documents or a release of Contractor's obligation to perform the Work in accordance with the Contract Documents:
1. observations by 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 or the issuance of a notice of acceptability by Engineer;
 6. any inspection, test, or approval by others; or
 7. any correction of defective Work by Owner.

6.20 *Indemnification*

- A. 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 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 6.20.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 6.20.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.

6.21 *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 law.
- 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, Shop Drawings and other submittals prepared by such professional. Shop Drawings and other submittals related to the Work designed or certified by such professional, if prepared by others, shall bear such professional's written approval when submitted to Engineer.
- C. Owner and Engineer shall be entitled to rely upon the adequacy, accuracy and completeness of the services, certifications or approvals performed by such design professionals, provided Owner and Engineer have specified to Contractor all performance and design criteria that such services must satisfy.
- D. Pursuant to this Paragraph 6.21, 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 6.17.D.1.
- E. Contractor shall not be responsible for the adequacy of the performance or design criteria required by the Contract Documents.

ARTICLE 7 – OTHER WORK AT THE SITE

7.01 *Related Work at Site*

- A. Owner may perform other work related to the Project at the Site with Owner's employees, or through other direct contracts therefor, or have other work performed by utility owners. If such other work is not noted in the Contract Documents, then:
 - 1. written notice thereof will be given to Contractor prior to starting any such other work; and
 - 2. if Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the Contract Price or Contract Times that should be allowed as a result of such other work, a Claim may be made therefor as provided in Paragraph 10.05.
- B. Contractor shall afford each other contractor who is a party to such a direct contract, each utility owner, and Owner, if Owner is performing other work with Owner's employees, proper and safe access to the Site, provide a reasonable opportunity for the introduction and storage of materials and equipment and the execution of such other work, and properly coordinate the Work with theirs. Contractor shall do all cutting, fitting, and patching of the Work that may be required to properly connect or otherwise make its several parts come together and properly integrate with such other work. Contractor shall not endanger any work of others by cutting, excavating, or otherwise altering such work; provided, however, that Contractor may cut or alter others' work with the written consent of Engineer and the others whose work will be affected. The duties and responsibilities of Contractor under this Paragraph are for the benefit of such utility owners and other contractors to the extent that there are comparable provisions for the benefit of Contractor in said direct contracts between Owner and such utility owners and other contractors.
- C. If the proper execution or results of any part of Contractor's Work depends upon work performed by others under this Article 7, Contractor shall inspect such other work and promptly report to 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.

7.02 *Coordination*

- A. If Owner intends to contract with others for the performance of other work on the Project at the Site, the following will be set forth in Supplementary Conditions:
 - 1. the individual or entity who will have authority and responsibility for coordination of the activities among the various contractors will be identified;
 - 2. the specific matters to be covered by such authority and responsibility will be itemized; and
 - 3. the extent of such authority and responsibilities will be provided.
- B. Unless otherwise provided in the Supplementary Conditions, Owner shall have sole authority and responsibility for such coordination.

7.03 *Legal Relationships*

- A. Paragraphs 7.01.A and 7.02 are not applicable for utilities not under the control of Owner.
- B. Each other direct contract of Owner under Paragraph 7.01.A shall provide that the other contractor is liable to Owner and Contractor for the reasonable direct delay and disruption costs incurred by Contractor as a result of the other contractor's wrongful actions or inactions.
- C. Contractor shall be liable to Owner and any other contractor under direct contract to Owner for the reasonable direct delay and disruption costs incurred by such other contractor as a result of Contractor's wrongful action or inactions.

ARTICLE 8 – OWNER'S RESPONSIBILITIES

8.01 *Communications to Contractor*

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

8.02 *Replacement of Engineer*

- A. In case of termination of the employment of Engineer, Owner shall appoint an engineer to whom Contractor makes no reasonable objection, whose status under the Contract Documents shall be that of the former Engineer.

8.03 *Furnish Data*

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

8.04 *Pay When Due*

- A. Owner shall make payments to Contractor when they are due as provided in Paragraphs 14.02.C and 14.07.C.

8.05 *Lands and Easements; Reports and Tests*

- A. Owner's duties with respect to providing lands and easements and providing engineering surveys to establish reference points are set forth in Paragraphs 4.01 and 4.05. Paragraph 4.02 refers to Owner's identifying and making available to Contractor copies of reports of explorations and tests of subsurface conditions and drawings of physical conditions relating to existing surface or subsurface structures at the Site.

8.06 *Insurance*

- A. Owner's responsibilities, if any, with respect to purchasing and maintaining liability and property insurance are set forth in Article 5.

8.07 *Change Orders*

- A. Owner is obligated to execute Change Orders as indicated in Paragraph 10.03.

8.08 *Inspections, Tests, and Approvals*

- A. Owner's responsibility with respect to certain inspections, tests, and approvals is set forth in Paragraph 13.03.B.

8.09 *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.

8.10 *Undisclosed Hazardous Environmental Condition*

- A. Owner's responsibility in respect to an undisclosed Hazardous Environmental Condition is set forth in Paragraph 4.06.

8.11 *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.

8.12 *Compliance with Safety Program*

- 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 pursuant to Paragraph 6.13.D.

ARTICLE 9 – ENGINEER'S STATUS DURING CONSTRUCTION

9.01 *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 Documents.

9.02 *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 9.09. 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.

9.03 *Project Representative*

- A. If Owner and Engineer agree, Engineer will furnish a Resident Project Representative to assist Engineer in providing more extensive observation of the Work. The authority and responsibilities of any such Resident Project Representative and assistants will be as provided in the Supplementary Conditions, and limitations on the responsibilities thereof will be as provided in Paragraph 9.09. 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.

9.04 *Authorized Variations in Work*

- A. Engineer may authorize minor variations in the Work from the requirements of the Contract Documents which do not involve an adjustment in the Contract Price or the Contract Times and are compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. These may be accomplished by a Field Order and will be binding on Owner and also on Contractor, who shall perform the Work involved promptly. If Owner or Contractor believes that a Field Order justifies an adjustment in the Contract Price or Contract Times, or both, and the parties are unable to agree on entitlement to or on the amount or extent, if any, of any such adjustment, a Claim may be made therefor as provided in Paragraph 10.05.

9.05 *Rejecting Defective Work*

- A. Engineer will have authority to reject Work which Engineer believes to be defective, or that Engineer believes will not produce a completed Project that conforms to the Contract Documents or that will prejudice the integrity of the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. Engineer will also have authority to require special inspection or testing of the Work as provided in Paragraph 13.04, whether or not the Work is fabricated, installed, or completed.

9.06 *Shop Drawings, Change Orders and Payments*

- A. In connection with Engineer's authority, and limitations thereof, as to Shop Drawings and Samples, see Paragraph 6.17.
- B. In connection with 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, see Paragraph 6.21.

- C. In connection with Engineer's authority as to Change Orders, see Articles 10, 11, and 12.
- D. In connection with Engineer's authority as to Applications for Payment, see Article 14.

9.07 *Determinations for Unit Price Work*

- A. 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 Paragraph 10.05.

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

- A. Engineer will be the initial interpreter of the requirements of the Contract Documents and judge of the acceptability of the Work thereunder. All matters in question and other matters between Owner and Contractor arising prior to the date final payment is due relating to the acceptability of the Work, and the interpretation of the requirements of the Contract Documents pertaining to the performance of the Work, will be referred initially to Engineer in writing within 30 days of the event giving rise to the question.
- B. Engineer will, with reasonable promptness, render a written decision on the issue referred. If Owner or Contractor believes that any such decision entitles them to an adjustment in the Contract Price or Contract Times or both, a Claim may be made under Paragraph 10.05. The date of Engineer's decision shall be the date of the event giving rise to the issues referenced for the purposes of Paragraph 10.05.B.
- C. Engineer's written decision on the issue referred will be final and binding on Owner and Contractor, subject to the provisions of Paragraph 10.05.
- D. When functioning as interpreter and judge under this Paragraph 9.08, Engineer will not show partiality to Owner or Contractor and will not be liable in connection with any interpretation or decision rendered in good faith in such capacity.

9.09 *Limitations on Engineer's Authority and Responsibilities*

- A. Neither Engineer's authority or responsibility under this Article 9 or under any other provision of the Contract Documents 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 14.07.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 9.09 shall also apply to the Resident Project Representative, if any, and assistants, if any.

9.10 *Compliance with Safety Program*

- A. While at the Site, Engineer's employees and representatives shall comply with the specific applicable requirements of Contractor's safety programs of which Engineer has been informed pursuant to Paragraph 6.13.D.

ARTICLE 10 – CHANGES IN THE WORK; CLAIMS

10.01 *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 by a Change Order, or a Work Change Directive. Upon receipt of any such document, Contractor shall promptly proceed with the Work involved which will be performed under the applicable conditions of the Contract Documents (except as otherwise specifically provided).
- B. If Owner and Contractor are unable to agree on entitlement to, or on the amount or extent, if any, of an adjustment in the Contract Price or Contract Times, or both, that should be allowed as a result of a Work Change Directive, a Claim may be made therefor as provided in Paragraph 10.05.

10.02 *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 as provided in Paragraph 3.04, except in the case of an emergency as provided in Paragraph 6.16 or in the case of uncovering Work as provided in Paragraph 13.04.D.

10.03 *Execution of Change Orders*

- A. Owner and Contractor shall execute appropriate Change Orders recommended by Engineer covering:
 - 1. changes in the Work which are: (i) ordered by Owner pursuant to Paragraph 10.01.A, (ii) required because of acceptance of defective Work under Paragraph 13.08.A or Owner's correction of defective Work under Paragraph 13.09, or (iii) agreed to by the parties;

2. 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; and
3. changes in the Contract Price or Contract Times which embody the substance of any written decision rendered by Engineer pursuant to Paragraph 10.05; provided that, in lieu of executing any such Change Order, an appeal may be taken from any such decision in accordance with the provisions of the Contract Documents and applicable Laws and Regulations, but during any such appeal, Contractor shall carry on the Work and adhere to the Progress Schedule as provided in Paragraph 6.18.A.

10.04 *Notification to Surety*

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

10.05 *Claims*

- A. *Engineer's Decision Required:* All Claims, except those waived pursuant to Paragraph 14.09, shall be referred to the Engineer for decision. A decision by Engineer shall be required as a condition precedent to any exercise by Owner or Contractor of any rights or remedies either may otherwise have under the Contract Documents or by Laws and Regulations in respect of such Claims.
- B. *Notice:* Written notice stating the general nature of each Claim shall be delivered by the claimant to Engineer and the other party to the Contract promptly (but in no event later than 30 days) after the start of the event giving rise thereto. The responsibility to substantiate a Claim shall rest with the party making the Claim. Notice of the amount or extent of the Claim, with supporting data shall be delivered to the Engineer and the other party to the Contract within 60 days after the start of such event (unless Engineer allows additional time for claimant to submit additional or more accurate data in support of such Claim). A Claim for an adjustment in Contract Price shall be prepared in accordance with the provisions of Paragraph 12.01.B. A Claim for an adjustment in Contract Times shall be prepared in accordance with the provisions of Paragraph 12.02.B. Each Claim shall be accompanied by claimant's written statement that the adjustment claimed is the entire adjustment to which the claimant believes it is entitled as a result of said event. The opposing party shall submit any response to Engineer and the claimant within 30 days after receipt of the claimant's last submittal (unless Engineer allows additional time).
- C. *Engineer's Action:* Engineer will review each Claim and, within 30 days after receipt of the last submittal of the claimant or the last submittal of the opposing party, if any, take one of the following actions in writing:
 1. deny the Claim in whole or in part;
 2. approve the Claim; or

3. notify the parties that the Engineer is unable to resolve the Claim if, in the Engineer's sole discretion, it would be inappropriate for the Engineer to do so. For purposes of further resolution of the Claim, such notice shall be deemed a denial.
- D. In the event that Engineer does not take action on a Claim within said 30 days, the Claim shall be deemed denied.
- E. Engineer's written action under Paragraph 10.05.C or denial pursuant to Paragraphs 10.05.C.3 or 10.05.D will be final and binding upon Owner and Contractor, unless Owner or Contractor invoke the dispute resolution procedure set forth in Article 16 within 30 days of such action or denial.
- F. No Claim for an adjustment in Contract Price or Contract Times will be valid if not submitted in accordance with this Paragraph 10.05.

ARTICLE 11 – COST OF THE WORK; ALLOWANCES; UNIT PRICE WORK

11.01 Cost of the Work

- A. *Costs Included:* The term Cost of the Work means the sum of all costs, except those excluded in Paragraph 11.01.B, necessarily incurred and paid by Contractor in the proper performance of the Work. When the value of any Work covered by a Change Order or when a Claim for an adjustment in Contract Price is determined on the basis of Cost of the Work, the costs to be reimbursed to Contractor will be only those additional or incremental costs required because of the change in the Work or because of the event giving rise to the Claim. Except as otherwise may be agreed to in writing by Owner, such costs 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 11.01.B, 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, 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 11.01.

4. Costs of special consultants (including but not limited to engineers, architects, testing laboratories, surveyors, attorneys, and accountants) employed for services specifically related to the Work.
5. Supplemental costs including the following:
 - a. The proportion of necessary transportation, travel, and subsistence expenses of Contractor's employees incurred in discharge of duties connected with the Work.
 - b. Cost, including transportation and maintenance, of all materials, supplies, equipment, machinery, appliances, office, and temporary facilities at the Site, and hand tools not owned by the workers, which are consumed in the performance of the Work, and cost, less market value, of such items used but not consumed which remain the property of Contractor.
 - c. Rentals of all construction equipment and machinery, and the parts thereof whether rented from Contractor or others in accordance with rental agreements approved by Owner with the advice of Engineer, and the costs of transportation, loading, unloading, assembly, dismantling, and removal thereof. All such costs shall be in accordance with the terms of said rental agreements. The rental of any such equipment, machinery, or parts shall cease when the use thereof is no longer necessary for the Work.
 - d. Sales, consumer, use, and other similar taxes related to the Work, and for which Contractor is liable, as imposed by Laws and Regulations.
 - e. Deposits lost for causes other than negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, and royalty payments and fees for permits and licenses.
 - f. Losses and damages (and related expenses) caused by damage to the Work, not compensated by insurance or otherwise, sustained by Contractor in connection with the performance of the Work (except losses and damages within the deductible amounts of property insurance established in accordance with Paragraph 5.06.D), 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 telegrams, long distance telephone calls, telephone 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 Contractor is required by the Contract Documents to purchase and maintain.

B. *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, expeditors, 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 11.01.A.1 or specifically covered by Paragraph 11.01.A.4, all of which are to be considered administrative costs covered by the Contractor's fee.
2. Expenses of Contractor's principal and branch offices other than Contractor's office at the Site.
3. Any part of Contractor's capital expenses, including interest on Contractor's capital employed for the Work and charges against Contractor for delinquent payments.
4. Costs due to the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, including but not limited to, the correction of defective Work, disposal of materials or equipment wrongly supplied, and making good any damage to property.
5. Other overhead or general expense costs of any kind and the costs of any item not specifically and expressly included in Paragraphs 11.01.A.

C. *Contractor's Fee:* When all the Work 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 or when a Claim for an 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 12.01.C.

D. *Documentation:* Whenever the Cost of the Work for any purpose is to be determined pursuant to Paragraphs 11.01.A and 11.01.B, 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.

11.02 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:*

1. Contractor agrees that:
 - a. 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
 - b. 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:*

1. 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.

11.03 *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. Determinations of the actual quantities and classifications of Unit Price Work performed by Contractor will be made by Engineer subject to the provisions of Paragraph 9.07.
- C. Each unit price will be deemed to include an amount considered by Contractor to be adequate to cover Contractor's overhead and profit for each separately identified item.
- D. Owner or Contractor may make a Claim for an adjustment in the Contract Price in accordance with Paragraph 10.05 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; and
 2. there is no corresponding adjustment with respect to any other item of Work; and
 3. Contractor believes that Contractor 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 12 – CHANGE OF CONTRACT PRICE; CHANGE OF CONTRACT TIMES

12.01 *Change of Contract Price*

- A. The Contract Price may only be changed by a Change Order. Any Claim for an adjustment in the Contract Price shall be based on written notice submitted by the party making the Claim to the Engineer and the other party to the Contract in accordance with the provisions of Paragraph 10.05.
- B. The value of any Work covered by a Change Order or of any Claim for 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, by application of such unit prices to the quantities of the items involved (subject to the provisions of Paragraph 11.03); or
 2. where the Work involved is not covered by unit prices contained in the Contract Documents, by a mutually agreed lump sum (which may include an allowance for overhead and profit not necessarily in accordance with Paragraph 12.01.C.2); or
 3. where the Work involved is not covered by unit prices contained in the Contract Documents and agreement to a lump sum is not reached under Paragraph 12.01.B.2, on the basis of the Cost of the Work (determined as provided in Paragraph 11.01) plus a Contractor's fee for overhead and profit (determined as provided in Paragraph 12.01.C).
- C. *Contractor's Fee:* 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 11.01.A.1 and 11.01.A.2, the Contractor's fee shall be 15 percent;
 - b. for costs incurred under Paragraph 11.01.A.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 12.01.C.2.a and 12.01.C.2.b is that the Subcontractor who actually performs the Work, at whatever tier, will be paid a fee of 15 percent of the costs incurred by such Subcontractor under Paragraphs 11.01.A.1 and 11.01.A.2 and that any higher tier Subcontractor and Contractor will each be paid a fee of five percent of the amount paid to the next lower tier Subcontractor;
 - d. no fee shall be payable on the basis of costs itemized under Paragraphs 11.01.A.4, 11.01.A.5, and 11.01.B;
 - 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 12.01.C.2.a through 12.01.C.2.e, inclusive.

12.02 *Change of Contract Times*

- A. The Contract Times may only be changed by a Change Order. Any Claim for an adjustment in the Contract Times shall be based on written notice submitted by the party making the Claim to the Engineer and the other party to the Contract in accordance with the provisions of Paragraph 10.05.
- B. Any adjustment of the Contract Times covered by a Change Order or any Claim for an adjustment in the Contract Times will be determined in accordance with the provisions of this Article 12.

12.03 *Delays*

- A. Where Contractor is prevented from completing any part of the Work within the Contract Times due to delay beyond the control of Contractor, the Contract Times will be extended in an amount equal to the time lost due to such delay if a Claim is made therefor as provided in Paragraph 12.02.A. Delays beyond the control of Contractor shall include, but not be limited to, acts or neglect by Owner, acts or neglect of utility owners or other contractors performing other work as contemplated by Article 7, fires, floods, epidemics, abnormal weather conditions, or acts of God.
- B. If Owner, Engineer, or other contractors or utility owners performing other work for Owner as contemplated by Article 7, 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 Price or the Contract Times, or both. 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.
- C. If Contractor is delayed in the performance or progress of the Work by fire, flood, epidemic, abnormal weather conditions, acts of God, acts or failures to act of utility owners not under the control of Owner, or other causes not the fault of and beyond control of Owner and Contractor, then Contractor shall be entitled to an equitable adjustment in Contract Times, if such adjustment is 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 described in this Paragraph 12.03.C.
- D. Owner, Engineer, and their officers, directors, members, partners, employees, agents, consultants, or subcontractors shall not be liable to Contractor for any claims, costs, losses, or damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) sustained by Contractor on or in connection with any other project or anticipated project.
- E. Contractor shall not be entitled to an adjustment in Contract Price or Contract Times for delays within the control of Contractor. Delays attributable to and within the control of a Subcontractor or Supplier shall be deemed to be delays within the control of Contractor.

ARTICLE 13 – TESTS AND INSPECTIONS; CORRECTION, REMOVAL OR ACCEPTANCE OF DEFECTIVE WORK

13.01 Notice of Defects

- A. Prompt notice of all defective Work of which Owner or Engineer has actual knowledge will be given to Contractor. Defective Work may be rejected, corrected, or accepted as provided in this Article 13.

13.02 Access to Work

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

13.03 Tests and Inspections

- A. Contractor shall give Engineer timely notice of readiness of the Work for all required inspections, tests, or approvals and shall cooperate with inspection and testing personnel to facilitate required inspections or tests.
- B. Owner shall employ and pay for the services of an independent testing laboratory to perform all inspections, tests, or approvals required by the Contract Documents except:
 - 1. for inspections, tests, or approvals covered by Paragraphs 13.03.C and 13.03.D below;
 - 2. that costs incurred in connection with tests or inspections conducted pursuant to Paragraph 13.04.B shall be paid as provided in Paragraph 13.04.C; and
 - 3. as otherwise specifically provided in the Contract Documents.
- 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 and obtaining and shall pay all costs in connection with any inspections, tests, or approvals required for Owner's and Engineer's acceptance of materials or equipment to be incorporated in the Work; or acceptance of materials, mix designs, or equipment submitted for approval prior to Contractor's purchase thereof for incorporation in the Work. Such inspections, tests, or approvals shall be performed by organizations acceptable to Owner and Engineer.
- E. If any Work (or the work of others) that is to be inspected, tested, or approved is covered by Contractor without written concurrence of Engineer, Contractor shall, if requested by Engineer, uncover such Work for observation.

- F. Uncovering Work as provided in Paragraph 13.03.E shall be at Contractor's expense unless Contractor has given Engineer timely notice of Contractor's intention to cover the same and Engineer has not acted with reasonable promptness in response to such notice.

13.04 *Uncovering Work*

- A. If any Work is covered contrary to the written request of Engineer, it must, if requested by Engineer, be uncovered for Engineer's observation and replaced at Contractor's expense.
- B. If Engineer considers it necessary or advisable that covered Work be observed by Engineer or inspected or tested by others, 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, furnishing all necessary labor, material, and equipment.
- C. If it is found that the uncovered Work is defective, 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 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 Owner shall be entitled to an appropriate decrease in the Contract Price. If the parties are unable to agree as to the amount thereof, Owner may make a Claim therefor as provided in Paragraph 10.05.
- D. 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, Contractor may make a Claim therefor as provided in Paragraph 10.05.

13.05 *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, 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.

13.06 *Correction or Removal of Defective Work*

- A. Promptly after receipt of written notice, Contractor shall correct all defective Work, whether or not fabricated, installed, or completed, or, if the Work has been rejected by Engineer, remove it from the Project and replace it with Work that is not defective. 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 removal (including but not limited to all costs of repair or replacement of work of others).

- B. When correcting defective Work under the terms of this Paragraph 13.06 or Paragraph 13.07, Contractor shall take no action that would void or otherwise impair Owner's special warranty and guarantee, if any, on said Work.

13.07 *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 land or areas made available for Contractor's use by Owner or permitted by Laws and Regulations as contemplated in Paragraph 6.11.A is found to be defective, Contractor shall promptly, without cost to Owner and in accordance with Owner's written instructions:
1. repair such defective land or areas; or
 2. correct such defective Work; or
 3. if the defective Work has been rejected by 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 other land or areas resulting therefrom.
- B. If Contractor does not promptly comply with the terms of Owner's written instructions, or in an emergency where delay would cause serious risk of loss or damage, Owner may have the defective Work corrected or repaired or may have the rejected Work removed and replaced. 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) will be paid by Contractor.
- 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 13.07, 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 13.07 are in addition to any other obligation or warranty. The provisions of this Paragraph 13.07 shall not be construed as a substitute for, or a waiver of, the provisions of any applicable statute of limitation or repose.

13.08 *Acceptance of Defective Work*

- A. If, instead of requiring correction or removal and replacement of defective Work, Owner (and, prior to Engineer's recommendation of final payment, Engineer) prefers to accept it, Owner may do so. 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) 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 pursuant to this sentence. If any such acceptance occurs prior to Engineer's recommendation of final payment, a Change Order will be issued incorporating the necessary revisions in the Contract Documents with respect to the Work, and Owner shall be entitled to an appropriate decrease in the Contract Price, reflecting the diminished value of Work so accepted. If the parties are unable to agree as to the amount thereof, Owner may make a Claim therefor as provided in Paragraph 10.05. If the acceptance occurs after such recommendation, an appropriate amount will be paid by Contractor to Owner.

13.09 *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 in accordance with Paragraph 13.06.A, or if Contractor fails to perform the Work in accordance with the Contract Documents, or if Contractor fails to comply with any other provision of the Contract Documents, 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 13.09, 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, take possession of Contractor's tools, appliances, construction equipment and machinery at the Site, and incorporate in the Work all materials and equipment stored at the Site or for which 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 (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) incurred or sustained by Owner in exercising the rights and remedies under this Paragraph 13.09 will be charged against Contractor, and a Change Order will be issued incorporating the necessary revisions in the Contract Documents with respect to the Work; and Owner shall be entitled to an appropriate decrease in the Contract Price. If the parties are unable to agree as to the amount of the adjustment, Owner may make a Claim therefor as provided in Paragraph 10.05. 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 13.09.

ARTICLE 14 – PAYMENTS TO CONTRACTOR AND COMPLETION

14.01 *Schedule of Values*

- A. The Schedule of Values established as provided in Paragraph 2.07.A 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.

14.02 *Progress Payments*

A. *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 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.

B. *Review of Applications:*

1. Engineer will, within 10 days after receipt of each Application for Payment, either indicate in writing a recommendation of payment and present the Application to Owner or return the Application to Contractor indicating in writing Engineer's reasons for refusing to recommend payment. In the latter case, Contractor may make the necessary corrections and resubmit the Application.
2. Engineer's recommendation of any payment requested in an Application for Payment will constitute a representation by Engineer to Owner, based on Engineer's observations of the executed Work as an experienced and qualified design professional, and on Engineer's review of the Application for Payment and the accompanying data and schedules, that to the best of Engineer's knowledge, information and belief:
 - a. the Work has progressed to the point indicated;

- b. the quality of the Work is generally in accordance with the Contract Documents (subject to an evaluation of the Work as a functioning whole prior to or upon Substantial Completion, the results of any subsequent tests called for in the Contract Documents, a final determination of quantities and classifications for Unit Price Work under Paragraph 9.07, 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 Documents; 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 moneys 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 14.02.B.2. Engineer may also refuse to recommend any such payment or, because of subsequently discovered evidence or the results of subsequent inspections or tests, revise or revoke any such payment recommendation previously made, to such extent as may be necessary in Engineer's opinion to protect Owner from loss because:
 - a. the Work is defective, or completed Work has been damaged, requiring correction or replacement;
 - b. the Contract Price has been reduced by Change Orders;

- c. Owner has been required to correct defective Work or complete Work in accordance with Paragraph 13.09; or
- d. Engineer has actual knowledge of the occurrence of any of the events enumerated in Paragraph 15.02.A.

C. *Payment Becomes Due:*

1. Ten days after presentation of the Application for Payment to Owner with Engineer's recommendation, the amount recommended will (subject to the provisions of Paragraph 14.02.D) become due, and when due will be paid by Owner to Contractor.

D. *Reduction in Payment:*

1. Owner may refuse to make payment of the full amount recommended by Engineer because:
 - a. claims have been made against Owner on account of Contractor's performance or furnishing of the Work;
 - b. 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;
 - c. there are other items entitling Owner to a set-off against the amount recommended; or
 - d. Owner has actual knowledge of the occurrence of any of the events enumerated in Paragraphs 14.02.B.5.a through 14.02.B.5.c or Paragraph 15.02.A.
2. If Owner refuses to make payment of the full amount recommended by Engineer, Owner will give Contractor immediate written notice (with a copy to Engineer) stating the reasons for such action 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, when Contractor remedies the reasons for such action.
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 14.02.C.1 and subject to interest as provided in the Agreement.

14.03 *Contractor's Warranty of Title*

- A. Contractor warrants and guarantees that title to all Work, materials, and equipment covered by any Application for Payment, whether incorporated in the Project or not, will pass to Owner no later than the time of payment free and clear of all Liens.

14.04 *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 (except for items specifically listed by Contractor as incomplete) and request that Engineer issue a certificate of Substantial Completion.

- 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 tentative certificate of Substantial Completion which shall fix the date of Substantial Completion. There shall be attached to the certificate a tentative list of items to be completed or corrected before final payment. Owner shall have seven days after receipt of the tentative certificate during which to make written objection to Engineer as to any provisions of the certificate or attached list. If, after considering such objections, Engineer concludes that the Work is not substantially complete, Engineer will, within 14 days after submission of the tentative certificate to Owner, notify Contractor in writing, stating the reasons therefor. If, after consideration of Owner's objections, Engineer considers the Work substantially complete, Engineer will, within said 14 days, execute and deliver to Owner and Contractor a definitive certificate of Substantial Completion (with a revised tentative list of items to be completed or corrected) reflecting such changes from the tentative certificate as Engineer believes justified after consideration of any objections from Owner.
- D. At the time of delivery of the tentative certificate of Substantial Completion, Engineer will deliver to Owner and Contractor a written recommendation as to division of responsibilities pending final payment between Owner and Contractor with respect to security, operation, safety, and protection of the Work, maintenance, heat, utilities, insurance, and warranties and guarantees. Unless Owner and Contractor agree otherwise in writing and so inform Engineer in writing prior to Engineer's issuing the definitive certificate of Substantial Completion, Engineer's aforesaid recommendation will be binding on Owner and Contractor until final payment.
- E. 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 tentative list.

14.05 *Partial Utilization*

- 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. Owner at any time may request Contractor in writing to permit Owner to use or occupy any such part of the Work which Owner believes to be ready for its intended use and 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 14.04.A through D for that part of the Work.
 - 2. Contractor at any time may notify Owner and Engineer in writing that Contractor considers any such part of the Work ready for its intended use and 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 14.04 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 5.10 regarding property insurance.

14.06 *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 is incomplete or defective. Contractor shall immediately take such measures as are necessary to complete such Work or remedy such deficiencies.

14.07 *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, marked-up record documents (as provided in Paragraph 6.12), and other documents, Contractor may make application for final payment following the procedure for progress payments.
2. The final Application for Payment shall be accompanied (except as previously delivered) by:
 - a. all documentation called for in the Contract Documents, including but not limited to the evidence of insurance required by Paragraph 5.04.B.6;
 - b. consent of the surety, if any, to final payment;
 - c. a list of all Claims against Owner that Contractor believes are unsettled; and
 - d. complete and legally effective releases or waivers (satisfactory to Owner) of all Lien rights arising out of or Liens filed in connection with the Work.
3. In lieu of the releases or waivers of Liens specified in Paragraph 14.07.A.2 and as approved by Owner, Contractor may furnish receipts or releases in full and an affidavit of Contractor that: (i) the releases and receipts include all labor, services, material, and equipment for which a Lien could be filed; and (ii) 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.

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 Documents have been fulfilled, Engineer will, within ten days after receipt of the final Application for Payment, indicate in writing Engineer's recommendation of payment and present the Application for Payment to Owner for payment. 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 14.09. 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. *Payment Becomes Due:*

1. Thirty days after the presentation to Owner of the Application for Payment and accompanying documentation, the amount recommended by Engineer, less any sum Owner is entitled to set off against Engineer's recommendation, including but not limited to liquidated damages, will become due and will be paid by Owner to Contractor.

14.08 *Final Completion Delayed*

- A. If, through no fault of Contractor, final completion of the Work is significantly delayed, and if Engineer so confirms, Owner shall, upon receipt of Contractor's final Application for Payment (for Work fully completed and accepted) and recommendation of Engineer, and without terminating the Contract, make payment of the balance due for that portion of the Work fully completed and accepted. If the remaining balance to be held by Owner for Work not fully completed or corrected is less than the retainage stipulated in the Agreement, and if bonds have been furnished as required in Paragraph 5.01, the written consent of the surety to the payment of the balance due for that portion of the Work fully completed and accepted shall be submitted by Contractor to Engineer with the Application for such payment. Such payment shall be made under the terms and conditions governing final payment, except that it shall not constitute a waiver of Claims.

14.09 *Waiver of Claims*

- A. The making and acceptance of final payment will constitute:
 1. a waiver of all Claims by Owner against Contractor, except Claims arising from unsettled Liens, from defective Work appearing after final inspection pursuant to Paragraph 14.06, from failure to comply with the Contract Documents or the terms of any special guarantees specified therein, or from Contractor's continuing obligations under the Contract Documents; and

2. a waiver of all Claims by Contractor against Owner other than those previously made in accordance with the requirements herein and expressly acknowledged by Owner in writing as still unsettled.

ARTICLE 15 – SUSPENSION OF WORK AND TERMINATION

15.01 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 notice in writing to Contractor and Engineer which will fix the date on which Work will be resumed. Contractor shall resume the Work on the date so fixed. Contractor shall be granted an adjustment in the Contract Price or an extension of the Contract Times, or both, directly attributable to any such suspension if Contractor makes a Claim therefor as provided in Paragraph 10.05.

15.02 Owner May Terminate for Cause

- A. The occurrence of any one or more of the following events will 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 established under Paragraph 2.07 as adjusted from time to time pursuant to Paragraph 6.04);
 2. Contractor's disregard of Laws or Regulations of any public body having jurisdiction;
 3. Contractor's repeated disregard of the authority of Engineer; or
 4. Contractor's violation in any substantial way of any provisions of the Contract Documents.
- B. If one or more of the events identified in Paragraph 15.02.A occur, Owner may, after giving Contractor (and surety) seven days written notice of its intent to terminate the services of Contractor:
 1. exclude Contractor from the Site, and take possession of the Work and of all Contractor's tools, appliances, construction equipment, and machinery at the Site, and use the same to the full extent they could be used by Contractor (without liability to Contractor for trespass or conversion);
 2. incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere; and
 3. complete the Work as Owner may deem expedient.
- C. If Owner proceeds as provided in Paragraph 15.02.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 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) sustained by Owner arising out of or relating to completing the Work, such excess will be paid to Contractor. If such claims, costs, losses, and damages exceed 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.

- D. Notwithstanding Paragraphs 15.02.B and 15.02.C, Contractor's services will not be terminated if Contractor begins within seven days of receipt of notice of intent to terminate to correct its failure to perform and proceeds diligently to cure such failure within no more than 30 days of receipt of said notice.
- E. 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. Any retention or payment of moneys due Contractor by Owner will not release Contractor from liability.
- F. If and to the extent that Contractor has provided a performance bond under the provisions of Paragraph 5.01.A, the termination procedures of that bond shall supersede the provisions of Paragraphs 15.02.B and 15.02.C.

15.03 *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;
 - 3. 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) incurred in settlement of terminated contracts with Subcontractors, Suppliers, and others; and
 - 4. reasonable expenses directly attributable to termination.
- B. Contractor shall not be paid on account of loss of anticipated profits or revenue or other economic loss arising out of or resulting from such termination.

15.04 *Contractor May Stop Work or Terminate*

- A. If, through no act or fault of Contractor, (i) the Work is suspended for more than 90 consecutive days by Owner or under an order of court or other public authority, or (ii) Engineer fails to act on any Application for Payment within 30 days after it is submitted, or (iii) 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 15.03.

- B. In lieu of terminating the Contract and without prejudice to any other right or remedy, if Engineer has failed to act on an Application for Payment within 30 days after it is submitted, or Owner has failed for 30 days to pay Contractor any sum finally determined to be due, Contractor may, seven days after written notice to Owner and Engineer, stop the Work until payment is made of all such amounts due Contractor, including interest thereon. The provisions of this Paragraph 15.04 are not intended to preclude Contractor from making a Claim under Paragraph 10.05 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 16 – DISPUTE RESOLUTION

16.01 Methods and Procedures

- A. Either Owner or Contractor may request mediation of any Claim submitted to Engineer for a decision under Paragraph 10.05 before such decision becomes final and binding. The mediation will be governed by the Construction Industry Mediation Rules of the American Arbitration Association in effect as of the Effective Date of the Agreement. The request for mediation shall be submitted in writing to the American Arbitration Association and the other party to the Contract. Timely submission of the request shall stay the effect of Paragraph 10.05.E.
- B. Owner and Contractor shall participate in the mediation process in good faith. The process shall be concluded within 60 days of filing of the request. The date of termination of the mediation shall be determined by application of the mediation rules referenced above.
- C. If the Claim is not resolved by mediation, Engineer's action under Paragraph 10.05.C or a denial pursuant to Paragraphs 10.05.C.3 or 10.05.D shall become final and binding 30 days after termination of the mediation unless, within that time period, Owner or Contractor:
1. elects in writing to invoke any dispute resolution process provided for in the Supplementary Conditions; or
 2. agrees with the other party to submit the Claim to another dispute resolution process; or
 3. gives written notice to the other party of the intent to submit the Claim to a court of competent jurisdiction.

ARTICLE 17 – MISCELLANEOUS

17.01 Giving Notice

- A. Whenever any provision of the Contract Documents requires the giving of written notice, it will be deemed to have been validly given if:

1. delivered in person to the individual or to a member of the firm or to an officer of the corporation for whom it is intended; or
2. delivered at or sent by registered or certified mail, postage prepaid, to the last business address known to the giver of the notice.

17.02 *Computation of Times*

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

17.03 *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 Documents. The provisions of this Paragraph will be as effective as if repeated specifically in the Contract Documents in connection with each particular duty, obligation, right, and remedy to which they apply.

17.04 *Survival of Obligations*

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

17.05 *Controlling Law*

- A. This Contract is to be governed by the law of the state of Texas and is performable and enforceable in the State District Courts of Liberty County, Texas. Venue will be Liberty County, Texas for any legal action brought hereunder.

17.06 *Headings*

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

SUPPLEMENTARY CONDITIONS

301. PROJECT SITE

(The "SUPPLEMENTARY CONDITIONS" provide a flexible Division of the Contract Documents in which to place provisions which contain elements that vary from one project to another, and which cover situations peculiar to the Project involved. The conditions outlined may require modification to fit the local situation or it may be necessary to include additional provisions to amplify the Contract requirements.)

The Project Area consists of the area within the property limits shown within the construction plans.

302. TIME FOR COMPLETION

The work which the Contractor is required to perform under this Contract shall be commenced at the time stipulated by the Owner in the Notice to Proceed, to be discussed at the pre-construction meeting.

303. LIQUIDATED DAMAGES

As actual damages for any delay in completion of the work which the Contractor is required to perform under this contract are impossible of determination, the Contractor and his Sureties shall be liable for and shall pay to the Owner the sum of Five Hundred Dollars (\$ 500) as fixed, agreed and liquidated damages for each calendar day of delay from the above stipulated for completion, or as modified in accordance with Section 109 hereof, until such work is satisfactorily completed and accepted.

304. SPECIAL HAZARDS

The Contractor's and his Subcontractor's Public Liability and Property Damage Insurance shall provide adequate protection against the following special hazards: (LIST)

305. CONTRACTOR'S AND SUBCONTRACTOR'S PUBLIC LIABILITY, VEHICLE LIABILITY, AND PROPERTY DAMAGE INSURANCE (not required for material supply contract)

As required under Section 129 of the General Conditions the Contractor's Public Liability Insurance and Vehicle Liability Insurance shall be in an amount not less than \$ 500,000 for injuries, including accidental death, to any one person, and subject to the same limit for each person, in an amount not less than \$ 1,000,000 on account of one accident, and Contractor's Property Damage Insurance in an amount not less than \$ 200,000.

The Contractor shall either (1) require each of his subcontractors to procure and to maintain during the life of his subcontract, Subcontractor's Public Liability and Property Damage of the type and in the same amounts as specified in the preceding paragraph, or (2) insure the activities of his subcontractors in his own policy.

306. BUILDER'S RISK INSURANCE

Does not apply to this project

307. RESPONSIBILITIES OF CONTRACTOR

Except as otherwise specifically stated in the Contract Documents and Technical Specifications, the Contractor shall provide and pay for all materials, labor, tools, equipment, water, light, heat, power, transportation, superintendence, temporary construction of every nature, charges, levies, fees or other expenses and all other services and facilities of every nature whatsoever necessary for the performance of the Contract and to deliver all Improvements embraced in this Contract and to deliver all Improvements embraced in this Contract complete in every respect within the specified time.

308. COMMUNICATIONS

- A. All notices, demands, requests, instructions, approval, proposals and claims must be in writing.
- B. Any notice to or demand upon the Contractor shall be sufficiently stated on the signature page of the Agreement (or at such other office as the Contractor may from time to time designate in writing to the Owner), or if deposited in the United States mail in a sealed, postage-prepaid envelope, or delivered with charges prepaid to any telegraph company for transmission, in each case addressed to such office.
- C. All paper required to be delivered to the Owner shall, unless otherwise specified in writing to the Contractor, be delivered to the City of Dayton, and any notice to or demand upon the Owner shall be sufficiently given if so delivered, or if deposited in the United States mail in a sealed, postage-prepaid envelope, or delivered with charges prepaid to any telegraph company for transmission to said Owner at such address, or to such other representatives of the Owner or to such other address as the Owner may subsequently specify in writing to the Contractor for such purpose.
- D. Any such notice shall be deemed to have been given as of the time of actual delivery or (in the case of mailing) when the same should have been received in due course of post, or (in the case of telegrams) at the time of actual receipt, as the case may be.
- E. This section does not apply to decisions given pursuant to section 113(b) of this contract.

309. JOB OFFICES

- A. The contractor shall furnish and maintain, during construction of the Improvements embraced in this Contract adequate facilities on the Project Area or adjacent thereto for the use of the Owner and its Engineers, as follows:
(None Required on this Project)
- B. The contractor and his sub-contractors may maintain such office and storage facilities on the Site as are necessary for the proper conduct of the work. These shall be located so as to cause

no interference to any work to be performed on the Site. The Owner shall be consulted with regard to locations.

- C. Upon completion of the Improvements, or as directed by the Owner the Contractor shall remove all such temporary structures and facilities from the Site, same to become his property, and leave the Site of the work in the condition required by the Contract.
- D. Consideration should be given to the deletion of paragraph if the time set for completion of the Improvements is less than sixty (60) days. It may also be deleted if a job office has been otherwise provided or usable space is available in existing buildings.
- E. If a job office is required specify in detail the facilities and services required, such as adequate office space, light, heat, hot and cold water, toilet facilities, janitor service, local telephone, closets, plan racks, etc.

310. PARTIAL USE OF SITE IMPROVEMENTS

The Owner, at its election, may give notice to the Contractor and place in use those sections of the Improvements which have been completed, inspected and can be accepted as complying with the Technical Specifications and if in its opinion, each such section is reasonably safe, fit, and convenient for the use and accommodation for which it was intended, provided;

- A. The use of such sections of the Improvements shall in no way impede the completion of the remainder of the work by the Contractor.
- B. The Contractor shall not be responsible for any damages or maintenance costs due directly to the use of such sections.
- C. The use of such section shall in no way relieve the Contractor of his liability due to having used defective materials or to poor workmanship.
- D. The period off guarantee stipulated in the Section 132 hereof shall not begin to run until the date of the final acceptance of all work which the Contractor is required to construct under this Contract.

311. WORK BY OTHERS

(It may be that local ordinances or regulations require connections, or disconnections, from utilities or sewers to be made by designated departments or companies. These facts should be obtained and inserted in this Section. The costs, if any, to the Contractor should be stated in paragraph "B".)

The following work will be done by others:

- A. At no expense to the Contractor:

- 1. On site:

- a. _____
 - b. _____
- etc.

2. Off site:

- a. _____
- b. _____

B. At the expense of the Contractor:

A. On site:

- A. _____
 - B. _____
- etc.

312. CONTRACT DOCUMENTS AND DRAWINGS

The Owner will furnish the Contractor without charge 3 (insert number to be supplied without cost to the Contractor which should be determined by the magnitude of the Contract and probable number of subcontracts) copies of the Contract Documents, including Technical Specifications and Drawings. Additional copies requested by the Contractor will be furnished at cost.

313. CONTRACT TIME

A. Working Day

A Working Day is defined as any day, in which weather or other conditions, not under the control of the CONTRACTOR, will permit construction of the principal units of the work for a period of not less than seven (7) hours between 7:00 a.m. and 6:00 p.m. Saturdays, Sundays and legal holidays will not be counted as a working day if not worked. If the Contractor works on any of these days, he will be charged a working day. Work will not be permitted on Sundays or within 30 minutes of sunset on any working day except with the approval of the Engineer and/or Owner.

If the Contractor intends to claim a day as a "rainout" day, one in which weather or site conditions will not permit the construction of the principal items of the project, as defined herein, he must do so before 9 a.m. of each day by notifying the Engineer. This does not pertain to weather conditions that develop after 9 a.m. and stop the progress of the work for the rest of the day. Site conditions that prevent work must be determined before 9 a.m. of each day. Requests for additional time will be reviewed on a case by case basis but only for the proceeding 30 day period. Requests for additional time should be made each month. No request for additional time will be considered for delays from previous months.

F. Calendar Day

A calendar day is everyday of the week including Saturday, Sunday and legal holidays. Additional time is not normally granted for CALENDAR day contracts for weather related delays. Requests for additional time for other delays will be reviewed on a case by case basis but only for the proceeding 30 day period. Requests for additional time should be made each month. No request for additional time will be considered for delays from previous months.

314. ORDER OF PRECEDENCE

The order of Precedence for the contract shall be as follows:

1. Drawings
2. Technical Specifications
3. Special Conditions
4. General Conditions

315. SAFETY PLAN

The contractor shall submit a safety plan to the Engineer and owner prior to beginning construction.

- A. The safety plan provided hereunder shall detail the Contractor's plan to initiate, maintain and supervise safety precautions and programs.
- B. The Contractor shall designate in writing and keep on the job site at all times during its process a competent, resident, technically qualified, English speaking superintendent, acceptable to the OWNER and the Engineer, who shall not be replaced without written notice to the OWNER and the Engineer except under extraordinary circumstances. This superintendent shall be the safety representative.
- C. The safety representative shall conduct daily safety inspections of the job site and shall provide to the OWNER, through the Engineer, a weekly log of safety inspections and the results thereof.

316. CONTRACTOR'S LIABILITY INSURANCE

As required under Section 305 of the General Specifications, Special Conditions Part III, the Contractor's Public Liability insurance and Vehicle Liability Insurance shall be in an amount not less than \$500,000 for injuries, including accidental death, to any one person, and subject to the same limit for each person, in an amount not less than \$1,000,000 on account of one accident, and Contractor's Property Damage Insurance in an amount not less than \$200,000.

The Contractor shall require each of his subcontractors to procure and to maintain during the life of his subcontract, Subcontractor's Public Liability and Property Damage of the type and in the same amounts as specified in the preceding paragraph.

The Contractor shall name the OWNER and the Engineer as Additional Insured on all insurance policies. The Contractor and any sub-contractors shall provide Certificates of Insurance evidencing said coverage. Said insurance certificates shall be presented to the OWNER for approval prior to the start of work on the project.

317. INDEMNIFICATION

- A. The Contractor shall indemnify, defend and hold harmless the OWNER and ENGINEER, their agents, officers, and employees from and against all claims and liabilities arising under or by reason of the contract or any performance of the work. This indemnity expressly extends to claims alleging negligence by the OWNER its agents, officers or employees arising from actions taken or occurrences under this contract. Such indemnification by the Contractor shall include but not be limited to the following:
1. Liability or claims resulting directly or indirectly from the negligence or carelessness of the Contractor, its employees, or its agents in the performance of the work, or in guarding or maintaining the same, or from any improper materials, implements, or appliances used in its construction, or by or on account of any act or omission of the Contractor or its agents;
 2. Liability or claims arising directly or indirectly from or based on the violation of any law, ordinance, regulation, order, or decree, whether by the Contractor or its agents;
 3. Liability or claims arising directly or indirectly from the use or manufacture by the Contractor, its agents, or the OWNER or ENGINEER in the performance of this contract of any copyrighted or uncopyrighted composition, secret process, patented or unpatented invention, article, or appliance, unless otherwise specifically stipulated in this contract;
 4. Liability or claims resulting directly or indirectly from the breach of any warranties, whether expressed or implied, made to the OWNER or any other parties by the Contractor or its agents;
 5. Liabilities or claims arising directly or indirectly from the willful misconduct of the Contractor, its employees, or its agents; and,
 6. Liabilities or claims arising directly or indirectly from any breach of the obligations assumed herein by the Contractor.
 7. Liabilities or claims of whatever kind or character, arising out of or in connection with the performance by the Contractor of those services contemplated by this Agreement, based upon allegations of negligent acts of Contractor, its officers, agents, employees, and expressly including allegations of negligence, acts or omissions of the OWNER, the ENGINEER, their consultants, agents, officers or employees, when such allegations of negligence to the OWNER or ENGINEER arise from the actions and work undertaken by Contractor hereunder.
- B. The Contractor shall reimburse the OWNER, and the ENGINEER for all costs and expenses, (including but not limited to fees and charges of architects, engineers, attorneys, and other

professionals and court costs) incurred by said OWNER, and the ENGINEER in enforcing the provisions of this Article.

- C. The indemnification obligation under this Article shall not be limited in any way by any limitation on the amount or type of damages, compensation or benefits payable by or for the Contractor or any such subcontractor or other person or organization under the Workers' Compensation Act, Disability Benefit Acts, or other employee benefit acts.

318. PRE-CONSTRUCTION CONFERENCE

A non-mandatory pre-construction conference will be held between the Engineer, Owner, and the Contractor prior to construction. The dates, time, and place will be announced after the project has been bid.

319. WARRANTY

Neither the final Certificate of Completion nor any provision in the contract nor partial or entire use of the improvements included in this contract shall constitute an acceptance of work not done in accordance with this contract or relieve the Contractor of liability in respect to any express warranties or responsibility for faulty workmanship. The Contractor shall promptly remedy any defects in the work and pay for any damage to other work resulting there from which shall appear within a period of 12 months from the date of final acceptance of the work.

320. SUBMITTALS AND AS-BUILTS

Details and manufacturer's information on all materials in the project shall be submitted to the Engineer in three (3) copies for approval within 14 days after the execution of the contract to afford ample time for checking, including time for correcting, resubmitting and rechecking if necessary. The contractor may proceed, only at his own risk, with manufacture or installation of any equipment or work covered by said shop drawings, etc. until they are approved and no claim, by the Contractor, for extension of the contract time shall be granted by reason of his failure in this respect.

Any drawings submitted without the Contractor's stamp of approval will not be considered and will be returned to him for proper resubmission. If any drawings show variations from the requirements of the Contract because of standard shop practice or other reason, the Contractor shall make specific mention of such variation in his letter of transmittal in order that, if acceptable, suitable action may be taken for proper adjustment of contract price and/or time, otherwise the Contractor will not be relieved of the responsibility for executing the work in accordance with the Contract even though the drawings have been approved.

If a shop drawing is in accordance with the contract or involves only a minor adjustment in the interest of the Owner not involving a change in contract price or time, the Engineer may approve the drawing. The approval shall not relieve the contractor from his responsibility for adherence to the contract or for any error in the drawing.

The Contractor shall provide to the Engineer, prior to and as a condition of release of retainage, a clean set of "As Built" plans. Such drawings shall include any changes made to the facilities from

what was shown in the plans. This shall include, but is not limited to, horizontal alignment of water and sewer lines, line depths at one hundred (100) feet stations, stations of all structures, actual lengths, dimensional changes, details not on original drawings, and changes made by change order.

321. CONDITIONS OF THE CONTRACT

In the event that any portions of the conditions in this Contract conflict with each other, the more strict requirements shall be followed.

322. PAYMENT FOR MATERIALS ON HAND

The Contractor will not be required to maintain a field office. In order to be paid for materials on hand, however, all materials that could, in the opinion of the Engineer, easily be removed from the site, must be stored in a materials storage yard.

The materials storage area shall be of adequate size to safely store all of the materials expected to be on hand but not installed. The area shall be fenced with a minimum six (6) foot hurricane fence and shall have a lockable gate. The fencing shall be such that it will prevent unauthorized access to stored materials. This area shall be kept locked when unattended.

323. NOTIFICATION

The Contractor shall be responsible for notifying the Owner at least 48 hours prior to disruption of water or sewer service or the blocking or closing of any roads. The contact person and phone number will be given to the Contractor at the pre-construction conference. All interference with City services or utilities shall be done so in accordance with the plans and specifications.

324. REQUIRED DOCUMENTATION

The following list represents the documents required of the contractor throughout the project. If the plans and specifications require a document not listed here, the Contractor must still provide that document.

1. Subcontractor list - within one week after award
2. Performance and payment bonds (as required by the contract documents) - within 15 days after award
3. Contractor's certificate of insurance (Section 316) - with the required bonds
4. Submittals (Section 320) - within 14 days of execution of the contract
5. Bid breakdown (if required of the successful bidder and unless required with the bid) - Prior to execution of the contract
6. Construction Schedule (SOW) - 10 days prior to start of construction
7. As built plans (Section 320) - prior to final payment.

325. PERMITS

The Contractor shall be responsible for acquiring all necessary permits associated with the construction of this project.

326. PUBLIC SAFETY AND CONVENIENCE

The safety of the public and the convenience of traffic shall be regarded as of prime importance. Unless otherwise shown on the plans or except as herein provided, all portions of the street shall be kept open to traffic. It shall be the entire responsibility of the CONTRACTOR to provide for traffic along and across the street as well as for ingress and egress to private property all as specified herein, as shown on the plans, or as directed by the ENGINEER.

The CONTRACTOR shall plan and execute his operations in a manner that will cause the minimum interference with traffic. The CONTRACTOR shall secure the ENGINEER's approval of his proposed plan of operation, sequence of work and methods of providing for safe passage of traffic before it is placed into operation.

If at any time during construction, the approved plan does not accomplish the intended purpose, due to weather or other conditions affecting the safe handling of traffic, the CONTRACTOR shall immediately make necessary changes therein to correct the unsatisfactory conditions.

Where the specifications require, or the ENGINEER directs that traffic be carried over or along the proposed work, construction operations shall be so prosecuted and new material kept as placed and spread as to allow the passage of traffic in comfort and safety. At night or otherwise, all equipment shall be stored in such manner and at such locations as not to interfere with the safe passage of traffic. The CONTRACTOR shall provide and maintain flag men at such points and for such periods of time as may be required to provide for the safety and convenience of public travel and CONTRACTOR's personnel, and as directed by the ENGINEER or OWNER.

327. SUPERINTENDENT

The Contractor shall appoint a superintendent as provided for in Section 2.3(B) and (C) hereof. The sole activity and responsibility of the Contractor's supervisor or superintendent shall be the full-time superintendence of the work and the fulfillment of the Contractor's responsibilities.

328. GENERAL CONDITIONS

Paragraph 5.06A and 5.06B of the General Conditions are void and do not apply to this contract.

Article 16 of the General Conditions refers to the American Arbitration Association. References to the American Arbitration Association are void and shall not apply to this contract. Any other reference to mediation process will apply and either party will have the right to file its claim in a court of competent jurisdiction.

CERTIFICATE OF CONSTRUCTION COMPLETION

Locality:

This is to certify that the project as described below was completed on the _____ day of _____, 20__.

Contract was entered into on the _____ day of _____, 20__ between the City of Dayton, Texas and _____ for the construction of **Clayton Water Well Improvements Project, Transmission Line.**

This is to further certify that:

1. The work has been completed in accordance with the plans and specifications and all addenda, change orders and supplemental agreements thereto, with the following exceptions:
2. The sum of \$_____, deducted from the final payment to the Contractor is a fair and equitable settlement for the foregoing excepted work.
3. The Contractor has presented on behalf of itself and its sureties, satisfactory evidence that he or she will repair, replace and make good any faulty workmanship and/or materials discovered in the work within a period of 12 months from the date of completion of the project, as provided in the Contract.

4.	Amount of Original Contract	\$
	Present Amount of Contract	\$
	Less Previous Payments	\$
	Less Deductions (from #2 above)	\$
	FINAL PAYMENT (Balance)	\$_____ plus all accrued interest

5. The Final Payment in the amount above is now due and payable.

Certified by:

Jeff D. Leavins, P.E.
President

Contractor

TECHNICAL SPECIFICATIONS

**CITY OF DAYTON, TEXAS
CLAYTON WATER WELL IMPROVEMENTS PROJECT
TRANSMISSION LINE**

ITEM 50

MOBILIZATION

50.01 DESCRIPTION

This item shall consist of the mobilization of personnel, equipment and supplies at the project site in preparation for beginning work on other contract items. Mobilization shall include, but is not limited to, the movement of equipment, personnel, material, supplies, etc. to the project site and the establishment of office and other facilities necessary prior to beginning the work.

50.02 MEASUREMENT

Measurement of the Item, "Mobilization" as specified herein will be by the "Lump Sum", as the work progresses.

50.03 PAYMENT

Partial payments of the "Lump Sum" bid for mobilization will be as follows. The adjusted contract amount for construction items as used below is defined as the total contract amount less the lump sum bid for Mobilization.

1. When 1% of the adjusted contract amount for construction items is earned, 50% of the mobilization lump sum bid will be paid.
2. When 5% of the adjusted contract amount for construction items is earned, 75% of the mobilization lump sum will be paid. Previous payment under this item will be deducted from the above amount.
3. When 10% of the adjusted contract amount for construction items is earned, 100% of the mobilization lump sum bid will be paid. Previous payments under this item will be deducted from the above amount.

ITEM 110

PIPING CONSTRUCTION AND MATERIALS (WATER)

110.01 GENERAL

Construction of water lines includes all preparation of site, clearing, grubbing, excavation, street surface removal, dewatering, sheeting, bracing, laying and joining of pipe, bedding, backfilling, installation of fittings, testing, and cleanup of the site. The work includes furnishing of all materials, equipment, tools, labor, and all other incidentals to complete the construction.

110.02 SEQUENCE OF WORK

The Contractor shall pursue the job in an orderly fashion. All appurtenances shall be constructed as soon as the pipeline they serve is constructed to their location. The construction of appurtenances may be postponed upon approval of the Engineer and determination that the circumstances were beyond the control of the Contractor. A sufficient space as determined by the Engineer, shall be provided for proper installation later.

At least ten (10) days prior to construction, the Contractor shall submit to the Engineer, in writing, a Construction Plan detailing the sequence in which each line segment will be constructed. The Contractor shall alter this plan at the request of the Engineer. The Contractor shall not deviate from this plan without the approval of the Engineer.

110.03 SUB-SURFACE CONDITIONS

No sub-surface investigation has been conducted in relation to this project. The contractor should make himself familiar with the conditions along the project route and area. The contractor may, with the permission of the Engineer, conduct his own sub-surface investigation.

110.04 SITE OF WORK

The Owner will furnish the site, easements, or any right of way considered necessary by the Engineer. If the Contractor needs more working area, he shall make his own arrangements and indemnify the Owner from any damages or claims.

110.05 PROTECTION OF THE PUBLIC

The Contractor shall make any provisions necessary to protect the public from inconveniences and dangers caused by the construction. Storage and stringing of the material and equipment and excavation shall be done in a manner to cause minimum obstruction and inconvenience to the traffic and the property owners along or adjacent to the construction site. Fire hydrants,

water meters, water valves, gas valves, manholes, catch basins, and boxes for telephone, signal, and alarms shall not be obstructed or covered.

The Owner reserves the right to remedy any neglect on the part of the Contractor in regard to public conveniences and safety which may come to its attention. After twenty-four (24) hours' notice in writing to the Contractor, save in cases of emergency, when the Owner shall have the right to remedy any neglect without notice, and, in either case, the cost of such work done by the Owner shall be deducted from monies due or to become due to the Contractor.

110.06 HANDLING OF TRAFFIC

The Contractor shall make any provision necessary to handle, direct, and divert traffic when traffic is interrupted due to the contractor's work. At no time shall a street be closed due to the Contractor's construction without 48 hours notification to the appropriate agency. Dead end streets must be always kept accessible to the residents.

110.07 BARRICADES, LIGHTS AND WATCHMEN

Where the work is carried on in, or adjacent to any street, alley, or public place, the Contractor shall, at his own expense, furnish and erect such barricades, fences, lights and danger signals and shall provide such watchmen and shall take such precautionary measures for the protection of persons, property, and of the work, as necessary in the opinion of the Engineer. Barricades shall be recently painted in a color that will be visible at night. From sunset to sunrise the Contractor shall furnish and maintain adequate lights at each barricade. A sufficient number of barricades shall be erected to keep vehicles from being driven on or into any work under construction. The Contractor shall furnish watchmen in sufficient numbers to protect the work.

The Contractor shall be held responsible for all damage to the work due to failure of barricades, signs, lights and watchmen to protect it, and whenever evidence is found of such damage, the Engineer may order the damaged portion immediately removed and replaced by the Contractor at the Contractor's cost and expense. The Contractor's responsibility for the maintenance of barricades, signs and lights, and for providing watchmen, shall not cease until the project has been accepted by the Owner.

Barricades, signs, and handling of traffic shall be in accordance with the latest edition of the Manual on Uniform Traffic Control Devices as adopted by the Texas Highway Department, and as directed by the Engineer, all in accordance with these specifications. A copy of the manual is available for review without charge at the Engineer's office.

110.08 PROTECTION OF UTILITIES

The plans note the existence of existing utilities. The Contractor shall inspect the route of the construction during the bidding period to check the location of such utilities, possibility of any conflict, and addition of new utilities. If, during construction, it is determined that a conflict exists with the alignment of the proposed sewer, the Engineer will make the necessary changes in the alignment of the sewer line.

The Contractor shall be responsible for making any provisions necessary to protect all utilities, services, and appurtenances. He shall locate and give the owner-operator of each utility that utility's required advance notice prior to progressing to such utility. The Contractor and/or utility owner shall be responsible for repairing and damaged utilities. If the contractor is required to repair a utility, it shall be done without delay.

110.09 PROTECTION OF PRIVATE PROPERTY

The Contractor shall not enter upon private property for any purpose without having previously obtained permission from the Owner. The Contractor shall be responsible for the preservation of and shall use every precaution to prevent damage to all trees, shrubbery, plants, lawns, fences, culverts, bridges, pavement, driveways, sidewalks, buildings, service lines, or any other structure in or adjacent to private property. The contractor shall be responsible for any damage to private (or public) property caused by his work.

110.10 PREPARATION OF THE SITE AND THE ROUTE

The Contractor shall make all preparation necessary before excavation starts. The construction site, and or the route which the pipe will be laid in, shall be cleared and grubbed before pipe laying. All stumps, brush, logs, rubbish and other objectionable material shall be removed and disposed of in a manner approved by the Engineer. Burning and/or hauling of the material shall be executed in compliance with ordinances of the City, County, or any other governmental body. If work is proceeding through a utility easement, care shall be taken to clear all the proposed easement as specified above.

110.11 PROTECTION OF STREET AND DRAINAGE

The Contractor shall make all attempts to keep streets and drainage ways open. Streets should be cleaned when the contractor's work leaves the streets dirty and/or muddy. Drainage ditches shall be kept open and if backfilled by the Contractor, they shall be reopened before the crew leaves the site at the end of a working day. The contractor shall provide temporary pumping facilities to provide drainage when a ditch is blocked by the contractor's work, as instructed by the Engineer and the Owner, at no additional cost to the owner.

110.12 MATERIALS

A. DUCTILE IRON PIPE

The following specification covers ductile iron pipe to be used under pressure for potable water. All ANSI and AWWA references shall be the latest revision thereof.

1. Pipe and Fittings. Ductile Iron Pipe shall be designed, manufactured, and tested in accordance with ANSI A21.51 (AWWA C-151) and ANSI 21.50 (AWWA C-150). Pipe and spool pieces 12" and smaller shall be Class 350; 14" to 24" shall be Class 250; and sizes larger than 24" shall be Class 150, unless otherwise noted on the plans. Flanged joints shall be as per AWWA C-115-1985 and mechanical joints shall be as per AWWA C-111-1985. All ductile iron water pipe, fittings, and coatings used in this contract shall meet the requirements of the American National Standards Institute\National Sanitation Foundation (ANSI\NSF) standard 61 and ASTM D-1784. All ductile iron water pipe shall bear the National Foundation Seal of Approval.

Fittings shall be manufactured and tested in accordance with AWWA C-110\ANSI A21.10, "Specification for Gray-Iron and Ductile Iron Fittings for Water and Other Liquids".

2. Coating. The interior of the pipe and fittings for potable water use shall be cement lined in accordance with ANSI/AWWA C104/A2.4

The exterior of all underground ductile iron pipe and fittings shall be coated with 1 mil of asphaltic coating applied at the factory. All underground ductile iron piping and fittings shall be totally encased with a single layer 8 mils high-density "Polywrap" polyethylene film, ANSI/ASTM D1248, installed to manufacturer's instructions and AWWA C105, unless otherwise specified.

The exterior of all exposed (above ground) ductile iron pipe and fittings shall be prepared and coated according to the below specifications.

Priming (by pipe manufacturer) - **All above ground (exposed) ductile iron pipe shall be shop primed.** The primer shall be compatible with Tnemec paint. The pipe supplier shall supply the Contractor with one gallon of the same primer used to prime the pipe so that the Contractor can field prime areas of the pipe that may be damaged during delivery.

Field painting - All exposed (above ground) ductile iron pipe and fittings shall be prepared and coated according to the following specifications:

Surface preparation: Sand all surfaces using 150 grit sandpaper to uniform and thoroughly abraded surface. If necessary, clean surface with solvents (for example, MEK) to remove grease, oil and other soluble contaminants. All surfaces shall be dry, clean and free of all dust, dirt, oil, grease and other contaminants. In areas where the coating has been damaged, clean with wire brushes and apply one coat of primer (provided by pipe supplier) to the bare area. Feather edges smooth. All surface preparation shall be in accordance with the painting specification.

First coat: Apply one coat of Delft Blue (39 BL) Tnemec Series N69 Hi-Build Epoxoline II at 6.0 to 8.0 dry mils. Thin only with Tnemec No. 4 Thinner.

Finish coat: Apply one coat of Clear Sky (26 BL) Tnemec Series 1074 Endura-Shield II at 2.0 to 5.0 dry mils. Thin only with Tnemec No. 39 Thinner.

3. Joints. Pipe and fittings shall be furnished with the type of joint and end combinations as well as pressure class specified. Mechanical joint fittings shall be furnished complete with glands, gaskets and nuts and bolts. Flanged joint fittings shall be furnished complete with gaskets and nuts and bolts. All bolts, glands and gaskets shall be in accordance with AWWA Standard Specification C111-85 and installed in accordance with the manufacturer's recommendations. All nuts and bolts installed underground shall be stainless steel. All mechanical joint fittings installed on pressurized systems shall have megalug restraining flanges.

B. PVC PIPE

The following specification covers PVC (Polyvinyl Chloride) pipe to be used under pressure for potable water. All ANSI and AWWA references shall be the latest revision thereof. All PVC water pipe and fittings used in this contract shall meet the requirements of the American National Standards Institute\National Sanitation Foundation (ANSI\NSF) standard 61 and ASTM D-1784. All PVC water pipe shall bear the National Foundation Seal of Approval.

1. AWWA C900 Pipe.

Pipe shall consist of AWWA C900 Class 150 PVC pipe & couplings shall be made from Class 124-B virgin compounds as defined in ASTM D-1784 and conforming with the outside dimensions of cast iron pipe.

- a. Installation. PVC pipe shall be installed in flat-bottom trenches with

tamped backfill and a minimum of three (3) feet of cover as per ASTM D-2774 or as shown in the plans.

- b. Joints. Joints shall be mechanical type or the push-on type as specified with confined elastomeric gasket and installed in accordance with the manufacturer's recommendations.
- c. Fittings. Fittings shall be manufactured and tested in accordance with AWWA C-110\ANSI A21.10, "Specification For Gray-Iron and Ductile Iron Fittings For Water and Other Liquids". Fittings shall be Mechanical Joint with Megalug restraining flanges. All nuts and bolts installed underground shall be stainless steel. Transition gaskets shall be used where necessary to connect to existing piping.

2. AWWA C905 Pipe.

Pipe shall consist of AWWA C905 DR 25 PVC pipe & couplings and shall be made from Class 12454-B virgin compounds as defined in ASTM D-1784 and conforming with the outside dimensions of cast iron pipe.

- a. Installation. PVC pipe shall be installed in flat-bottom trenches with tamped backfill and a minimum of three (3) feet of cover as per ASTM D-2774 or as shown in the plans.
- b. Joints. Joints shall be mechanical type or the push-on type as specified with confined elastomeric gasket and installed in accordance with the manufacturer's recommendations and shall conform to ASTM D-3139.
- c. Fittings. Fittings shall be manufactured and tested in accordance with AWWA C-110\ANSI A21.10, "Specification For Gray-Iron and Ductile Iron Fittings For Water and Other Liquids". Fittings shall be Mechanical Joint with Megalug restraining flanges. All nuts and bolts installed underground shall be stainless steel. Transition gaskets shall be used where necessary to connect to existing piping.

3. SDR 26 or SDR 21 Pressure Pipe.

Pipe shall consist of IPS pressure pipe (ASTM D 2241) SDR 26 or SDR 21 PVC pipe & couplings and shall be made from Class 12454-B virgin compounds as defined in ASTM D-1784 and conforming with the outside dimensions of cast iron pipe.

- a. Installation. PVC pipe shall be installed in flat-bottom trenches with

tamped backfill and a minimum of three (3) feet of cover as per ASTM D-2774, or as shown in the plans.

- b. Joints. Joints shall be mechanical type or the push-on type as specified with confined elastomeric gasket and installed in accordance with the manufacturer's recommendations.
- c. Fittings. Fittings shall be manufactured and tested in accordance with AWWA C-110\ANSI A21.10, "Specification For Gray-Iron and Ductile Iron Fittings For Water and Other Liquids". Fittings shall be Mechanical Joint with Megalug restraining flanges. All nuts and bolts installed underground shall be stainless steel. Transition gaskets shall be used where necessary to connect to existing piping.

4. Schedule 40 and 80 PVC Pipe.

Pipe and coupling shall consist of PVC pipe (ASTM D-1785) and shall be made from class 12454-B virgin compounds as defined in ASTM D-1784. Pipe dimensions shall conform to ASTM D-1785.

- a. Installation. PVC pipe shall be installed in flat-bottom trenches with tamped backfill and three (3) feet of cover in accordance with ASTM D-2774 or as shown in the plans.
- b. Joints. Joints shall be of the glued socket fitting type in accordance with the manufacturer's recommendations.
- c. Fittings. Fittings shall be of the glued socket fittings type and shall be in accordance with ASTM D-2467.

C. CHEMICAL PIPING

1. PVC Piping: PVC pipe for chemicals, vacuum and solution, shall be ASTM D 1785, Type 1, Grade 1, Schedule 80 for exposed piping and Schedule 40 for buried piping and piping beneath grating, rigid, unplasticized PVC, normal impact, bearing NSF seal. Fittings shall be molded, bearing NSF seal, as manufactured by Tube Turn Plastics, or equal. Pipe threads, if used, shall conform to ASA B2.1, NPT, and shall be full and cleanly cut with sharp dies.

- a. If glued joints are used, cement shall be of type that welds plastic surfaces together. Cement shall be as recommended by the pipe manufacturer and shall be compatible with the chemical conveyed.

Teflon tape shall be used on all threaded joints. Teflon tape shall be mil spec P-7730A or as recommended by the pipe supplier for the chemical service. Tubing connecting to piping shall utilize barbed fittings and 316 stainless steel tube clamps, two per connection. Barbed fittings shall be CPVC or other material recommended by the manufacturer rated for work pressure of 50 psi and chemical service up to 406_F.

b. Gaskets and O-rings for chlorine vacuum and solution piping shall be Viton. Gaskets and O-rings for other chemicals shall be compatible with the chemical being used.

c. Cement and primers shall be suitable for use in potable water. Cement shall be industrial grade and primer shall be purple color. Cement used shall have a manufacture date within 14 months of the date being utilized. Containers shall be kept tightly closed when not in use. Brush or swab applicators shall be appropriately sized and utilized as recommended by the manufacturer.

d. Chemical piping shall be tested to a hydrostatic pressure of 150 psi.

e. Mark pipe in accordance with ASTM D1785.

2. CPVC Piping: Materials:

a. CPVC Pipe: Schedule 40 or Schedule 80, as specified, in accordance with ASTM F441 and Appendix, CPVC 4120.

1) Pipe: Extruded from Type IV, Grade 1, Class 23447 material in accordance with ASTM D1784.

b. Fittings: Conform to ASTM F438 or ASTM F439 for pressure fittings, as appropriate to the service and pressure requirement.

1) Fitting: Supplied by the pipe manufacturer.

2) Flanges shall be fabricated of CPVC with 150-lb flanges per ANSI/ASME B16.5. Gaskets shall be full-face viton.

c. Solvent Cement: In accordance with ASTM F493. Cement shall be industrial grade and primer shall be purple color. Cement used shall have a manufacture date within 14 months of the date being utilized. Containers shall be kept tightly closed when not in use. Brush or swab applicators shall be appropriately sized and utilized as recommended by the manufacturer.

1) *For CPVC pipe in sodium hypochlorite solution service, utilize IPS Corp Type 724 cement or another cement certified by the manufacturer for high strength hypochlorite service.*

d. Mark pipe and fittings in accordance with ASTM F441.

3. INSTALLATION

a. General:

1) Comply with the general requirements of Item 1120 and the supplemental requirements following.

2) Install all piping in accordance with pipe manufacturer's instructions.

3) Chemical piping shall be installed at uniform grades or slopes without any high points in the pipe except at the pumps.

b. Making of Joints:

1) General:

i. Make joints in accordance with pipe manufacturer's recommendations and the supplemental specifications below.

ii. For shorter than standard pipe lengths, field cuts may be made with either hand or mechanical saws with fine tooth blade (16–18 teeth per inch) or plastic pipe cutters. Cut piping accurately and squarely within 1/8 inch and install without forcing or springing.

iii. Ream out all pipes and tubing to full inside diameter after cutting.

iv. Remove all cuttings and foreign matter from the inside of pipes and ends shall be smoothly beveled by a mechanical beveller or by hand with a rasp or file before installation. Field spigots shall be stop-marked with an adequate marker for the proper length of assembly insertion.

- v. Joints shall not be covered until approved by Engineer or his representative. Connections that are made for future use shall be properly capped.

2) Solvent Weld Joints Only:

- i. Comply with the requirements of ASTM D2855 and F493.
- ii. File end of PVC or CPVC Pipe to form a 10 to 15 degree bevel 1/16-inch to 3/32-inch wide on the exterior of the pipe end.
- iii. The pipe and fittings shall be cleaned of all loose dirt and moisture and then lightly roughened with emery cloth over the entire surfaces to be glued, after cutting pipe and removing all burrs and prior to applying the primer.
- iv. Apply primer to the female end, then the male end and then reapply to female end, keeping the surface wet with primer over 5- to 15-second period.
- v. Apply solvent cement to pipe end and socket and then apply a second coat to pipe end using a brush one-half of the diameter of the pipe. Hold for 30 seconds.
- vi. Immediately insert pipe end in socket and wipe off excess cement.
- vii. Rotate pipe under 6 inches about one-quarter turn after inserting in socket.
- viii. Completed glue joints shall not have any gaps or voids in the glue between the pipe and the fitting.
- ix. Do not perform solvent welding operations when temperature is below 40°F or above 90°F, or when rain or drizzle is present.
- x. Do not move or disturb the glued joints for 3 minutes after completion. Joints shall not have any pressure or deflection applied for at least 1 hour after completing the joint. Allow all joints to set 24 hours prior to performing

pressure test on system.

- xi. All joints shall be checked for leakage 48 hours and again 15 days after placing them in service with the proposed chemical. Joints that show signs of leaking or signs of salt buildup shall be replaced and system retested and checked again 48 hours and 15 days after repair until satisfactory results are obtained.
- xii. Small diameter pipes shall be checked for excess glue after the joints have set. Joints with more than one-half of the pipe area blocked shall be drilled or reamed out.
- xiii. All pipe systems shall be flushed at velocity greater than 5 fps for a minimum of 5 minutes and longer for pipes larger than 300 feet.

3) Threaded Joints Only:

- i. Use liquid lubricant for permanent joints.
- ii. Use tape lubricant at valves and equipment where piping may have to be disconnected for maintenance.

4) Gasketed Joints Only:

- i. Thoroughly clean pipe ends and gaskets before installation.
- ii. Apply lubricant recommended by manufacturer.

5) Plastic to Metal Connections:

- i. Make all plastic to metal connections by means of PVC adapters.
- ii. Do not cut threads on PVC Pipe.

c. Buried Piping:

- 1. All excavation shall be done in an approved manner to the elevations and grades shown on the Plans or specified. The trench bottom shall be free of sharp rocks and large clods of dirt.

2. Embedment for PVC pipe shall be granular fill (sand) six inches below to six inches above the pipe compacted to the density of the surrounding soil. Granular material shall have a plasticity index of not greater than twenty (20) and with less than forty (40) percent passing a No. 200 sieve.
3. Backfill shall be placed according these specifications and the manufacturer's recommendations.
4. Sand or granular embedment material shall be used for PVC pipe 2 inches and smaller.

d. Exposed Piping:

1. Where required PVC piping shall be installed in the locations indicated with hangers, brackets, supports, etc., at spacings specified in Item 1120 or recommended by the pipe manufacturer.
2. Flexible connections shall be required at locations where pipe passes through a concrete wall.
3. All exposed PVC piping shall be painted.

D. HIGH DENSITY POLYETHYLENE (HDPE) PIPE

This specification covers HDPE (High Density Polyethylene) pipe to be used as a water main. Pipe shall be manufactured from a high density high molecular weight polyethylene (HDPE) resin which conforms to ASTM D-1248 and meets the requirements for Type III, Class B, Grade P34, Category 5, and has a PPI rating of PE 3408, when compounded. The pipe produced from this resin shall have a minimum cell classification of 345434E (inner wall shall be light in color) under ASTM D3350. Pipe shall be NSF approved for potable water use and shall meet the requirements of the latest revision of AWWA C 906, "Polyethylene (PE) Pressure Pipe and Fittings, 4 in. through 63 in., for Water Distribution" and AWWA C901, "Polyethylene (PE) Pressure Pipe and Tubing, ½ in. through 3 in. For Water Service."

Pipe supplied under this specification shall have a nominal DIPS (Ductile Iron Pipe Size) unless otherwise specified.

Before beginning work, the Contractor shall submit to the Engineer for approval, the vendor's specific technical data with complete physical properties of pipe and pipe dimensions pertinent to this job.

The outside diameter and minimum wall thickness shall conform to dimensions listed in Table I and shall be measured in accordance with ASTM D-2122.

TABLE 1
POLYETHYLENE WATER PIPE DIMENSIONS

	NOMINAL OD (Inches)	MINIMUM WALL THICKNESS (Inches)	
		DR 17	DR 11
4	4.80	0.282	0.436
6	6.90	0.406	0.627
8	9.05	0.532	0.823
10	11.10	0.653	1.009
12	13.20	0.776	1.200
14	15.30	0.900	1.391
16	17.40	1.024	1.582
18	19.50	1.147	1.773
20	21.60	1.271	1.964
24	25.80	1.518	2.345
30	32.00	1.882	2.909

Standard dimension ratio is calculated by dividing the specified outside diameter by the minimum wall thickness. The wall thickness tolerance shall be within plus 12%.

Tests for compliance with this specification shall be made according to the applicable ASTM specification. A certificate of compliance with this specification shall be provided by the manufacturer for all material furnished under this specification. In addition, the purchaser may, at his own expense, witness inspection and test of the materials.

1. Intermediate Connections

a) Fusion Fittings

Fusion couplings for adjoining HDPE pipe in the trench may be used. Materials shall be as specified by the pipe manufacturer. Installation procedures shall only include equipment recommended and provided by the pipe manufacturer. The Contractor **MUST** provide proof to the Engineer that the equipment used in the installation process is approved by the pipe manufacturer for use on the pipe and fusion fittings to be used in this project.

2. Installation Procedures

a) Finished Pipe

Pipe with gashes, nicks, abrasions, or any such physical damage that may have occurred during storage and/or handling, which are larger/deeper than 10% of the wall thickness shall not be used and shall be removed from the construction site. The installed pipe shall meet requirements of the pressure test as specified herein.

b) Pipe Joining

Sections of polyethylene replacement pipe shall be assembled and joined on the job site above the ground. Joining shall be accomplished by the heating and butt-fusion method in strict conformance with the manufacturer's printed instructions and ASTM D-2657.

The butt-fusion method for pipe joining shall be carried out in the field by operators with prior experience in fusing polyethylene pipe with similar equipment using proper jigs and tools per standard procedures outlined by the pipe manufacturer. These joints shall have a smooth, uniform, double rolled back bead made while applying the proper melt, pressure, and alignment. It shall be the sole responsibility of the Contractor to provide an acceptable butt-

fusion joint. All joints shall be made available for inspection by the Engineer before insertion. The replacement pipe shall be joined on the site in appropriate working lengths near the insertion pit.

c) Insertion of Pipe

The pipe shall be allowed time to relax prior to making connections and sealing the ends of casing. The Contractor shall allow the time recommended by the manufacturer, but not less than twelve (12) hours, for the pipe to relax from the stretching incurred during the pulling process.

3. Testing of HDPE Pipe

Pressure testing will be required as called for in the Testing and Sterilization specification item.

4. Quality Assurance

a) Referenced Specifications for HDPE: This Specification references American Society for Testing and Materials (ASTM) standard specification and American Water Works Association (AWWA) standards, which are made apart hereof by such reference and shall be the latest edition and revision thereof:

- 1) ASTM D 1784 - Specification for Rigid (Poly Vinyl Chloride) (PVC) Compounds.
- 2) ASTM D 1248 - Polyethylene Plastics Molding and Extrusion Material.
- 3) ASTM D 2122 - Determining Dimensions of Thermoplastic Pipe and Fittings.
- 4) ASTM D 2412 - Determination of External Loading Characteristics of Plastic Pipe by Parallel-Plate Loading.
- 5) ASTM D 2837 - Test Method for Obtaining Hydrostatic Design Basis for Thermoplastic Pipe Materials.
- 6) ASTM D 3350 - Polyethylene Plastics Pipe and Fittings Materials.
- 7) ASTM F 385 - Practice for Insertion of Flexible Polyethylene Pipe Into Existing Sewers.
- 8) ASTM F 714 - Polyethylene (PE) Plastic Pipe (SDR-PR) Based on Outside Diameter.
- 9) AWWA C906 - Polyethylene (PE) Pressure Pipe and Fittings, 4 in. through 63 in. for Water Distribution.

10) AWWA C901 - Polyethylene (PE) Pressure Pipe and Fittings, 1/2 in. through 3 in. for Water Service.

- b) Causes for rejection of piping material and fittings shall include but not be limited to physical defects in pipe including but not limited to concentrated ridges, chain marks, discoloration, excessive spot roughness, pitting, visible cracks, foreign inclusions, and varying wall thickness.

110.13 EXCAVATION AND BACKFILL

Excavation for the water line will be by open trench method as necessary to install the mains to the grade and alignment shown on the plans. Backfill and bedding shall be in accordance with the details in the plans for each specific surface type. Backfill of stabilized material in the street shall be done in 24" lifts and shall be compacted to the density of the surrounding soil to prevent voids in the backfill. Surface restoration shall be as shown in the details and shall be to original condition or better. Backfill outside of the pavement shall be select native material compacted to the density of the surrounding soil or as shown in the details. Backfilling shall begin as soon as the joining of the pipe has been completed. All open trenches and pits shall be backfilled before the end of the day. No open pits shall be left open overnight unless they are barricaded in accordance with this specification and they are out of the roadway.

All excavations deeper than five (5) feet shall adhere to the trench safety specification herein.

110.14 LAYING OF PIPE

Proper implements, tools, and equipment should be used for placement of the pipe in the trench to prevent damage. Under no circumstances should the pipe or accessories be dropped into the trench. Jointing of pipes shall be in strict accordance with manufacturer's printed instructions. Each pipe segment shall rest on the bottom of the trench the entire length of the pipe.

PVC Pipe shall be installed in accordance with ASTM D-2774. Pipe bells should be laid on the upstream end. All foreign matter or dirt should be removed from the pipe interior. Pipe joints should be assembled with care. Whenever pipe laying is interrupted, the open ends of installed pipe should be closed to prevent entrance of trench water, mud, or foreign matter.

All pipe lines must be laid in a straight line, unless otherwise shown on the drawings, with the flow line of the pipe at the grade shown on the plans.

No variation from true and even grade, alignment, and invert will be permitted except to avoid existing underground main service line or utilities, and then only with the written permission of the Engineer.

If a piece of pipe is installed and is determined to be defective or collapses, the Contractor shall replace that section of pipe, at no additional cost to the Owner, including surface restoration.

110.15 LOCATING INTERSECTING PIPES

The Contractor shall make attempts to locate intersecting lines ahead of pipe laying. He shall locate and excavate in advance any water lines which will be tied into the system being constructed. All service connections shall be restored to the property line immediately, no service shall be left out of service overnight.

Any pipeline or gas line, as well as underground power lines and telephone cables, shall be located and owner given proper notification prior to construction in area of lines.

110.16 DEWATERING

Under no circumstances shall the surface water be allowed to flow in the trench. When ground water exists in the trench, the Contractor shall make attempts to drain it away from pipe laying area or pump it out of the trench. If quicksand or water sand conditions appear in the trench bottom, the Contractor shall undercut the trench and replace it with a Class I granular material, such as crushed stone or gravel, with the Engineer's approval. Payment shall be as specified in the Payment portion of this specification. No payment shall be made for trench bottom stabilization unless approval from the Engineer is obtained prior to placement of the material.

110.17 STREET SURFACES

Streets shall be restored in the most workmanlike manner without needless delay and shall in every respect be equal in quality, character, material, and workmanship to the original street or better. The expense of restoring the streets must be included in the price bid per linear foot for main lines, unless otherwise provided. Backfill in and along streets shall be as per the details in the plans. If the streets are not immediately restored, temporary base material shall be placed in the upper portion of the excavation until such time that the street is restored to its original condition. No extra payment will be made for temporary street materials.

110.18 CROSSING OF DRIVEWAYS

Should the Contractor damage any portions of a driveway, he shall restore those driveways and their culverts to their original condition or better as soon as possible. He shall inform citizens which will be affected by this work at least 24 hours prior to the start of the work. No driveway shall be left unusable overnight.

For any disturbed concrete driveways, the disturbed areas shall be backfilled to within 2" of the existing concrete with 2 sack per ton stabilized sand and then with 3000 psi reinforced concrete. Asphalt driveways shall be replaced similarly to asphalt streets, as shown in the details in the plans. Driveways which are open cut shall be replaced with sand or native material around the pipe, 2 sack per ton cement stabilized sand to within 8" of the surfaces, and with the original material to the surface and to the original condition or better. Care should be taken when compacting the backfill under existing driveways so that future settlement does not occur.

This backfill is only for those driveway crossings called for in the plans to have stabilized backfill. Any other areas must have the approval of the Engineer prior to placement of stabilized backfill.

110.19 UTILITY LINE CROSSINGS

The plans note the existence of pipelines and utility lines in the route of construction. Exact locations are not in the plans. The Owner and the Engineer assume no responsibility for inaccuracies, additions, omissions, or revisions. It is the responsibility of the Contractor to locate all utility lines to be crossed, contact the owner of the utility line, and decide for crossing such lines. It is best to locate such lines a few hundred feet ahead of pipe laying operation in order to make revisions in grade or alignment, if they are necessary and approved by the Engineer.

110.20 EXCESS SOILS

Excess soils shall be disposed of by the Contractor in accordance with all local, state, and federal laws. The Contractor shall make his own arrangements, at his own cost, to dispose of the excess soils in a manner approved by the Engineer. If, in the opinion of the Engineer, the excess soils constitute a hazard or a nuisance, the Contractor shall dispose of those soils immediately.

110.21 CLEAN-UP

The Contractor shall remove from the site of work, and from public and private property, all job related temporary structures, rubbish, and waste material including all excess excavated materials, and all trees removed. Completed clean up shall not be more than 1000' feet behind the pipe construction. Completed clean up shall mean that the trench has been backfilled as shown in the details, disturbed ditches restored to their original grade and shape, any disturbed structures replaced, and any disturbed roadway or driveways restored to their original condition. The Contractor shall temporarily seed, within 14 days of construction stopping, any areas where construction activities will cease for more than 21 days.

Final clean up shall mean that the work area shall be returned to its original condition, in the opinion of the Engineer including any area which has rutting or ponding resulting from the Contractor's work. Final clean up shall be under taken as soon as possible.

All cleanup activities shall adhere to the General Source Control specification contained herein.

110.22 AGENCY REQUIREMENTS TO BE MET

All water lines, non-potable water lines, and sewer lines installed shall meet the requirements of the Texas Commission on Environmental Quality (TCEQ). Sewer lines shall comply with the requirements of design criteria for sewerage systems as established by the TCEQ in accordance with the 30 TAC Chapter 217:

§217.53d Separation Distances.

The following rules apply to separation distances between potable water lines and sanitary sewers.

- (a) Water line/new sewer line separation. When new sanitary sewers are installed, they shall be installed no closer to water lines than nine feet in all directions. Sewers that parallel water lines must be installed in separate trenches. Where the nine foot separation distance cannot be achieved, the following guidelines will apply:
 - (1) Where a sanitary sewer parallels a waterline, the sewer shall be constructed of cast iron, ductile iron or PVC meeting ASTM specifications with a pressure rating for both the pipe and joints of 150 psi. The vertical separation shall be a minimum of two feet

between outside diameter and the horizontal separation shall be a minimum of four feet between outside diameters. The sewer shall be located below the waterline.

- (2) Where a sanitary sewer crosses a waterline and the sewer is constructed of cast iron, ductile iron or PVC with a minimum pressure rating of 150 psi, an absolute minimum distance of 6 inches between outside diameters shall be maintained. In addition the sewer shall be located below the waterline where possible and one length of the sewer pipe must be centered on the waterline.
 - (3) Where a sewer crosses under a waterline and the sewer is constructed of ABS truss pipe, similar semi-rigid plastic composite pipe, clay pipe or concrete pipe with gasketed joints, a minimum two foot separation distance shall be maintained. The initial backfill shall be cement stabilized sand (two or more bags of cement per cubic yard of sand) for all sections of sewer within nine feet of the waterline. This initial backfill shall be from one quarter diameter below the centerline of the pipe to one pipe diameter (but not less than 12 inches) above the top of the pipe.
 - (4) Where a sewer crosses over a waterline all portions of the sewer within nine feet of the waterline shall be constructed of cast iron, ductile iron, or PVC pipe with a pressure rating of at least 150 psi using appropriate adapters. In lieu of this procedure the new conveyance may be encased in a joint of 150 psi pressure class pipe at least 18 feet long and two nominal sizes larger than the new conveyance. The space around the carrier pipe shall be supported at 5 feet intervals with spacers or be filled to the spring line with washed sand. The encasement pipe should be centered on the crossing and both ends sealed with cement grout or manufactured seal.
- (b) Water line/manhole separation. Unless sanitary sewer manholes and the connecting sewer can be made watertight and tested for no leakage, they must be installed so as to provide a minimum of nine feet of horizontal clearance from an existing or proposed waterline. Where the nine-foot separation distance cannot be achieved, a carrier pipe as described in subsection (a)(4) of this section may be used where appropriate.

- (c) Potable water line/Non-Potable water line separation. Reclaimed water piping shall be separated from potable water piping by a horizontal distance of at least nine (9) feet. Where the nine (9) foot separation distance cannot be achieved, the reclaimed water piping must meet the line separation requirements of Chapter 290 of this title (relating to water Hygiene).

110.23 MEASUREMENT AND PAYMENT

Pipe and fittings will be measured by the linear foot of pipe complete in place. Such measurement will be along the centerline between the ends of the pipe barrel, as installed. Unit price shall include all materials including pipe, fittings, labor, excavation, backfilling, testing, pavement and surface restoration, removal and disposal of brush, trees, and roots, seeding, tracing tape installed over the pipe, and other incidentals necessary for a complete installation. Items called for in the plans but not specifically provided for in the bid proposal shall be considered incidental to the appropriate bid items. **No payment shall be made for line that is not backfilled and tested.** There will be no extra payment for the removal and disposal of brush, trees, and roots. Such payment shall be incidental to the installation of the pipe. Payment for Trench Safety Systems shall be made in accordance with specification item no. 950.

No extra payment will be made for the control of groundwater or surface water in trenches or pits unless specifically provided for in the Bid Proposal. Such payment shall be considered incidental to cost of the various bid items.

Special embedment materials, if ordered by the Engineer, shall be paid for at the unit bid per cubic yard based on quantities taken from truck tickets if provided for in the Bid Proposal. Otherwise, such materials shall be incidental to appropriate bid items. Special embedment material shall be materials determined to be necessary after inspection of the trench bed. Sand, if used, is not considered special embedment material.

Fittings shall be paid for individually **only** if specifically called for in the plans **and** provided for in the bid proposal. All other fittings shall be incidental to the line work. The cost for the Megalug restraining flanges and any necessary transition gaskets shall be considered incidental to the installation of the fittings. Payment for the connections of proposed water lines to existing water lines shall be considered full payment for the connection regardless of any field modifications or other fittings that may be necessary due to space or other limitations or conditions.

ITEM 120

PROJECT RECORD DOCUMENTS

120.01 GENERAL

Prepare and maintain record documents for the project to accurately reflect the construction "As Built." Documents must be maintained up to date on an ongoing basis. Proof of this shall be required for each monthly pay estimate. Documents must also be submitted at work completion as a condition of final acceptance.

120.02 MAINTENANCE OF RECORD DOCUMENTS

A. Maintain at the job site, one copy of:

- (1) Contract drawings.
- (2) As-Built drawings.
- (3) Specifications.
- (4) Addenda.
- (5) Reviewed shop drawings.
- (6) Change orders and field orders.
- (7) Other contract modifications.
- (8) Field test records.
- (9) Correspondence.

B. Store record documents in an approved location apart from documents used for construction. Do not use record documents for construction purposes. Provide files and racks for orderly storage. Maintain documents in clean, dry, legible condition. Make documents and samples available at all times for inspection by the Engineer.

120.03 MARKING DEVICES

Mark all changes legibly in red ink.

120.04 RECORDING

- A. Keep record documents current. Do not permanently conceal any work until required information has been recorded.
- B. Label each document "PROJECT RECORD" in neat, large, printed letters. Legibly mark contract drawings to record actual construction:
 - (1) Alignment and profile of water line, and location and depth of appurtenances.
 - (2) Horizontal and vertical location of underground and under slab utilities and appurtenances referenced to permanent surface improvements.
 - (3) Location of internal utilities and appurtenances referenced to permanent surface improvements.
 - (4) Field changes of dimension and detail.
 - (5) Changes made by change order or field order.
 - (6) Details not on original contract drawings.
- C. Legibly mark specifications and addenda to record:
 - (1) Manufacturer, trade name, catalog number and supplier of each product and item of equipment actually installed.
 - (2) Changes made by change order or field order.
 - (3) Other matters not originally specified.
- D. Legibly annotate shop drawings to record changes made after review.

120.05 SUBMITTAL

- A. At project completion, deliver record documents to the Engineer. Place all letter-sized material in a 3-ring binder, neatly indexed. Bind contract drawings and shop drawings in rolls of convenient size for ease of handling.

B. Accompany the SUBMITTAL with a 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) Certification that each document as submitted is complete and accurate.
- (6) Signature of Contractor.

ITEM 140

EMBANKMENT AND FILL

140.01 DESCRIPTION

This item shall govern the placement and compaction of all materials obtained from roadway, borrow, channel, structural excavation and purchased material for utilization in the construction of roadway embankments, levees, dykes, concrete slabs, and all other areas or items which require fill.

140.02 FILL MATERIAL

1. General - All fill material shall be free from all humus or organic debris, inorganic silt, and gravel larger than three (3") inches. The fill material shall not contain highly expansive or compressible clays, highly plastic soils, very loose sand and silts, or poorly drained less soils. No large lumps or clods will be permitted, and material should be friable. Very moist or dry material shall not be used until the material has been reworked to proper moisture content.

Trees, stumps, roots, and other vegetation shall not be placed in fills and embankments.

Unless otherwise indicated on the plans, the surface of ground of all unpaved areas other than rock which are to receive embankment shall be loosened by scarifying or plowing to a depth of not less than 4 inches. The loosened material shall be recompacted with the new embankment as hereinafter specified.

2. Select (Structural) Fill - Select fill material shall be composed of native material or material obtained from borrow, channel, or structural excavations as approved by the Engineer.

The selected materials shall be composed of graded sand and gravel with clay binder. The maximum size of the granular portion should be limited to 1.5". The clay binder shall have a Plastic Index less than 10 (PI<10) and a Liquid Limit less than 40 (LL<40). The selected soil shall conform to AASHTO Classification Group A4. The selected soil (clayey sand soil) should be 50% to 70% sand with 30% to 50% clay. The sand particles shall 100% pass a Standard Sieve #10 and the clay particles shall 100% be retained between a sieve #200 and #270. The selected material shall be free of any organic material (OH), Clay with high plasticity (CH), silt with high compressibility (MH), peat materials (PT). The material shall be free of vegetation, debris, and clay lumps.

3. Sand Cushion Under Structures - The top layer of fill underneath a slab shall consist of clean sand or clean bank sand free from clay, clay lumps, shale, loam, organic matter, or excessive amounts of silt or other deleterious materials. The fine particle should be limited to 5% by weight of the soil and should have a maximum Plasticity Index of seven percent (7%).
4. Granular Fill Under Structures - The Contractor shall provide an 18" to 24" thick layer of granular fill under the entire footing of a structure. The Contractor shall over excavate the structure by 18 to 24 inches and compact the subgrade before installing granular material. Granular fill shall be installed in 8-inch lifts and shall be compacted to 95% of its maximum density confirmed by Standard Proctor Compaction Test. Granular material shall be a mix of well graded sand and gravel with a maximum particle size of one inch (1"). The fine portion of the soil shall be less than 5% by weight.

140.03 CONSTRUCTION METHODS

1. Preparation and Scarifying - Fill and embankment shall not be placed until stripping and/or clearing and grubbing has been completed for the excavation sources and for the proposed fill areas. Stump holes or other small excavations in the limits of the embankment shall be backfilled with suitable material and thoroughly tamped by approved methods before commencing embankment construction. The surface of the ground, including plowed, loosened ground, or surface roughened by small washes or otherwise, shall be restored to approximately its original slope by blading or other methods. Where indicated on plans or required by the Engineer, the ground surface thus prepared shall be compacted by sprinkling and rolling.

Where embankments are to be placed adjacent to or over existing roadbeds, or levees, the existing slopes shall be plowed or scarified to a depth of not less than four (4") inches and the embankment built up in successive layers, as hereinafter specified, to the satisfaction of the Engineer, the top of the old bed shall be scarified and re-compacted with the next layer of the new embankment. The total depth of the scarified and added material shall not exceed the permissible depth for a layer.

Other areas shall be scarified to the satisfaction of the Engineer before placing any fill material.

2. Layer Construction - Unless otherwise required by the plans, all fill shall be constructed in layers approximately parallel to finished grade, covering the full length and width of the fill area. Layers of embankment for roadbeds, levees, or similar purposes shall have a uniform slope of one-fourth (1/4") inch per foot from the centerline of the roadbed to the outside.

Fill under structures and roads shall be placed in eight (8") inch maximum layers (measured loose). Where fill to subgrade is less than six (6") inches, the ground shall be scarified to a depth of six (6") inches and compacted as specified. All fill shall be placed to subgrade elevation without addition of topsoil.

Fill not covered by structures or roads shall be placed in ten (10") inch maximum layers (measured loose). This fill shall be placed within four (4") inches of finish grade unless otherwise specified by the plans. Four (4") inches of topsoil shall be placed over these fill areas within limits shown on plans, or as directed by the Engineer.

Regardless of the fill location, fill shall be placed in six (6") inch maximum layers (measured loose) when pneumatic tire rollers are used.

3. Spreading, Sprinkling, and Compaction - Layers of fill may be placed by equipment which will spread the material as it is dumped; or the material may be dumped in piles or windrows, then spread evenly by blading or other acceptable method.

Each layer of fill shall be uniform as to material, density, and moisture content before beginning compaction. Where layers of unlike materials abut each other, each layer shall be feather-edged, or the material shall be so mixed as to prevent abrupt change in the soil. No material placed in the fill by dumping in a pile or windrow shall be incorporated in a layer in that position, but all such piles or windrows shall be moved by blading or similar methods.

Clods or lumps shall be broken, and the fill material mixed by blading, barrowing, or similar methods, so that a uniform material of uniform density is secured in each layer.

All fill shall be compacted at or near optimum moisture for maximum compaction. Water needed to bring the material to this moisture level shall be evenly applied, and the Contractor shall secure a uniform moisture content throughout the layer by such methods as may be necessary. In order to facilitate uniform wetting of the fill material, the Contractor may apply water at the material source if the sequence and methods used are such as not to cause an undue waste of water. Such procedure shall be subject to the approval of the Engineer. Water shall be clean fresh (not salty) and free of oil or any organic materials.

Each layer of fill shall be compacted until there is no evidence of further compaction. The material shall be kept leveled with suitable equipment to insure uniform compaction over the entire layer.

Where the placement method above is impractical, such as fill placed against buildings, retaining walls, or structural walls, the material shall be compacted with mechanical tampers. Layers shall not exceed six (6") inches in depth, and moisture content must be suitable for effective compaction by this method.

4. Shaping - Fill areas and embankments shall be constructed to the rough and final grade established by the Engineer. Completed embankments shall correspond to the general shape of the typical sections shown on the plans, and each section of the embankment shall correspond to the detailed section of slopes established by the Engineer. After completion of the earthwork, the embankment shall be continuously maintained to its finished section and grade until the project is accepted.
5. Compaction Requirements - Minimum density of fill shall be ninety-five (95%) percent standard Proctor (Maximum Density - Optimum Moisture), as per ASTM D698, unless noted otherwise in the plans. This requirement shall also apply to undisturbed native soil which will directly support load bearing members. Should the subgrade, due to any reason or cause, lose the required stability, density or finish before the pavement or the structure is placed, it shall be recompacted and refinished at the sole expense of the Contractor. Excessive loss of moisture in the subgrade shall be prevented by sprinkling, sealing or covering with a subsequent layer or granular material. Excessive loss of moisture shall be construed to exist when the subgrade soil moisture content is more than 4 percent below the optimum of compaction ratio density.
6. Testing - The Contractor shall have all necessary laboratory testing performed at his own expense by a commercial laboratory acceptable to the Engineer.

Required material tests prior to fill placement are as follows:

- a. At least one (1) Proctor needle plasticity test for each material type to be used in fill areas.
- b. At least one (1) Atterberg limit test per 500 cu. yds. of material.

Required density tests following compaction are as follows:

- a. At least one test per lift per 400 sq. ft. under structures.
- b. At least one test per lift per 1000 sq. ft under driving areas and parking lots.

- c. At least one test per lift per 5000 sq. ft in other areas not under concrete or other structural units.
 - d. At least one test per 150 linear ft. in levee and roadway areas.
7. Waste Materials - The Contractor shall waste stripped materials from areas so indicated on the plans. Waste material shall be spread over designated areas as directed by the Engineer, dressed by blading, and sloped to provide drainage.
8. Final Cleanup - Washes, ruts, depressions, and mounds shall be leveled to give the site a smooth finish.

140.04 MEASUREMENT AND PAYMENT

Embankment construction will be measured in its original position and the volume computed in cubic yards by the method of average end areas.

When specifically included as a bid item, payment will be made at the unit price bid per cubic yard of Embankment construction, measured as provided herein, for the actual quantity excavated within the theoretical section specified, which price shall be full compensation for furnishing all labor, materials, equipment and incidentals required to complete the work as specified.

Interim measurements of embankment construction shall be made by the Contractor while the final grade inspection and volume calculations will be made by the Owner for final payment. The method of volume calculations shall be the average end area or other Engineer approved method.

When not specifically provided for in the Bid Proposal, embankment shall be incidental to other appropriate bid items. When provided for as a lump sum item, unit price quantities will not be used.

ITEM 150

EXISTING UTILITIES

150.01 DESCRIPTION

Utility locations shown on the plans are for informational purposes only and are not exact. The Contractor shall be responsible for locating and protecting all utility lines during the construction and for support and maintenance in position of all ducts and conduits. The Contractor should also make sure that all utilities have been located as there may be more utilities present than what is shown on the plan sheets. The Contractor shall be responsible for any damage to existing utilities and shall promptly repair same or make arrangements for such repair with the Owner of the utility involved.

150.02 CONSTRUCTION METHOD

In all cases the Contractor shall coordinate his work with the Owners of the various utilities and shall notify their proper representative not less than forty-eight (48) hours in advance of any work which might damage, interfere with or require adjustments to utilities along or adjacent to the work.

All utility adjustments shall be the responsibility of the Owners of the utilities and if in the opinion of the Engineer adjustment is required, the Contractor will be responsible for notifying the respective owner.

150.03 PAYMENT

Payment for this item will be subsidiary to other items.

ITEM 300

VALVES

300.01 GENERAL

The Contractor shall furnish all equipment, materials, fittings, and appurtenances and perform all necessary operations required for a complete installation of each valve in its specified location. This shall include all nuts and bolts, gaskets, and supports. Where required, manhole enclosures shall be installed as shown in the details with traffic load lids marked "Sewer" or "Water", as appropriate.

300.02 GATE VALVES

Gate valves shall strictly conform to the requirements of the latest revisions of the American Water Works Association Standard Specification C509 in addition to changes and additions specifically stated in these specifications. Gate valves for this project shall be American Valve & Hydrant Model AFC-500 FLG x FLG or prior approved equivalent. The gate valve shall be designed to withstand a minimum of 400 psi while in the open position and a minimum of 200 psi in the closed position.

Valve Construction shall be as follows:

1. All gate valves shall be of the non-rising stem type and shall be resilient seated. Those valves installed underground shall have an operating nut and shall include a valve box as indicated in the plans and those valves installed above ground shall have a hand wheel. Valve boxes for sewage applications shall have lids marked "Sewer" and those for water applications shall have lids marked "Water".
2. The valve body and the bonnet shall be cast from a high-grade gray cast iron conforming to the latest revision of ASTM A-126 Class B. The valve stem, stem nuts, and stem collars shall be forged from manganese bronze.
3. The minimum number of turns required to fully open a gate valve shall be a minimum of 4 turns per inch of nominal diameter for each gate valve.
4. All ferrous surfaces, both inside and out, shall be coated with a fusion bonded epoxy conforming to the latest revision of AWWA C550.

300.03 SWING CHECK VALVES

Check valves shall be swing check type and shall conform to the latest revisions of AWWA C508. Check valves shall be gray iron flange x flange, ANSI B16.1 Class 125, with stainless steel shaft and ductile iron hinge with pin. The check valve shall have a minimum working pressure of 200

psi. The check valve shall be as per AFC 50SC line swing check valve or prior approved equivalent. Check valves shall be supplied with outside weight, lever, and spring.

300.04 SILENT GLOBE CHECK VALVES

Check valves shall be globe style silent check valves and shall conform to the latest revisions of AWWA C508. Check valves shall be gray iron ASTM A-126-B, with stainless steel spring and screws. The seat, plug and bushings shall be bronze, B-62. The check valve shall have a minimum working pressure of 400 psi.

300.05 BALL VALVES

Ball valves shall conform to the latest revisions of AWWA specifications. The ball valve shall be threaded and have a full ported all bronze body except the ball and stem which shall be stainless steel, unless noted otherwise on the plans.

300.06 PLUG VALVES

Eccentric plug valves shall be DeZurik Permaseal valves or approved equivalent. The valve body shall be constructed of cast iron or ductile iron. It shall be equipped with ANSI Class 150 flanges on each end and a handle. All joints and castings shall be completely watertight. No casting shall show any indication of permanent distortion. The resilient mechanism shall provide zero leakage at the rated water working pressure when installed with the flow in either direction. All seats shall be PTFE type. The valve shall be furnished with all required bolts, glands, and gaskets for a complete installation.

300.07 BUTTERFLY VALVES

Butterfly valves shall strictly conform to the requirements of the latest revisions of the American Water Works Association Standard Specification C504 in addition to changes and additions specifically stated in these specifications. Butterfly valves for this project shall be DeZurik valves or prior approved equivalent.

Butterfly valves shall have wafer type or flanged bodies and shall be resilient seated. The valve body shall be cast from a high grade gray cast iron conforming to the latest revision of ASTM A-126 Class B. The disc shall be ductile iron conforming to the latest revision of ASTM A 395. The shaft shall be type 416 stainless steel conforming to ASTM A276. The wafer type valves shall be operated with a minimum 10 position lever while the flanged butterfly valves shall have an operating nut with a removable handle.

300.08 COMBINATION AIR VALVES FOR SEWAGE SERVICE

The combination air release valve (single body double orifice) shall be of the single housing type and have both the features of an air/vacuum and an air release valve with a working pressure of up to 250 psi. The combination valve shall have an inlet and an outlet as shown in the plans. The valve body shall be stainless steel SAE 316. Floats shall be made of composite material. Nuts and bolts shall be stainless steel according to ASTM 276. The valve shall not have any corrosive type materials in its construction.

The Contractor shall furnish all equipment, appurtenances, and labor necessary for the installation of a complete air valve. Installation shall be in the vertical position at high points in the piping system and will include an inlet valve, and air valve. The inlet valve shall be a stainless steel ball valve with stainless steel stem and handle, or other non-corrosive material approved by the Engineer. PVC valves or handles will not be allowed. The assembly shall be installed in accordance with the locations and notes in the plans. Backflushing attachments shall be provided with the valve.

Manufacturers shall be **A.R.I. Flow Control Accessories, model D-023 and D-023 NS** or prior approved equivalent.

300.09 AIR RELEASE VALVES FOR SEWAGE SERVICE

Sewage air release valves shall have an elongated body and designed to operate while pressurized allowing entrained air in a sewage force main line, sewage pump, or waste water system to escape thru the air release orifice without spillage. After the entrained air escapes, the valve shall be closed by a needle mounted on a compound lever mechanism and prevent media from escaping. The valve shall have a working pressure of up to 250 psi. The air release valve shall have a inlet and a outlet as shown in the plans. The valve body shall be stainless steel SAE 316. Floats shall be made of composite material. Nuts and bolts shall be stainless steel according to ASTM 276. The valve shall not have any corrosive type materials in its construction.

The Contractor shall furnish all equipment, appurtenances, and labor necessary for the installation of a complete air valve. Installation shall be in the vertical position at high points in the piping system and will include an inlet valve, brass double strap pipe saddle, air valve, and manhole. The inlet valve shall be a brass ball valve with stainless steel stem and handle or other non-corrosive material approved by the Engineer. PVC valves or handles will not be allowed. The assembly shall be installed in accordance with the locations and notes in the plans.

Manufacturers shall be **A.R.I. Flow Control Accessories, model D-020**, or prior approved equivalent.

300.10 PAYMENT

Payment for valves shall include payment for furnishing all equipment and materials necessary for a complete installation. Materials shall include, but not be limited to Megalug flanges, valve, valve box or other specified enclosure such as manholes, fittings, nuts and bolts, polywrap, painting, and testing. Where not specifically provided for in the bid proposal, payment for valves shall be considered incidental to appropriate bid items.

ITEM 320

WATER LINE TESTING AND STERILIZATION

320.01 DESCRIPTION

This Item shall govern for the furnishing of all materials and equipment and performance of all operations necessary for testing and sterilization of the completed water lines prior to being placed in service.

The Contractor shall provide all necessary equipment and shall perform all work required in connection with the tests. All pipe installations shall be tested for leakage. The contractor shall complete the test record form and submit it to the Engineer before the line is considered tested.

320.02 STERILIZATION

The flushing, checking, chlorinating, sampling and testing of the completed line shall be done in the following sequence:

- A. Flush line properly through valve or other opening at dead end. Area of opening should be no less than 1/4 area of pipe being flushed.
- B. Chlorinate line. Pressure drop, and flow should be away from point of chlorination and should be toward dead end (open) of line, not toward supply connection. Chlorination shall be in accordance with AWWA Specification C601-86.
- C. Make specified pressure test using the Owner's water through the connection of pump suction to a portable tank or a direct connection with a back flow preventing device.
- D. Make bacteriological test after pressure test at a rate of one test for every 1,000 linear feet of water line installed. Testing laboratory shall be approved by the Engineer prior to use.
- E. Installation, disinfection and testing shall meet the requirements of the "Rules and Regulations for Public Water Systems" adopted by the Texas State Department of Health, September 9, 1973 and AWWA Standard C-651-92.

In case of line failure where a joint or portion of a joint of pipe has to be replaced, that section of line should be isolated by closing adjacent line valves, open line kept free of foreign matter, repairs made and HTH used liberally, then flushed out at the nearest hydrant.

In extreme cases of failure, the Contractor may be required to repeat the entire chlorination procedure.

Only personnel authorized by the Owner may open and close existing valves.

320.03 PRESSURE MAIN TESTING

The test pressure shall be 1.5 times the maximum water main design pressure or 125 pounds per square inch gauge, whichever is greater. The test shall be held for a period of two (2) hour.

Each test section shall be slowly filled with water, care taken to expel all air from the pipe. If necessary, the pipes shall be tapped at high points to vent the air. There will be no extra charge to the Owner for venting.

At the end of the test period, the amount of leakage shall be determined by the quantity of water that must be supplied into the pipe, or any valved section thereof, to maintain pressure within five pounds per square inch of the specified test pressure, after the air in the pipe has been expelled. The maximum allowable leakage shall be calculated using the following formula.

$$L = SD(P^{0.5})/133,200$$

Where L = leakage in gal/hr

S = length of pipe in ft

D = inside diameter of pipe in inches

P = pressure in pounds per square inch

If the quantity of leakage exceeds the maximum amount calculated, the failed section will be rejected and not accepted until it meets the above requirements.

320.04 STERILIZATION FOR REPAIRS AND CONNECTIONS

When repairs are made to existing water mains or when new water main extensions are provided, they must be disinfected by the Contractor using such amount of chlorine or chlorine compounds as to fill the repaired or new mains and appurtenances with water containing 50 ppm chlorine. After the water containing this amount of chlorine, which is greater than that normally present in drinking water, has been in contact with the pipe and appurtenances at least 24 hours, the water shall be replaced with water to be transported normally and samples of water from the new or repaired main submitted to laboratories for bacteriological examination so as to be assured that the disinfection procedure was effective.

When adding valves and/or fittings for future connections to existing facilities, the Contractor shall clean all visible mud and contaminants from fittings. The interior of the fittings shall be sprayed with 100% sodium hypochlorite 5.5% (Clorox).

320.05

MEASUREMENT AND PAYMENT

Work performed, and materials furnished as prescribed by this Item will not be measured or paid for directly, but shall be considered subsidiary to the various bid items in the contract.

Pressure Main Test Report Form

Date: _____

Line Segment(s) Tested (with Line Size): _____

All Valves Open/Closed: _____ Flow Meter Calibrated: _____

Initial Flow Meter Reading: _____ gal

Beginning Pressure: _____ psi

Low Pressure: _____ psi Water Pumped: _____ gal

Resulting Pressure: _____ psi

Low Pressure: _____ psi Water Pumped: _____ gal

Resulting Pressure: _____ psi

Low Pressure: _____ psi Water Pumped: _____ gal

Resulting Pressure: _____ psi

Low Pressure: _____ psi Water Pumped: _____ gal

Resulting Pressure: _____ psi

Low Pressure: _____ psi Water Pumped: _____ gal

Resulting Pressure: _____ psi

Total Water Pumped: _____ gal

Leakage

Calculation: _____

Allowable Leakage for Test Section: _____ gal

Passed: _____

Failed: _____

ITEM 350

BORING

350.01 GENERAL

This specification shall cover materials and procedures required for installing pipelines under roadways, highways, railroads, and ditches as indicated on the plans. Items of work included herein are bored without encasement and bore with encasement.

350.02 MATERIALS

The carrier pipe shall be as specified under appropriate specifications included herein. The encasement pipe shall be as called for in the plans and specified below.

A. Steel Encasement

Specification for steel encasement pipe shall be steel pipe ASTM A 139, Grade B. The exterior of the casing pipe shall have a minimum of 20 mils of coal tar epoxy applied in three separate coats after surface preparation. Surface preparation shall be a minimum SSPC-SP10-85, a near white condition. The Contractor shall mechanically brush any Blemishes and welded joints and paint with a quick cure coal tar epoxy.

The contractor shall be responsible for determining the appropriate wall thickness of the casing. The casing and joints shall be designed to carry thrust of jacks or loads due to pulling mechanism in combination with overburden, earth, and hydrostatic loads. Select casings for dry augering to withstand action of auger without damage. Use the following design elements:

1. Design stress in pipe wall shall be 50 percent of minimum yield point of steel or 18,000 psi, whichever is less, when subjected to applicable loading conditions;
2. Wall thickness shall provide for a maximum allowable deflection which does not exceed 3 percent of nominal casing diameter;
3. Use Cooper E-80 locomotive loading distribution as criteria for railroad crossings in accordance with AREMA specifications for culverts. In design, account for additive loadings due to multiple tracks;

4. Use H-20 vehicle loading distribution as criteria for truck loading in accordance with AASHTO;

5. When not specifically indicated on the plans or in the specifications, select casing diameter to permit practical installation (including skids or spacers) and grouting.

B. HDPE Encasement

Specification for high density polyethylene (HDPE) encasement pipe shall be high density polyethylene DR11 pipe, iron pipe size (IPS) in accordance with ASTM D 3350 and ASTM F 714. Pipe meet the requirements of AWWA C906-90 "Polyethylene (PE) Pressure Pipe and Fittings, 4 in through 63 in, for Water Distribution."

C. Carrier and Casing Sizes

The carrier and casing material options shown below are approximate sizes and thicknesses for bidding purposes. The Contractor shall submit the recommended sizes, thicknesses, and clearances to the Engineer in accordance with the design parameters contained herein.

350.03 METHODS OF CONSTRUCTION

A. GENERAL

Bore pits and tail trenches shall be located to prevent damage to surrounding facilities and shall not be larger or deeper than required for the bore and as shown on the plans. Any damages to adjacent facilities caused by the Contractor's work shall be repaired or replaced by the Contractor at his expense. The Contractor shall provide shoring, sheet piling, or other stabilization equipment as required for a safe installation and in accordance with the Trench Safety specification contained herein. All trenches backfill shall be mechanically tamped back to its original density. Clean up of the area requires all roadway shoulders, berms, slopes, and ditches be shaped to original condition or better.

All bores shall be accomplished with a mechanical boring machine capable of producing a smooth, straight bore. The boring device shall be capable of making grade adjustments at the boring face during the boring process. Grade shall be controlled using a laser beam or other approved leveling device. The size of the bore shall be such that sufficient room is provided for bells and joints.

Bores in Texas Department of Transportation ROW shall be wet bores if the bore hole is 15" or smaller and shall be dry bores if the bores are larger than 15".

B. HORIZONTAL DIRECTIONAL DRILLING

Steerable method for the installation of pipes using a surface launched drilling rig, in which a fluid filled pilot bore is drilled. The hole is then enlarged to the size required by rotating a large pipe and cutting head. Tracking of the drill string is done by using a down hole survey tool. The required deviation during pilot boring is achieved by positioning the bent sub. The void between the pipe and the bore hole wall shall not be greater than 1" or it shall be pumped full of grout in accordance with ASTM C 476.

The contractor shall be responsible for ensuring the facilities crossed are not damaged from heaving of the soil or any other portion of the boring operation. The contractor shall employ whatever means necessary to prevent damage including relief holes, removal of materials to prevent excessive pressures, additional incremental cutting procedures, and/or any other procedure recommended by the equipment manufacturer. Any damage caused by the contractor shall be repaired or replaced at his expense.

C. WET BORES

The bore hole shall be of such a diameter to permit the insertion of the carrier pipe following the removal of excess materials from the bore hole. The bore shall allow for the insertion of the carrier pipe by jacking without exceeding the jacking load capacity of the pipe as specified by the manufacturer. The bore diameter shall not be more than 1" larger than the maximum diameter of the carrier pipe. Annular void between the pipe and the bore hole wall shall be pumped full of grout if the annular space is greater than 1". Pumping of grout shall be in accordance with ASTM C-476.

D. DRY BORES

The bore shall be made so as to facilitate the immediate placement of the casing pipe by jacking. Casing shall be installed with even bearing throughout its length laid at the grade indicated on the plans. The bore hole shall be of such a diameter to permit the insertion of the casing pipe without exceeding the jacking load as specified by the manufacturer. The bore diameter shall not be more than 1" larger than the maximum diameter of the casing pipe. Annular voids between the pipe and the bore hole wall shall be pumped full of grout if the annular space is greater than 1". Pumping of grout shall be in accordance with ASTM C-476. The removal of excess material through the inside of the casing shall be accomplished in a manner that will not damage the protective coating. The carrier pipe shall be supported with a minimum of casing spacers with a minimum of two per joint of pipe so as to provide adequate support and to prevent damage to pipe bells during installation. Casing spacers shall be of a

non- 350 4 of 4 corroding material such as polyethylene and must be approved by the Engineer. The pipe shall not rest on the pipe bells, but, rather, on the supports. The annular space at both ends of the encasement pipe shall be plugged with grout 12" into the pipe to prevent excessive water infiltration.

E. JACKING OF CASING PIPE

Heavy duty jacks suitable for jacking of the casing pipe size and type as specified herein shall be used by the Contractor. The jacking process shall provide for even pressure around the entire circumference of the casing pipe. The jacking head shall be not less than six (6) inches larger in diameter than the casing pipe. The boring equipment shall be such that an even grade and alignment as called for in the plans can be obtained and such that all forces are transmitted to undisturbed soils in the bore pits. Once the jacking process has begun, the operations shall be complete without interruption. Any pipe damaged in this process shall be replaced by the Contractor at his own expense. Bore pits and trenches shall be backfilled immediately upon completion of the boring process.

350.04 NOTIFICATION

The contractor shall notify the appropriate R.O.W. owner at least seven (7) days prior to initiation of construction. R.O.W. owners shall be informed of all construction schedule changes within their respective R.O.W.'s.

350.05 MEASUREMENT AND PAYMENT

Boring shall be measured for payment in linear feet along the centerline from end to end of the casing specified to be placed therein. Boring shall be paid for at the contract unit price per linear foot complete in place. The linear foot price shall be total compensation for furnishing and placing all materials including grout packing, backfill, jacking, boring, excavation, backfill, bore pits, dewatering, drainage control, disposal of materials, labor, tools, equipment, and incidental necessary for a complete installation, as specified in the plans and specifications.

Payment shall be only for the limits as shown on the plans unless prior approval is obtained from the Engineer.

ITEM 380

HORIZONTAL DIRECTIONAL DRILLING

380.01 GENERAL

A. SCOPE OF WORK

This section contains guidelines and specifications applicable to the installation of sanitary sewer force mains using horizontal directional drilling (HDD). It includes minimum requirements for design, materials and equipment used for the horizontal directional drilling for the substantially trenchless construction of pipelines. The section also includes materials, dimensions and other pertinent properties of pipe and required accessories. These properties provide minimum performance requirements for various components including joints.

The Contractor shall submit to the Engineer for review, the bore profile produced from the boring software used prior to making the bores.

B. DESCRIPTION OF SYSTEM

Installation of sanitary sewer force mains shall be carried out by HDD, where shown on the drawings and elsewhere by approval of the Engineer. The bore path shall be designed by the drilling contractor to ensure that pipe joints do not deflect more than 50% of manufacturer's recommended maximum deflection.

380.02 REFERENCE SPECIFICATIONS, CODES AND STANDARDS

A. The following standards contain provisions that, through reference in this text, constitute provisions of these guidelines. All standards are subject to revision, and users of these guidelines are cautioned to use the latest revisions.

1. American National Standards Institute (ANSI)/American Water Works Association (AWWA)

380.03 SUBMITTALS

A. Prior to beginning work, the Contractor shall submit to the Engineer a work plan detailing the procedure and schedule to be used to execute the project. The work plan shall include a description of all equipment to be used, down-hole tools, a list of personnel and their qualifications and

experience (including back-up personnel in the event that an individual is unavailable), list of subcontractors, a schedule of work activity, a safety plan (including MSDS of any potentially hazardous substances to be used), traffic control plan (if applicable), an environmental protection plan and contingency plans for possible problems. Work plan shall be comprehensive, realistic and based on actual working conditions for this particular project. Plan shall document the thoughtful planning required to successfully complete the project.

B. Specifications on material to be used shall be submitted to Engineer and material shall include the pipe, fittings, drilling mud, drilling additives and any other item, which is to be an installed component of the project or used during construction.

C. GENERAL

1. The bore path alignment and design for HDD shall be based on the Engineer's plans and other factors. Some of these factors are the pipe bell and barrel diameters, the optimum individual pipe length, bore path inside diameter and maximum deflection capabilities of the joint.

2. Prior to the start of drilling, reaming and pipe placement operations, the Contractor shall properly locate and identify all existing utilities in proximity to the pipeline alignment. The Contractor shall confirm the alignment of all critical utilities, using vacuum excavation or other suitable excavation method, for further detailed confirmations as necessary.

E. PIPE AND FITTINGS

1. Pipe and fittings shall meet the requirements of AWWA/ANSI C151/A21.51 and ANSI/AWWA C153/A21.53, respectively. Pipe used for directional drilling shall be as specified by the engineer, with pipe manufacturer designed restrained flexible joints and smoothly contoured bells. Joints with bulky glands or flanges that may prevent the smooth flow of the drilling fluid/soil slurry over the joint shall not be acceptable.

D. LININGS AND COATINGS

1. Pipe for sewer applications shall be Cement-Mortar lined in accordance with ANSI/AWWA C104/A21.4 or if required by the engineer, lined with PROTECTO 401[®].

The Contractor shall have equipment and expertise, appropriate for horizontal directional drilling installations. This includes the preparation and maintenance of the bore path using drilling fluids appropriate for the geology of the soils. The Contractor shall also have experience in safety and dependability installing, in similar geology, similar size and length of piping involved.

A. DRILLING SYSTEMS

1. The directional drilling machine shall consist of a hydraulically powered system to rotate, push and pull hollow drill pipe into the ground at variable angles down to 8 degrees above horizontal, while delivering a pressurized fluid mixture to a guidable drill (bore) head. The machine shall have a capacity to adequately complete the drilling and piping installation. The machine shall be anchored to the ground to withstand the pulling, pushing and rotating pressure required to complete the crossing. The hydraulic power system shall be self-contained with sufficient pressure and volume to power drilling operations. Hydraulic system shall be free of leaks. Rig shall have a system to monitor the maximum pull-back pressure during the pull-back operation. The rig shall be grounded during drilling and pull-back operations. There shall be a system to detect electrical current from the drill string and an audible alarm, which automatically sounds when an electrical current is detected.
2. The drill head shall be a steerable type and shall provide the necessary cutting surfaces and drilling fluid jets. Mud motors shall be adequate power to turn the required drilling tools.

B. GUIDANCE SYSTEM

1. A conventional electromagnetic sound walkover system, Magnetic Guidance System (MGS) probe or proven gyroscopic probe and interface shall be used to provide a continuous and accurate determination of the location of the drill head during the drilling operation. The guidance shall be capable of tracking at the maximum depth required and in any soil condition, including hard rock. It shall enable the driller to guide the drill head by providing immediate information to the tool face, azimuth (horizontal direction), and inclination (vertical direction). The guidance system shall be accurate to $\pm 2\%$ of the vertical depth of

the borehole at sensing position at depths up to one hundred feet and accurate within 4.5 feet, (54"), horizontally.

2. The Guidance System shall be of a proven type and shall be setup and operated by personnel trained and experienced with this system. The Operator shall be aware of any geo-magnetic anomalies and shall consider such influences in the operation of the guidance system if using a magnetic system.

C. DRILLING FLUID (MUD) SYSTEM

1. A self-contained, closed, drilling fluid mixing system shall be of sufficient size to mix and deliver drilling fluid composed of bentonite clay, potable water and appropriate additives. Mixing system shall be able to molecularly shear individual bentonite particles from the dry powder to avoid clumping and ensure thorough mixing. The drilling fluid reservoir tank shall be a minimum of 500 gallons. Mixing system shall continually agitate the drilling fluid during drilling operations.
2. Additives to drilling fluid such as drill soap, polymers, etc. shall be "environmentally safe" and be approved for such usage. No diesel fuel shall be used.

D. OTHER EQUIPMENT

1. Pipe rollers shall be of sufficient size to fully support the weight of the pipe while being hydro-tested and during pull-back operations. Sufficient number of rollers shall be used to prevent excess sagging of pipe. Rollers shall be used as necessary to assist in pull back operations and in layout/jointing of piping.
2. Hydraulic or pneumatic pipe rammers may only be used if necessary and with the authorization of Engineer.
3. Other devices or utility placement systems for providing horizontal thrust other than those previously defined in the preceding sections shall not be used unless approved by the Engineer prior to commencement of the work. Consideration for approval shall be made on an individual basis for each specified location. The proposed device or system shall be evaluated prior to approval or rejection on its potential ability to complete the utility placement satisfactorily without undue stoppage and to maintain line and grade within the tolerances prescribed by the particular conditions of the project.

380.05 JOINTS, INTERCONNECTIONS, AND PULLING BELL ASSEMBLIES

- A. Joints used for directional drilling shall be boltless, flexible, restrained. Pipe and joint seals, when properly assembled and installed, shall be capable of dependably handling the specified internal pressure, as well as vacuum and external pressures that can occur in pipeline operation. Joints shall exhibit such performance attributes in straight alignment or at maximum rated joint deflection. The pipe pulling head shall be made of ductile-iron and designed and furnished by the pipe manufacturer or an approved equal. The pulling head assembly shall have the same performance characteristics as the pipe to which it is connecting. It shall also be supplied with a filling/testing port, of appropriate size, for testing of the pipe after it is pulled through the bore path.

- B. For pipe that is installed using the Assembly Line method or Ramp Method, described as follows, the pulling head may also be used as one of the two (2) bulkheads required for a low pressure air test of the pipe string prior to pull back, if required by the engineer. After complete installation, the pulling head may also be helpful, with or without further connection of piping, in normal higher pressure hydrostatic testing of the installed piping.

380.06 PROOF-OF-DESIGN TESTS

The Manufacturer shall have representative proof-of-design tests of flexible restrained pipe joints.

380.07 EXECUTION

A. GENERAL

- 1. The Engineer must be notified 48 hours in advance of starting work. The Directional Bore shall not begin until the Engineer is present at the job site and agrees that proper preparations for the operation have been made. The Engineer approval for beginning the installation shall in no way relieve the Contractor of the ultimate responsibility for the satisfactory completion of the work as authorized under the Contract.

- 2. The drawings show existing utilities that are believed to be near the directional drill alignment. There is no guarantee that these utilities are located as shown or that the other utilities may not be present. The Contractor is to field locate existing utilities in

advance of the work so as not to delay work and avoid conflict or disruption of utility services.

B. PERSONNEL REQUIREMENTS

1. All personnel shall be fully trained in their respective duties as part of the directional drilling crew and in safety. Contractor must show job history and reference list of equal or greater size and length of piping involved. The Supervisor must have at least two years directional drilling experience. A competent and experienced supervisor representing the Drilling Contractor shall be present at all times during the actual drilling operations. A responsible representative who is thoroughly familiar with the equipment and type work to be performed, must be in direct charge and control of the operation at all times.

C. DRILLING PROCEDURE

1. Work site as indicated on drawings, within right-of-way, shall be graded or filled to provide a level working area. No alterations beyond what is required for operations are to be made. Contractor shall confine all activities to designated work areas.
2. Entire drill path shall be accurately surveyed with entry and exit stakes placed in the appropriate locations within the areas indicated on drawings. If Contractor is using a magnetic guidance system, drill path shall be surveyed for any surface geomagnetic variations or anomalies.
3. Contractor shall adhere to all applicable state, federal and local safety regulations and all operations shall be conducted in a safe manner.
4. Pipe lengths shall be connected together in one length, if space permits. Pipe shall be placed on pipe rollers before pulling into bore hole with rollers spaced close enough to prevent excessive sagging of pipe.
5. Pilot hole shall be drilled on bore path with no deviations greater than 5% of depth over a length of 100'. In the event that pilot hole does deviate from bore path more than 5% of depth in 100', Contractor shall notify Engineer and Engineer may require Contractor to pull-back and re-drill from the location along bore path before the deviation.

6. Upon successful completion of pilot hole, Contractor shall ream bore hole to a minimum of 25% greater than outside diameter of pipe bell for straight pulls and 50% greater for curved or radius pulls using the appropriate tools. Contractor shall have the option to pre-ream or ream and pull back pipe in one operation if conditions allow. Contractor shall not attempt to ream at one time more than the drilling equipment and mud system are designed to safely handle.
7. After successfully reaming bore hole to the required diameter, Contractor shall pull the pipe through the bore hole. In front of the pipe shall be a swivel. Once pull-back operations have commenced, operations must continue without interruption until pipe is completely pulled into bore hole. During pull-back operations Contractor shall not apply more than the maximum safe pipe pull force at any time. In the event that pipe becomes stuck, Contractor shall notify Engineer. Engineer, Contractor, and/or the maintaining agency shall discuss options and then work shall proceed accordingly.
8. Excess pipe shall be removed and the bore hole associated with this excess pipe shall be filled with flowable fill or grout unless the area of the excess pipe is excavated and backfilled as part of the tie-in operations. In the event that a drilling fluid fracture, inadvertent returns or returns loss occurs during pilot hole drilling operations, Contractor shall cease operations and shall discuss corrective options with the Engineer and/or maintaining agency, then work shall proceed accordingly.

D. BASIC ASSEMBLY/PULLING METHODS

1. Cartridge Assembly (Option 1) - Cartridge assembly option is defined as the assembling of individual sections of flexible restrained joint carrier pipe in a secured entry and assembly pit. The pipe sections are assembled individually and then progressively pulled into the bore path a distance equivalent to a single pipe section. This assembly-pull process is repeated for each pipe length until the entire line is pulled through the bore path to the exit point.
2. Assembly-Line or Ramp Method (Option 2) - Assembly-line option is defined by the pre-assembly of multiple lengths of flexible

restrained joint carrier pipe, with subsequent pulling installation into the bore path as a long pipe string. With this option the Contractor shall provide an entry ramp to the entrance of the bore path. The ramp shall be of sufficient length and grade such that any one pipe joint does not exceed the allowable joint deflection at any point prior to the pipe string entering the bore path. The Contractor shall be responsible for providing the necessary equipment or ground surface preparation to allow the pipe to be pulled back along the surface prior to the entry ramp and bore path without damaging the PE encasement, if required. The Contractor shall repair any damage to the wrap prior to the pipe section entering the bore path.

E. JOINT CLEANING/ASSEMBLIES IN HDD

1. The Contractor shall be responsible for the proper assembly of all pipe and appurtenances in accordance with the Manufacturers written installation procedure and as supplemented by these guidelines. Prior to joint assembly all joints and joint components shall be thoroughly cleaned and examined to ensure proper assembly and performance. In the event that the Contractor is not experienced with the assembly of the type of flexible restrained joint being used, it shall be the responsibility of the Contractor to contact a factory-trained representative for recommendations on the proper and efficient installation of the joint.

F. PIPE TESTING

1. Following successful pullback of pipe, Contractor shall hydro-test pipe.

G. SITE RESTORATION

1. Following drilling operations, the Contractor shall de-mobilize equipment and restore the work-site to original condition. Any noticeable surface defects, due to the drilling operation, shall be repaired by the Contractor.

H. RECORD KEEPING

1. Contractor shall maintain a daily record of the drilling operations and a guidance system log with a copy given to Engineer at completion of boring. As-built drawings shall be certified by the Contractor, for accuracy.
2. Contractor shall accurately record, maintain, and provide to the Engineer, copies of the plan and profile drawings of the Contractor installed horizontal directional drilled carrier pipe.

ITEM 600

GENERAL CONCRETE SPECIFICATIONS

600.01 SCOPE

These specifications shall govern for the materials used, for the storing, measuring and handling of materials, and for the proportioning and mixing of concrete for construction as required on this project.

600.02 GENERAL

Concrete shall be of the class indicated in the plans and shall be composed of portland cement, mineral filler if necessary, fine aggregate, coarse aggregate, and water proportioned and mixed as specified herein.

600.03 MATERIALS

Cement shall be Type I Portland Cement, the composition, marking, handling and storage of which shall conform with ASTM C-150. Type III (High Early Strength) cement may be used if approved by the Engineer. Cement which has become damp, lumpy or otherwise affected so as to reduce its strength shall not be used in the work. The Contractors shall furnish the Engineer with Certified Mill Test Reports for all cement used in the work.

Aggregates shall be clean, uncoated, and free of any impurities other than nominal amounts of fine clay, the limits of which are specified herein. Aggregates shall conform with ASTM C-33 except that the gradation shall be within limits specified below:

600.04

COARSE AGGREGATE GRADATION CHART

Aggregate Grade No. ¹	Maximum Nominal Size	Percent Passing on Each Sieve								
		2-1/2"	2"	1-1/2"	1"	3/4"	1/2"	3/8"	#4	#8
1	2"	100	80-100	50-85		20-40			0-10	
2	1-1/2"		100	95-100		35-70		10-30	0-10	
3	1-1/2"		100	95-100		60-90	25-60		0-10	
4 (57)	1"			100	95-100		25-60		0-10	0-5
5 (67)	3/4"				100	90-100		20-55	0-10	0-5
6 (7)	1/2"					100	90-100	40-70	0-15	0-5
7	3/8"						100	70-95	0-25	
8	3/8"						100	95-100	20-65	0-10

FINE AGGREGATE GRADATION CHART

Sieve Size	Percent Passing
3/8"	100
#4	95-100
#8	80-100
#16	50-85
#30	25-65
#50	10-35 ¹
#100	0-10
#200	0-3 ²

600.05 MISCELLANEOUS

Water shall be clean and free from injurious amounts of oil, acid, alkali, organic matter, or other deleterious substances.

Bar Supports (chairs) shall be plastic, plastic protected wire, stainless steel, or precast concrete supports. Precast concrete bar supports shall be wedge-shaped, not larger than 3-1/2 X 3-1/2 inches of thickness equal to that indicated for concrete cover and shall have an embedded hooked tie wire for anchorage.

Metal Accessories shall be spacers, chairs, ties, and other approved devices necessary for properly assembling, spacing and supporting the reinforcement in place.

Expansion Joint Material shall be premolded saturated felt, or other approved material, not less than plan thickness and as wide as the slab depth.

600.06 MIXING AND PROPORTIONING

Concrete may be proportioned and mixed on the job, dry-batched for mixing on the job, or procured from a "ready mixed" concrete plant.

If "ready mixed", the mixing and transportation operations shall conform with ASTM C-94. Mixing water shall not be added after a truck has left the plant. No concrete shall be used in the work which has been held longer than one hour in a mixer truck.

If dry-batching to the job site, the batching plant operation shall conform with ASTM C-94. Transportation of dry materials shall be performed in such manner as to prevent loss, segregation or contamination of the ingredients.

If job-proportioned and mixed, the aggregate shall be stockpiled separately and handled in such a manner as to prevent the inclusion of any foreign materials. Cement shall be stored in a watertight building with the floor off the ground. Except for emergency hand-mixing under approved conditions, all concrete shall be machine-mixed in an approved type mixer for a minimum period of 1-1/2 minutes in a drum rotating at the peripheral speed of about 200 feet per minute.

Aggregate shall be proportioned by weight unless a satisfactory volumetric method of measure is approved by the Engineer. The use of fractional sacks of cement will not be permitted unless the cement is proportioned by weight. Free moisture content of aggregate shall be included as a portion of the mix water required.

Revamping of partially hardened concrete or mortar will not be permitted.

The concrete shall be uniform and workable. The minimum cement content, maximum allowable water content and slump, and minimum strength shall conform to the following:

CLASS OF CONCRETE	MIN. COMPRESSIVE STRENGTH @ 28 DAYS P.S.I.	MINIMUM FLEXURAL STRENGTH @ 7 DAYS P.S.I.	MIN. CEMENT CONTENT SACKS
A	3,000	550	5.0
B	2,000	375	4.0
C	3,600	600	6.0
D	1,500	250	3.0

CLASS OF CONCRETE	MAXIMUM AGGREGATE SIZE	MAX. WATER CEMENT RATIO	MAX. ALLOWABLE SLUMP (INCHES)	
			FOR HAND PLACEMENT	FOR MACHINE PLACEMENT
A	1-1/2"	6.5	4	2
B	1-1/2"	8.0	3	1-1/2
C	1-1/2"	6.0	4	2
D	2-1/2"	11.0	2-1/2	2

To conform with the requirements of these specifications, the average of all the strength tests representing each class of concrete as well as the average of any five consecutive strength tests representing each class of concrete shall be equal to or greater than the specified strength and no strength test shall be less than 80 percent of the specified strength.

The concrete shall develop a minimum compressive strength of 4000 PSI at 28 days.

600.07 TESTING

Slump, air and compressive cylinder testing shall be performed by an independent testing laboratory. A total of three (3) test cylinders for every 10 CY of concrete placed shall be cast and tested at 7, 14 and 28 days. The cylinder tests shall be done by an independent testing laboratory satisfactory to the Engineer.

The contractor shall perform a slump test on the concrete prior to placing. The slump shall be no greater than 3" to 5".

All test results must be submitted to the Engineer. The Contractor shall be responsible for all costs associated with testing.

600.08 FORMS

General: Forms shall be so constructed that the finished concrete will conform to the shape, line, grades, and dimensions indicated on the drawings. Lumber used in the forms for exposed surfaces shall be dressed to a uniform thickness and shall be horizontal or vertical. Lumber once used in forms, or used lumber, shall be cleaned and satisfactorily reconditioned.

Design:

(A) Forms shall be sufficiently tight to prevent the leakage of mortar. They shall be properly shored, braced, and otherwise supported so as to maintain the desired position and shape during and after placing concrete.

(B) Bolts and rods shall be used for interval ties; they shall be so arranged that when the forms are removed, no metal shall be within one (1") inch of any surface.

(C) If conditions are favorable, the Engineers may permit the use of earth forms for trenches or footings; in which case the bottom shall be level, clean and without fill; and the sides shall be even and clean and unless otherwise shown, shall be vertical.

Molding: Suitable moldings or bevels shall be placed in the angles of forms to round or bevel the edges of the concrete where such shaping is shown on the drawing or where directed by the Engineer.

Oiling: The inside of forms shall be coated with a non-staining mineral oil or other approved material. Oil shall be applied before the reinforcement is placed.

Clean-out Opening: Temporary openings shall be provided at the base of column and wall forms and at other points where necessary to facilitate cleaning and inspection immediately before depositing concrete.

Form Removal: The removal of forms shall be subject to the Engineer's approval and shall not be started until the concrete has attained the necessary strength to support its own weight and any construction live loads.

600.09 DEPOSITING CONCRETE

General: No concrete shall be placed until the forms and other conditions are approved by the Engineer, and until all pipes, conduits, sleeves, thimbles hangers, flashing and other items required to be placed in the concrete have been properly installed.

Temperature: Concrete may be placed when the temperature is 45F, or more and rising, provided there is no reason to expect a drop in temperature to below 45F within 12 hours of the placement of the pour. Concrete may not be placed when the temperature of the concrete is more than 90F.

Cleaning: Hardened concrete and foreign materials shall be removed from the inner surfaces of mixing and conveying equipment before any concrete is mixed.

Before depositing concrete, forms shall be thoroughly wetted and all debris removed.

Removal of Water: Water shall be removed from the space to be occupied by concrete and any continuous flow of water shall be diverted to a sump or removed by pumping.

Handling: Concrete during and immediately after depositing shall be thoroughly compacted by means of suitable tools. The use of approved type of mechanical vibration is recommended and urged.

Depositing Continuously: Concrete shall be deposited continuously or in layers of such thickness that no concrete shall be deposited against concrete which has hardened. If a section cannot be placed continuously, construction joints may be located at points as provided for in the drawings or approved by the Engineer. Before depositing new concrete against old, the forms shall be retightened, the hardened surfaces cleaned and covered with a coating of mortar of neat cement grout.

600.10 CURING AND PROTECTION

General: All concrete shall be cured by an approved method for the period of time given below before the concrete is subjected to any loads:

Type III Portland Cement	3 days
Type I Portland Cement	7 days
Type II Portland Cement	14 days

Immediately after placement, concrete shall be protected from premature drying, extremes in temperatures, rapid temperature changes, mechanical injury, and injury from rain and flowing water. All materials and equipment needed for adequate curing and protection shall be available and at the job site prior to start of concrete placement. Concrete shall be protected from the damaging effects of rain for 12 hours, flowing water for 14 days and direct rays of the sun for 3 days. All concrete shall be adequately protected from damage. No fire nor excessive heat shall be permitted near nor in direct contact with concrete at any time.

Moist Curing: Concrete moist-cured shall be maintained continuously (not periodically) wet for the entire curing period. If water or curing materials used stain or discolor concrete surfaces which are to be permanently exposed, they shall be cleaned as required by the Engineer. When wooden form sheathing is left in place during curing, the sheathing shall be kept wet at all times.

Horizontal surfaces shall be cured by ponding, by covering with a minimum uniform thickness of two (2") inches continuously saturated sand, or by covering with saturated non-staining burlap or cotton mats or sealed impervious sheet materials. The following exceptions are permitted:

- 1) Horizontal construction joints may be allowed to dry for twelve (12) hours immediately prior to placing of the following lift.
- 2) Where insulation is approved for cold weather protection, all joints in the insulation shall be sealed to prevent moisture loss and maintained sealed throughout curing period.

Membrane Curing: Any surface to which concrete, paint, sack rubbed finish or any subsequent treatment that depends on adhesion or bonding to the concrete shall not be cured with curing compound. Curing compound shall be of an approved pigmented or non-pigmented type. On surfaces permanently exposed to view, the non-pigmented type containing a fugitive dye shall be shaded from direct rays of the sun for the first seven days of the curing period.

The curing compound shall be applied to formed surfaces immediately after the forms are removed and prior to any patching or other surface treatment except the cleaning of loose sand, mortar, and debris from the surface. The surfaces shall be thoroughly moistened with water and curing compound applied to unformed surfaces as soon as free water has disappeared. The curing compound shall be applied in a two-coat continuous operation by approved power spraying equipment and at a uniform coverage of not more than 400 square feet per gallon for each coat. Concrete surfaces on which the curing compound has been applied shall be adequately protected for the duration of the entire curing period from pedestrian and vehicular traffic and from any other cause which will disrupt the continuity of the curing membrane.

600.11 FINISHED EXPOSED SURFACES

The type of surface finish shall be one of the three types herein described as called for on the plans or in the special provisions. Where the plans do not specify the type of surface finish, Type I Surface Finish shall be used.

Type I Surface Finish: All railing, curbs, the underside of overhanging beams, the outside and bottom of exterior girders of fascia beams, and all portions of piers, columns, bents, abutments, retaining walls, and culverts which are exposed to view after backfill and roadway embankments are placed shall be surface finished with a first and second rubbing as hereinafter described. The area inside of culvert barrels including both sidewalls and the underside of the top slab shall be a distance equal to one-third (1/3) the clearance height but not less than eighteen (18) inches shall be considered exposed to view.

Forms for all surfaces which are to be finished as specified above shall be face lined with a lining material such as masonite or plywood.

Type II Surface Finish: All concrete portions of railing and the top and roadway faces of all curbs, including ear walls, on bridges and culverts shall be surface finished with a first and second rubbing as hereinafter described.

The following concrete surfaces, while not required to be rubbed, shall be made of smooth and uniform texture by face lining the forms with a lining material such as masonite or plywood; the outside vertical face of curbs and slabs, the underside of overhanging slabs, and all portions of piers, columns, bents, abutments, culverts, and retaining walls which are exposed to view after backfill.

Type III Surface Finish: All concrete portions of railing and top roadway faces of all curbs on bridges and culverts, shall be surface finished with a first rubbing only as hereinafter described. No other rubbing will be required except as hereinafter specified for patching and correcting defective surfaces. No face lining of forms will be required with Type III Surface Finish.

The first rubbings shall be performed as follows: as soon as forms are removed, all necessary pointing shall be done. When the pointing has set sufficiently to permit it, all surfaces requiring surface finish shall be wet with a brush and given a first surface rubbing with No. 16 Carborundum Stone or an abrasive of equal quality. The rubbings shall be continued sufficiently to bring the surface to a paste, to remove all form marks and projections and to produce a smooth dense surface without pits or irregularities. The use of cement to form a surface paste will not be permitted.

Where a second rubbing is not specified, chamfered corners shall be rubbed in the first rubbing and the material which has been ground to a paste in the rubbing process shall be spread uniformly over all rubbed surfaces by striping with a brush and the mortar on the surface shall be allowed to take a re-set. The surface shall be left with a clean, neat, and uniform appearance and shall be uniform in color.

Where a second rubbing is to follow the first rubbing, the material ground into a paste during the first rubbing shall be carefully spread or brushed uniformly over the surface and allowed to take a re-set, but washing down following this first rubbing will not be required. Also, chamfered corners generally shall not be rubbed in the first rubbing if a second rubbing is to follow.

The second rubbing, when required, shall be performed as follows: during the process of conditioning the complete structure for final acceptance, the surfaces of the entire structure requiring finish shall be given a final finish with a No. 30 Carborundum Stone or an abrasive of equal quality. On completion of this rubbing, the surface shall be neatly striped with a brush, and the mortar on the surface shall be allowed to take a re-set. The surface shall then be washed down with clean water. The entire structure shall be left with a clean, neat and uniform appearing finish and shall be uniform in color. The surface of concrete roadway and sidewalk slabs shall be finished by floating, screening and belting.

Rubbing of surfaces other than those herein specified will not be required, unless such surfaces are not true or have porous spots or honeycombed areas. In case these defects occur, the areas immediately affected shall be given a first surface rubbing. Such rubbing shall extend over a sufficient area around the blemished portions to blend the rubbed area into the surrounding unfinished surface, but this shall not be construed to require the rubbing of large areas of unblemished surfaces of the portion of the structure in question.

600.12 PAYMENT

Payment for concrete in place will only be paid for separately when specifically included as a bid item. Otherwise, payment will be incidental to appropriate bid items. This price shall be full compensation for forming, pouring, providing and installing reinforcing steel, finishing, and curing.

When not included as a bid item, concrete placement will be considered incidental to pay items.

ITEM 650

REINFORCEMENT STEEL

650.01 GENERAL

This item shall govern deformed reinforcement; plain reinforcement; prestressing tendons; and reinforcement consisting of structural steel, steel pipe, or steel tubing as specified herein.

Reinforcement to be welded is indicated on the drawings. Reinforcement of the specified ASTM steel, except for ASTM A-706, shall require a report of material properties conforming to "Reinforcing Steel Welding Code" (AWS D12.1) of the American Welding Society.

650.02 MATERIALS

1. Deformed Reinforcement

- a. Deformed reinforcing bars shall conform to one of the following specifications, except as provided in Section 1.b below.
 - (1) "Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement" (ASTM A-615), Grade 60.
 - (2) "Specification for Rail-Steel Deformed and Plain Bars for Concrete Reinforcement" (ASTM A-616), Grade 60.
 - (3) "Specification for Axle-Steel Deformed and Plain Bars for Concrete Reinforcement" (ASTM A-617), Grade 60.
 - (4) "Specification for Low-Alloy Steel Deformed Bars for Concrete Reinforcement" (ASTM A-706).
- b. Deformed reinforcing bars shall conform to the following exceptions to the ASTM specifications listed in Section 1.a. above.
 - (1) For ASTM A-615, and A-617, yield strength shall correspond to that determined by tests on full size bars.
 - (2) For ASTM A-615, A-616, and A-617, bend test requirements for all bar sizes #3 through #11 shall be based upon 180 deg. bends of full-size bars around pins with diameters specified in Table 1. If #14 or #18 bars meeting these specifications are to be bent, full-size bar specimens shall

be bend tested 90 deg. at a minimum temperature of 60° F around a 9d_b pin without cracking of the bar. However, if #14 and #18 bars as used in the structure are required to have bends exceeding 90 deg., specimens shall be bend tested 180 deg. with other criteria the same as for 90 deg.

TABLE 1
BEND TEST REQUIREMENTS

Bar Designation	Pin Diameter for Bend Test
#3, #4, and #5	3-½d _b
#6, #7, and #8	5d _b
#9, #10, and #11	7d _b
#9, #10, and #11	5d _b (of Grade 40)

- c. Bar and rod mats for concrete reinforcement shall conform to "Specification for Fabricated Deformed Steel Bar Mats for Concrete Reinforcement" (ASTM A-184).
- d. Deformed wire for concrete reinforcement shall conform to "Specification for Deformed Steel Wire for Concrete Reinforcement" (ASTM A-496).
- e. Welded deformed wire fabric for concrete reinforcement shall conform to "Specification for Welded Deformed Steel Wire Fabric for Concrete Reinforcement" (ASTM A-497).

2. Plain Reinforcement

- a. Plain bars for spiral reinforcement shall conform to the specification listed in Section 1.a. (1), (2), or (3) including additional requirements of Section 1.b.
- b. Smooth wire for spiral reinforcement shall conform to "Specification for Cold-Drawn Steel Wire for Concrete Reinforcement" ASTM A-82).
- c. Welded smooth wire fabric for concrete reinforcement shall conform to "Specification for Welded Steel Wire Fabric for Concrete Reinforcement" (ASTM A-185).

3. Prestressing Tendons

- a. Wire, strands, and bars for tendons in prestressed concrete shall conform to one of the following specifications:
 - (1) "Specification for Uncoated Stress-Relieved Wire for Prestressed Concrete" (ASTM A-421).
 - (2) "Specification for Uncoated Seven-Wire Stress-Relieved Strand for Prestressed Concrete" (ASTM A-416).
 - (3) "Specification for Uncoated High-Strength Steel Bar for Prestressing Concrete" (ASTM A-722).
- b. Wire, strands, and bars not specifically listed in ASTM A-421, A-416, or A-722 may be used provided they conform to minimum requirements of these specifications and do not have properties that make them less satisfactory than those listed in ASTM A-421, A-416, or A-722.

4. Structural Steel, Steel Pipe, or Tubing

- a. Structural steel shall conform to one of the following specifications:
 - (1) "Specification for Structural Steel" (ASTM A-36).
 - (2) "Specification for High-Strength Low-Alloy Structural Steel" (ASTM A-242).
 - (3) "Specification for High-Strength Low-Alloy Structural Manganese Vanadium Steel" (ASTM A-441).
 - (4) "Specification for High-Strength Low-Alloy Columbium-Vanadium Steels of Structural Quality" (ASTM A-572), Grade 60.
 - (5) "Specification for High-Strength Low-Alloy Structural Steel with 50,000 psi Minimum Yield Point to 4 in. Thick" (ASTM A-588).
- b. Steel pipe or tubing shall conform to one of the following specifications:
 - (1) Grade B of "Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless" (ASTM A-53).
 - (2) "Specification for Cold-Formed Welded and Seamless Carbon Steel

- Structural Tubing in Rounds and Shapes" (ASTM A-500), Grade B.
- (3) "Specification for Hot-Formed Welded and Seamless Carbon Steel Structural Tubing" (ASTM A-501).

650.03 SIZES AND WEIGHTS

The nominal sizes and areas, and the theoretical weights of deformed bars shall not be less than the Current standard of the Concrete Reinforcing Steel Institute.

650.04 BENDING

Reinforcement bars shall be bent cold to the shapes indicated on the plans.

All bending of hard grade new billet and rail steel bars shall be done in the shop; other grades shall preferably be bent in the shop. Bends shall be made around pins; the diameter of pins shall be not less than four (4) times the minimum thickness of the bar. Heating for bending shall be employed only when authorized specifically.

650.05 STORAGE

Reinforcement shall be stored above the ground surface upon skids, platforms, or other supports, and shall be protected from mechanical injury and from deterioration by exposure to the weather. When placed in the work, the reinforcement shall be free from dirt, loose rust, scale, paint, oil, or other foreign material.

650.06 SPLICES

No splices of bars, except when shown on the plans, will be permitted except upon the written approval of the Engineer. Splices which are permitted shall have a length of not less than that required by the ACI Code and shall be well distributed or else located at points of low tensile stress. The spacing between bars shall meet the recommendation of the ACI Code for anchorage bond and placing concrete.

Where welded splices may be required, they shall conform to AWS D 12.1 "Recommended Practices for Welding Reinforcing Steel, Metal Inserts and Connections in Reinforced Concrete Construction." Welded splices shall develop in tension at least 125% percent of the specified yield strength of the reinforcing bar. Splices shall transfer the entire computed stress from bar to bar without exceeding three-fourths of the permissible bond. Welded wire fabric shall be lapped not less than two mesh, i.e., the length of the lap shall be at least equal to the spacing of wires parallel to the lap.

Bars shall be rigidly clamped or wired at all splices in a manner approved by the Engineer.

650.07 REJECTION

Reinforcement may be rejected for failure to meet any of the requirements of this specification on account of any of the following:

1. Reinforcement exceeding the allowable variations in size or weight.
2. Reinforcement with bends not in conformity with the details.
3. Reinforcement with a coating of dirt, loose rust, scale, paint, oil, or other foreign substance at time of placing in the work.
4. Twisted bars.

650.08 DETAILING

1. Completely detailed shop drawings and schedules shall be submitted by the Contractor for approval of the Engineer in accordance with requirements specified for working drawings.
2. The bars shall be supplied in lengths which will allow them to be conveniently placed in the work and provide sufficient lap at joints. Dowels of proper length, size, and shape shall be provided for tying walls, beams, floors, and the like together where shown, specified, or ordered.
3. Steel reinforcement shall be of the type and size, cut to lengths, and bent to shape as indicated on the plans. Where dimensions of hooks are not shown, the diameter of the hook shall equal six (6) times the bar diameter for bar sizes #3 through #8 and 8 times for #9, #10 and #11, with a straight length of bar at the end of the hook equal to four (4) times the bar diameter, or 2-½" minimum, whichever is greater.

650.09 PLACING REINFORCEMENT

Reinforcement, before being placed, shall be thoroughly cleaned of mill and rust scale and of coatings that will destroy or reduce the bond with the concrete. When there is a delay in concreting operations and the reinforcement has been in place in excess of two (2) days, it shall be reinspected and, when necessary, cleaned.

Metal reinforcement shall be accurately positioned and dimensioned in accordance with the plans and specifications. The bars and mesh shall be tightly secured against displacement by using

annealed wire of not less than No. 16 gauge and suitable clips at intersections. The reinforcement shall be supported in a manner that will keep all metal away from the interior surfaces of forms, or the surface against which the concrete is placed, in accordance with the "clear" dimensions as shown on the plans or as specified single layer reinforcement in slabs shall be placed at mid-depth unless otherwise dimensioned in plans.

Nails shall not be driven into the outside forms to support reinforcement, nor shall any other device for this purpose come in contact with outside form, except that wood strips shall be inserted between the reinforcement and the forms at intervals to maintain the required clear distances between the reinforcement and the outside surfaces of the concrete. These wood strips shall be pulled up and removed as the level of the concrete rises in the forms. In the case of slabs and beams, metal chairs, spacers, and other metal accessories necessary to provide the required clear distances and proper alignment and spacing between bars shall be used subject to the approval of the Engineer. Precast concrete blocks wired to the reinforcing bars will not be permitted as supports or spacers.

650.10 CONCRETE PROTECTION FOR REINFORCEMENT

Steel reinforcement shall be placed and held in position so that the concrete cover as measured from the surface of the bar, shall be the following, except as otherwise shown, specified, or directed:

Slabs:

¾ inch, in general, top and bottom;

1½ inches at surfaces troweled as floor finish, walkway, or driveway;

1½ inches at bottom for slabs over water;

Footings:

3½ inches at top of footings;

3 inches at bottom, sides, and end of footings;

Walls:

2 inches on surfaces against earth;

1 inch on interior surfaces;

1½ inches on interior surfaces contacting water;

3 inches at top surface;

Beams and Girders:

1½ inch minimum for stirrup steel, top and bottom; 2 inch minimum to main longitudinal steel;

Columns:

2 inches, in general to main vertical reinforcement.

650.05 PAYMENT

Reinforcing steel used in structures will be paid for only when specifically included as a bid item in the proposal form at the unit price bid per pound of "Reinforcing Steel" which price shall be full compensation for furnishing, bending, fabricating, welding, and placing the reinforcement; for all the clips, blocks, metal spacers, ties, wire or other materials used for fastening reinforcement in place; and for all tools, labor, equipment, and incidentals necessary to complete the work.

When not included as a Bid Item, this item will not be paid for directly but will be considered incidental to pay items provided.

ITEM 900

SEEDING

900.01 DESCRIPTION

This Item shall govern for preparing ground, providing for sowing of seeds, mulching with straw, hay, or cellulose fiber and other management practices along and across such areas as are designated on the plans and in accordance with these specifications.

900.02 MATERIALS

All seed must meet the requirements of the Texas Seed Law including the labeling requirements for showing pure live seed (P.S. = purity x germination), name and type of seed. Seed furnished shall be of the previous season's crop and the date of analysis shown on each bag shall be within nine months of the time of use on the project. Each variety of seed shall be furnished and delivered in separate bags or containers. A sample of each variety of seed shall be furnished for analysis and testing when directed by the Engineer. The amount of seed planted per acre shall be of the type specified below.

<u>Common Name</u>	<u>Scientific Name</u>
Bermuda and giant Bermuda grass (Hulled or Unhulled)	Cynodon dactylon
Annual Rye	Lolium multiflorum
German Foxtail Millet	Setaria italica

900.03 PLANTING SEASON

Planting dates, seed mixtures and application rates shall conform to the following table.

<u>Planting Date</u>	<u>Application Rate</u>	
	<u>Type(s)</u>	<u>(Lbs. per Acre P.S.)</u>
April 1 - September 30	Bermuda and Giant	20
	Bermuda grass (Hulled)	
	Millet	40
October 1 - March 31	Hulled Bermuda	20
	Unhulled Bermuda	20

900.04 FERTILIZER

All fertilizers used shall be delivered in bags or containers clearly labeled showing the analysis. The fertilizer is subject to testing in accordance with the Texas Fertilizer Law. A palette or granulated fertilizer shall be used with an analysis of 13-13-13 or having the analysis shown on the plans. The figures in the analysis represent the percent of nitrogen, phosphoric acid, and potash nutrients respectively as determined by the methods of the Association of Official Agricultural Chemists.

In the event it is necessary to substitute a fertilizer of a different analysis, it shall be a palette or granulated fertilizer with a lower concentration, but the total amount of nutrients furnished and applied per acre shall equal or exceed that specified for each nutrient.

Palette or granulated fertilizer shall be applied uniformly over the area specified to be fertilized and, in the manner, directed for the particular item of work. The fertilizer shall be dry and in good physical condition. Fertilizer that is powdered or caked will be rejected. Distribution of fertilizer for the particular item of work shall meet the approval of the Engineer.

Unless otherwise indicated in the plans or specifications, fertilizer shall be applied uniformly at the average rate of 600 pounds per acre for all types of "Seeding."

900.05 SPRINKLE IRRIGATION

Sprinkle Irrigation shall consist of the authorized application of water on those portions of the right of way as shown on plans or as directed by the Engineer, and as herein specified.

Water shall be furnished by the Contractor and shall be clean and free of industrial wastes and other substances harmful to the growth of grass.

This work will be done only at such time as approved by the Engineer and in sufficient frequency to allow optimum germination. The Contractor shall furnish and operate approved sprinklers which will insure the distribution of water in a uniform and controllable rate of application.

900.06 STRAW MULCH

Straw mulch shall be oat, wheat, or rice straw. Hay mulch shall be prairie grass, Bermuda grass, or other hay as approved by the Engineer. The mulch shall be free of Johnson grass or other noxious weeds and foreign materials. It shall be kept in a dry condition and shall not be molded or rotted.

900.07 CELLULOSE FIBER MULCH

Cellulose fiber mulch shall be a natural cellulose fiber mulch produced from grinding clean, whole wood chips, or fiber produced from ground newsprint with a labeled ash content not to exceed 7%. The mulch shall be designed for use in conventional mechanical planting, hydraulic planting of seed or hydraulic mulching of grass seed, either alone or with fertilizers and other additives. The mulch shall be such that when applied the material shall form a strong, moisture-retaining mat without the need of an asphalt binder. Application rate for mulch in HYDRO MULCH SEEDING shall be 2000 Lbs/acre.

900.08 SOIL STABILIZER/TACKING AGENT

Soil stabilizer for hydro-mulch seeding shall be of a commercially available type approved by the Engineer and shall be applied at a rate of 40 Lbs./acre unless otherwise specified.

900.09 CONSTRUCTION METHODS

After the designated areas have been completed to the lines, grades and cross sections shown on the plans and as provided for in other items of this contract, seeding shall be performed in accordance with the requirements hereinafter described. All areas to be seeded shall be cultivated to a depth of at least four (4") inches, unless otherwise directed by the Engineer. The seed bed shall be cultivated sufficiently to reduce the soil to a state of good tilth when the soil particles on the surface are small enough and lie closely enough together to prevent the seed from being covered too deep for optimum germination. Cultivation of the seed bed will not be required in loose sand where depth of sand is four (4") inches or more.

The cross-section previously established shall be maintained throughout the process of cultivation and any necessary reshaping shall be done prior to any planting of seed.

The following are four methods of seeding which may be specified in the plans:

900.10 STRAW OR HAY MULCH SEEDING

The seed or seed mixture in the quantity specified shall be uniformly distributed over the areas shown on plans or where directed by the Engineer. If the sowing of seed is by hand, rather than by mechanical methods, the seed shall be sown in two directions at right angles to each other. If mechanical equipment is used, all varieties of seed as well as fertilizer may be distributed at the same time provided that each component is uniformly applied at the specified rate. When seed and fertilizer are to be distributed as a water slurry, the mixture shall be applied to the area to be seeded within 30 minutes after all components are placed in the equipment. Upon completion of planting of seed, straw or hay mulch shall be spread uniformly over the seeded area at the rate of approximately 1½ to 21 tons of hay or 2 to 2½ tons of straw per acre. A mulching machine approved by the Engineer shall be equipped to inject a tacking agent into the straw or hay uniformly as it leaves the equipment at a rate of 0.05 to 0.10 gallon of tacking agent

per square yard of mulched area. If the straw or hay and tacking agent are placed by hand, then the rate of application for the tacking agent shall be approximately 0.15 gallon per square yard.

900.11 CELLULOSE FIBER MULCH SEEDING

The seed or seed mixture, in the quantity specified, and fertilizer, shall be uniformly distributed over the areas shown on the plans or where directed. If the sowing of seed is by hand, rather than by mechanical methods, the seed shall be sown in two directions at right angles to each other. If mechanical equipment is used all varieties of seed as well as fertilizer may be distributed at the same time, provided that each component is uniformly applied at the specified rate. When seed and fertilizer are to be distributed as a water slurry, the mixture shall be applied to the area to be seeded within 30 minutes after all components are placed in the equipment. After planting, the planted area shall be rolled with a corrugated roller of the "Cultipacker" type. All rolling of the slope areas shall be on the contour. Upon completion of planting and cultipacking of the seed, cellulose fiber mulch shall be spread uniformly over the area at the rate of 2000 lbs. per acre given in dry weight of mulch per acre. A mulching machine, approved by the Engineer, shall be equipped to eject the thoroughly wet mulch material at a uniform rate to provide the mulch coverage specified.

900.12 HYDRO MULCH SEEDING

The seed or seed mixture, in the quantity specified, shall be mixed in an approved mixer/distributor with fertilizer and Cellulose Fiber Mulch at the specified rates. Mixing and distributing shall be in such a manner so that thoroughly wet mulch material will be distributed at a uniform rate to provide the coverages specified. Soil stabilizer/tacking agent shall be added to the mixture at the specified rates.

900.13 BROADCAST SEEDING

The seed or seed mixture in the quantity specified shall be uniformly distributed over the areas shown on plans or where directed by the engineer. If the sowing of seed is by hand, rather than by mechanical methods, the seed shall be sown in two directions at right angles to each other. If mechanical equipment is used, all varieties of seed as well as fertilizer may be distributed at the same time provided that each component is uniformly applied at the specified rate. When seed and fertilizer are to be distributed as a water slurry, the mixture shall be applied to the area to be seeded within 30 minutes after all components are placed in the equipment. After planting, the planted area shall be rolled with a corrugated roller of the "Cultipacker" type. All rolling of the slope areas shall be on the contour.

900.14 REQUIRED COVERAGE

Germination and establishment of a good stand of Bermuda grass will be required in order to qualify any Seeding as "Acceptable Work." Substantial bare spots and ruts designed by the Engineer will be reseeded and fertilized as required to achieve germination. Isolated bare spots

measuring 2 ft. in diameter or less will be considered as acceptable work. These requirements will be adhered to assuming normal weather conditions. In the event of abnormal flooding conditions, these requirements will be applied to areas above measured high-water marks.

900.15 MEASUREMENT AND PAYMENT

Work and accepted material as prescribed for this item, will be incidental to those bid items calling for seeding. This shall include all materials, for all excavation, loading, hauling, stockpiling, placing, sprinkling, and rolling and for furnishing all labor, equipment, tools, supplies and incidentals necessary to complete the work. There will be no separate pay item for Seeding.

ITEM 950

TRENCH SAFETY SYSTEMS

950.01 DESCRIPTION

This section covers excavation and supporting systems for trenches to protect the safety of workers, provide suitable means for constructing utility lines, and to protect public or private property, including existing utilities. A trench system shall be required for all trenches or excavation 5 feet or greater in depth.

The Contractor shall comply with the minimum requirements of this specification. Maintenance and inspection of any shoring and related equipment shall be the responsibility of the Contractor. The Contractor shall determine the safety system needed for the project within the minimum requirements of this specification. The Contractor has the sole responsibility to provide a safe work environment for all of his employees and anyone else present at the work site.

950.02 SUBMITTALS

The Contractor shall submit to the Owner's Engineer a Trench Safety System designed and sealed by a Registered Professional Engineer registered and in good standing in the State of Texas. The Trench Safety System along with certification from the Contractor's Registered Professional Engineer indicating that the Contractor's Trench Safety System meets the minimum requirements of this specification shall be submitted to the Owner's Engineer. The Contractor shall make adjustments as required by the Owner and/or Engineer to meet minimum requirements at Contractor's expense. Approval of a trench safety system by the Owner and/or Engineer shall not relieve the Contractor of his responsibility to provide a safe working place for his employees.

In addition, the Contractor shall submit a general safety program that conforms to OSHA standards that govern the activities of individuals in and around trench excavations. Both the Trench Safety System and the general safety plan shall be submitted to the Owner's Engineer prior to the start of construction.

950.03 REGULATORY COMPLIANCE

All trench excavations shall be accomplished in accordance with the detailed specifications set out in the provisions for Excavations, Trenching, and Shoring, as published by the Federal Occupational Safety and Health Administration (OSHA), 29 CFR, Part 1926, Subpart P, Section 1926.650 - 1926.653, and also the Rules published in the Federal Register (Vol. 52, No. 209, pages 45959 - 45991) on Tuesday October 31, 1989, or the latest revision thereof. These sections are hereby incorporated, by reference, into these specifications. Whatever method or option the

Contractor may select, a request in writing must be submitted to the Engineer for approval before work can start.

REVIEW AND APPROVAL OF METHOD, EQUIPMENT AND PLANS BY THE ENGINEER WILL BE ONLY FOR GENERAL CONFORMANCE WITH OSHA SAFETY STANDARDS, AND IN NO CASE WILL REVIEW AND APPROVAL RELIEVE THE CONTRACTOR OF SOLE AND COMPLETE RESPONSIBILITY AND LIABILITY FOR ENSURING THE SAFETY OF ALL PERSONS PRESENT AT HIS WORK SITE OR FROM PROTECTING PROPERTY FROM DAMAGE WHICH MAY RESULT FROM HIS CONSTRUCTION OPERATIONS.

950.04 EXISTING STRUCTURES

Where existing buildings, other utilities, streets, highways, or other structures are in close proximity to the trench, adequate protection shall be provided by the use of sheeting and shoring to protect the structure, street, or highway from possible damage. In the case of utilities, the Contractor may elect to remove the utility provided that the removal and subsequent replacement meets with the approval of the Engineer and the utility owner. In all cases, it shall be the responsibility of the Contractor to protect public and private property and any person or persons who might, as a result of the Contractor's work, be injured.

950.05 IMPLEMENTATION AND INSPECTION

The Contractor shall make daily inspections of the Trench Safety Systems to ensure that the systems meet OSHA requirements. Daily inspections are to be made by a "competent person" provided by the Contractor. If evidence of possible cave-ins, or failures, is apparent, all work in the trench shall cease until the necessary precautions have been taken by the Contractor to safeguard personnel entering the trench. The Contractor shall maintain a permanent record of daily inspections.

It is the sole duty, responsibility and prerogative of the Contractor, not the Owner or the Engineer, to determine the specific applicability of trench safety systems to each field and soil condition encountered on the project. He shall pay special attention to the type of soil or soils in which he will be working, any adjacent roads, highways, and railroads, and any previous excavations. All underground installations shall be located, including utility lines, pipelines, etc., before any excavation begins.

The Contractor shall provide a trench safety system in every trench. The trench safety system shall be installed in a true horizontal position, be spaced vertically and shall be secured to prevent sliding, falling, or kickouts. The trench safety system shall be effective to the bottom of the excavation. All trenches shall be provided with an adequate means of exit at all times with spacings of 25 feet or less. These means of exit shall be anchored in place in order to aid in the event a quick exit is necessary. During trench excavation, the excavated material shall be placed a minimum of two feet (2') away from the edge of the trench.

950.06 MATERIALS AND MAINTENANCE

Materials used for sheeting, sheet piling, cribbing, bracing, shoring, and underpinning shall be in good serviceable condition. All materials which are found to be defective in any way shall be immediately removed from the job site. It shall be the responsibility of the Contractor to regularly check all trench safety equipment for soundness and adequacy. Steel trench shields shall be constructed of steel plate sides, welded to a steel framework. All shields shall be constructed in order to provide protection equivalent to or greater than sheeting or shoring required for the trench. Adjustable jacks may be used in order to adjust the shield to varying trench widths. An access ladder shall be provided at the midpoint.

All maintenance of the trench safety equipment shall be the sole responsibility of the Contractor.

950.07 INDEMNIFICATION

The Contractor shall indemnify and hold harmless the Owner, its employees and agents and the Engineer, 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 failure of trenches constructed under this contract.

The Contractor acknowledges and agrees that this indemnity provision provides indemnity for the Owner and the Engineer in case the Owner and/or Engineer is negligent either by act or omission in providing for trench safety, including, but not limited to inspections, failure to issue stop work orders, and the hiring of the Contractor.

The Trench Safety System plan by the Contractor's Engineer should cover all situations that may be encountered during construction. It should be recognized that information contained in the Geotechnical Report is based on the data obtained from the soil borings and conditions along the line route may differ from those found at the individual soil boring locations. It is the Contractor's responsibilities to detect varying conditions which may be hazardous and take appropriate action. The Contractor is responsible for determining the appropriate trench safety systems necessary for specific locations based on actual subsurface conditions encountered during construction. The Owner and Owner's Engineer shall be held harmless from any claim or liability for injury or loss that results from failure on the part of the Contractor to implement the Trench Safety System plan properly or to make necessary changes to the trench safety systems necessitated by conditions encountered during construction.

950.08 MEASUREMENT AND PAYMENT

Measurement for payment for temporary sheeting, shoring, and bracing or equivalent method shall be paid for by the linear foot, all depths, as measured along the center line of the pipe

including manholes/inlets and bore pits in accordance with the specification.

Measurement for payment for temporary sheeting, shoring, and bracing or equivalent method shall be paid for by the square foot for all shoring from five feet below ground to the bottom of the excavation.

Payment shall be full compensation, in accordance with the pay items set in the bid for the trench safety system, including but not limited to planning, engineering, materials, equipment, fabrications, installation, inspection, recovery, all incidental work required, excavation and backfill including all benching, sloping, hauling shoring, sheeting, excess excavations, dewatering, sheet piling, bracing, trench shields, and all other incidentals necessary to provide the trench safety system as specified in the approved Trench Safety System plan.