CONSTRUCTION DOCUMENTS MANUAL
AND
TECHNICAL SPECIFICATIONS

MESA DEL NORTE SUBDIVISION
SANITARY SEWER IMPROVEMENTS PHASE II

LVWD BID NO.: 20-0227-01

VOLUME 1 OF 2

Lower Valley
WATER DISTRICT

1557 FM ROAD 1110
CLINT, TEXAS 79836

BOARD MEMBERS

Rosalinda Vigil, President
David Carrasco, Vice-President
Henry Trujillo, Secretary/Treasurer
David Estrada, Director
Rod Chavez, Director
Gerald Grijalva, General Manager

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Sealed proposals for construction of the Mesa del Norte Subdivision Sanitary Sewer Improvements Phase II will be received by the Lower Valley Water District (LVWD) at the District’s Main office located at 1557 FM 1110 or by mail to 1557 FM 1110, Clint, Texas 79836 until 04:00 pm local time, on February 27, 2020, and at that time and place will be publicly opened and read aloud.

The work under this contract shall be for furnishing all labor, materials, transportation and services for the construction and installation of the following work:

BASE BID No.1: The installation of approximately 680 linear feet of 8-inch diameter sanitary sewer pipe (SDR-35, P.V.C.); approximately 120 linear feet of 16-inch diameter steel pipe casing by boring methods; 1 – 48-inch diameter manhole; approximately 1-72-inch diameter manhole (cast in place); approximately 10 vertical feet of additional manhole depth. Approximately, 135 linear feet of 2-inch diameter potable water line (K-Copper) with water services of various sizes; approximately 110 linear feet of 4-inch diameter steel pipe casing by boring methods. Approximately 290 square yards of hot mix asphaltic concrete pavement replacement including base course; trench safety system; videotaping of project site before and after construction; and a traffic control plan on TX DOT & El Paso County Right of Ways.

ADDITIVE ALTERNATE No.1: The installation of all By-Passing Sewage Pumping System and Effluent Tanks, including all pumps, valves, fittings, all components and accessories; including all site improvements and a 16-foot-wide all-weather access road; new installation of a 24-inch diameter RCP.

ADDITIVE ALTERNATE No.2: The connection of existing sanitary sewer system to divert service to the existing LVWD sanitary sewer system. Including all cutting of pipe, additional pipe, installation of cast in place manholes, coring and/or existing manholes, and additional vertical depths. Cutting, connecting and/or capping of existing waterline main(s) to properly complete a functional LVWD water system. Including all asphalt removal and replacement (including base course), rolled curb, trench safety system, traffic control and videotape of the project.

Contract documents may be examined and obtained at the Purchasing Department of the Lower Valley Water District, 1557 FM 1110, Clint, Texas 79836; (915)791-4480.

A pre-bid meeting will be held on February 12, 2020 at 04:00 pm at the Lower Valley Water District, 1557 FM 1110, Clint, Texas.

A payment of $7.50 for a Compact Disk, or in cash or $12.50 for a USB, in cash or check payable to the Lower Valley Water District will be required for each set of Contract Documents in either electronic version. This payment represents reproduction costs and is non-refundable.

Each Bid shall be submitted in accordance with the Instructions to Bidders and be accompanied by a Bid Security in the amount of five percent of the amount bid.

The Successful Bidder states he or she must furnish a 100 percent (100%) Performance Bond and a 100 percent (100%) Payment Bond, in accordance with the Instructions to Bidders and the General Conditions.

By submission of the bid, Bidder fully understands the requirements of the Contract Documents and agrees to comply with all requirements thereof.

Wages paid on this project shall be not less than the minimum prevailing wage rates listed in the Contract Documents, Section 00840, General Wage Requirements.

The Lower Valley Water District (LVWD) adheres to the Cone of Silence policy which prohibits any communication regarding the bid between potential bidders (and subcontractors) and LVWD Board Members, Staff, and assigned Consulting Engineers. The provisions do not apply to oral communications with Purchasing Agent or Administrative Analyst, provided the communications is limited strictly to matters of process or procedure already contained in the solicitation document, oral communications at pre-bid conferences, or communications in writing (email preferred) submitted to the Administrative Analyst in response to inquiries regarding the bid. In addition to any other penalties provided by law, violation of the Cone of Silence by any bidder shall render that bidder’s bid voidable. Any person having personal knowledge of a violation of these provisions shall report such violations to the LVWD General Counsel and/or the Purchasing Agent in writing.
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INVITATION TO BID

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END OF SECTION 00020

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SECTION 00100

INSTRUCTIONS TO BIDDERS

1. DEFINED TERMS

Terms used in these Instructions to Bidders which are defined in the Standard General Conditions of the Construction Contract (EJCDC C-700, 2007 ed.) have the meanings assigned to them in the General Conditions. The term "Bidder" means the entity (such as a corporation, partnership or sole proprietor) that submits a Bid directly to Owner, as distinct from a sub-bidder, who submits a Bid to a Bidder. The term "Successful Bidder" means the lowest, responsible and responsive Bidder to whom Owner (on the basis of Owner's evaluation as hereinafter provided) makes an award. The term "Bidding Documents" includes the Advertisement or Invitation to Bid, Instructions to Bidders, the Bid Form, the Bid Bond or other Bid Security, and the proposed Contract Documents (including all Addenda issued prior to receipt of Bids). Other terms are defined in this Section 00100.

Other terms used in the Bidding Documents and not defined elsewhere have the following meanings which are applicable to both the singular and plural thereof:

Texas Resident Bidder - A bidder whose principal place of business is in this state and includes a Contractor whose ultimate parent company or majority owner has its principal place of business in this state.

Nonresident Bidder - A bidder whose principal place of business is not in this state, but excludes a Contractor whose ultimate parent company or majority owner has its principal place of business in this state.

EPCWID #1 - El Paso County Water Improvement District #1 which authorizes dewatering into its facilities under certain terms and conditions and with whom the Owner has negotiated specific basic fees and procedures.

2. COPIES OF BIDDING DOCUMENTS

2.1 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 at the Purchasing Department, Lower Valley Water District, 1557 FM 1110, Clint, Texas; (915) 791-4480.

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

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

3. DETERMINING LOWEST RESPONSIBLE, RESPONSIVE BIDDER

To demonstrate that the Bidder is responsible and able to perform the Work, each Bidder must be prepared to submit written evidence, such as financial data, previous experience, present commitments and other data as may be called for below (or in the Supplementary Instructions). 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.
In determining the lowest responsible, responsive Bidder, in addition to price, the following elements will be considered:

(a) the quality, availability and adaptability of the supplies, materials, equipment, or contractual services, to the particular use required;
(b) the number and scope of conditions attached to the bid;
(c) the ability, capacity and skill of the entity to perform the contract or to provide the service required;
(d) whether the bidder can perform the contract and provide the service promptly, or within the time required, without delay or interference;
(e) the character, responsibility, integrity, reputation, and experience of the bidder;
(f) the quality of performance of previous services, or contracts;
(g) the previous and existing compliance by the bidder with laws relating to the contract or service;
(h) any previous or existing noncompliance by the bidder with specifications, or requirements relating to time of submission of specified data such as samples, models, drawings, certificates, or other information;
(i) the sufficiency of the financial resources and ability of the bidder to perform the contract or to provide the service;
(j) the ability of the bidder to provide future maintenance, repair parts, and service for the use of the subject of the contract.
(k) the ability of the bidder to provide competent personnel for the job, as demonstrated by a listing of the names and the skills of experienced personnel who are currently employed by the bidder and who will be available for performing this work;
(l) the experience of the bidder in performing work similar in type, size and complexity to this project, as demonstrated by a listing of projects, with verifiable references (names, addresses, phone numbers, etc.), successfully completed.

MINIMUM GENERAL REQUIREMENTS - ALL CONSTRUCTION PROJECTS

PROJECTS WITH VALUE LESS THAN $1,000,000:

The Bidder, or at least two *Key Personnel employed by the Bidder, must demonstrate **Successful Completion of a project similar in nature and scope to this project within the past five (5) years and a similar project with a value of at least one-third (1/3) the value bid for this project.

PROJECTS WITH VALUE BETWEEN $1,000,000 AND $3,000.00:

The Bidder, or at least three *Key Personnel employed by the Bidder, must demonstrate **Successful Completion of one project similar in nature and scope to this project within the past five (5) years and one similar project with a value of at least 50% of the value bid for this project.

PROJECTS WITH VALUE BETWEEN $3,000,000 AND $6,000,000:

The Bidder must demonstrate a minimum of four (4) years experience in projects similar in nature and scope to this project. At least four *Key Personnel employed by the Bidder must have a minimum of five (5) years experience in similar construction projects. The Bidder must demonstrate **Successful Completion during the last five (5) years of at least one project comparable in nature and scope to this project and one similar project with a dollar value of at least 60% of the value bid for this project. The Bidder must have an employee, to be dedicated to this project, who is experienced in scheduling, with demonstrated ability in employing scheduling techniques similar to those to be used for this project.
PROJECTS WITH VALUE BETWEEN $6,000,000 AND $15,000,000:

The Bidder must have a minimum of five (5) years experience in projects similar in nature and scope to this project. At least four of the Bidder’s *Key Personnel must have a minimum of five (5) years experience in similar construction projects. The Bidder must demonstrate **Successful Completion of at least two (2) projects similar in nature and scope to this project and one similar project with a dollar value of at least 75% of the value bid for this project, both within the past five years. The Bidder must demonstrate that it has an experienced employee who will serve as the scheduler; who is dedicated to this project; who has successfully employed scheduling techniques appropriate for this project. At least two (2) *Key Personnel for this project must have completed at least two (2) projects, similar in scope and nature to the project being bid, as an employee of the Company bidding this project.

* KEY PERSONNEL: Defined as individuals who will be directly assigned to this project. Includes, but is not limited to, the Bidder’s Project Manager, the Project Superintendent, the Scheduler, the Bidder’s Construction Engineer, and Supervisory personnel such as the Foremen who will be directly assigned to this project as well as similar Subcontractor Key Persons. Resumes of Key Personnel must be submitted and accepted by the Owner in order for Bidder to receive the Award. Bidders are encouraged to submit documentation with the Bid but shall submit such documentation to Purchasing, no later than five (5) days after Engineer’s Request.

**SUCCESSFUL COMPLETION: Defined as completion of a project on time, which generally means no more than thirty (30) days later than the original contract time allocated. It also means within budget, which generally means within 5% of the original contract price. If there is any project submitted by the Bidder as qualifying, but which does not meet these requirements, in order to be fully responsive the Bidder is required to submit detailed information on that project demonstrating what caused the increases to cost or time. The name and telephone numbers of the Design Engineer and the Client are to be provided for evaluation as to whether the project may be considered “successful”. For any project where liquidated damages were assessed, the Bidder will not be considered to have been on time.
BIDDER MUST MEET THE FOLLOWING MINIMUM PROJECT SPECIFIC CRITERIA IN ORDER TO QUALIFY FOR AWARD OF THE BID:

1. This Project is in a traffic/pedestrian congested area. Bidder must demonstrate he has successfully completed two (2) projects with similar complexity (existing development), employing traffic control plans within the last five (5) years. Experienced subcontractor is acceptable. Experienced subcontractor is acceptable.

2. The Project involves the installation of sanitary sewer pipeline. Bidder must demonstrate successful completion of at least two (2) projects with similar complexity (existing development and depth of pipe) within the past five (5) years. At least one of those projects required the installation of at least 1,000 ft of 8-inch and/or larger diameter gravity sewer pipe of pipe material proposed for this project.

3. The Project involves the installation of sanitary sewer and potable water pipelines within TX DOT R.O.W and EPCWID #1 R.O.W. by Boring Methods. Included in the installation is the requirement for the Contractor to coordinate with the Lower Valley Water District, the Texas Department of Transportation and EPCWID #1. Bidder must demonstrate successful completion of at least two (2) projects with similar complexity and the same diameter casing within the past five (5) years. Experienced subcontractor is acceptable.

4. Project involves the replacement of pavement along the pipeline route. Bidder must demonstrate two (2) successful projects within the past five (5) years where pavement replacement was required and performed under his direction. At least one of the projects involved the pavement replacement of no less than 250 square yards with similar complexity (existing development). Experienced subcontractor is acceptable.

5. The Key Personnel required for this Project are a Project Manager, a Full Time Superintendent, Full Time Foremen, a Project Scheduler, and Owners or Principals of the Bidder to be assigned to this project for the duration by the Contractor to assure a completely functional and timely completion of the project. The Bidder, or at least three *Key Personnel employed by the Bidder, must demonstrate **Successful Completion of one project similar in nature and scope to this project within the past five (5) years and one similar project with a value of at least 50% of the value bid for this project. Owner reserves the right to review, approve or reject the persons listed as key personnel. Resumes of Key Personnel must be submitted with the bid and accepted by the Owner in order for Bidder to receive the Award.
LVWD FUNDED PROJECTS
MANDATORY GOOD FAITH EFFORTS
TO OBTAIN MINORITY PARTICIPATION IN THIS PROJECT

THE UTILITY'S POLICY FOR ITS PROJECTS IS TO ENCOURAGE THE PARTICIPATION OF SMALL LOCALLY-OWNED BUSINESSES (SMLB), MINORITY BUSINESS ENTERPRISES (MBE) AND WOMEN-OWNED BUSINESS ENTERPRISES (WBE). THE UTILITY'S MINIMUM GOALS FOR THIS PROJECT ARE:

- 10% FOR SMALL LOCALLY OWNED BUSINESSES
- 14% FOR MINORITY-OWNED BUSINESSES
- 2% FOR WOMEN-OWNED BUSINESSES

THE BIDDER MUST MEET EACH OF THESE THREE GOALS OR DEMONSTRATE, AT THE TIME OF MAKING THE BID, THAT HE HAS MADE A GOOD FAITH EFFORT TO MEET EACH OF THE THREE GOALS IN ORDER TO QUALIFY FOR AWARD OF THIS PROJECT. THE DEFINITION OF A "GOOD FAITH EFFORT" IS DESCRIBED BELOW. IF THE BIDDER FAILS TO MEET THE GOALS, AND ALSO FAILS TO PROVIDE EVIDENCE THAT A GOOD FAITH EFFORT HAS BEEN MADE TO MEET EACH GOAL, THE OWNER RESERVES THE RIGHT TO REQUEST ADDITIONAL INFORMATION FROM THE BIDDER AS SUPPORT TO GOOD FAITH EFFORT DOCUMENTATION. THE BIDDER MAY MEET THE MANDATORY REQUIREMENT IN ONE OF THREE WAYS:

IF GOALS IN EACH CATEGORY ARE FULLY ACHIEVED, THEN THE BIDDER ONLY NEEDS TO PROVIDE ALL THE DETAILS OF THE ACTUAL PARTICIPATION IN THE BID PROPOSAL FORM, SECTION 00300, WHERE SPACE HAS BEEN PROVIDED FOR BIDDER'S USE.


IF GOALS ARE NOT ACHIEVED, PROVIDE EVIDENCE OF A DEMONSTRATED GOOD FAITH EFFORT, AS DEFINED BELOW, AS PART OF THE BID PROPOSAL, AT THE TIME THE BID IS SUBMITTED.

Although a single prime contractor, a subcontractor, or a supplier may be a small locally-owned business and also a minority business or a woman-owned business, each firm may be counted in only one category (SMLB, MBE or WBE) for purposes of meeting these goals.

DEFINITION OF "GOOD FAITH EFFORT": Documentation that minority firms were given a genuine opportunity to participate. Evidence of a good faith effort must include a reasonable number of letters, which may be sent certified mail return receipt requested, showing the full details of the work to be performed by the minority firm, sent to bona fide firms in each of the categories described below; copies of responses to the letters; copies of correspondence with Chamber of Commerce (for Locally Owned Small Businesses) and with MBE and WBE associations; newspaper or trade magazine notices; and copies of Bidder's documentation file of the results of its solicitations.
DEFINITION OF "SMALL LOCALLY-OWNED BUSINESS FIRM" (SMLB): A Business corporation, partnership, joint venture, sole proprietorship, or other legal entity, formed for the purpose of making a profit, which has been located within the County of El Paso for at least twelve (12) months and of which 51% of the business must be owned by residents of El Paso County. Furthermore, the business must employ fewer than one hundred (100) employees or have annual gross receipts of less than one million dollars ($1,000,000.00). It must not be a subsidiary of a business which would not meet these guidelines. Only United States citizens, born or naturalized, will be deemed eligible to be Small Locally-Owned Businesses.

DEFINITION OF "MINORITY BUSINESS ENTERPRISE (MBE)" : A business which is:

1) certified as socially and economically disadvantaged by the Small Business Administration;

2) certified as a minority business enterprise by a US State or Federal agency;

(3) an independent business concern which is at least 51% owned and controlled by minority group members

A. A minority group member is an individual who is a citizen of the United States and one of:

1. Black American
2. Hispanic American
3. Native American
4. Asian Pacific American
5. Other groups whose members have been found to be disadvantaged by the Small New Business Act or by the Secretary of Commerce under Executive Order 11625, Sec. 5

B. The minority owner's interest must be real, substantial and continuing. This would include such characteristics as risk of loss/share of profit commensurate with proportional ownership and receipt of the customary incidents of ownership such as salary and/or tangible benefits.

C. A minority owner must have control of business decisions such as authority to sign bids and contracts, decisions in price negotiations, incurring liabilities for the firm, making staffing decisions, policymaking, etc.

D. A qualified MBE firm must perform a useful business function according to custom and practice in the industry. Acting merely as a passive conduit of funds to some other firm where such action is unnecessary to accomplish the project does not constitute a useful business function to practice in the industry.

DEFINITION OF "WOMEN-OWNED BUSINESS ENTERPRISE (WBE)" : An independent business concern which is at least 51% owned by a woman or women having the same interests and controls identified in the MBE definition section of this guidance. Only United States citizens will be deemed eligible to be WBE's.

The form entitled "Minority Certification and Participation Summary", which is located at the end of Section 00300, Bid Form, should be completed and submitted by the Successful Bidder within fifteen (15) days of Notice of Award.

It is mandatory that bidder submit with his or her bid a fully executed bid proposal (including the tabulation of proposed subcontractors and suppliers), an original bid bond, the certificate of insurance availability, and minority participation categories reflecting bidder has met minority participation goals OR evidence of bidder’s good faith effort to do so. Failure to submit these items with the bid will result in a finding that the bid is non-responsive and the bid will be disqualified.

EVIDENCE OF BIDDER'S GOOD FAITH EFFORT OR EVIDENCE OF FULL PARTICIPATION IN EACH CATEGORY IS ALSO REQUIRED AT THE TIME OF BID. OWNER RESERVES THE RIGHT TO REQUEST ADDITIONAL INFORMATION FROM THE BIDDER AS SUPPORT TO GOOD FAITH EFFORT DOCUMENTATION.
Bidders shall furnish a financial statement or other evidence of the Bidder's financial sufficiency to perform the contract, a sworn statement of his experience record, and a listing of the equipment available to him or any other statement or documentation required by the Owner as to his capability to complete the Work. The Post-Bid/Pre-Award Checklist and the Qualifications Statement may require submittal of additional documentation. PLEASE REVIEW THE CHECKLISTS PROVIDED AT THE END OF THIS SECTION 00100.

To assist the Owner in evaluating the Bidder's responsibility, the lowest responsive Bidder is required to complete and submit the "Qualification and Financial Disclosure Statement" found at the end of Section 00100 within five (5) calendar days of the Engineer's request. The Engineer will submit this document and any additional information requested by the Engineer, to the Owner as an attachment to his Recommendation of Award.

The Checklists found at the back of this Section are provided to assist the Bidder in fulfilling these requirements.

The Purchasing Department will evaluate the responsiveness of the Bidder’s submittal. Purchasing Agent will forward the bids and results of the Purchasing Department’s evaluation to the Engineer for further evaluation of responsiveness, qualifications of the Bidder and other related conditions of this Bid. Engineer will forward the results of their evaluation to the Owner. Owner will review and present its recommendation to the Public Service Board for award.

Bidder is required to submit information regarding his status as a "RESIDENT" or "NONRESIDENT" on the spaces provided in the proposal form.

A "Nonresident Bidder" will not be awarded the Contract if the state of his principal place of business assesses a penalty against out-of-state bidders unless his bid is lower than the lowest bid submitted by a responsible Texas resident bidder by the same amount that a Texas resident bidder would be required to underbid the nonresident bidder to obtain a comparable contract in the state in which the nonresident's principal place of business is located.

The terms "Texas Resident Bidder" and "Nonresident Bidder" shall the meanings set forth for those terms in Chapter 2252 of the Tx. Government Code.

4. EXAMINATION OF CONTRACT DOCUMENTS AND SITE

4.1 It is the responsibility of each Bidder, before submitting a Bid, to (a) examine the Contract Documents thoroughly, (b) visit the site to become familiar with local conditions that may affect cost, progress, performance or furnishing of the Work, and to determine the character of equipment and facilities needed preliminary to and during the prosecution of the Work, (c) consider federal, state and local laws and regulations that may affect cost progress, performance or furnishing of the Work, (d) study and carefully correlate Bidder's observations with the Contract Documents, and (e) notify Engineer of all conflicts, errors or discrepancies in the Contract Documents.

When information as to soil conditions, test borings, and existing underground and overhead utility locations is shown on the Plans, Specifications, Drawings, or in preliminary reports prepared by the Engineer or under the Engineer's direction, such information was obtained for the Owner. The correctness of such information is not guaranteed by the Owner or by the Engineer and in no event shall be considered as a part of the contract, an inducement to bidding, or a factor for computation of bids. If such information is used by the Bidder in preparing a proposal, the Bidder must assume all risks that conditions encountered in performing the Work may be different from the approximation shown.

4.2 Reference is made to the Supplementary General Conditions for identification of:

4.2.1 Those reports of explorations and tests of subsurface conditions at the site which have been utilized by Engineer in preparation of the Contract Documents.

4.2.2 Those drawings of physical conditions in or relating to existing surface and subsurface conditions (except Underground Facilities) which are at or contiguous to the site which have been utilized by Engineer in preparation of the Contract Documents.
Copies of such reports and drawings will be made available by Owner to any Bidder on request. Those reports and drawings are not part of the Contract Documents. Technical data has been identified and established in the Supplementary General Conditions.

4.2.3 See SC 17.08. Those certain dewatering issues, procedures, payment terms, submittal requirements, and close out terms which are the responsibility of the Bidder and which may impact Bidder's pricing of this Bid.

4.3 Information and data reflected in the Contract Documents with respect to 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 or others, and Owner does not assume responsibility for the accuracy or completeness thereof.

4.4 Provisions concerning responsibilities for the adequacy of data furnished to prospective Bidders on subsurface conditions, Underground Facilities and other physical conditions, and possible changes in the Contract Documents due to differing conditions appear in Paragraphs 4.2 and 4.3 of the General Conditions, and as may be amended in the Supplementary Conditions.

4.5 Before submitting a Bid, each Bidder will, at Bidder's own expense, make or obtain any additional examinations, investigations, explorations, tests and studies and obtain any additional information and data which pertain to the physical conditions (surface, subsurface and Underground Facilities) at or contiguous to the site or otherwise which may affect cost, progress, performance or furnishing of the Work and which Bidder deems necessary to determine its Bid for performing and furnishing the Work in accordance with the time, price and other terms and conditions of the Contract Documents.

4.6 Each Bidder will be required to get permission from property owners to obtain access to the site to conduct such explorations and tests as each Bidder deems necessary for submission of a Bid. Bidder shall fill all holes, clean up and restore the site to its former condition and to the satisfaction of the Engineer, upon completion of such explorations.

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

4.8 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 Contract Documents and such means, methods, techniques, sequences or procedures of construction as may be indicated in or required by the Contract Documents, and that the Contract Documents are sufficient in scope and detail to indicate and convey understanding of all terms and conditions for performance and furnishing of the Work.

5. INTERPRETATIONS AND ADDENDA

5.1 All questions about the meaning or intent of the Contract Documents are to be directed to Purchasing Department. Interpretations or clarifications considered necessary by Engineer in response to such questions will be issued by Addenda mailed, delivered, and/or e-mailed to all parties recorded by Engineer as having received the Bidding Documents. Questions received less than 7 days prior to the date for opening of Bids will not be answered. Only questions answered by formal written Addenda will be binding. Oral and other interpretations or clarifications will be without legal effect.

5.2 Addenda may also be issued to modify the Bidding Documents as deemed advisable by Owner or Engineer, with Owner’s approval.
6. **BID SECURITY**

6.1 Each Bid must be accompanied by Bid security made payable to Owner in an amount of five percent of the Bidder's maximum Bid price and in the form of a certified or cashier's check or a Bid Bond issued by a surety meeting the requirements of Paragraph 5.1 of the General Conditions and Paragraph 5.1 of the Supplementary General Conditions.

6.2 The Bid security of the Successful Bidder will be retained until such Bidder has executed the Agreement and furnished the required contract security and insurance, whereupon the Bid security will be returned. If the Successful Bidder fails to execute and deliver the Agreement and furnish the required contract security, insurance and other required contract documents within fifteen days after the Notice of Award, Owner may annul the Notice of Award and the Bid security of that Bidder will be forfeited. 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 the seventh day after the Effective Date of the Agreement or the forty-sixth day after the Bid opening, whereupon Bid security furnished by such Bidders will be returned. Bid security with Bids which are not competitive will be returned within seven days after the Bid opening.

The Bidder has agreed by signing this Bid that he fully understands the requirements of the bid documents.

Should the Bidder fail to return the Agreements, acceptable Bonds, Insurance Certificates and insurance policies within fifteen days of receipt of the documents, the Utility may charge excess costs generated by such delay at the rate of $100 for each day of delay. In the event more than two reviews of insurance submittals are required by the Utility's Risk Manager, the Successful Bidder will additionally reimburse the Utility for those costs at the rate of $125 per hour which will apply to each fifteen minute fraction thereof charged by the Risk Manager. These reimbursed costs will be deducted from the Bidders first Application for Payment or, in the event a Bid Bond is forfeited, such expenses may be reimbursed from the proceeds of the Bid Bond as part of the excess costs or reprocurement.

7. **CONTRACT TIME**

The numbers of Calendar Days within which, or the dates by which, the Work is to be substantially completed and also completed and ready for final payment (the Contract Time) are set forth in the Agreement. Completion within this time is of the essence in the performance of this contract.

8. **LIQUIDATED DAMAGES**

Provisions for liquidated damages, if any, are set forth in the Agreement and in the Supplementary General Conditions.

9. **SUBSTITUTE OR "OR EQUAL" ITEMS**

The Contract, if awarded, will be on the basis of materials and equipment described in the Drawings or specified in the Specifications without consideration of possible substitute or "or equal" items. Whenever it is indicated in the Drawings or specified in the Specifications that a substitute or "or equal" item of material or equipment may be furnished or used by Contractor is acceptable to Engineer, application for such acceptance will not be considered by Engineer until after the date of the Notice to Proceed. The procedure for submission of any such application by Contractor and consideration by Engineer is set forth in Paragraphs 6.7.1, 6.7.2, and 6.7.3 of the General Conditions and may be supplemented in the General Requirements.
10. **SUBCONTRACTORS, SUPPLIERS AND OTHERS**

10.1 The Bidder is required to identify all Subcontractors and Suppliers; to provide the value of each proposed subcontract or purchase order; and to provide their own and their subcontractor's business classification (Small Locally-Owned Business Enterprise, Minority Business Enterprise, Woman Owned Business Enterprise, or Other). The Bidder shall submit with his Bid a list of all proposed Subcontractors and Suppliers. Space for this submittal is provided within the Bid Proposal, Section 00300. Use additional sheets as necessary. The Bidder is encouraged to submit the MWBE Certification and Participation Summary Form with his Bid; the Form is not mandatory at the time bids are opened, but it must be submitted prior to Award. If requested by Engineer or by Owner, Bidder shall provide an experience statement with pertinent information regarding similar projects and other evidence of qualifications for each such Subcontractor, Supplier, person or organization. If Owner or Engineer, after due investigation, has reasonable objection to any proposed Subcontractor, Supplier, other person or organization, either Owner or Engineer may, before the Notice of Award is given, request the apparent Successful Bidder to submit an acceptable substitute, in which case the apparent Successful Bidder shall submit an acceptable substitute, that 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.

After Award, Bidder shall provide a copy of the proposed subcontracts (unexecuted copies are acceptable at this time) to Purchasing indicating the scope and the value of work to be subcontracted or to be obtained through a purchase order to a Supplier. After execution of this Agreement by Owner and Bidder, contractor shall provide copies of the executed subcontracts and purchase orders to Suppliers to the Owner's Contracts Department prior to submittal of the first Application for Payment.

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

10.3 The Bidder shall submit a Final Report of total payments made to each subcontractor and supplier, as part of the required close out documents.

**This submittal shall be made as a condition precedent to Final Payment.**

11. **BID FORM**

11.1 The Bid Form is included with the Bidding Documents; additional copies may be obtained from Owner.

11.2 All blanks on the Bid Form must be completed in ink. Bids which do not have all blanks filled in or completed may be rejected at the Owner's option.

11.3 Bids by corporations must be executed in the corporate name by the president or a vice president (or other corporate officer accompanied by evidence of authority to sign) and the corporate seal must be affixed and attested by the secretary or an assistant secretary. The corporate address and state of incorporation must be shown below the signature.

11.4 Bids by partnerships must be executed in the partnership name and signed by a partner, whose title must appear under the signature and the official address of the partnership must be shown below the signature.

11.5 All names must be printed below the signature.

11.6 The Bid shall contain an acknowledgment of receipt of all Addenda (the numbers of which must be filled in on the Bid Form).

11.7 The address and telephone number for communications regarding the Bid must be shown.
12. **SUBMISSION OF BIDS**

Bids shall be submitted at the time and place indicated in the Advertisement or Invitation to Bid and shall be enclosed in an opaque sealed envelope, marked with the Project title (and, if applicable, the designated portion of the Project for which the Bid is submitted) and name and address of the Bidder and accompanied by the Bid security and other required documents. If the Bid is sent through the mail or other delivery system, the sealed envelope shall be enclosed in a separate envelope with the notation "BID ENCLOSED" on the face of it. The Bid proposal packet must include an electronic version of the bid (e.g., saved on a compact disk).

13. **MODIFICATION AND WITHDRAWAL OF BIDS**

13.1 Bids may be modified or withdrawn by an appropriate document duly executed (in the manner that a Bid must be executed) and delivered to the place where Bids are to be submitted at any time prior to the opening of Bids.

13.2 If, within twenty-four 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 the mistake is clerical; that the mistake is so serious that enforcement of the Bid would be unconscionable; and that the mistake has occurred despite the exercise of ordinary care; that Bidder may withdraw its Bid and the Bid security will be returned. Thereafter, that Bidder will be disqualified from further bidding on the Work to be provided under the Contract Documents.

14. **OPENING OF BIDS**

Bids will be opened and (unless obviously nonresponsive) 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.

15. **BIDS TO REMAIN SUBJECT TO ACCEPTANCE**

All Bids will remain subject to acceptance for forty-five (45) days after the day of the Bid opening, but Owner may, in its sole discretion, release any Bid and return the Bid security prior to that date. In the case of State, Federal, or NADBank-funded projects, all Bids will remain subject to acceptance for ninety (90) days or such reasonable time as the funding agency may require.

16. **AWARD OF CONTRACT**

16.1 Owner reserves the right to reject any and all Bids, to waive any and all informalities not involving price, time or changes in the Work and the right to disregard all immaterial, nonconforming, nonresponsive, unbalanced or conditional Bids. Also, Owner reserves the right to 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 the Bidder, whether because the Bid is not responsive or the Bidder is not responsible because the Bidder is deemed to be unqualified or of doubtful financial ability or fails to meet any other pertinent criteria established by Owner under Paragraph 3 hereof. Discrepancies in 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. Any bids submitted in which there is a material failure to comply with the Bid requirements or specifications will be rejected and the contract will be awarded to the lowest responsible Bidder conforming to the specifications unless the Owner decides to reject all Bids.

16.2 In evaluating Bids, Owner will consider the responsiveness of the Bid, responsibility of the Bidders, 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.
16.3 Owner may consider the qualifications and experience of Subcontractors, Suppliers, and other persons and organizations proposed for those portions of the Work as to which the identity of Subcontractors, Suppliers, and other persons and organizations must be submitted as provided in the Supplementary General Conditions or other sections of this bid document. Owner also may consider the operating costs, maintenance requirements, performance data and guarantees of major items of materials and equipment proposed for incorporation in the Work when such data is required to be submitted prior to the Notice of Award or as a substitute.

16.4 Owner may conduct such investigations as Owner deems necessary to assist in the evaluation of any Bid and to establish the responsibility, qualifications and financial ability of Bidders, proposed Subcontractors, Suppliers and other persons and organizations to perform and furnish the Work in accordance with the Contract Documents to Owner's satisfaction within the prescribed time.

16.5 If the contract is to be awarded, it will be awarded to the lowest Bidder whose responsibility has been evaluated in accordance with these Instructions to Bidders.

16.6 If the contract is to be awarded, Owner will give the Successful Bidder a Notice of Award within forty-five (45) days after the day of the Bid opening. In the case of State or Federally-funded projects, Owner will give the Successful Bidder a Notice of Award within ninety (90) days after the day of the Bid opening, or such reasonable time as the funding agency may require.

17. **CONTRACT SECURITY**

Paragraph 5.1 of the General Conditions and the Supplementary General Conditions set forth Owner's requirements as to performance and payment Bonds. When the Successful Bidder delivers the executed Agreement to Owner, it must be accompanied by the required Performance and Payment Bonds and the Certificate of Insurance and insurance policies. A Payment Bond must be provided for contracts $25,000.00 or greater in value. If the contract requires an expenditure of less than $100,000, the Owner reserves the right to waive the requirement for a Performance Bond, provided that payment is not due to the Contractor until the Work is completed and accepted by the Owner. Any provision in any bond furnished in attempted compliance with House Bill No. 31 that expands or restricts the rights or liabilities provided under this Act shall be disregarded and the provisions of this Act shall be read into that Bond.

18. **SIGNING OF AGREEMENT**

When Owner gives a Notice of Award to the Successful Bidder, it will be accompanied by the required number of unsigned counterparts of the Agreement with all other written Contract Documents attached. Within ten days after, Contractor shall sign and deliver the required number of counterparts of the Agreement and attached documents to Owner with the required Bonds and a copy of the Certificate of Insurance along with a copy or copies of the actual Insurance policy or policies. Owner shall deliver fully signed final contract to Contractor when all pre-construction contract requirements have been met.

19. **PRE-BID CONFERENCE**

A pre-bid conference will be held at 04:00 pm on the 12 day of February 2020 at 1557 FM 1110, Clint, Texas. 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.

20. **SALES AND USE TAXES**

Owner is exempt from Municipal and State Sales and Use Taxes on materials and equipment to be incorporated in the Work. Said taxes shall not be included in the Contract Price. Refer to Supplementary General Conditions SC-6.15 for additional information.
QUALIFICATION AND FINANCIAL DISCLOSURE STATEMENT

BIDDER: _______________________________

PROJECT NAME: Mesa Del Norte Subdivision
Sanitary Sewer Improvements Phase II

1. ORGANIZATION

1.1 How many years has your organization been in business as a Contractor?

1.2 How many years has your organization been in business under its present business name?

1.2.1 Under what other or former names has your organization operated?

1.3 If your organization is a corporation, answer the following:

1.3.1 Date of incorporation: _______________________________

1.3.2 State of incorporation: _______________________________

1.3.3 President's name: _______________________________

1.3.4 Vice-president's name(s): _______________________________

1.3.5 Secretary's name: _______________________________

1.3.6 Treasurer's name: _______________________________

1.4 If your organization is a partnership, answer the following:

1.4.1 Date of organization: _______________________________

1.4.2 Type of partnership (if applicable): _______________________________

1.4.3 Name(s) of general partner(s): _______________________________

1.5 If your organization is individually owned, answer the following:

1.5.1 Date of organization: _______________________________

1.5.2 Name of owner: _______________________________

1.6 If the form of your organization is other than those listed above, describe it and name the principals:
2. LICENSING

2.1 List jurisdictions and trade categories in which your organization is legally qualified to do business, and indicate registration or license numbers, if applicable. Indicate name, license number and expiration date for Master Electrician or other trade required under the Instructions to Bidders section of this Bid.

2.2 List jurisdictions in which your organization's partnership or trade name is filed.

3. EXPERIENCE

3.1 List the categories of work that your organization normally performs with its own forces.

3.2 Claims and Suits. (If the answer to any of the questions below is yes, please attach details.)

3.2.1 Has your organization ever failed to complete any work awarded to it?

3.2.2 Are there any judgments, claims, arbitration proceedings or suits pending or outstanding against your organization or its officers?

3.2.3 Has your organization filed any law suits or requested arbitration with regard to construction contracts within the last five years?

3.3 Within the last five years, has any officer or principal of your organization ever been an officer or principal of another organization when it failed to complete a construction contract? (If the answer is yes, please attach details.)

3.4 On a separate sheet, list major construction projects your organization has in progress, giving the name of project, owner, architect, contract amount, percent complete and scheduled completion date.

3.4.1 State total worth of work in progress and under contract:

3.5 On a separate sheet, list the major projects your organization has completed in the past five years, giving the name of project, owner, architect, contract amount, date of completion and percentage of the cost of the work performed with your own forces.

3.5.1 State annual amount of construction work performed each year during the past five years:

3.6 On a separate sheet, list the construction experience and present commitments of the key individuals of your organization. Submit resumes of Key Personnel (as defined in Section 00100, Instructions to Bidders). Bidder hereby certifies that the Resident Superintendent has the authority to act on behalf of the Contractor at all times. No substitution shall be made without the written authorization of the Owner and the Engineer based upon acceptance of the qualifications of the proposed substitute.

3.7 On a separate sheet, provide evidence that the Bidder meets the minimum criteria called out in Section 00100, Instructions to Bidders. Provide similar evidence for Subcontractors, if required by Bid or by Engineer.

3.8 Provide the MWBE CERTIFICATION SUMMARY FORM found at the end of Section 00300.
4. REFERENCES

4.1 Trade References:

4.2 Bank References:

4.3 Surety:

Name and telephone number of Bonding Company: ___________________________

Name, telephone and address of Agent: ___________________________

5. FINANCING

5.1 Financial Statement

5.1.1 Attach a financial statement, preferably audited, including your organization's latest balance sheet and income statement showing the following items:

a. Cash Flow Statement

b. Notes to Financial Statement

c. Auditor Statement

d. Comparison Statements, if available

5.1.2 Name and address of firm preparing attached financial statement, and date thereof.

5.1.3 Is the attached financial statement for the identical organization named on page one?

5.1.4 If not, explain the relationship and financial responsibility of the organization whose financial statement is provided (e.g., parent-subsidiary).

5.2 Will the organization whose financial statement is attached act as guarantor of the contract for construction?

6. SIGNATURE

6.1 To be executed by a Principal of the firm authorized to certify the foregoing information:

, being duly sworn, deposes and says that the information provided herein is true and sufficiently complete so as not to be misleading.

6.2 Dated at __________ this _____ day of ______________, 20__.

Name of Organization: _________________________________________________

By: ___________________________________________________________________

(Printed Name)

Title: ___________________________________________________________________
### BID PROPOSAL CHECKLIST

<table>
<thead>
<tr>
<th>Section</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>00100/00300</td>
<td><strong>1. MANDATORY:</strong> Signed Bid Form with all blanks filled in, including acknowledgement of any issued addenda and names of all Subcontractors and Suppliers.</td>
</tr>
<tr>
<td>00100/00300</td>
<td><strong>2. MANDATORY:</strong> Original and Notarized Bid Security or Bond</td>
</tr>
<tr>
<td>00100/00300</td>
<td><strong>3. MANDATORY:</strong> Certificate of Insurance Availability</td>
</tr>
<tr>
<td>00100/00300</td>
<td><strong>4. MANDATORY:</strong> Names and categories (SMLB, MBE OR WBE) of all Subcontractors and Suppliers with SMLB, MBE OR WBE certifications</td>
</tr>
<tr>
<td>00100/00300</td>
<td><strong>5. MANDATORY:</strong> Evidence of Good Faith Efforts if Minority Participation Goals are not met</td>
</tr>
<tr>
<td>000100/00300</td>
<td><strong>6. MANDATORY:</strong> Electronic version of the Bid Proposal (saved on a Compact Disk)</td>
</tr>
<tr>
<td>000100/00300</td>
<td><strong>7. MANDATORY:</strong> Qualification Statement and Qualifications of Key Personnel (included in Section 00100)</td>
</tr>
</tbody>
</table>

### POST-BID/PRE-AWARD CHECKLIST

<table>
<thead>
<tr>
<th>Section</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>00100/00810</td>
<td><strong>1. MANDATORY:</strong> Evidence of Worker’s Compensation Insurance Coverage: a Certificate of Insurance or Form DWC-81, DWC-82, DWC-83, DWC-84, DWC-85 or if self-insured, a coverage agreement filed with the Texas Worker's Compensation Commission's Division of Self Insurance Regulation.</td>
</tr>
<tr>
<td>00100/00810</td>
<td><strong>2. MANDATORY:</strong> If employees provided by leasing company, evidence of Texas State License and copy of their Worker's Compensation policy. If no leased employees will be used, provide a letter on Contractor's letterhead stating so.</td>
</tr>
<tr>
<td>00100/00300</td>
<td><strong>3. MANDATORY:</strong> Financial Statements</td>
</tr>
<tr>
<td>00100/00300</td>
<td><strong>4. MANDATORY:</strong> Updated Minority Certification And Participation Summary</td>
</tr>
</tbody>
</table>
SECTION 00300

BID FORM

PROJECT IDENTIFICATION: Lower Valley Water District

MESA DEL NORTE SUBDIVISION
SANITARY SEWER IMPROVEMENTS PHASE II

LVWD BID NO.: 20-0227-01

Name and Address of OWNER: Lower Valley Water District
1557 FM 1110
P.O. Box 909
Clint, Texas 79836

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

2. BIDDER accepts all of the terms and conditions of the Advertisement or Invitation to Bid and Instructions to Bidders, including without limitation those dealing with the disposition of Bid security. This Bid will remain subject to acceptance for forty-five days after the day of Bid opening. In the case of State, Federal, or NADBank-funded projects, all Bids will remain subject to acceptance for 90 days or such reasonable time as the funding agency may require. BIDDER will sign and submit the Agreement with the Bonds and other documents required by the Bidding Requirements within fifteen days after the date of OWNER's Notice of Award.

3. In submitting this Bid, BIDDER represents, as more fully set forth in the Agreement, that:

   A. BIDDER has examined copies of all the Bidding Documents and of the following Addenda (receipt of all which is hereby acknowledged):

      | Date | Number |
      |------|--------|
      |       |        |
      |       |        |
      |       |        |

   B. BIDDER has familiarized itself with the nature and extent of the Contract Documents, Work, site, locality, and all local conditions and Laws and Regulations that in any manner may affect cost, progress, performance or furnishing of the Work.

   C. BIDDER has studied carefully all reports and drawings of subsurface conditions and drawings of physical conditions which are identified in the Supplementary Conditions as provided in Paragraph 4.2 of the General Conditions, and accepts the determination set forth in Paragraph SC-4.2 of the Supplementary Conditions of the extent of the technical data contained in such reports and drawings.
D. BIDDER has obtained and carefully studied (or assumes responsibility for obtaining and carefully studying) all such examinations, investigations, explorations, tests and studies (in addition to or to supplement those referred to in "C."
above) which pertain to the subsurface or physical conditions at the site or otherwise may affect the cost, progress, performance or furnishing of the Work as BIDDER considers necessary for the performance or furnishing of the Work at the Contract Price, within the Contract Time and in accordance with the other terms and conditions of the Contract Documents, including specifically the provisions of Paragraph 4.2 of the General Conditions.

E. BIDDER has reviewed and checked all information and data shown or indicated on the Contract Documents with respect to existing Underground Facilities at or contiguous to the site and assumes responsibility for the accurate location of said Underground Facilities.

F. BIDDER has correlated the results of all such observations, examinations, investigations, explorations, tests, reports and studies with the terms and conditions of the Contract Documents.

G. BIDDER has given ENGINEER written notice of all conflicts, errors or discrepancies that it has discovered in the Contract Documents and the written resolution thereof by ENGINEER is acceptable to BIDDER.

H. This Bid is genuine and not made in the interest of or on behalf of any undisclosed person, firm or corporation and is not submitted in conformity with any agreement or rules of any group, association, organization or corporation; BIDDER has not directly or indirectly induced or solicited any other Bidder to submit a false or sham Bid; BIDDER has not solicited or induced any person, firm or corporation to refrain from bidding; and BIDDER has not sought by collusion to obtain for itself any advantage over any other Bidder or over OWNER.

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

UNIT PRICE SCHEDULE FOR BASE BID No. 1:
MESA DEL NORTE SUBDIVISION SANITARY SEWER IMPROVEMENTS PHASE II

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Estimated Quantity</th>
<th>UOM</th>
<th>Brief Description of Item</th>
<th>Unit Bid Price</th>
<th>Extended Amount (Qty x Unit Price)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>1</td>
<td>L.S.</td>
<td>Insurance, Bonds, and Mobilization/Demobilization, Not to Exceed 5% of Bid Items No. 2 through 16.</td>
<td>$</td>
<td>$</td>
</tr>
<tr>
<td>2.</td>
<td>680</td>
<td>L.F.</td>
<td>Furnish and Install 8-Inch Diameter Sanitary Sewer Pipe (SDR-35). Including all material, labor and all related appurtenances. Complete in Place.</td>
<td>$</td>
<td>$</td>
</tr>
<tr>
<td>3.</td>
<td>135</td>
<td>L.F.</td>
<td>Furnish and Install 2-Inch Diameter Water Pipe Type K-Copper, within TxDOT R.O.W. Including all material, labor and all related appurtenances. Complete in Place.</td>
<td>$</td>
<td>$</td>
</tr>
<tr>
<td>Item No.</td>
<td>Estimated Quantity</td>
<td>UOM</td>
<td>Brief Description of Item</td>
<td>Unit Bid Price</td>
<td>Extended Amount (Qty x Unit Price)</td>
</tr>
<tr>
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</tr>
<tr>
<td>4.</td>
<td>1</td>
<td>EA</td>
<td>Furnish and Install 3/4-Inch Water Service with Meter and backflow preventer. Including all material, labor and all related appurtenances. Complete in Place.</td>
<td></td>
<td>$</td>
</tr>
<tr>
<td>5.</td>
<td>1</td>
<td>EA</td>
<td>Furnish and Install 1-Inch Water Service with Meter and backflow preventer. Including all material, labor and all related appurtenances. Complete in Place.</td>
<td></td>
<td>$</td>
</tr>
<tr>
<td>6.</td>
<td>120</td>
<td>L.F</td>
<td>Furnish and Install 16-Inch Diameter Steel Casing by Boring Methods. Including all material, labor and all related appurtenances. Complete in Place.</td>
<td></td>
<td>$</td>
</tr>
<tr>
<td>7.</td>
<td>110</td>
<td>L.F</td>
<td>Furnish and Install 4-Inch Diameter Steel Casing by Boring Methods. Including all material, labor and all related appurtenances. Complete in Place.</td>
<td></td>
<td>$</td>
</tr>
<tr>
<td>8.</td>
<td>1</td>
<td>EA</td>
<td>Furnish and Install 72-Inch Diameter Manhole (6’ Standard) Including all material, labor and all related appurtenances. Complete in Place.</td>
<td></td>
<td>$</td>
</tr>
<tr>
<td>9.</td>
<td>5</td>
<td>V.F</td>
<td>Additional Vertical Depth of 72-Inch Manhole, including all material, labor &amp; all related appurtenances. Complete in Place.</td>
<td></td>
<td>$</td>
</tr>
<tr>
<td>10.</td>
<td>1</td>
<td>EA</td>
<td>Furnish and Install 48-Inch Diameter Manhole (6’- Standard). Including all material, labor and all related appurtenances. Complete in Place.</td>
<td></td>
<td>$</td>
</tr>
<tr>
<td>11.</td>
<td>5</td>
<td>V.F</td>
<td>Additional Vertical Depth of 48-Inch Manhole, including all material, labor &amp; all related appurtenances. Complete in Place.</td>
<td></td>
<td>$</td>
</tr>
<tr>
<td>12.</td>
<td>290</td>
<td>SY</td>
<td>Removal and Replacement of Existing HMAC Pavement, including Base Course/2-Sac, all material, labor &amp; all related appurtenances. Complete in Place.</td>
<td></td>
<td>$</td>
</tr>
<tr>
<td>Item No.</td>
<td>Estimated Quantity</td>
<td>UOM</td>
<td>Brief Description of Item</td>
<td>Unit Bid Price</td>
<td>Extended Amount</td>
</tr>
<tr>
<td>---------</td>
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<td>------------------------------------------------------------------------------------------</td>
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</tr>
<tr>
<td>13</td>
<td>450</td>
<td>L.F</td>
<td>Removal and Replacement of Existing Rolled Curb, including Base Course, and all material, labor &amp; all related appurtenances. Complete in Place.</td>
<td>$</td>
<td>$</td>
</tr>
<tr>
<td>15</td>
<td>1</td>
<td>L.S.</td>
<td>Provide and Maintain Approved Traffic Control. Including all material, labor and all related appurtenances. Complete in Place.</td>
<td>$</td>
<td>$</td>
</tr>
<tr>
<td>16</td>
<td>1</td>
<td>L.S.</td>
<td>Videotape project limits, Before and After Construction, including all material, labor &amp; all related appurtenances.</td>
<td>$</td>
<td>$</td>
</tr>
</tbody>
</table>

**TOTAL BASE BID No.1 (ITEMS 1 THROUGH 16)**

Quantities are not guaranteed.

**TOTAL BASE BID No.1 (in words)**

---

**UNIT PRICE SCHEDULE FOR ADDITIVE ALTERNATE No. 1: MESA DEL NORTE SUBDIVISION SANITARY SEWER IMPROVEMENTS PHASE II**

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Estimated Quantity</th>
<th>UOM</th>
<th>Brief Description of Item</th>
<th>Unit Bid Price</th>
<th>Extended Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>L.S.</td>
<td>Sewage Pumping System and Effluent Tanks including pumps, valves, fittings, all components and accessories, all site improvements and a 16 foot wide all-weather access road, 24-inch diameter RCP as shown on Plan Sheet C3.1 of the Contract Drawings including all related appurtenances. Complete in Place.</td>
<td>$</td>
<td>$</td>
</tr>
</tbody>
</table>

**TOTAL ADDITIVE ALTERNATE No.1 (ITEMS 1)** $

Quantities are not guaranteed.

**TOTAL ADDITIVE ALTERNATE No.1 (in words)**
### UNIT PRICE SCHEDULE FOR ADDITIVE ALTERNATE No. 2:
MESA DEL NORTE SUBDIVISION SANITARY SEWER IMPROVEMENTS PHASE II

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Estimated Quantity</th>
<th>UOM</th>
<th>Brief Description of Item</th>
<th>Unit Bid Price</th>
<th>Extended Amount (Qty x Unit Price)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>L.S.</td>
<td>Connection of existing sanitary sewer system to divert service to the existing LVWD sanitary sewer system. Including all additional pipe, installation of cast-in-place manholes, coring and/or existing manholes, and additional vertical depths; Cutting, connecting and/or capping of existing water main(s) to properly complete a functional LVWD water system. Including all asphalt removal and replacement (including base course), rolled curb, trench safety system, traffic control and videotape of the project as shown on Plan Sheet C3.2 of the Contract Drawings including all related appurtenances. Complete in Place.</td>
<td>$_____________</td>
<td>$_____________</td>
</tr>
</tbody>
</table>

**TOTAL ADDITIVE ALTERNATE No.2 (ITEMS 1)**  $_________________________

Quantities are not guaranteed.

**TOTAL ADDITIVE ALTERNATE No.2 (in words)**

---

In accordance with Section 151.311 of the Texas Tax Code (V.A.T.C.S.), regarding taxes on materials and services, and requiring a separated contract, the following is the breakdown of cost for materials and cost for labor for this bid:

**MATERIALS TO BE INCORPORATED IN PROJECT NOT SUBJECT TO SALES TAX:**  $_________________________

**LABOR TO BE INCORPORATED IN PROJECT NOT SUBJECT TO SALES TAX:**  $_________________________

**RENTAL EQUIPMENT AND OTHER TAXABLE ITEMS:**  $_________________________

**OTHER (I.E. BONDS, INSURANCE, CAPITAL EQUIPMENT, ETC.):**  $_________________________

**TOTAL CONTRACT (TOTAL MUST EQUAL TOTAL BASE PRICE):**  $_________________________
5. BIDDER agrees that the Work will be complete within **120** Calendar Days after the date when the Contract time commences to run as provided in Paragraph 2.3 of the General Conditions as modified in the Supplementary Conditions.

BIDDER accepts the provisions of the Supplementary Conditions and the Agreement as to liquidated damages in the event of failure to complete the Work on time.

6. BIDDER MUST ANSWER THE FOLLOWING QUESTIONS: (Refer to INSTRUCTIONS TO BIDDERS for definitions.)

   A. Is the bidder that is making and submitting this bid a "RESIDENT BIDDER" or a "NONRESIDENT BIDDER"?

   Answer: __________________________________________________________

   B. If the bidder is a "NONRESIDENT BIDDER", does the state in which the Nonresident Bidder's principal place of business is located have a law requiring a Nonresident Bidder of that state to bid a certain amount of percentage under the bid or a Resident Bidder of that state in order for the nonresident bidder of that state to be awarded a contract on his bid in such state?

   Answer: __________________________________________________________

   C. If the answer to Question Number 2 is "yes", then what amount or percentage must a Texas Resident Bidder bid under the bid of a Resident Bidder of that state in order to be awarded a contract on such bid in said state?

   Answer: __________________________________________________________

7. The following documents are attached to and made a condition of this Bid:

   A. Required Bid Security in the form of __________________________________________

   B. A tabulation of all Subcontractors who will provide labor at the site of the work or render services to the CONTRACTOR in or about the construction of the work and Suppliers and other persons and organizations is required to be identified in this Bid. Complete the following table, designating each as Small Locally-Owned Business Enterprise (SMLB), Minority Business Enterprise (MBE), Women-Owned Business Enterprise (WBE), or Other (not either SMLB, WBE MBE) is required. Only one category may be checked. Include the work item and value of work to be provided by the Prime Contractor, as well as its category.
C. Will the Contractor meet the Small Locally Owned Business Enterprise, Minority Business Enterprise and Women-Owned Business Enterprise goals as required by these contract documents and the funding agencies?

YES              NO _____

If "YES", include above each of the firms to be used, their business status as a MBE, WBE or SMLB, the proposed dollar value and type of work to be performed.

If "NO", documentation supporting good faith effort is required.

8. Communications concerning this Bid shall be addressed to the following named individual, address, telephone number, and facsimile number:

Name: _________________________________________________
Address: _________________________________________________
_________________________________________________

Phone: ______________________ Fax: _____________
E-Mail ______________________________

9. The terms used in this Bid which are defined in the General Conditions of the Construction Contract included as part of the Contract Documents have the meanings assigned to them in the General Conditions.

SUBMITTED on ______________________, 20 ____.
If BIDDER is:

**An Individual**

By ________________________________ (SEAL)

(Name of Bidder)

______________________________

(Title)  (Signature)

doing business as __________________________

Business address: __________________________

______________________________

Phone No.: __________________________

**A Partnership**

By ________________________________ (SEAL)

(Firm Name)

______________________________

(Signature - general partner)

Business address: __________________________

______________________________

Phone No.: __________________________
A Corporation

By____________________________________________________________________________
(Corporation Name)
_____________________________________________________________________________
(state of incorporation)
By____________________________________________________________________________
(name of person authorized to sign)
_____________________________________________________________________________
(Title) (Signature)
(Corporate Seal)
Attest_________________________________________________________________________
(Secretary)
Business address:_______________________________________________________________
______________________________________________________________________________
Phone No.:_____________________________________________________________________
Federal Tax Identification Number
When proposing as a Corporation, Bidder swears and affirms by signing this Bid that the proposing
Corporation is currently in existence, is currently authorized to do business in the State of Texas (or State of
incorporation) and that no franchise tax reports or payments are delinquent as of the date of this Bid Proposal.
The Bidder will provide a Certificate of Account Status with the signed Contract Documents. See the
Agreement, Section 00500, for the sample form which is to be obtained by the successful Contractor from
the Texas (or other state) Comptroller of Public Accounts and submitted as part of the final, executed Contract
Documents.
CERTIFICATION OF INSURANCE AVAILABILITY

Date ___________________________________

I, ______________________________________ (Name of Insurance Agent), certify that I have reviewed the insurance requirements listed in Article 5 of the Supplementary Conditions of the specifications for the Mesa del Norte Subdivision Sanitary Sewer Improvements Phase II LVWD BID No. 20-0227-01, and further certify that ______________________________________ (Name of Bidder) has or can obtain the insurance coverage required by this Project so that a certificate of insurance and a copy(s) for the actual insurance policies can be submitted to the Owner within fifteen (15) days of the Notice of Award.

Signed____________________________________

Title______________________________________

Insurance Agency___________________________

Address___________________________________

Telephone_________________________________
MINORITY CERTIFICATION
AND
PARTICIPATION SUMMARY
(LVWD FUNDED PROJECTS)

BID NUMBER: 20-0227-01

BID TITLE: MESA DEL NORTE SUBDIVISION SANITARY SEWER IMPROVEMENTS PHASE II

I certify that the Minority (MBE) and Women's Business Enterprises (WBE) and Small Locally Owned Businesses (SMLB) participating in this project are qualified in accordance with the Minority requirements included in the above listed Bid Documents and that we will ensure all consultants, contractors, suppliers and subcontractors will comply with the Minority guidelines. Definitions of each category are found in the 00100, Instructions to Bidders Section. Attached are:

Solicitation Documents: __________________________  Proposed Subcontracts for the below listed firms: ________________

<table>
<thead>
<tr>
<th>MBE, WBE or SMLB FIRM NAME</th>
<th>ADDRESS</th>
<th>PHONE</th>
<th>CONTRACT AMOUNT</th>
<th>MBE</th>
<th>WBE</th>
<th>SMLB</th>
</tr>
</thead>
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</tbody>
</table>

The attached documents outline the efforts taken in complying with the Minority Guidelines.

__________________________________________  _______________________________________________
CONTRACTOR                                  SIGNATURE OF AUTHORIZED REPRESENTATIVE

__________________________________________  _______________________________________________
DATE                                        PRINTED NAME OF AUTHORIZED REPRESENTATIVE
January 5, 2008

CERTIFIED MAIL / RETURN RECEIPT REQUESTED

Amazing Results Landscape and Supply Company
111 Red Rock Terrace
Lignite, Texas 72533

Gentlemen:

We are actively seeking MWBE Contractors and suppliers for work to be done under Project Number 123456, Sewer System Improvements, City of Anywhere, Texas. The work will consist of utility work, concrete, paving, fencing, landscaping, masonry, excavation and trucking, barricades, back-hoe work and supplies and materials.

Plans and specifications may be viewed or obtained at the project engineer’s general offices, Bing, Campbell and Associates, 19510 Jackson Blvd., Muleshoe, Texas 76698.

All bids must be submitted to the above mentioned address by Noon, Friday, February 16, 2008.

Sincerely,

John Q. Doe, Project Director
Acme Construction
January 12, 2008

Mr. John Q. Doe, Project Director
Acme Construction
10518 Burr Oak Drive
San Antonio, Texas 78609

RE: PROJECT NO. 123456, ANYWHERE TEXAS SEWER SYSTEM IMPROVEMENTS PROJECT

Dear Mr. Doe:

We wish to submit the following bid for the above mentioned project:

St. Augustine sod – 900 square yards at $1.75 per square yard $1,575.00
(Includes installation, rolling, fertilizing, and days of watering)

Hydro-Mulch – 15 acres at $1,175 per acre $17,625.00
(5-acre minimum pre trip; No water; No maintenance; areas that do not germinate will be reseeded) Proper watering is the responsibility of customer.

Hay Bales – We will furnish and install at a rate of $15.00 per bale

We look forward to hearing from you concerning our bid. Thank you.

Sincerely,

Theodore T. “Red” Robbins
Manager

*** A Certified MBE FIRM ***
January 5, 2008

CERTIFIED MAIL / RETURN RECEIPT REQUESTED

Rider Excavation Services
7856 Dry Gulch
Little Indian Mound, Texas 74561

Gentlemen:

We are actively seeking MWBE Contractors and suppliers for work to be done under Project Number 123456, Sewer System Improvements, City of Anywhere, Texas. The work will consist of utility worm, concrete, paving, fencing, landscaping, masonry, excavation and trucking, barricades, back-hoe work and supplies and materials.

Plans and specifications may be viewed or obtained at the project engineer’s general offices, Bing, Campbell and Associates, 19510 Jackson Blvd., Muleshoe, Texas 76698.

All bids must be submitted to the above mentioned address by Noon, Friday, February 16, 2008.

Sincerely,

John Q. Doe, Project Director
Acme Construction
January 8, 2008

Mr. John Q. Doe, Project director
Acme Construction
10518 Burr Oak Drive
San Antonio, Texas 78609

RE: PROJECT NO. 123456
ANYWHERE TEXAS SEWER SYSTEM IMPROVEMENTS PROJECT

Dear Mr. Doe:

Thank you for your letter of January 5, 2008 requesting bids for the Anywhere, Texas Sewer System Improvements Project. We will not be submitting a bid because we are scheduled to begin work on another project that is projected to start on approximately the same date as ours.

We appreciate the opportunity to participate in your project. Please contact us again for any future projects.

Sincerely,

Easy Rider President
Rider Excavation Services
January 5, 2008

CERTIFIED MAIL / RETURN RECEIPT REQUESTED

Shadow Paving
P. O. Box 903
Pharr, Texas 72579

Gentlemen:

We are actively seeking MWBE Contractors and suppliers for work to be done under Project Number 123456, Sewer System Improvements, City of Anywhere, Texas. The work will consist of utility work, concrete, paving, fencing, landscaping, masonry, excavation and trucking, barricades, backhoe work and supplies and materials.

Plans and specifications may be viewed or obtained at the project engineer’s general offices, Bing, Campbell and Associates, 19510 Jackson Blvd., Muleshoe, Texas 76698.

All bids must be submitted to the above mentioned address by Noon, Friday, February 16, 2008.

Sincerely,

John Q. Doe, Project Director
Acme Construction
January 8, 2008

Acme Construction
John Q. Doe, Project Director
10518 Burr Oak Dr.
San Antonio, TX 78609

Dear Mr. Doe:

Thank you for your letter of January 5, 2008 requesting a bid for the paving portion of the Anywhere, Texas Sewer System Improvements Project. Because of the distance of the project from our offices, we will not be interested in submitting a bid.

We appreciate your interest in our services. Please keep us in mind for future projects that may require expertise and services.

Sincerely,

Elmer A. Paver
Office Manager, Shadow Paving
January 5, 2008

CERTIFIED MAIL / RETURN RECEIPT REQUESTED

Construction Trades Newsletter
100 Someplace Dr.
P. O. Box 500
Anywhere, Texas 08654

Attn: Ms. Glory Everett, Editor

Dear Ms. Everett:

Please publish the following in the “Public Notices” section of your weekly newsletter on the following dates: 1/11/08; 1/18/08; 1/25/08; and 2/1/08.

“Acme Construction is soliciting subcontract and material bids in connection with the Improvements to the Sewer System for the City of Anywhere, Texas. Qualified MBE and WBE firms are encouraged to submit bids in response to this invitation. The work will consist of utility work, concrete, paving, fencing, landscaping, masonry, excavation and trucking, barricades, back-hoe work and supplies and materials. Plans and specifications may be viewed or obtained at the project engineer’s general offices, Bing, Campbell and Associates, 19510 Jackson Blvd., Muleshoe, Texas 76698. Telephone No. 512-557-2091, Fax 512-557-2090. All bids must be submitted to the above mentioned address by Noon, Friday, February 16, 2008”.

Please bill Acme Construction, 10518 Burr Oak Drive, San Antonio, Texas 78609. The person authorizing the placement of this ad is B. J. Tenfold. If you have any questions, you may contact Mr. Tenfold at 512-557-7000.

Sincerely,

B. J. Tenfold
Manager of Accounts
January 5, 2008

CERTIFIED MAIL / RETURN RECEIPT REQUESTED

Anywhere Weekly Courier
1111 Main Street
P. O. Box 1
Anywhere, Texas 08654

Attn: Mr. Bucky Beaver, Circulation Manager

Dear Mr. Beaver:

Please publish the following in the “Public Notices” section of your weekly newspaper editions on the following dates: 1/11/08; 1/18/08; 1/25/08; and 2/1/08.

“Acme Construction is soliciting subcontract and material bids in connection with the Improvements to the Sewer System for the City of Anywhere, Texas. Qualified MBE and WBE firms are encouraged to submit bids in response to this invitation. The work will consist of utility work, concrete, paving, fencing, landscaping, masonry, excavation and trucking, barricades, back-hoe work and supplies and materials. Plans and specifications may be viewed or obtained at the project engineer’s general offices, Bing, Campbell and Associates, 19510 Jackson Blvd., Muleshoe, Texas 76698. Telephone No. 512-557-2091, Fax 512-557-2090. All bids must be submitted to the above mentioned address by Noon, Friday, February 16, 2008”.

Please bill Acme Construction, 10518 Burr Oak Drive, San Antonio, Texas 78609. The person authorizing the placement of this ad is B. J. Tenfold. If you have any questions, you may contact Mr. Tenfold at 512-557-7000.

Sincerely,

B. J. Tenfold
Manager of Accounts
Before me Homer Shortcut, a Notary Public in and for GHI County, Texas on this day personally appeared Bucky Beaver, Circulation Manager for Small Town Newspapers Group, Inc., publishers of the Anywhere Weekly Courier, who being by me duly sworn did depose and say that said newspaper has been published continuously for more than fifty-two weeks prior to the first insertion of this Legal Notice Number 879 at GHI County, Texas and the attached printed copy of the legal notice is a true copy of the original and was printed weekly on the following date(s): 1/11/08; 1/18/08; 1/25/08; 2/1/08.

Circulation Manager
Anywhere Weekly Courier
Small Town Newspaper Group, Inc.

Appeared and sworn to before me on this 21st day of January, 2008

NOTARY PUBLIC in and for the State of Texas
My Commission expires 12/28/2010

Legal Notice as Published

Acme Construction is soliciting subcontract and material bids in connection with the Improvements to the Sewer System for the City of Anywhere, Texas. Qualified MBE and WBE firms are encouraged to submit bids in response to this invitation. The work will consist of utility work, concrete, paving, fencing, landscaping, masonry, excavation and trucking, barricades, back-hoe work and supplies and materials. Plans and specifications may be viewed or obtained at the project engineer’s general offices, Bing, Campbell and Associates, 19510 Jackson Blvd., Muleshoe, Texas 76698. Telephone No. 512-557-2091, Fax 512-557-2090. All bids must be submitted to the above mentioned address by Noon, Friday, February 16, 2008.
BID BOND

KNOW ALL MEN BY THESE PRESENTS, that we the undersigned, ____________________________________________ as PRINCIPAL, AND ___________________________________________ as SURETY are held and firmly bound unto ______________________________________ hereinafter called the “Local Public Agency”, in the penal sum of _______________________________________________ Dollars, ($_________________), lawful money of the United States, for the payment for which sum well and truly to be made we bind ourselves, our heirs, executors, administrators, successors, and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH, that Whereas the Principal has submitted the accompanying Bid, dated ____________________________, 20____, for Mesa del Norte Subdivision Sanitary Sewer Improvements Phase II.

NOW, THEREFORE, if the Principal shall not withdraw said Bid within the period specified therein after the opening of the same, or, if no period be specified, within thirty (30) days after the said opening, and shall within the period specified therefore, or if no period by specified, within ten (10) days after the prescribed forms are presented to him for signature, enter into a written Contract with the Local Public Agency in accordance with the Bid as accepted, and give bond with good and sufficient surety or sureties, as may be required, for the faithful performance and proper fulfillment of such contract or in the event of the withdrawal of said Bid within the period specified, or the failure to enter into such Contract and give such bond within the time specified, if the Principal shall pay Local Public Agency the difference between the amount specified in said Bid and the amount for which the Local Public Agency may procure the required work or supplies or both, if the latter be in excess of the former, then the above obligation shall be void and of no effect, otherwise to remain in full force and virtue.

IN WITNESS WHEREOF, the above-bounded parties have executed this instrument under their several seals this ________ day of ___________________________, 20___, the name and corporate seal of each corporate party being hereto affixed and these present signed by its undersigned representative, pursuant to authority of its governing body.

(SEAL)

(SEAL)

Attest: By: ________________________________

_____________________________________

By: ________________________________

Countersigned
By: ________________________________

Attorney-in-Fact, State of ________________________________

__________________________________________________________________________

1 Forms of Bid Bonds prepared to meet the requirements of local or State laws or the needs of the Local Public Agency should be substituted for this form where necessary.

2 Power-of-attorney for person signing for surety company must be attached to bond.
SECTION 00500

STANDARD FORM OF AGREEMENT BETWEEN OWNER AND CONTRACTOR ON THE BASIS OF A STIPULATED PRICE

THIS AGREEMENT is dated as of the __________ day of __________ in the year 201__ by and between Lower Valley Water District (hereinafter called OWNER) and ________________________________________________________________________
__________________________________________________________________________
(hereinafter called CONTRACTOR). OWNER and CONTRACTOR, in consideration of the mutual covenants hereinafter set forth, agree as follows:

ARTICLE 1. WORK.

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

MESA DEL NORTE SUBDIVISION
SANITARY SEWER IMPROVEMENTS PHASE II

The work under this contract shall be for furnishing all labor, materials, transportation and services for the construction and installation of the following work:

The improvements for this project consist of the Water and Sewer Improvements of Mesa del Norte Subdivision. In general, the work will encompass:

BASE BID No.1: The installation of approximately 680 linear feet of 8-inch diameter sanitary sewer pipe (SDR-35, P.V.C.); approximately 120 linear feet of 16-inch diameter steel pipe casing by boring methods; 1 – 48-inch diameter manhole; approximately 1-72-inch diameter manhole (cast in place); approximately 10 vertical feet of additional manhole depth. Approximately, 135 linear feet of 2-inch diameter potable water line (K-Copper) with water services of various sizes; approximately 110 linear feet of 4-inch diameter steel pipe casing by boring methods. Approximately 290 square yards of hot mix asphaltic concrete pavement replacement including base course; trench safety system; videotaping of project site before and after construction; and a traffic control plan on TX DOT & El Paso County Right of Ways.

ADDITIVE ALTERNATE No.1: The installation of all By-Passing Sewage Pumping System and Effluent Tanks, including all pumps, valves, fittings, all components and accessories; including all site improvements and a 16-foot-wide all-weather access road; new installation of a 24-inch diameter RCP.

ADDITIVE ALTERNATE No.2: The connection of existing sanitary sewer system to divert service to the existing LVWD sanitary sewer system. Including all cutting of pipe, additional pipe, installation of cast in place manholes, coring and/or existing manholes, and additional vertical depths. Cutting, connecting and/or capping of existing waterline main(s) to properly complete a functional LVWD water system. Including all asphalt removal and replacement (including base course), rolled curb, trench safety system, traffic control and videotape of the project.

ARTICLE 2. ENGINEER.

The Project has been designed by CEA GROUP who is hereinafter called ENGINEER and who is to act as OWNER's representative, assume all duties and responsibilities and have the rights and authority assigned to ENGINEER in the Contract Documents in connection with completion of the Work in accordance with the Contract Documents.

ARTICLE 3. CONTRACT TIME.

3.1 The Work will be Substantially completed within 120 Calendar Days from the date when the Contract Time commences to run as provided in Paragraph 2.03 of the General Conditions, and as revised in Supplementary Conditions, and completed and ready for final payment in accordance with Paragraph 14.07 of the General Conditions, and as revised in the Supplementary Conditions, within 150 calendar days.
Final completion includes CONTRACTOR’S resolution of all punch list items and CONTRACTOR’S submission of required close-out documentation. Any failure of the CONTRACTOR to complete the project within the contract time will be considered a material breach of this contract.

3.2 Liquidated Damages. OWNER and CONTRACTOR recognize that time is of the essence of this Agreement and that OWNER will suffer financial loss and public inconvenience if the Work is not completed and the submittals are not submitted within the times specified in Paragraph 3.1 above, plus any extensions thereof allowed in accordance with Article 12 of the General Conditions. They also recognize the delays, expense and difficulties involved in proving in a legal proceeding the actual loss suffered by OWNER if the Work is not completed on time. Accordingly, instead of requiring any such proof, OWNER and CONTRACTOR agree that as liquidated damages for delay (but not as a penalty) CONTRACTOR shall pay OWNER the sum of **One Thousand One Hundred Seventy Dollars & No Cents ($ 1,170.00)** for each Calendar Day that expires after the time specified in the Agreement for Substantial Completion until the Work is substantially complete. After Substantial Completion, if CONTRACTOR shall neglect, refuse or fail to complete the remaining Work within the Contract Time or any proper extension thereof granted by OWNER, CONTRACTOR shall pay OWNER **Five Hundred Dollars & No Cents ($ 500.00)** for each Calendar Day that expires after the time specified in the Agreement for completion and readiness for final payment.

ARTICLE 4. CONTRACT PRICE.

4.1 OWNER shall pay CONTRACTOR for completion of the Work in accordance with the Contract Documents in current funds, per the attached CONTRACTOR's Bid in accordance with the below listed separate charges:

- **MATERIALS TO BE INCORPORATED IN PROJECT NOT SUBJECT TO SALES TAX:** $__________
- **LABOR TO BE INCORPORATED IN PROJECT NOT SUBJECT TO SALES TAX:** $__________
- **RENTAL EQUIPMENT AND OTHER TAXABLE ITEMS:** $__________
- **OTHER (I.E. BONDS, INSURANCE, CAPITAL EQUIPMENT, ETC.):** $__________

**TOTAL CONTRACT:** $__________

*TOTAL MUST EQUAL TOTAL BID PRICE*

ARTICLE 5. PAYMENT PROCEDURES.

CONTRACTOR shall submit Applications for Payment in accordance with Article 14 of the General Conditions. Applications for Payment will be processed by ENGINEER as provided in the General Conditions.

5.1 Progress Payments. OWNER shall make progress payments on account of the Contract Price on the basis of CONTRACTOR's Applications for Payment as recommended by ENGINEER for Work which is completed in accordance with the terms and conditions of the Contract Documents. All progress payments will be on the basis of the progress of the Work measured by the schedule of values established in Paragraph 2.9 of the General Conditions (and in the case of Unit Price Work based on the number of units completed and accepted) or, in the event there is no schedule of values, as provided in the General Requirements. No interest will be paid for late payments.

Prior to Substantial Completion, progress payments will be made in an amount equal to the percentages indicated below, but, in each case, less the aggregate of payments previously made and less such amounts as ENGINEER shall determine, or OWNER may withhold, in accordance with Paragraph 14.7 of the General Conditions.
Ninety-five percent of Work completed (ninety percent for contracts under $400,000.00), including 95 percent of materials and equipment not incorporated in the Work (but delivered, suitably stored and accompanied by documentation satisfactory to OWNER as provided in Paragraph 14.2 of the General Conditions).

5.2 Final Payment. Upon final completion and acceptance of the Work in accordance with Paragraph 14.13 of the General Conditions, OWNER shall pay the remainder of the Contract Price as recommended by ENGINEER as provided in said Paragraph 14.13.

ARTICLE 6. CONTRACTOR'S REPRESENTATIONS.

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

6.1 CONTRACTOR has familiarized itself with the nature and extent of the Contract Documents, Work, site, locality, and all local conditions and Laws and Regulations that in any manner may affect cost, progress, performance or furnishing of the Work.

6.2 CONTRACTOR has studied carefully all reports of explorations and tests of subsurface conditions and drawings of physical conditions which are identified in the Supplementary Conditions as provided in Paragraph 4.2 of the General Conditions, and accepts the determination set forth in Paragraph SC-4.2 of the Supplementary Conditions of the extent of the technical data contained in such reports and drawings.

6.3 CONTRACTOR has obtained and carefully studied (or assumes responsibility for obtaining and carefully studying) all such examinations, investigations, explorations, tests, reports and studies (in addition to or to supplement those referred to in Paragraph 6.2 above) which pertain to the subsurface or physical conditions at or contiguous to the site or otherwise may affect the cost, progress, performance or furnishing of the Work necessary for the performance or furnishing of the Work at the Contract Price, within the specifically the provisions of Paragraph 4.2 of the General Conditions. CONTRACTOR understands that the correctness of such information is not guaranteed by the OWNER or the ENGINEER and CONTRACTOR understands that the conditions encountered in performing the work may be different from the approximations shown.

6.4 CONTRACTOR has reviewed and checked all information and data shown or indicated on the Contract Documents with respect to existing Underground Facilities at or contiguous to the site and assumes responsibility for the location of said Underground Facilities as determined by his own field investigations. CONTRACTOR understands that the correctness of such information is not guaranteed by the OWNER or the ENGINEER and CONTRACTOR understands that the conditions encountered in performing the work may be different from the approximations shown.

6.5 CONTRACTOR has correlated the results of all such observations, examinations, investigations, explorations, tests, reports and studies with the terms and conditions of the Contract Documents.

6.6 CONTRACTOR has given ENGINEER written notice of all conflicts, errors or discrepancies that he has discovered in the Contract Documents and the written resolution thereof by ENGINEER is acceptable to CONTRACTOR.

ARTICLE 7. CONTRACT DOCUMENTS.

The Contract Documents which comprise the entire agreement between OWNER and CONTRACTOR concerning the Work consist of the following:

7.1 CONTRACTOR's Bid (Section 00300)

7.2 Agreement (Section 00500)

7.3 Performance and Payment Bonds, and Certificate of Insurance, and insurance policies identified as Sections 00610, 00630 and 00650.

7.4 Bid Bond.
7.5 General Conditions (Section 00700)
7.6 Supplementary Conditions (Section 00810)
7.7 General Wage Rates (Section 00840)
7.8 Specifications bearing the title Project Manual for the Construction of Mesa del Norte Subdivision Sanitary Sewer Improvements Phase II consisting of division numbers 1 through 3.
7.9 Drawings consisting of a cover sheet and sheets listed in the Index to Drawings, each sheet bearing the following general title:

Mesa del Norte Subdivision Sanitary Sewer Improvements Phase II
(Drawings not attached to this Agreement.)
7.10 Addenda numbers _______ to _______, inclusive (not attached to this Agreement.)
7.11 Documentation submitted by CONTRACTOR prior to Notice of Award (Pages _________ to ________, inclusive).
7.12 The Instructions to Bidders, Information Available to Bidders, Bid Form and Bid Security, as well as any supplements to the Bid Form.
7.13 The following which may be delivered or issued after the Effective Date of the Agreement and are not attached hereto: All Written Amendments and other documents amending, modifying, or supplementing the Contract Documents pursuant to Paragraphs 3.4 and 3.5 of the General Conditions.
7.14 The documents listed in Paragraphs 7.2 et. seq. above are attached to this Agreement (except as expressly noted otherwise above).

There are no Contract Documents other than those listed above in this Article 7. The Contract Documents may only be amended, modified or supplemented as provided in Paragraphs 3.4 and 3.5 of the General Conditions.

ARTICLE 8. MISCELLANEOUS.
8.1 Terms used in this Agreement which are defined in Article 1 of the General Conditions will have the meanings indicated in the General Conditions.
8.2 No assignment by a party hereto of any rights under or interests in the Contract Documents will be binding on another party hereto without the written consent of the party sought to be bound; and specifically but without limitation moneys that may become due and moneys that are due may not be assigned without such consent (except to the extent that the effect of this restriction may be limited by law), and unless specifically stated to the contrary in any written consent to an assignment, no assignment will release or discharge the assignor from any duty or responsibility under the Contract Documents.
8.3 OWNER and CONTRACTOR each binds itself, its partners, successors, assigns and legal representatives to the other party hereto, its partners, successors, assigns and legal representatives in respect of all covenants, agreements and obligations contained in the Contract Documents.
8.4 Any contract or contracts awarded under this Invitation for Bids are expected to be funded in part by a loan from the Texas Water Development Board. Neither the State of Texas nor any of its departments, agencies, or employees are or will be a party to this Invitation for Bids or any resulting contract.

ARTICLE 9. OTHER PROVISIONS.
9.1 Should any dispute arise under this Contract which culminates in litigation, venue of that suit shall be in a court of competent jurisdiction sitting in El Paso County, Texas. The court shall apply the laws of the State of Texas in construing and interpreting the terms of this Contract and the Contract Documents.
9.2 In case any one or more of the provisions contained in this Agreement shall, for any reason, be held to be invalid, illegal, or unenforceable in any respect, that invalidity, illegality, unenforceability shall not affect any other provisions and this Agreement shall be construed as if such invalid, illegal, or unenforceable provisions had never been included.

9.3 The captions or headings of paragraphs in this Contract are inserted for convenience only and shall not be considered in constraining the provisions hereof if any question of intent should arise.

9.4 For NADBank-funded projects, Contractor agrees to indemnify and hold harmless North American Development Bank (NADB) and each of its directors, officers, employees, agents and representatives (collectively, “NADB’s Associated Persons”) against all claims for death, personal injury, damages, or other relief against NADB or NADB’s Associated Persons, including costs, expenses and attorney’s fees, resulting from negligence or willful acts or failure to act by the Contractor.

IN WITNESS WHEREOF, OWNER and CONTRACTOR have signed this Agreement in triplicate. One counterpart each has been delivered to OWNER, CONTRACTOR and ENGINEER. All portions of the Contract Documents have been signed or identified by OWNER and CONTRACTOR or by ENGINEER on their behalf.

This Agreement will be effective on _______________________, 20___.

OWNER: Lower Valley Water District  CONTRACTOR __________________________

________________________________________  By______________________________________

General Manager  Name __________________________

Title __________________________

Address for giving notices:  Address for giving notices:

1557 FM 1110  __________________________

Clint, Texas 79836  __________________________

Date Signed __________________________  Date Signed __________________________

Federal Tax I.D. No.

Agent for service of process: __________________________
INSTRUCTIONS FOR EXECUTING CONTRACT

If the CONTRACTOR be a corporation, the following certificate should be executed:

I, ____________________________________________, certify that I am the _________________ of the corporation named as CONTRACTOR hereinabove; that, ___________________________________________ who signed the foregoing Contract on behalf of the CONTRACTOR was then, ______________________________________ of said Corporation; that said Contract was duly signed for and in behalf of said Corporation by authority of its governing body and is within the scope of its corporate powers.

____________________________________
Corporate Seal

If the Contract is signed by the secretary of the corporation, the above certificate should be executed by some other officer of the corporation under the corporate seal. In lieu of the foregoing certificate, there may be attached to the Contract copies of so much of the records of the corporation as will show the official character and authority of the officers signing, duly certified by the Secretary or Assistant Secretary under the corporate seal to be true copies.

The full name and business address of the CONTRACTOR should be inserted, and the Contract shall be signed with his official signature. Please have the name of the signing party or parties typewritten or printed under all signatures to the Contract.

If the CONTRACTOR should be operating as a partnership, each partner should sign the Contract. If the Contract is not signed by each partner, there should be attached to the Contract a duly authenticated Power of Attorney, evidencing the signer's (signers') authority to sign such Contract for and in behalf of the partnership.

If the CONTRACTOR is an individual, the trade name (if the CONTRACTOR is operating under a trade name) should be indicated in the Contract and the Contract should be signed by such individual. If signed by one other than the CONTRACTOR, there should be attached to the Contract a duly authenticated Power of Attorney evidencing the signer's authority to execute such Contract for and in behalf of the CONTRACTOR.
### CONTRACT SUBMITTAL CHECKLIST

1. Executed Agreement
2. Payment and Performance Bonds
3. Insurance Certificate and Policies
4. Certificate of Account Status (paid franchise taxes)
5. If employees provided by leasing company, evidence of Texas State License and copy of their Worker's Compensation policy. If no leased employees will be used, provide a letter on Contractor's letterhead stating so.
6. Federal Tax Identification Number
7. Certificate of Account Status (paid franchise taxes)
8. Final/Updated (if applicable) Minority Certification and Participation Summary
9. Preliminary Schedule of Values
10. Preliminary Construction Schedule
11. Schedule of Shop Drawings
12. Trench Safety System (sealed by a Professional Engineer)
13. Trench Safety Plan
14. SWPPP and NOI
15. Traffic Control Plan

Deliver all items to the OWNER’s Purchasing Department.
Deliver copies of items 9-15 to ENGINEER.
*Once Notice to Proceed has been issued, provide executed subcontracts and purchase orders to Purchasing Manager.*
STATEMENT OF NONDIVESTMENT FROM ISRAEL

The following information is required by the Lower Valley Water District ("LVWD") in order to comply with the provisions of Texas Government Code §§ 2270.002.

I swear and attest that the following is true and correct as of the date ____________________________ ("Bidder") submitted its bid on LVWD Bid No. ______: Bidder does not boycott Israel and will not boycott Israel during the term of the contract should it be awarded to Bidder. I further attest that I am an authorized representative of Bidder or have been duly authorized to represent Bidder in this matter. I understand that the information provided is being relied on by LVWD in order for it to comply with state purchasing laws and will materially affect its decisions in this regard. Should it be discovered that the statement by Bidder contained herein is false, any contract entered into between LVWD and Bidder will be void and LVWD may pursue any legal claims it may have against Bidder.

[SIGNATURE ON NEXT PAGE]

By: ____________________________
Name: ____________________________
Title: ____________________________
Company: ____________________________

ACKNOWLEDGMENT

STATE OF _______  §
COUNTY OF _______  §

This instrument was acknowledged before me on the______ day of_______, 20__, by________________________, as __________________________ of________________________, a ____________________________.

__________________________
Notary Public, State of ___________

My Commission Expires: ____________________________
TEXAS STATUTORY PERFORMANCE BOND
(Penalty of this Bond must be 100% of Contract Amount)
Public Work – State of Texas

STATE OF TEXAS    
COUNTY OF_____________  
BOND NUMBER_____________

KNOW ALL MEN BY THESE PRESENTS:

That __________________________________________ (hereinafter called the Principal), as Principal and _____________________________, a corporation organized and existing under the laws of the State of ________________, and whose principal office is located in the City of ____________________________, and duly authorized to do business in the State of Texas (hereinafter called the Surety).

As Surety, are held firmly bound unto ____________________________, hereinafter called the Owner), in the penal sum of ________________ Dollars ($______________) for the payment of which sum well and truly to be made, we bind ourselves, our heirs, administrators, executors, successors and assigns, jointly and severally, by these presents.

WHEREAS, the Principal has entered into a certain written Contract with the Owner, dated the _____ day of ________________, 20___, a copy of which is hereto attached and made a part hereof, for ____________________________.

NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION IS SUCH that if the said Principal shall faithfully perform the work in accordance with the plans, specifications and contract documents, then this obligation shall be void; otherwise to remain in full force and effect.

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

IN WITNESS WHEREOF, the said Principal and Surety have signed and sealed this instrument this __________ day of ________________, 20___.

______________________________________________

BY: ____________________________

Principal

WITNESS:

______________________________________________

BY: ____________________________

Surety
PAYMENT BOND
PUBLIC WORK - STATE OF TEXAS

STATE OF TEXAS    }  BOND NUMBER _________________
COUNTYOF ________________  }

KNOW ALL MEN BY THESE PRESENTS: That ________________________________________________
_________________________________ of the City of ____________________________________________
County of __________________________________ and State of __________________ (hereinafter called the
Principal) , and ___________________________________________________________________________
, authorized under the laws of the State of Texas to act as Surety on bonds for Principals (hereinafter called the Surety)
are held and firmly bound unto ________________________________________________ (hereinafter
called the Owner) , in the penal sum of ____________________________________________________ Dollars
($__________________) for the payment whereof, the said Principal and Surety bind themselves and their heirs,
administrators executors, successors and assigns, jointly and severally, by these presents.

WHEREAS, the Principal has entered into a certain written contract with the Owner, dated the ___________ day
of _____________ , 20 ___________ for _______________________________________________________
________________________________ to which contract is hereby referred to and made part hereof as fully and
to the same extend as if copied at length herein.

NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION IS SUCH that if the said Principal shall pay all
claimants supplying labor and material to him or a subcontractor in the prosecution of the work provided
for in said
contract, then this obligation shall be void: otherwise to remain in full force and effect.

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

Surety, for value received, stipulates and agrees that no change, extension of time, alteration or addition to the terms
of the contract, or to the work performed thereunder, or the plans, specifications or drawings accompanying the same,
shall in anywise 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 to be performed thereunder.

IN WITNESS WHEREOF, the said Principal and Surety have signed and sealed this instrument this
____________________ day of _________ ________ , 20 _______.

____________________________________
BY: ________________________________
Principal

WITNESS:

_______________________________________________________________________ BY: _______________________________
Surety
**Certificate of Insurance**

**Producer**

This certificate is issued as a matter of information only and confers no rights upon the certificate holder. This certificate does not amend, extend or alter the coverage afforded by the policies below.

**Companies Affording Coverage**

<table>
<thead>
<tr>
<th>Company Letter</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
</tr>
</thead>
</table>

**Insured**

**Coverages**

This is to certify that policies of insurance listed below have been issued to the insured named above for the policy period indicated, notwithstanding any requirement, term or condition of any contract or other document with respect to which this certificate may be issued or may pertain. The insurance afforded by the policies described herein is subject to all the terms, exclusions, and conditions of such policies.

<table>
<thead>
<tr>
<th>CO #</th>
<th>Type of Insurance</th>
<th>Policy Number</th>
<th>Policy Effective Date</th>
<th>Policy Expiration Date</th>
<th>All Limits in Thousands</th>
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<tbody>
<tr>
<td></td>
<td>General Liability</td>
<td></td>
<td></td>
<td></td>
<td>General Aggregate: $</td>
</tr>
<tr>
<td></td>
<td>Commercial</td>
<td></td>
<td></td>
<td></td>
<td>Products-Compo's: $</td>
</tr>
<tr>
<td></td>
<td>General Liability</td>
<td></td>
<td></td>
<td></td>
<td>Personal &amp; Advertising: $</td>
</tr>
<tr>
<td></td>
<td>Claims Made</td>
<td></td>
<td></td>
<td></td>
<td>Each Occurrence: $</td>
</tr>
<tr>
<td></td>
<td>Occurrence</td>
<td></td>
<td></td>
<td></td>
<td>Fire Damage (Any One): $</td>
</tr>
<tr>
<td></td>
<td>Owners &amp; Contractors Protective</td>
<td></td>
<td></td>
<td></td>
<td>Medical Expenses (Any One Period): $</td>
</tr>
<tr>
<td></td>
<td>Auto</td>
<td></td>
<td></td>
<td></td>
<td>CSL: $</td>
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<tr>
<td></td>
<td>Any Auto</td>
<td></td>
<td></td>
<td></td>
<td>CSL: $</td>
</tr>
<tr>
<td></td>
<td>All Owned Autos</td>
<td></td>
<td></td>
<td></td>
<td>CSL: $</td>
</tr>
<tr>
<td></td>
<td>Scheduled Autos</td>
<td></td>
<td></td>
<td></td>
<td>CSL: $</td>
</tr>
<tr>
<td></td>
<td>Hired Autos</td>
<td></td>
<td></td>
<td></td>
<td>CSL: $</td>
</tr>
<tr>
<td></td>
<td>Non-Owned Autos</td>
<td></td>
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</tr>
<tr>
<td></td>
<td>Garage Liability</td>
<td></td>
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<tr>
<td></td>
<td>Excess Liability</td>
<td></td>
<td></td>
<td></td>
<td>Each Occurrence: $</td>
</tr>
<tr>
<td></td>
<td>Other Than Umbrella Form</td>
<td></td>
<td></td>
<td></td>
<td>Aggregate: $</td>
</tr>
<tr>
<td></td>
<td>Workers' Compensation</td>
<td></td>
<td></td>
<td></td>
<td>(Each Accident): $</td>
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<tr>
<td></td>
<td>and Employers' Liability</td>
<td></td>
<td></td>
<td></td>
<td>(Disease-Policy Limit): $</td>
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<tr>
<td></td>
<td>Other</td>
<td></td>
<td></td>
<td></td>
<td>(Disease-Each Employee): $</td>
</tr>
</tbody>
</table>

**Description of Operations/Locations/Vehicles/Restrictions/Special Items**

* Delete Employee Exclusions

**Additional Insured/Certificate Holder**

Cancellation

Should any of the above described policies be cancelled or materially changed before the expiration date thereof, the issuing company shall provide 30 days written notice to the certificate holder named to the left.

Authorized Representative
STANDARD GENERAL CONDITIONS
OF THE CONSTRUCTION CONTRACT

Prepared by
ENGINEERS JOINT CONTRACT DOCUMENTS COMMITTEE

and

Issued and Published Jointly by

ACEC
AMERICAN COUNCIL OF ENGINEERING COMPANIES

ASCE
American Society of Civil Engineers

NSPE
National Society of Professional Engineers
Professional Engineers in Private Practice

AMERICAN COUNCIL OF ENGINEERING COMPANIES

ASSOCIATED GENERAL CONTRACTORS OF AMERICA

AMERICAN SOCIETY OF CIVIL ENGINEERS

PROFESSIONAL ENGINEERS IN PRIVATE PRACTICE
A Practice Division of the
NATIONAL SOCIETY OF PROFESSIONAL ENGINEERS

These General Conditions have been prepared for use with the Suggested Forms of Agreement Between Owner and Contractor (EJCDC C-520 or C-525, 2007 Editions). Their provisions are interrelated and a change in one may necessitate a change in the other. Comments concerning their usage are contained in the Narrative Guide to the EJCDC Construction Documents (EJCDC C-001, 2007 Edition). For guidance in the preparation of Supplementary Conditions, see Guide to the Preparation of Supplementary Conditions (EJCDC C-800, 2007 Edition).
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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.


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 or terms discussed in Paragraph 1.02.B-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 which 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 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.
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 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 oblige 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 Owner’s Property Insurance

A. Unless otherwise provided in the Supplementary Conditions, Owner 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 their work and will only cut or alter their 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, and 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'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, expediters, timekeepers, clerks, and other personnel employed by Contractor, whether at the Site or in Contractor's principal or branch office for general administration of the Work and not specifically included in the agreed upon schedule of job classifications referred to in Paragraph 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-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 or Owner’s property might in any way be responsible 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


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 in which the Project is located.

17.06 Headings

A. Article and paragraph headings are inserted for convenience only and do not constitute parts of these General Conditions.
SECTION 00800
SUPPLEMENTARY CONDITIONS

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INTRODUCTORY STATEMENT

These Supplementary Conditions amend or supplement the Standard General Conditions of the Construction Contract (EJCDC C-700, 2007 Edition). All provisions which are not so amended or supplemented remain in full force and effect.

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

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

ARTICLE 1 – DEFINITIONS AND TERMINOLOGY

SC-1.01.A.10  Add the following sentence to Paragraph 1.01.A.10

When submitted, a Claim must be signed by the Designated Authorized Representative.

SC-1.01.A.51  Delete Paragraph 1.01.A.51 in its entirety and insert the following in its place:

Designated Authorized Representative — the representative authorized by the party filing the Claim to execute legally-binding agreements on behalf of that party. For Owner, the Designated Authorized Representative shall be the Chief Technical Officer, a Vice President, or President and Chief Executive Officer. For Contractor, the owner or its designee authorized pursuant to a power of attorney.

SC-1.01.A.52  Add the following paragraph immediately after Paragraph 1.01.A.51:

Health and Safety Plan — The part of the Contract Documents prepared by Contractor that describes safety procedures for the Work, identifies the Contractor’s safety representative required by Paragraph 6.14.A, and certifies that the Contractor’s employees have received or will receive training prior to the commencement of the Work on (1) basic health and safety issues; (2) the Health and Safety Plan; (3) the methods and techniques the Contractor will use on the Project; (4) procedures for Contractor entrance into an exit from the Site(s); and (5) informing Owner about any unique hazards presented by the Work or found as a result of the Work.
ARTICLE 2 - PRELIMINARY MATTERS

SC-2.02 Delete Paragraph 2.02.A in its entirety and insert the following in its place:

A. Owner shall furnish to Contractor up to three (3) printed copies of the Drawings and Project Manual and one copy in electronic form, as portable document format (.PDF) files. Additional copies will be furnished upon request at the cost of reproduction.

SC-2.03 Amend the third sentence of Paragraph 2.03.A by changing the word “sixtieth” to read as “seventy-fifth”.

SC-2.05.B Add the following new paragraph immediately after Paragraph 2.05.A.3:

B. Health and Safety Plan. Contractor shall submit a copy of Health and Safety Plan no later than the later of: (1) fifteen days after the bid award; or (2) thirty days before Work at the Site is started. No Work shall proceed until the Owner has accepted the Health and Safety Plan.

SC-2.06 Amend the first sentence of Paragraph 2.06.B to read as follows:

At or prior to this conference Owner and Contractor each shall designate, in writing by Owner and in writing by Contractor as a submittal, a specific individual to act as its authorized representative with respect to the services and responsibilities under the Contract.

SC-2.07 Amend the first sentence of Paragraph 2.07.A to read as follows:

At the preconstruction conference indicated in Paragraph 2.06 or other time acceptable to the parties and Engineer, Engineer and Contractor will review the acceptability to Engineer, as provided below, of the schedules submitted in accordance with Paragraph 2.05.A.

ARTICLE 3 - CONTRACT DOCUMENTS: INTENT, AMENDING, REUSE

SC-3.01.B.1 Add the following to new paragraph immediately after Paragraph 3.01.B:

SC-3.01.B.1 In resolving such conflicts, errors and discrepancies, the Contract Documents will be given precedence in the following order: Change Orders, Field Orders; Addenda, Agreement, Performance Bond and Payment Bond, Supplementary Conditions, General Conditions, Specifications and Drawings. Numerical dimensions shown on the Drawings shall govern over scaled dimensions on the Drawings. This Paragraph SC-3.01.B.1 is not, however, a definitive enumeration of what comprises the “Contract Documents”, which definitive enumeration is indicated in the Agreement.

SC – 3.04.A Remove the words “or a Work Change Directive”.

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(Revised 1/11/2017)
ARTICLE 4 – AVAILABILITY OF LANDS; SUBSURFACE AND PHYSICAL CONDITIONS; HAZARDOUS ENVIRONMENTAL CONDITIONS; REFERENCE POINTS

SC 4.01.D Add the following new paragraph immediately after Paragraph 4.01.C:

SC-4.01.D All Work associated with special provisions of easements shall be performed in accordance with the Contract Documents, unless the Contract Documents indicate that easement provisions govern. Should the actions of Contractor or Subcontractors or Suppliers cause the Work to be delayed to the point that the ending date of an easement is exceeded, Contractor shall reimburse Owner for additional costs required to extend the period of rights to the easement to complete the Work. Such delay shall be considered to be within the control of Contractor, in accordance with Paragraph 12.03.

SC-4.02.A Delete Paragraphs 4.02.A and 4.02.B in their entirety and insert the following in their place:

SC-4.02.A No reports of explorations or tests of subsurface conditions at or contiguous to the Site, or drawings of physical conditions relating to existing surface or subsurface structures at the Site, are known to Owner.

SC-4.02.B Not Used.

SC-4.04.B.2 Amend Paragraph 4.04.B.2 by removing the following after “contract Documents is required,” in the first sentence “

a Work Change Directive or

SC-4.05.A Amend the third sentence of Paragraph 4.05.A to read as follows:

Contractor shall report to Engineer when a reference point, including property boundary stakes or monuments, or an elevation benchmark, is disturbed, lost, or destroyed, or requires relocation because of necessary changes in grades or locations. Contractor shall be responsible for accurately replacing or relocating such reference points by a professional land surveyor licensed by and registered in the State of Texas.

SC-4.06.A.1 Add the following subparagraphs immediately after Paragraph 4.06.A:

SC-4.06.A.1 The following reports regarding Hazardous Environmental Conditions at the Site are known to Owner:

a. N/A

SC-4.06.A.2 The following drawings regarding Hazardous Environmental Conditions at the Site are known to Owner:

a. N/A
1) N/A

SC-4.06 Delete Paragraphs 4.06.A and 4.06.B in their entirety and insert the following in its place:

SC-4.06.A No reports or drawings related to Hazardous Environmental Conditions at the Site are known to Owner.

SC-4.06.B Not Used.
ARTICLE 5 - BONDS AND INSURANCE

SC-5.01.A Delete Paragraph 5.01.A in its entirety and insert the following in its place:

SC-5.01.A Except as provided in this Paragraph SC-5.01.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 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 and certificates of insurance as are required by the Contract Documents. Certificates of insurance shall be in the form prescribed by the Contract Documents. Conditions under which a performance bond or payment bond are not required are as follows:

1. Payment bond is not required when the Contract Price is $25,000 or less.
2. When the Contract Price is less than $100,000, a performance bond is not required.

SC-5.01.B Delete Paragraph 5.01.B in its entirety and insert the following in its place:

SC-5.01.B All bonds shall be in the form prescribed by the Contract Documents, except as provided otherwise by Laws and Regulations including, but not limited to, Chapter 2253 of the Texas Government Code and Article 7.19-1 of the Texas Insurance Code. The bonds shall be executed by surety which shall be authorized and admitted to do business in the State of Texas, licensed by the State of Texas to issue surety bonds, and carry an A.M. Best Key rating of not less than A VIII. If the amount of the bond is in excess of ten percent of surety’s capital and surplus, surety shall furnish to Owner a written certification that surety has insured that portion of surety’s risk that exceeds ten percent of surety’s capital and surplus with one or more reinsurers who are duly authorized, accredited or trusteeed to do business in the State of Texas. If any portion of surety's obligation is reinsured, the amount reinsured shall not exceed ten percent of the reinsurer's capital and surplus. Surety and the reinsurer(s) shall furnish additional information and documentation, if any, required by Owner for Owner to determine whether surety or its reinsurer(s) comply with the requirements of this Paragraph SC-5.01.B. All bonds signed by an agent or attorney-in-fact shall 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.

SC-5.02 Add the following at the end of Paragraph 5.02.A:

Insurance shall be procured from insurers or indemnity companies acceptable to Owner. Insurance or indemnity company furnishing insurance for the Contract shall carry an A.M. Best Key rating of not less than A VIII.

SC-5.04.B.1 Delete Paragraph 5.04.B.1 in its entirety and insert the following in its place:

SC-5.04.B.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, Engineer, Engineer’s consultants, and entities indicated below under Paragraph SC-5.04.B.1.a, 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;
a. In addition to the individuals or entities specified above, include as additional insured, or loss payees as their interest may appear, the following:
  1) N/A.

**SC-5.04.B.4** Add the following at the end of Paragraph 5.04.B.4:

If, at any time, the required insurance policies are canceled, terminated, or modified so that the insurance is not in full force and effect as required under the Contract Documents, Owner may terminate for cause in accordance with Paragraph 15.02 of the General Conditions or, where possible, obtain insurance coverage equal to that required by the Contract Documents, the full cost of which will be charged to Contractor and deducted from any payments due Contractor.

a. Each Contractor shall require his subcontractors, at all tiers, to carry insurance coverages satisfactory to the Contractor and to provide evidence of such insurance as specified herein.

For purposes of this Bid, a Payment Bond will be required in an amount equal to the Bid Price and a Performance Bond will be required in a like amount.

**SC-5.04.B.6.b** Delete Paragraph 5.04.B.6.b in its entirety and replace with the following:

SC-5.04.B.6.b. Contractor shall furnish to Owner and each other additional insured identified in the Contract Documents, to whom evidence of insurance has been issued, evidence satisfactory to Owner and other such additional insured of continuation of such insurance at final payment and for a duration thereafter equal to the correction period required under Paragraph 13.07.

**SC-5.04.C** Add the following new Paragraph 5.04.C:

C. The limits of liability for the insurance required by Paragraph 5.04 of the General Conditions shall provide coverage for not less than the following amounts or greater where required by Laws and Regulations:

1. Workers' Compensation and Employer's Liability Insurance:
   a. State: Statutory
   b. Employer's Liability: In accordance with Table 00800-1 of these Supplementary Conditions.
   c. Terminology: The following terms are not defined but when used in this Paragraph SC-5.04.C.1 for workers' compensation insurance, and have the meanings indicated below:

      1) Certificate of coverage: A copy of a certificate of insurance, a certificate of authority to self-insure, issued by the Texas Workers Compensation Commission, or a coverage agreement (TWCC-81, TWCC-82, TWCC-83, or TWCC-84), showing statutory workers' compensation insurance coverage for the person's or entity's employees providing services on the Project, for the duration of the Project. Contractor shall not execute TWCC Forms 83 or 85 or other form that precludes coverage under
Contractor’s policy if Contractor hires a Subcontractor or service provider without worker's compensation insurance.

2) Duration of the Project: Is the time from the Contractor’s beginning work on the Project until the time Contractor's and Subcontractor’s obligations under the Contract Documents are fully complete.

3) Contractor and Subcontractors (as indicated in Texas Labor Code §406.5096) includes all persons or entities performing all or part of the Work, regardless of whether that person or entity contracted directly with Contractor and regardless of whether that person or entity has employees. This includes, without limitation, independent contractors, Subcontractors, leasing companies, motor carriers, owner-operators, employees of any such entity, or employees of any entity which furnishes persons to provide services on the Project. "Services" include, without limitation, providing, hauling, or delivering equipment or materials, or providing labor, transportation, or other services related to the Project. "Services" does not include activities unrelated to the Project, such as food or beverage vendors, office supply deliveries, and delivery of portable toilets or portable sanitary facilities.

d. Comply with the following relative to Worker's Compensation and Employer's Liability insurance:

1) Waiver of Subrogation Relative to Workers’ Compensation Insurance:
The policy shall be endorsed to provide that insurer waives any right of subrogation that insurer may acquire against Owner, Engineer, Engineer's consultants, and others named in the Contract Documents as additional insured relative to Contractor’s liability insurance, by reason of any payment made on account of injury, including death resulting therefrom, sustained by an employee of the insured.

2) If workers employed on the Work will be employed through a leasing company, furnish evidence of leasing company’s State of Texas license and a copy of leasing company’s Worker's Compensation policy insuring its employees (including sole proprietors, partners, supervisors, and executive officers) who perform work in the State of Texas.

3) Contractor shall furnish coverage, based on proper reporting of classification codes and payroll amounts and filing of coverage agreements, which meets the statutory requirements of Texas Labor Code §401.011(44) for all employees of Contractor performing the Work or services on the Project, for the duration of the Project.

4) Contractor shall furnish to Owner a certificate of coverage prior to being awarded the Contract.

5) If the coverage period shown on the Contractor's current certificate of coverage ends during the Contract Times, Contractor shall, prior to the end of the coverage period, furnish to Owner a new certificate of coverage indicating that coverage has been extended; furnish updated certificate of coverage throughout the duration of the Project.

6) Subcontractors and Workers’ Compensation and Employee Liability Insurance:
a) Contractor shall contractually require each Subcontractor to comply with the workers’ compensation and employer’s liability insurance requirements of the Contract Documents, to same extent such requirements are binding on Contractor.

b) Obtain from each Subcontractor and furnish to Owner a certificate of coverage, prior to that Subcontractor beginning work on the Project. Not later than seven days after receipt by Contractor, furnish updated, valid certificate of coverage for each Subcontractor throughout the duration of the Project.

7) Retain Contractor’s and Subcontractors’ required certificates of coverage for the duration of the Project.

8) Contractor shall notify Owner in writing, in accordance with Paragraph 17.01, within 10 days after Contractor knew or should have known, of a change that materially affects the provision of coverage of any entity performing work or services on the Contract.

9) Post at the Site a notice, in the text, form, and manner prescribed by the Texas Workers' Compensation Commission, informing persons performing work or services on the Contract that they are required to be covered, and stating how a person may verify coverage and report lack of coverage. Such posted notice does not satisfy other posting requirements imposed by the Act or other commission rules in the State of Texas. Such notice shall be printed with a title in text that is not less than 30-point bold type, with and other text in not less than 19-point non-bold type, and shall be in English, Spanish, and other languages, if any, common to the workers at the Site. Text for the notices shall be as indicated by the Commission on the sample notice without changes.

10) By executing the Agreement or furnishing or causing to be furnished a certificate of coverage, Contractor represents to Owner that employees of Contractor and Subcontractors who will perform work or services on the Contract will be covered by workers' compensation coverage for the duration of the Project; that such coverage will be based on proper reporting of classification codes and payroll amounts; and that coverage agreements will be filed with the appropriate insurance carrier or, in the case of a self-insured, with the commission's Division of Self-Insurance Regulation. Furnishing false or misleading information may subject Contractor to administrative penalties of authorities having jurisdiction, criminal penalties, civil penalties of authorities having jurisdiction, and other civil actions.

11) Contractor’s failure to comply with one or more workers’ compensation insurance provisions is a breach of the Contract by Contractor, entitling Owner to terminate for cause in accordance with Paragraph 15.02, unless otherwise provided by Laws and Regulations.
12) If any provision of the Workers’ Compensation and Employee Liability insurance requirements of the Contract Documents, or its application to any person or circumstance, is held invalid, the invalidity does not affect other provisions or applications of this rule that can be given effect without the invalid provision or application, and to this end the provisions of this rule are declared to be severable.

2. Contractor’s General Liability under Paragraphs 5.04.A.3 through 5.04.A.6 of the General Conditions which shall include completed operations and product liability coverages and eliminate the exclusion with respect to property under the care, custody, and control of Contractor. General Liability coverage shall be for not less than the limits indicated in Table 00800-1 of these Supplementary Conditions.

3. Automobile Liability under Paragraph 5.04.A.6 of the General Conditions: Shall be for not less than the limits indicated in Table 00800-1 of these Supplementary Conditions.

4. Umbrella Liability:
   a. Contractor shall purchase and maintain, until final payment by Owner, Umbrella Liability Insurance. Such insurance shall insure against all claims in excess of the limits provided under workers' compensation and employer’s liability, general liability insurance, and automobile liability policies. The limits of umbrella liability shall be in accordance with Table 00800-1 of these Supplementary Conditions.

5. *Table of Minimum Liability Insurance Coverage Limits*: The limits of liability insurance shall provide coverage for not less than the following amounts or greater where required by Laws and Regulations. The limits of coverage under Paragraph 5.04 vary with the Contract Price as indicated in Table 00800-1:
<table>
<thead>
<tr>
<th>LIMITS OF COVERAGE FOR ALL CONSTRUCTION PROJECTS</th>
<th>AUTOMOBILE (5.04.A.6) {Combined Single Limit} Per Accident</th>
<th>COMMERCIAL GENERAL LIABILITY (5.04.A.3 through 5.04.A.6) {Combined Single Limit} Per Project</th>
<th>WORKERS’ COMPENSATION (5.04.A.1 through 5.04.A.2) {Employers’ Liability} Per Accident Per Employee Per Disease</th>
<th>UMBRELLA (SC-5.04.C.4) {Combined Single Limit}</th>
</tr>
</thead>
<tbody>
<tr>
<td>CONTRACT PRICE LESS THAN $100,000:</td>
<td>Occurrence</td>
<td>General Aggregate Products/Completed Operations Aggregate</td>
<td>Not applicable</td>
<td></td>
</tr>
<tr>
<td></td>
<td>*General Aggregate Products/Completed Operations Aggregate</td>
<td>$300,000</td>
<td>$500,000</td>
<td>$500,000</td>
</tr>
<tr>
<td>CONTRACT PRICE EQUAL TO $100,000 OR GREATER AND LESS THAN $500,000:</td>
<td>Occurrence</td>
<td>General Aggregate Products/Completed Operations Aggregate</td>
<td>Not applicable</td>
<td></td>
</tr>
<tr>
<td></td>
<td>*General Aggregate Products/Completed Operations Aggregate</td>
<td>$500,000</td>
<td>$500,000</td>
<td>$500,000</td>
</tr>
<tr>
<td>CONTRACT PRICE EQUAL TO OR GREATER THAN $500,000 AND UP TO AND INCLUDING $10,000,000:</td>
<td>Occurrence</td>
<td>General Aggregate Products/Completed Operations Aggregate</td>
<td>Not applicable</td>
<td></td>
</tr>
<tr>
<td></td>
<td>*General Aggregate Products/Completed Operations Aggregate</td>
<td>$1,000,000</td>
<td>$1,000,000</td>
<td>$1,000,000</td>
</tr>
<tr>
<td>CONTRACT PRICE GREATER THAN $10,000,000:</td>
<td>Occurrence</td>
<td>General Aggregate Products/Completed Operations Aggregate</td>
<td>Not applicable</td>
<td></td>
</tr>
<tr>
<td></td>
<td>*General Aggregate Products/Completed Operations Aggregate</td>
<td>$1,000,000</td>
<td>$1,000,000</td>
<td>$1,000,000</td>
</tr>
</tbody>
</table>

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(Revised 1/11/2017)
6. *Railroad Liability*: Refer to Article SC-17 of these Supplementary Conditions for requirements, if any, regarding railroad liability insurance to be furnished by Contractor.

**SC-5.05**
Delete Paragraph 5.05 in its entirety and insert the following in its place:

**SC-5.05**
Not Used.

**SC-5.06**
Delete Paragraph 5.06 in its entirety and insert the following in its place:

**SC-5.06. Property Insurance**

A. Contractor shall purchase and maintain property insurance upon the Work at the Site in the amount of the full replacement cost of the Work. This insurance shall:

1. include the interests of Owner, Contractor, Subcontractors, Engineer, and other individuals or entities identified herein, and the officers, directors, members, partners, employees, agents and other consultants and subcontractors of each and any of them, each of whom is deemed to have an insurable interest and shall be listed as an insured, additional insured, or loss payee as their interest may appear;

   a. In addition to the individuals or entities specified above, include as additional insured, or loss payees as their interest may appear, the following:
      1) N/A

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

   _____________: _____________: _____________:

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 start-up; 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 additional insured to whom a certificate of insurance has been issued.

B. All the policies of insurance (and the certificates or other evidence thereof) required to be purchased and maintained in accordance with Paragraph SC-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 additional insured or loss payee to whom a certificate of insurance has been issued and will contain waiver provisions in accordance with Paragraph SC-5.07.

C. The risk of loss within any deductible amount applicable to the policies of insurance purchased in accordance with this Paragraph SC-5.06 will be borne by Contractor, Subcontractors, or others suffering such loss.

SC-5.07 Delete Paragraph 5.07 in its entirety and insert the following in its place:

SC-5.07. Waiver of Rights

A. Owner and Contractor intend that all policies purchased in accordance with Paragraph SC-5.06 will protect Owner, Contractor, Subcontractors, Engineer, and all other individuals or entities identified in Paragraph SC-5.06 to be listed as insureds or additional insured or loss payees (and the officers, directors, members, partners, employees, agents, and other 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 loss or damage the insurers will have no rights of recovery against any of the insureds or additional insured or loss payees thereunder. Owner and Contractor waive all rights against each other and their respective officers, directors, members, partners, employees, agents and other 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, Engineer, and all other individuals or entities identified in Paragraph SC-5.06 to be listed as insureds or additional insureds or loss payees (and the officers, directors, members, partners, employees, agents and other 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, Engineer, and the officers, directors, partners, employees, agents, and other 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 and 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 SC-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, Engineer, and the officers, directors, members, partners, employees, agents and other consultants and subcontractors of each and any of them.

ARTICLE 6 - CONTRACTOR'S RESPONSIBILITIES

SC-6.02.C Add the following new paragraph immediately after Paragraph 6.02.B:

SC-6.02.C For Work financed in whole or in part by loans or grants from, or loans insured or guaranteed by, the United States or any agency or instrumentality thereof under any statute of the United States providing wage standards for such work, the provisions of the Contract Documents are subject to the applicable provisions of the Contract Work Hours and Safety Standards Act, 40 U.S.C.A. §327 et seq. Contractor and Subcontractor shall not require or allow any laborer or mechanic to be employed on the Work in excess of forty hours in any work week unless such laborer or mechanic receives compensation at a rate not less than one-and-one-half times his or her basis rate of pay for hours worked in excess of forty hours in such work week. Except as may be otherwise required by law, all claims pertaining to the classification of labor employed on the Project shall be decided by Owner's governing body or other duly designated official.

SC 6.06.H Add the following new paragraphs immediately after Paragraph 6.06.G:

SC-6.06.H Contractor shall perform, with his organization and with the assistance of workers under Contractor’s immediate superintendence, not less than 40 percent of the Contract Price, exclusive of Work not commonly found in contracts for similar construction which require specialized knowledge, craftsmanship, or equipment not ordinarily available in the organizations of contractors performing construction similar in nature to the Work. The value of the Work, exclusive of said items, will be interpreted as the value of labor, equipment, superintendence, and only those portions of materials and equipment incorporated into the Work that are related to the Contract’s direct labor requirements.
SC-6.08.A Amend the first sentence of Paragraph 6.08.A to read as follows:

Contractor shall obtain, pay for, and be responsible for complying with all construction permits and licenses necessary to perform the Work and operate at the Site.

SC-6.08.B Add the following new paragraph immediately after Paragraph 6.08.A:

SC-6.08.B  TPDES Permit and Related Permits and Requirements

1. The Work is subject to the Texas Pollution Discharge Elimination System (TPDES) permitting requirements for the installation and maintenance of temporary and permanent erosion and sediment controls and stormwater pollution prevention measures throughout the construction period.

2. Contractor’s responsibilities are as follows:

   a. Prepare a Stormwater Pollution Prevention Plan (SWPPP) in compliance with Laws and Regulations.

   b. Obtain a signed certification statement from all Subcontractors responsible for implementing erosion and sedimentation controls and other best management practices for the Site that are part of the SWPPP. Such statement shall indicate that the Subcontractor understands the permit requirements. The certified statement forms shall be attached to and become part of the SWPPP.

   c. Fill out the TCEQ’s “Construction Site Notice” form, which is Attachment 2 to the TPDES General Permit TXR150000 (form available from Owner or on the Internet at http://www.tceq.state.tx.us/assets/public/permitting/waterquality/attachment/stormwater/txr152d2.pdf and post it near the main entrance of the Site, or at multiple postings if the Work is linear. Submit a copy of the completed Construction Site Notice form to Owner and Engineer.

   d. Maintain erosion/sedimentation controls and other protective measures identified in the SWPPP in effective operating condition.

   e. Perform inspections every 14 days and after every half-inch of rainfall, noting the following observations on an inspection form provided by Owner:

      1) Locations of discharges of sediment or other pollutants from the Site.

      2) Locations of storm water, erosion, sedimentation controls that are in need of maintenance or repair.

      3) Locations of storm water, erosion, sedimentation controls that are not performing, failing to operate, or are inadequate.
4) Locations where additional storm water, erosion, sedimentation controls are needed.

f. Continuously maintain at the Site a copy of the SWPPP (with updates, as described below) and inspection reports.

g. Update the SWPPP as necessary to comply with TPDES permitting requirements, which includes noting changes in erosion, and sedimentation controls and other best management practices that are part of the SWPPP and which may be necessary due to the results of inspection reports.

h. Upon Substantial Completion or establishment of permanent cover over disturbed soil areas (if such cover is established after Substantial Completion), submit TPDES records to Owner.

SC-6.09.D Add the following new paragraph immediately after Paragraph 6.09.C:

SC-6.09.D Minimum Prevailing Wage Rates

1. Wage rates paid to workers employed in performing the Work at the Site, including Contractor and Subcontractor employees, shall not be less than the following:

   a. Federal Davis-Bacon minimum prevailing wage rates, comprised of 8 pages, which is part of the Contract Documents. Comply with 40 USC 31 and 29 CFR Parts 1, 3, and 5.

   Contractor shall be aware of changes in the minimum prevailing wage rates applicable to the Work and shall pay the minimum prevailing wages at no additional cost to Owner. Contractor shall post the schedule of classifications and wage rates at conspicuous locations at the Site. Such schedule shall also show deductions, if any, required by law to be made from wages earned by laborers and mechanics engaged on the Work.

2. Contractor shall give preference to hiring qualified local residents for work as laborers and mechanics on the Project. Employees shall be bona-fide residents of the United States of America.

3. Contractor and Subcontractors shall pay each of their employees, engaged in the Work in full, not less often than once per week, and without deductions or subsequent rebates on any account, except for deductions mandated by law.
4. Contractor, and Subcontractors shall keep a complete payroll record indicating the name, address, and Social Security number of each employee engaged in the Work, together with the classification of work in which the employee is engaged, the hourly wage rate paid, number of deductions made from such wages and total amount paid to the employee. Submit to Owner one copy of each such payroll record, for the period for which payment is requested, with each Application for Payment. Each payroll record shall bear the affidavit of the employer certifying, under oath, that such payroll is a true, complete, and accurate report of the wages earned and paid to each employee engaged in the Work, that no deductions from any wages due each employee, except as set out on the payroll, have been directly or indirectly made, and that no rebates, either direct or indirect, have been nor will be required of an employee.

5. Certified payroll reports shall indicate for each worker whether the labor performed was performed under the Building, Heavy, Highway, or Water and Sewer Line Prevailing Wage Rate scale. Certified payroll reports shall be submitted for the complete Contract period and, for weeks where no Work was performed, negative reports shall be submitted, marked “No Work Performed”. Clearly mark “FIRST PAYROLL” on the first payroll submitted, and clearly mark “FINAL PAYROLL” on the last payroll submitted for the Contract.

6. Apprentices will be work only under a bona fide apprenticeship program registered with the U.S. Department of Labor. A copy of such program shall be submitted to Owner, together with current certification or evidence of registration with the U.S. Department of Labor, Bureau of Apprenticeship and Training, for each apprentice engaged in the Work.

7. Contractor shall, when requested by Owner, submit additional certification and documentation (such as copy of cancelled check or an Employee Restitution Receipt Form) indicating that employee has received back compensation due.

8. Contractor and Subcontractors in violation of this provision are subject to a penalty of $60 per day for each worker that is paid less than the rate specified in the Project’s applicable prevailing wage rates.

SC-6.10.B Add the following new paragraph immediately after Paragraph 6.10.A:

SC-6.10.B Exemption from State of Texas sales tax may be obtained on materials and equipment incorporated into the Work and supplies required to perform the Work. Owner is an organization which qualifies for such exemption pursuant to provisions of Article 20.04(F) of the Texas Limited Sales, Excise and Use Tax Act. In accordance with Texas House Bill 11, Contractor may purchase, materials, equipment, and supplies consumed in the performance of the Work by issuing to Suppliers an exemption certificate in lieu of the tax, said exemption certificate complying with State of Texas Comptroller's ruling no. 95-0.07. Such exemption certificate(s) issued by Contractor in lieu of the sales will be subject to the provisions of the State of Texas Comptroller's ruling no. 95-0.09 as amended to be effective October 2, 1968. Exemption certificate may be obtained from Owner's Purchasing Agent.
SC-6.11.E Add the following new paragraph immediately after Paragraph 6.11.D:

**SC-6.11.E Dust Control**

1. Contractor shall not cause or allow dust-generating operations, earthmoving operation, use of property, or other operation that results in fugitive dust emissions that exceed the limits prescribed by the authority having jurisdiction, in accordance with Texas Administrative Code Title 30, Part 1, Chapter 111, Subchapter A, Division 4, Rule 111.145.

2. Provide necessary equipment and materials to apply sufficient dust suppressants, properly clean all vehicle “track-out” areas on and adjacent to the Site, and provide adequate physical stabilizations of soils to comply with requirements of earthmoving permits and approved dust control plan or activities, if any.

3. Contractor shall pay fines and civil penalties imposed by authorities having jurisdiction and incurred by Owner because of Contractor’s violation of earthmoving permits and dust control plans or activities.

4. Implement measures to control fugitive dust emissions from the Site in compliance with earthmoving permit and Laws and Regulations.

**SC-6.13.D** Replace the word “safety program” with “Health and Safety Plan.”

**SC-6.13.G** Add the following new paragraphs immediately after Paragraph 6.13.F:

SC-6.13.G Within twenty-four hours of receiving a request from Owner, Contractor shall furnish to Owner documentation substantiating representations made in the Health and Safety Plan including, but not limited to, that each of the Contractor’s employees has received training on the Health and Safety Plan as well as any other training necessary to competently effectuate the Health and Safety Plan.

SC-6.13.H Owner maintains a drug- and alcohol-free workplace in accordance with the Drug-free Workplace Act of 1983. Contractor shall publicize a statement notifying employees on the Work that the unlawful manufacture, distribution, dispensation, possession, or use of a controlled substance is prohibited in the workplace, including at the Site.

SC-6.14.I Owner maintains specific rules regarding smoking on Owner's properties. Contractor shall adhere to such rules at the Site.

SC-6.14.J Owner maintains specific rules regarding firearms and Contractor shall adhere to such rules at the Site.


SC-6.14.A.1 Contractor’s safety representative shall be identified in submittal to Owner and Engineer for acceptance prior to commencement of Work at the Site. Name and qualifications of proposed substitute, if any, shall be submitted to Owner for acceptance.

SC-6.17.E.2  Add the following new paragraphs immediately after Paragraph 6.17.E.1:

SC-6.17.E.2 For each Contractor submittal required under the Contract Documents, Engineer will review one initial submittal and one resubmittal at no cost to Contractor. Engineer will record Engineer’s time for reviewing subsequent submittals of Shop Drawings, Samples, or other submittals requiring approval or acceptance, and Contractor shall reimburse Owner for Engineer’s charges for labor and expenses for such time.

SC-6.17.F  In the event that Contractor requests a change of a previously approved or previously accepted submittal, Contractor shall reimburse Owner for Engineer’s charges for Engineer’s review time unless the need for such change is beyond Contractor’s control.

ARTICLE 8 - OWNER’S RESPONSIBILITIES

SC-8.11  Delete Paragraph 8.11 in its entirety and insert the following in its place:

SC-8.11  Not used.

ARTICLE 9 – ENGINEER’S RESPONSIBILITIES

SC-9.03  Add a new paragraph immediately after Paragraph 9.03.A that is to read as follows:

SC-9.03.B  Resident Project Representative (RPR) will be Engineer’s employee or agent at the Site, will act as directed by and under the supervision of Engineer, and will confer with Engineer regarding RPR’s actions. RPR’s dealings in matters pertaining to the Work in general shall be with Engineer and Contractor keeping Owner advised as necessary. RPR’s dealings with Subcontractors shall only be through or with the full knowledge and approval of Contractor. RPR shall generally communicate with Owner with the knowledge of and under the direction of Engineer.

1.  Duties and Responsibilities to RPR:

   a.  Schedules: Review the Progress Schedule, Schedule of Submittals, and Schedule of Values prepared by Contractor and consult with Engineer concerning acceptability.

   b.  Conferences and Meetings: Attend meetings with Contractor, such as preconstruction conferences, progress meetings, job conferences, and other Project-related meetings, and prepare and circulate copies of minutes thereof.

   c.  Liaison:

      1)  Serve as Engineer’s liaison with Contractor, working principally through Contractor’s superintendent, and assist in providing understanding of the intent of the Contract Documents; and assist Engineer in serving as Owner’s liaison with Contractor when Contractor’s operations affect Owner’s operations on the Site.
2) Assist in obtaining from Owner additional details or information, when required for proper execution of the Work.

d. Shop Drawings and Samples:

1) Record date of receipt of Shop Drawings and Samples that are received at the Site.

2) Receive Samples that are furnished at the Site by Contractor, and notify Engineer of availability of Samples for examination.

3) Advise Engineer and Contractor of the commencement of any Work requiring a Shop Drawing or Sample if the submittal has not been approved by Engineer.

e. Review of Work, Rejection of Defective Work, Inspections, and Tests:

1) Conduct observations of the Work in progress on the Site to assist Engineer in determining if the Work is, in general, proceeding in accordance with the Contract Documents.

2) Report to Engineer when RPR believes that any Work is unsatisfactory, faulty, or defective or does not conform generally to the Contract Documents, or has been damaged, or does not meet the requirements of any inspection, test, or approval required to be made; and advise Engineer of Work that RPR believes should be corrected or rejected or should be uncovered for observation, or requires special testing, inspection, or approval.

3) Verify that tests, equipment, and systems startups, and operating and maintenance training are conducted in the presence of appropriate Owner’s personnel, and that Contractor maintains adequate records thereof; and observe, record, and report to Engineer appropriate details relative to the test procedures and startups.

4) Accompany visiting inspectors representing public or other agencies having jurisdiction over the Project, record the results of these inspections and report to Engineer.

f. Interpretation of Contract Documents: Report to Engineer when clarifications and interpretations of the Contract Documents are needed and transmit to Contractor clarifications and interpretations as issued by Engineer.

g. Modifications: Consider and evaluate Contractor’s suggestions for modifications to Drawings or Specifications and report with RPR's recommendations to Engineer. Transmit to Contractor decisions issued by Engineer.
h. Records:

1) Maintain at the Site orderly files for correspondence, reports of job conferences, Shop Drawings and Samples, and reproductions of original Contract Documents including all Addenda, Change Orders, Field Orders, additional Drawings issued subsequent to the execution of the Agreement, Engineer’s clarifications and interpretations of the Contract Documents, progress reports, and other Project-related documents.

2) Keep a record recording Contractor’s hours on the Site, weather conditions, data relative to questions on Change Orders or changed conditions, list of visitors to the Site, daily activities, decisions, observations in general, and specific observations in more detail as in the case of observing test procedures; and send copies to Engineer.

3) Record names, addresses, and telephone numbers of all Contractors, Subcontractors, and major Suppliers of materials and equipment.

Reports:

1) Furnish Engineer periodic reports as required of progress of the Work and of Contractor’s compliance with the Progress Schedule and Schedule of Submittals.

2) Consult with Engineer in advance of scheduled major tests, inspections, or start of important phases of the Work.

3) Prepare draft of proposed Change Orders, obtaining backup documents from Contractor, and provide recommendations to Engineer regarding Change Orders and Field Orders.

4) Report immediately to Engineer and Owner upon the occurrence of any Site accident, any Hazardous Environmental Condition, emergencies or acts of God endangering the Work, or property damage by fire or other cause.

j. Payment Requests: Review Applications for Payment with Contractor for compliance with the established procedure for their submission, and submit recommendations to Engineer, noting particularly the relationship of the payment requested to the Schedule of Values, Work completed, and materials and equipment delivered at the Site but not incorporated in the Work.

k. Certificates, Maintenance and Operation Manuals: During the course of the Work, verify that certificates, maintenance and operation manuals, and other data required by the Specifications to be assembled and furnished by Contractor are applicable to the items actually installed and in accordance with the Contract Documents, and have this material delivered to Engineer for review and forwarding to Owner prior to final payment for the Work.
1. Completion:

   1) Before Engineer issues a certificate of Substantial Completion, submit to Contractor a list of observed items requiring completion or correction.

   2) Observe whether Contractor has arranged for inspections required by Laws and Regulations, including but not limited to those to be performed by public authorities having jurisdiction over the Work.

   3) Conduct final inspection in the company of Engineer, Owner, and Contractor, and prepare a final list of items to be completed or corrected.

   4) Observe that all items on final list have been completed or corrected and make recommendations to Engineer concerning acceptance of the Work.

2. The RPR shall not:

   a. Authorize any deviation from the Contract Documents or substitution of materials or equipment, including “or equal” items.

   b. Exceed limitations of Engineer’s authority as set forth in the Contract Documents.

   c. Undertake any of the responsibilities of Contractor, Subcontractors, or Contractor’s superintendent.

   d. Advise on, issue directions relative to, or assume control over any aspect of the means, methods, techniques, sequences, or procedures of construction, unless such advice or directions are specifically required by the Contract Documents.

   e. Advise on, issue directions regarding, or assume control over safety precautions and programs in connection with the Work.

   f. Accept Shop Drawing or Sample submittals from anyone other than Contractor.

   g. Authorize Owner to occupy the Project in whole or in part.

   h. Participate in specialized field or laboratory tests or inspections conducted by others except as specifically authorized by Engineer.
ARTICLE 10 - CHANGES IN THE WORK; CLAIMS

SC-10.01.A Amend Paragraph 10.01.A by removing from the first sentence “, or a Work Change Directive”.

SC-10.01.B Remove Paragraph 10.01.B in its entirety.

SC-10.03.A.2 Remove Paragraph 10.03.A.2 in its entirety and replace with the following: “Not used.”

SC-10.03.B Add the following new paragraph immediately after Paragraph 10.03.A:

SC-10.03.B Change Order requests shall be accompanied by Contractor’s time impact analysis for the Change Order request to be reviewed.

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

SC-11.01.A.5.c Delete Paragraph 11.01.A.5.c in its entirety and insert the following in its place:

c. Construction Equipment and Machinery

1) Rentals of all construction equipment and machinery, and the parts thereof 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.

2) Costs for equipment and machinery owned by Contractor will be paid at a rate shown for such equipment in the Rental Rate Blue Book. An hourly rate will be computed by dividing the monthly rates by 176. These computed rates will include all operating costs. Costs will include the time the equipment or machinery is in use on the changed Work and the costs of transportation, loading, unloading, assembly, dismantling, and removal when directly attributable to the changed Work. The cost of any such equipment or machinery, or parts thereof, shall cease to accrue when the use thereof is no longer necessary for the changed Work. Equipment or machinery with a value of less than $1,000 will be considered small tools.

SC-11.03.D.1 Delete Paragraph 11.03.D.1 in its entirety and insert the following in its place:

SC-11.03.D.1 The total cost of a particular item of Unit Price Work amounts to 10 percent or more of the Contract Price and the variation in the quantity of that particular item of Unit Price Work performed by Contractor differs by more than 25 percent from the estimated quantity of such item indicated in the Agreement; and
ARTICLE 12 – CHANGE OF CONTRACT PRICE; CHANGE OF CONTRACT TIMES

SC-12.01.C.2.c  Delete the semicolon at the end of GC 12.01.C.2.c, and add the following:

, provided, however, that on any subcontracted work the total maximum fee to be paid by Owner under this subparagraph shall be no greater than 25 percent of the costs incurred by the Subcontractor who actually performs the work;

SC-12.04  Add the following new paragraph immediately after Paragraph 12.03:

SC-12.04  Liquidated Damages:

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

B.  Liquidated Damages Relative to Substantial Completion and Readiness for Final Payment: Owner and Contractor recognize that time is of the essence as stated in Paragraph SC-12.04.A above and that Owner will suffer financial loss if the Work is not completed within the Contract Times for Substantial Completion, completion and readiness for final payment, and Milestones (if any) specified in the Contract Documents, plus any changes thereof allowed in accordance with Article 12 of the General Conditions. The parties also recognize the delays, expense, and difficulties involved in proving in a legal or arbitration preceding the actual loss suffered by Owner if the Work is not completed on time. Accordingly, instead of requiring any such proof, Owner and Contractor agree that as liquidated damages for delay (but not as a penalty), Contractor shall pay Owner **One Thousand One Hundred Seventy Dollars & No Cents** ($1,170.00) for each day that expires after the time specified in the Contract Documents for Substantial Completion until the Work is substantially complete. After Substantial Completion, if Contractor shall neglect, refuse, or fail to complete the remaining Work within the Contract Time or any proper extension thereof granted by Owner, Contractor shall pay Owner **Five Hundred Dollars & No Cents** ($500.00) for each day that expires after the time specified in the Contract Documents for completion and readiness for final payment until the Work is completed and ready for final payment.

ARTICLE 14 – PAYMENTS TO CONTRACTOR AND COMPLETION

SC-14.02.A.1  Add the following new subparagraph immediately after Paragraph 14.02.A.1:

SC-14.02.A.1  Contractor’s and Subcontractor's certified payroll record for the period covered by the Application for Payment shall accompany the Application for Payment. Contractor’s Application for Payment shall be on Owner's standard Application for Payment form.
SC-14.02.C.1 Delete Paragraph 14.02.C.1 in its entirety and insert the following in its place:

SC-14.02.C.1 Thirty 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.

SC-14.07.B.1 Amend the first sentence of Paragraph 14.07.B.1 to read as follows:

If, on the basis of Engineer’s 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 20 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.

SC 14.07.C.1 Add the following at the end of Paragraph 14.07.C.1:

An approvable application for final payment shall include Contractor and Subcontractor payrolls for the period covered in the final Application for Payment; an update of progress against the accepted Progress Schedule; and such other items as the Engineer may reasonably require.

ARTICLE 15 - SUSPENSION OF WORK AND TERMINATION

SC-15.02.A.5 Add the following new paragraphs immediately after Paragraph 15.02.A.4:

SC-15.02.A.5 If the Contract or any part thereof is sublet or assigned to another party by Contractor, without the written consent of Owner and surety that issued the performance bond and payment bond;

ARTICLE 17 - MISCELLANEOUS

SC-17.07 Add the following new paragraph immediately after Paragraph 17.06:

SC-17.07 Working Near Utilities

A. Construction Adjacent to High Voltage Electric Lines:

1. Contractor shall comply with Laws and Regulations, including U.S. Occupational Safety and Health Administration (OSHA) safety standards regarding construction adjacent to high-voltage electric lines and facilities, including trenching, crane operations, final grading, and other associated work which may result in impaired clearance to an existing electrical line or facility.

2. It is a violation of OSHA regulations to operate equipment in a manner that results in persons or equipment coming within ten feet of an energized electric line. Such Laws and Regulations are enforced by OSHA, and violators are subject to penalties imposed under federal Law.
3. Texas Law prohibits function or activity where it is possible for the person performing such activity to come within six feet of an overhead power line.

4. Contractor shall notify the El Paso Electric Company in writing of Contractor’s anticipated dates and times when such work is scheduled. Written notification of El Paso Electric Company shall be at least six working days prior to each scheduled activity near El Paso Electric Company power lines and facilities, so that El Paso Electric Company personnel can coordinate with Contractor to provide proper clearance of energized electric lines. No other type of notice will be acceptable and work shall not be initiated until proper clearance and arrangements are confirmed by Contractor with the El Paso Electric Company.

5. Submit written notification to:

   Raul Guel, Distribution Engineering Design  
   El Paso Electric Company  
   P. O. Box 982  
   El Paso, Texas 79960  
   (915) 543-4015

6. Simultaneously submit one copy of the notification letter to Owner's Contracts Development Manager and retain copy in Contractor’s file.

7. Below are selected El Paso Electric Company phone numbers:

   - Claims Director (915) 543-4158
   - Trouble & Emergencies (915) 543-5720
   - Field Services/Power Consultants (915) 543-2255
   - Cable Locator (915) 543-4051

B. Construction Adjacent to Gas Lines: Contractor shall comply with the One-Call Notification and System Protection Program developed by Southern Union Gas Company, and with State Damage Prevention Law, HB 2295:

   - Contact Texas Gas Co. not less than two working days before commencing excavation activities
   - Determine exact location of all underground utilities by safe and acceptable means
   - Employ the two-foot safety rule
   - Utilize “Professional Excavator's Manual” as revised
SC-17.08 Add the following new paragraph immediately after Paragraph 17.07:

17.08 EPCWID #1 Dewatering Permit Requirements

A. A license agreement for “Discharge of Foreign Waters into District Drain Ditches” is required between Owner and the El Paso County Water Improvement District (EPCWID) #1 before Contractor may begin dewatering operations. Contractor shall be a co-licensee with Owner. Terms and conditions of the license agreement are applicable to Contractor, who will function, relative to the license EPCWID #1 agreement only, as an agent of Owner, by preparing an approvable plan and carrying out the terms of the plan and the EPCWID #1 license agreement. Contractor shall, to the extent permitted by law, defend and hold harmless Owner, its employees, insurers and agents; and the Engineer and Engineer’s consultants, and their employees, officers, insurers, and agents from claims arising out of damages caused by actions, or inactions, of Contractor or as a result of EPCWID’s exercise of any or all options given it under the license agreement.

B. Contractor shall prepare and submit to Engineer a “Dewatering Plan”, a “Final Schedule for Dewatering”, and an estimate of fees due EPCWID #1. Submit “Dewatering Plan” within 15 days of the date that the Contract Times commence running. “Dewatering Plan” shall include the estimated quantities of dewatering for each month of the Contract, the design capacity and number of pumps to be used by Contractor, and the point(s) of dewatering pump discharge. Engineer will review for acceptability the “Dewatering Plan” and, when the submittal is acceptable to Engineer, Engineer will forward it, through Owner, to EPCWID #1. Prepare and submit the submittal and schedule the Work so that Owner receives the “Dewatering Plan” submittal not less than 14 days before the start of dewatering operations at the Site. Owner will pay the fees as estimated in the "Dewatering Plan".

C. Estimate the dewatering fees on the following basis:

1. Dewatering fee at the rate of $150 per acre-foot of water discharged. For a month in which the discharge exceeds the amount estimated under the “Dewatering Plan”, Contractor shall advise Owner and Engineer in writing, that such excess fees may be due so that the Owner may consider its liability for, and take action to make payment of, such excess fees to EPCWID #1. Owner will pay such excess fees only to the extent that such fees are incurred through no fault of Contractor.

D. Samples of the discharge water shall be tested by a qualified testing laboratory hired by Contractor. Submit to Engineer results of total dissolved solids (TDS) tests, which Engineer will transmit to EPCWID #1. Submit to Engineer and Owner monthly reports of discharge quantities and quality (TDS and sulfates), which specific requirements may be more particularly indicated in the Specifications and in the associated discharge permit; Engineer will transmit monthly reports to EPCWID #1.
E. Contractor will not be eligible for final payment by Owner until final dewatering fees based upon actual quantities and damages (if any) due EPCWID #1 have been paid and payment due from Contractor has been made. A “Final Release” from EPCWID #1 shall be received by Owner as a condition precedent to Contractor applies for final payment.

*** END OF SUPPLEMENTARY CONDITIONS ***
REQUIRED WORKERS' COMPENSATION COVERAGE

(Title must be 30 point font & bold lettering)

(19 point font from here on)

The law requires that each person working on this site or providing services related to this construction project must be covered by workers' compensation insurance. This includes persons providing, hauling, or delivering equipment or materials, or providing labor or transportation or other service related to the project, regardless of the identity of their employer or status as an employee."

"Call the Texas Workers' Compensation Commission at 512-440-3789 to receive information on the legal requirements for coverage, to verify whether your employer has provided the required coverage, or to report an employer's failure to provide coverage."
SECTION 00840

GENERAL WAGE REQUIREMENTS

PART 1: GENERAL

1.01 REQUIREMENTS

A. Each employee shall be paid not less than the minimum rate of wages for the classification of work in which he is employed, as set out in the most current Davis-Bacon wage rates and set out in this section of the Specifications.

B. Sewer and Water Lines Wage Rates shall be used for the entire project except on the pavement replacement, where the Highway Construction Wage Rates shall be used.

END OF SECTION
"General Decision Number: TX20200024 01/03/2020

Superseded General Decision Number: TX20190024

State: Texas

Construction Type: Highway

County: El Paso County in Texas.

HIGHWAY CONSTRUCTION PROJECTS (excluding tunnels, building structures in rest area projects & railroad construction; bascule, suspension & spandrel arch bridges designed for commercial navigation, bridges involving marine construction; and other major bridges).

Note: Under Executive Order (EO) 13658, an hourly minimum wage of $10.80 for calendar year 2020 applies to all contracts subject to the Davis-Bacon Act for which the contract is awarded (and any solicitation was issued) on or after January 1, 2015. If this contract is covered by the EO, the contractor must pay all workers in any classification listed on this wage determination at least $10.80 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on the contract in calendar year 2020. If this contract is covered by the EO and a classification considered necessary for performance of work on the contract does not appear on this wage determination, the contractor must pay workers in that classification at least the wage rate determined through the conformance process set forth in 29 CFR 5.5(a)(1)(ii) (or the EO minimum wage rate, if it is higher than the conformed wage rate). The EO minimum wage rate will be adjusted annually. Please note that this EO applies to the above-mentioned types of contracts entered into by the federal government that are subject to the Davis-Bacon Act itself, but it does not apply to contracts subject only to the Davis-Bacon Related Acts, including those set forth at 29 CFR 5.1(a)(2)-(60). Additional information on contractor requirements and worker protections under the EO is available at www.dol.gov/whd/govcontracts.

Modification Number     Publication Date
0             01/03/2020

* SUTX2011-005 08/02/2011

Rates          Fringes

CEMENT MASON/CONCRETE FINISHER (Paving and Structures)......................$ 12.44

ELECTRICIAN......................$ 20.27

FORM BUILDER/FORM SETTER (Structures)......................$ 12.26

LABORER
Asphalt Raker................$ 11.44
Laborer, Common...........$ 10.58
Laborer, Utility...........$ 11.33
Pipelayer..................$ 11.37

POWER EQUIPMENT OPERATOR:
Asphalt Distributor........$ 13.28
Asphalt Paving Machine....$ 13.26
Excavator, 50,000 lbs or
less................................$ 13.49
Front End Loader  Over 3CY..$ 13.57
Front End Loader 3CY or
less................................$ 13.29
Motor Grader  Fine Grade...$ 16.13
Scraper.......................$ 11.12
Servicer......................$ 13.44

TRUCK DRIVER
Single Axle..................$ 13.16
Single or Tandem Axle Dump..$ 14.06

WELDER.......................$ 13.74

WELDERS - Receive rate prescribed for craft performing
operation to which welding is incidental.

Note: Executive Order (EO) 13706, Establishing Paid Sick Leave
for Federal Contractors applies to all contracts subject to the
Davis-Bacon Act for which the contract is awarded (and any
solicitation was issued) on or after January 1, 2017. If this
contract is covered by the EO, the contractor must provide
employees with 1 hour of paid sick leave for every 30 hours
they work, up to 56 hours of paid sick leave each year.
Employees must be permitted to use paid sick leave for their
own illness, injury or other health-related needs, including
preventive care; to assist a family member (or person who is
like family to the employee) who is ill, injured, or has other
health-related needs, including preventive care; or for reasons
resulting from, or to assist a family member (or person who is
like family to the employee) who is a victim of, domestic
violence, sexual assault, or stalking. Additional information
on contractor requirements and worker protections under the EO
is available at www.dol.gov/whd/govcontracts.

Unlisted classifications needed for work not included within
the scope of the classifications listed may be added after
award only as provided in the labor standards contract clauses
(29CFR 5.5 (a) (1) (ii)).

The body of each wage determination lists the classification
and wage rates that have been found to be prevailing for the
cited type(s) of construction in the area covered by the wage
determination. The classifications are listed in alphabetical
order of "identifiers" that indicate whether the particular
rate is a union rate (current union negotiated rate for local),
a survey rate (weighted average rate) or a union average rate
(weighted union average rate).
Union Rate Identifiers

A four letter classification abbreviation identifier enclosed in dotted lines beginning with characters other than "SU" or "UAVG" denotes that the union classification and rate were prevailing for that classification in the survey. Example: PLUM0198-005 07/01/2014. PLUM is an abbreviation identifier of the union which prevailed in the survey for this classification, which in this example would be Plumbers. 0198 indicates the local union number or district council number where applicable, i.e., Plumbers Local 0198. The next number, 005 in the example, is an internal number used in processing the wage determination. 07/01/2014 is the effective date of the most current negotiated rate, which in this example is July 1, 2014.

Union prevailing wage rates are updated to reflect all rate changes in the collective bargaining agreement (CBA) governing this classification and rate.

Survey Rate Identifiers

Classifications listed under the "SU" identifier indicate that no one rate prevailed for this classification in the survey and the published rate is derived by computing a weighted average rate based on all the rates reported in the survey for that classification. As this weighted average rate includes all rates reported in the survey, it may include both union and non-union rates. Example: SULA2012-007 5/13/2014. SU indicates the rates are survey rates based on a weighted average calculation of rates and are not majority rates. LA indicates the State of Louisiana. 2012 is the year of survey on which these classifications and rates are based. The next number, 007 in the example, is an internal number used in producing the wage determination. 5/13/2014 indicates the survey completion date for the classifications and rates under that identifier.

Survey wage rates are not updated and remain in effect until a new survey is conducted.

Union Average Rate Identifiers

Classification(s) listed under the UAVG identifier indicate that no single majority rate prevailed for those classifications; however, 100% of the data reported for the classifications was union data. EXAMPLE: UAVG-OH-0010 08/29/2014. UAVG indicates that the rate is a weighted union average rate. OH indicates the state. The next number, 0010 in the example, is an internal number used in producing the wage determination. 08/29/2014 indicates the survey completion date for the classifications and rates under that identifier.

A UAVG rate will be updated once a year, usually in January of each year, to reflect a weighted average of the current negotiated/CBA rate of the union locals from which the rate is based.

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WAGE DETERMINATION APPEALS PROCESS

1.) Has there been an initial decision in the matter? This can
be:
* an existing published wage determination
* a survey underlying a wage determination
* a Wage and Hour Division letter setting forth a position on a wage determination matter
* a conformance (additional classification and rate) ruling

On survey related matters, initial contact, including requests for summaries of surveys, should be with the Wage and Hour Regional Office for the area in which the survey was conducted because those Regional Offices have responsibility for the Davis-Bacon survey program. If the response from this initial contact is not satisfactory, then the process described in 2.) and 3.) should be followed.

With regard to any other matter not yet ripe for the formal process described here, initial contact should be with the Branch of Construction Wage Determinations. Write to:

Branch of Construction Wage Determinations  
Wage and Hour Division  
U.S. Department of Labor  
200 Constitution Avenue, N.W.  
Washington, DC 20210

2.) If the answer to the question in 1.) is yes, then an interested party (those affected by the action) can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Write to:

Wage and Hour Administrator  
U.S. Department of Labor  
200 Constitution Avenue, N.W.  
Washington, DC 20210

The request should be accompanied by a full statement of the interested party’s position and by any information (wage payment data, project description, area practice material, etc.) that the requestor considers relevant to the issue.

3.) If the decision of the Administrator is not favorable, an interested party may appeal directly to the Administrative Review Board (formerly the Wage Appeals Board). Write to:

Administrative Review Board  
U.S. Department of Labor  
200 Constitution Avenue, N.W.  
Washington, DC 20210

4.) All decisions by the Administrative Review Board are final.

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END OF GENERAL DECISION

"
"General Decision Number: TX20200035 01/03/2020

Superseded General Decision Number: TX20190035

State: Texas

Construction Type: Heavy

County: El Paso County in Texas.

HEAVY CONSTRUCTION, (INCLUDING WATER/SEWER LINES)

Note: Under Executive Order (EO) 13658, an hourly minimum wage of $10.80 for calendar year 2020 applies to all contracts subject to the Davis-Bacon Act for which the contract is awarded (and any solicitation was issued) on or after January 1, 2015. If this contract is covered by the EO, the contractor must pay all workers in any classification listed on this wage determination at least $10.80 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on the contract in calendar year 2020. If this contract is covered by the EO and a classification considered necessary for performance of work on the contract does not appear on this wage determination, the contractor must pay workers in that classification at least the wage rate determined through the conformance process set forth in 29 CFR 5.5(a)(1)(i) (or the EO minimum wage rate, if it is higher than the conformed wage rate). The EO minimum wage rate will be adjusted annually. Please note that this EO applies to the above-mentioned types of contracts entered into by the federal government that are subject to the Davis-Bacon Act itself, but it does not apply to contracts subject only to the Davis-Bacon Related Acts, including those set forth at 29 CFR 5.1(a)(2)-(60). Additional information on contractor requirements and worker protections under the EO is available at www.dol.gov/whd/govcontracts.

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* ELEC0583-003 12/01/2019

HEAVY CONSTRUCTION (INCLUDING WATER/SEWER LINES)

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SUTX2005-015 05/13/2005

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Laborers:

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POWER EQUIPMENT OPERATOR:

https://beta.sam.gov/wage-determination/TX20200035/0?index=wd&keywords=&is_active=true&sort=-modifiedDate&date_filter_index=0&date_rad_s...
Backhoe.....................$ 11.57  0.00
Front End Loader............$ 10.43  0.00
Grader......................$ 11.19  0.00
TRUCK DRIVER.....................$  9.17  0.00

WELDERS - Receive rate prescribed for craft performing operation to which welding is incidental.

Note: Executive Order (EO) 13706, Establishing Paid Sick Leave for Federal Contractors applies to all contracts subject to the Davis-Bacon Act for which the contract is awarded (and any solicitation was issued) on or after January 1, 2017. If this contract is covered by the EO, the contractor must provide employees with 1 hour of paid sick leave for every 30 hours they work, up to 56 hours of paid sick leave each year. Employees must be permitted to use paid sick leave for their own illness, injury or other health-related needs, including preventive care; to assist a family member (or person who is like family to the employee) who is ill, injured, or has other health-related needs, including preventive care; or for reasons resulting from, or to assist a family member (or person who is like family to the employee) who is a victim of, domestic violence, sexual assault, or stalking. Additional information on contractor requirements and worker protections under the EO is available at www.dol.gov/whd/govcontracts.

Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clauses (29CFR 5.5 (a) (1) (ii)).

The body of each wage determination lists the classification and wage rates that have been found to be prevailing for the cited type(s) of construction in the area covered by the wage determination. The classifications are listed in alphabetical order of "identifiers" that indicate whether the particular rate is a union rate (current union negotiated rate for local), a survey rate (weighted average rate) or a union average rate (weighted union average rate).

Union Rate Identifiers

A four letter classification abbreviation identifier enclosed in dotted lines beginning with characters other than "SU" or "UAVG" denotes that the union classification and rate were prevailing for that classification in the survey. Example: PLUM0198-005 07/01/2014. PLUM is an abbreviation identifier of the union which prevailed in the survey for this classification, which in this example would be Plumbers. 0198 indicates the local union number or district council number where applicable, i.e., Plumbers Local 0198. The next number, 005 in the example, is an internal number used in processing the wage determination. 07/01/2014 is the effective date of the most current negotiated rate, which in this example is July 1, 2014.

Union prevailing wage rates are updated to reflect all rate
changes in the collective bargaining agreement (CBA) governing this classification and rate.

Survey Rate Identifiers

Classifications listed under the "SU" identifier indicate that no one rate prevailed for this classification in the survey and the published rate is derived by computing a weighted average rate based on all the rates reported in the survey for that classification. As this weighted average rate includes all rates reported in the survey, it may include both union and non-union rates. Example: SULA2012-007 5/13/2014. SU indicates the rates are survey rates based on a weighted average calculation of rates and are not majority rates. LA indicates the State of Louisiana. 2012 is the year of survey on which these classifications and rates are based. The next number, 007 in the example, is an internal number used in producing the wage determination. 5/13/2014 indicates the survey completion date for the classifications and rates under that identifier.

Survey wage rates are not updated and remain in effect until a new survey is conducted.

Union Average Rate Identifiers

Classifications listed under the UAVG identifier indicate that no single majority rate prevailed for those classifications; however, 100% of the data reported for the classifications was union data. EXAMPLE: UAVG-OH-0010 08/29/2014. UAVG indicates that the rate is a weighted union average rate. OH indicates the state. The next number, 0010 in the example, is an internal number used in producing the wage determination. 08/29/2014 indicates the survey completion date for the classifications and rates under that identifier.

A UAVG rate will be updated once a year, usually in January of each year, to reflect a weighted average of the current negotiated/CBA rate of the union locals from which the rate is based.

----------------------------------------------------------------

WAGE DETERMINATION APPEALS PROCESS

1.) Has there been an initial decision in the matter? This can be:

* an existing published wage determination
* a survey underlying a wage determination
* a Wage and Hour Division letter setting forth a position on a wage determination matter
* a conformance (additional classification and rate) ruling

On survey related matters, initial contact, including requests for summaries of surveys, should be with the Wage and Hour Regional Office for the area in which the survey was conducted because those Regional Offices have responsibility for the Davis-Bacon survey program. If the response from this initial contact is not satisfactory, then the process described in 2.) and 3.) should be followed.

With regard to any other matter not yet ripe for the formal process described here, initial contact should be with the
Branch of Construction Wage Determinations. Write to:

Branch of Construction Wage Determinations
Wage and Hour Division
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

2.) If the answer to the question in 1.) is yes, then an interested party (those affected by the action) can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Write to:

Wage and Hour Administrator
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

The request should be accompanied by a full statement of the interested party's position and by any information (wage payment data, project description, area practice material, etc.) that the requestor considers relevant to the issue.

3.) If the decision of the Administrator is not favorable, an interested party may appeal directly to the Administrative Review Board (formerly the Wage Appeals Board). Write to:

Administrative Review Board
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

4.) All decisions by the Administrative Review Board are final.

================================================================
END OF GENERAL DECISION
TECHNICAL SPECIFICATIONS
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### TECHNICAL SPECIFICATIONS

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DIVISION 1
SECTION 01010 – GENERAL

PART 1  GENERAL

1.01 CONSTRUCTION SEQUENCING

A. These specifications cover the work required to install the sanitary sewer and water pipelines. For all phases of this work, the Contractor shall reference the plans prepared by the Lower Valley Water District under the title, "Mesa del Norte Subdivision Sanitary Sewer Improvements Phase II", to ensure that other requirements are met.

B. All construction shall be sequenced in such a way to allow for a minimum of vehicular and pedestrian traffic interruption, while keeping the existing sewer lines and other utilities in service, as well as complying with the requirements of the County of El Paso, TX DOT, Lower Valley Water District, and Texas Commission on Environmental Quality (TCEQ).

C. The lowest, responsible, responsive bidder must meet all of the qualifications as set forth in the contract documents.

1.02 COMPLETE FACILITY

A. It is the intent of these specifications that the pipeline facilities function in accordance with the specified purpose. Therefore, it is the direct responsibility of the Contractor to furnish, install, and construct the complete improvements as required by the plans, specifications and code for the price(s) stated in the Contract, and to take account of all subsidiary requirements in accordance with the specified requirements.

1.03 RIGHTS-OF-WAY

A. The Sanitary Sewer and the Water Pipelines shall be installed within County of El Paso, TX DOT and EPCWID#1 Right-of-Ways. The Contractor shall use the minimum area practicable for construction of the new facility. Excess excavated material shall be removed from the street right-of-way and disposed of by the Contractor as required by the Specifications and by local, state and federal law. All street right-of-way shall be restored to their original or better condition upon completion of work in the immediate area.

B. Construction within County of El Paso, TX DOT and EPCWID#1 Right-of-Ways shall be performed in a manner causing a minimum of inconvenience to pedestrian and vehicular traffic and adjacent property. Safe passage shall be provided at all times for the public in those areas where the construction is occurring. Provisions shall be made by Contractor for notification of the County of El Paso, TX DOT and/or EPCWID#1 whenever work is to be carried out in any street in County of El Paso, TX DOT and/or EPCWID#1, and care shall be taken for the control of traffic. The Contractor is responsible for all traffic control and safety and plans and permits and with complying with the requirements of the jurisdictional agency. Permits required by County of El Paso, TX DOT and/or EPCWID#1 are obtainable through their office. Permits must be acquired by the Contractor.

1.04 CONTRACTOR’S SUPERINTENDENCE

A. The Contractor’s Superintendent shall be assigned to this project on a full time basis. This will require that the Contractor’s Superintendent be at the project site at all times when construction activities are occurring. If the Contractor’s Superintendent is not at the site, the Owner has the right, at his discretion, to stop the Contractor’s entire operation at that given time. The Contractor’s Superintendent will not be an operator of any equipment at any time during the project.
If at any time during the progress of the Work, the Owner, at his discretion, finds that the Contractor’s Superintendent is not found to be competent to perform the duties for this project, the Owner may require that the Contractor change Superintendents.

1.05 TESTING LABORATORY

A. If needed, Owner will retain a testing laboratory to perform inspections, sampling and confirmation tests to determine Quality Assurance (QA) compliance of the work. Procedures and methods for determining compliance shall be as directed by the Engineer. Owner shall be responsible for payment for all costs associated with initial confirmation tests required to determine compliance with the Contract Documents. Costs for retests performed because the initial test resulted in a failure and any delay or extra time during the test, shall be paid for by the Contractor. Any costs incurred by the Owner for retesting shall be deducted from subsequent Contractor pay requests.

B. Contractor shall employ services of independent testing laboratory to perform services and testing required in ensuring compliance (Quality Control) with the Contract or for his convenience. Contractor is responsible and shall pay for all independent testing laboratory services in connection with compaction, design mixes, job mix formula and materials and manufacture items in accordance with the General Conditions. Contractor is responsible and shall pay for all independent testing laboratory services in connection with establishing suitability of excavated on-site materials for use as fill or embankment. Owner may employ independent testing laboratory to verify suitability of these materials proposed for use in the project at Owner’s cost.

C. If the Contractor elects to utilize a testing laboratory for the Contractor’s convenience, it shall not be the same firm retained by the Owner.

D. Engineer will contact the Owner’s independent testing laboratory and order Owner paid appropriate QA field testing, will select sample locations, and shall be furnished copies of all test results.

E. Contractor’s Responsibilities

1. Cooperate with laboratory personnel, provide access to Work.

2. Secure and deliver to the laboratory adequate quantities of representational samples of materials proposed to be used and which require testing.

3. Provide to the laboratory the preliminary design mix proposed to be used for concrete, and other materials mixes which require control by the testing laboratory.

4. Furnish copies of products’ test reports as required.

5. Furnish incidental labor and facilities:
   a. To provide access to Work to be tested.
   b. To facilitate tests including obtaining and handling samples at Project site if so requested.

6. Notify Owner and Engineer sufficiently (at least 24 hours) in advance of operations to allow for laboratory assignment of personnel and scheduling of tests. When tests cannot be performed because of inadequate notice, Contractor shall bear all additional expenses incurred for laboratory personnel and travel due to Contractor’s negligence. Contractor shall also not be entitled to extension of Time in such event, if Work cannot proceed prior to performance of tests.
7. If so desired, make arrangements with its own laboratory and pay for additional samples and tests required for the Contractor’s convenience.

8. The Contractor is responsible for all tests and certifications regarding pipeline materials and appurtenances and pipeline testing for conformance with specifications.

1.06 TESTS

A. Where tests of materials or any portions of the Work are required by standards, law/ordinance or public authority, the Contractor shall bear all costs of such tests, shall give timely notice of readiness therefore and shall furnish to the Engineer the required certification of testing or approval.

B. Tests specified in the Technical Specifications shall fall into four categories: (1) those required for approval of materials prior to use, which serve the same purpose as shop drawings or samples; (2) those required by law; (3) those necessary for acceptance of equipment, or facilities; and (4) those made during the progress of the Work to check compliance with the requirements of the Contract Documents. The Contractor shall bear all the costs of the tests in the first three categories.

C. The tests made in the fourth category will be made at the discretion of the Engineer and all costs thereof will be borne by the Owner, except that the Contractor shall furnish the materials or samples for the test and shall cooperate with the Engineer or Testing Laboratory in securing such samples. In addition, the costs for all failing tests in this category shall be borne by the Contractor.

1.07 EMERGENCY COMMUNICATION

A. The Contractor shall maintain at all times during construction, a local telephone number where responsible supervisory personnel may be contacted twenty-four hours a day of every day the project is under construction and not yet accepted by the Owner. The telephone number shall be given to the dispatcher, wastewater superintendent, the General Manager of the Lower Valley Water District (915-791-4480), the Project Manager and to the Engineer so that contact can be made in the event of any emergency.

1.08 EXISTING UTILITIES AND FACILITIES

A. The Contractor shall be fully responsible for all underground facilities which are shown on the drawings or which can be located by the Contractor with reasonable effort, or which are brought to the attention of the Contractor in any manner. The Contractor shall be responsible for notifying the Engineer if any unknown facilities are uncovered and for protecting those facilities after they are uncovered.

B. The drawings do not indicate the approximate location of existing utilities that could be located or approximated during design. Therefore, the Contractor shall be responsible for determining the exact location of all buried utilities along the manholes routes prior to starting any excavation activities. The Contractor shall be responsible for locating, protecting, and repairing any damages utilities and service connections resulting from the work along the route of construction at their cost.

C. The Contractor shall be responsible for the protection of all electric power poles, overhead lines, light poles, etc. which occur within/near private properties. The Contractor shall provide whatever temporary shoring is necessary to ensure that all poles are adequately supported, braced, etc. so that the pole does not sink, shift, tilt, or otherwise move from its original position. Any removal of guy wires or anchors and setting of any guy wires or anchors shall be done at the Contractors expense. Any measures the Contractor takes to support any type of pole shall be based upon approval of the owner of the pole and the Engineer. The owner of the pole and the Engineer shall be notified of probable work on the pole no later than within the first week of Contractor’s work, and again 5 business days prior to the work being done. Removal of temporary supports of guy wires shall be with the approval of the owner of the pole and the Engineer. Said removals of temporary
facilities shall only be accomplished upon 5 business day’s notification to the owner of the pole and the Engineer.

D. The Contractor shall coordinate the work with all utility companies having facilities within the area of work, including but not limited to the Texas Gas Service Company, El Paso Electric, Lower Valley Water District, MCI Telecommunications Company, A. T. & T. and Time Warner Cable for the relocation, by-passing or protection of their existing utility lines. Any work associated with the protection, hanging, relocation or by-passing of existing utility lines shall be reflected in the Contractor’s project schedule so that the work may be completed without delay to the project. All the requirements of the contract documents will apply to any subcontractor who performs any relocation, hanging, by-passing, or protection of existing utility lines. All work associated with the relocating, hanging, by-passing, or protection of existing utility lines shall be at the expense of the Contractor. Prior to the commencement of any protection, hanging, relocation, or by-pass work the Contractor shall submit a work plan to the utility line owner and the Engineer for approval. No relocation or by-pass work shall be performed without prior written approval of the work by the owner of the utility line and the Engineer. Emergency protection of existing utility lines to protect the line from immediate damage may be performed by the Contractor without prior approval; however, the Contractor shall take every action available to notify the Owner and the Engineer of the situation as quickly as possible.

1.09 DAMAGE TO PRIVATE PROPERTY

A. The Contractor shall be responsible for any damage to private property caused by the construction project. The Contractor upon receipt of a complaint of damage shall within 24 hours respond in writing with a proposal to repair said damage or a letter with reasons explaining why the damage was not caused by the construction. The damage shall be repaired completely within 15 days of the complaint. If the damages are not repaired within the 15 days as stated above, the Owner may perform the repairs and back charge the Contractor.

1.10 TRENCH EXCAVATION SAFETY SYSTEM

A. The Contractor will be required to install a trench safety system to provide for the safe excavating of all trenches in accordance with OSHA standards.

B. The Contractor’s attention is directed to the Bid Item No.2 under which full compensation will be made for all designs, testing, materials, equipment, and labor required to furnish, install, and remove the trench safety system regardless of the method to be used to make the trench excavation safe.

C. It shall be the duty and responsibility of the Contractor and all his subcontractors to be familiar with and comply with all requirements of Public Law 91-586, 29 U.S.C. Secs. 651 et seq., the Occupational Safety and Health Act of 1970 (OSHA), and all amendments thereto, and to enforce and comply with all of the provisions of the Act. In addition, on a project in which trench excavation will exceed a depth of five feet, the Contractor and all of his subcontractors shall comply with all requirements of 29 C.F.R. Secs. 1926.652 and 1926.653, OSHA Safety and Health Standards, which are more fully described above, for the particular safety system to be utilized by the Contractors.

D. The successful low bidder will be required to submit an original and 5 copies of excavation plans for tank excavation safety system to the Program Manager for informational purposes within 15 calendar days after Award of Contract.

E. Plans must be designed and sealed by a professional engineer registered in the State of Texas with professional experience in geotechnical engineering. The Contractor is responsible for obtaining borings and soil analysis as required for the design and preparation of the manhole excavation plan and manhole safety system.
F. No excavation will be allowed without the use of the manhole safety system in accordance with OSHA standards. Any changes in the manhole excavation plan after initiation of construction will not be cause of Extension of Time or Change Order.

G. The Contractor accepts sole responsibility for compliance with all applicable safety requirements. Reviews by the Engineer are only for an evaluation of general conformance with OSHA safety standards; and review of the trench excavation plan does not relieve the Contractor of any or all construction means, methods, techniques, and procedures. Any property damage or bodily injury, including death, which arises from use of the trench, remains the sole responsibility and liability of the Contractor.

1.11 VIDEO TAPING

A. Prior to and after the construction of the cuadrilla site improvements and all other construction sites shall be videotaped by the Contractor accompanied by the Engineer or his representative, to show existing conditions of roadways, adjacent properties, easements, structures, utilities, rockwalls, chainlink fence, sidewalks, curb and gutter, power poles, light poles, landscaping, driveways, and other existing improvements and if it is possible Contractor should videotape inside the private property. If the Contractor cannot show on the video tape that the damage was present prior to construction, the Contractor will be responsible for repairing the damages at his expense as described in Item 1.09 of this section. Two copies of the videotaping shall be given to the Engineer in D.V.D Format. Payment for videotaping shall be lump sum as shown on the Proposal.

1.12 APPROVAL OF EQUIPMENT AND MATERIALS

A. All materials shall be new and shall be designed and manufactured for the function and service specified herein. No materials shall be used in the project except those which have been approved by the Engineer. Approval for installation or incorporation in the project will be made only after submittal and examination of shop and installation drawings, manufacturer’s specifications, test results or other data required in the paragraph SHOP AND INSTALLATION DRAWINGS or in connection with the Technical Specifications. Final approval and acceptance of equipment will be made only after such equipment is in operation and has met all specified tests.

1.13 SHOP AND INSTALLATION DRAWINGS

A. Shop and Installation Drawings, Installation Instructions, Manufacturer’s Specifications, and all other pertinent data required by the Engineer to determine approval for installation of the materials and equipment, shall be submitted to the Engineer, as required by the General Conditions and Section 01300, of the Specifications. Such drawings and other data as required shall be submitted to the Engineer at the earliest practicable date. Delay in submission of shop drawings will not of itself be grounds for granting an extension of time. Shop Drawings submitted to the Engineer without having been checked by Contractor will be returned to the Contractor for such checking before being examined by the Engineer.

B. Shop Drawings shall be complete, showing all pipelines pieces and fittings dimensions, anchor bolts or other mounting devices, openings in structures required for installation of connecting piping, and any other pertinent data necessary for determining compliance with the specifications and suitability of the installation and for the service intended.

C. One initial shop drawing submittal consisting of the Contractor’s requirement plus 4 complete sets and one re-submittal of an equal number of complete sets will be reviewed by the Engineer at no cost to the Contractor. Subsequent reviews on resubmitted shop drawings will be reviewed at a cost to the Contractor equal to the billing rate of the reviewing Engineer times the hours required to review the submittal.
1.14 TRAFFIC CONTROL

A. Traffic control for all areas of the project shall be the complete responsibility of the Contractor. Seven days prior to commencing any work in specific areas of the project, the Contractor shall prepare and submit for Engineer’s, County of El Paso, TX DOT and/or EPCWID#1 approval, traffic control plans for that particular work area. The traffic control plans shall conform to the specifications and principles as required by the Texas Department of Transportation as well as any County of El Paso requirements. Six (6) copies of the Approved Traffic Control Plan shall be submitted to the Engineer.

1.15 DELIVERIES TO OWNER

A. Contractor shall provide copies of paid receipts with the monthly partial payment request to the Owner.

B. Contractor shall keep delivery receipts with Project Record Documents.

C. All deliveries to Owner shall be at the Owner’s designated location on the job site. Location may vary according to materials delivered.

1.16 OWNER FURNISHED ITEMS

1.17 NIGHTTIME, WEEKEND AND HOLIDAY WORK

A. If the Contractor desires to perform any work between the hours of 5 p.m. and 7 a.m., or on Saturdays, Sundays or national holidays, he shall request in writing to do so before he starts such work. The Contractor shall acquire any necessary permits associated with such work and comply with all permit conditions and all laws and ordinances relating thereto.

B. The Contractor shall reimburse the Owner for additional costs incurred as a result of providing additional inspection personnel when the Contractor performs the nighttime, weekend or holiday work. Additional inspection costs will be at the rate of $142.50 per hour.

PART 2 PRODUCTS

NOT USED

PART 3 EXECUTION

NOT USED

PART 4 MEASUREMENT AND PAYMENT

A. No measurement shall be made for the work of this Section. Payment made for all work covered in this section except videotaping will be included in the unit price per manhole indicated in the Bid Proposal. Videotaping of construction areas shall be paid at the lump sum price bid, as shown on the Proposal. Such payment shall be complete compensation for the complete performance of the work in accordance with the Drawings and the provisions of these Specifications.

END OF SECTION
SECTION 01014 – TRENCH SAFETY SYSTEM

PART 1   GENERAL

1.01   GENERAL

A. This section shall govern the Trench Safety Systems required for the construction of all trench excavation to be utilized in the project including all additional excavation and backfill necessitated by the safety system. The trench safety systems shall be suitable for installation of manholes or pipelines, utilities, etc., that are installed below grade and shall be sufficient to fully protect public or private property including other existing utilities and structures below, or above grade. Trench Safety Systems include but are not limited to sloping of side of excavation, sheeting, trench boxes or trench shields, sheet piling, cribbing, bracing, shoring, dewatering, or diversion of water to provide adequate drainage.

1.02   SECTION INCLUDES

A. Special Conditions.
B. Indemnification.
C. Construction Methods.
D. Safety Program.
E. Emergencies.
F. OSHA.

1.03   SPECIAL CONDITIONS

A. The Contractor will be required to install a shoring safety system to provide for the safe excavation of all trenches exceeding a depth of five (5) feet as per OSHA standards or when existing soil conditions dictate.

B. It shall be the duty and responsibility of the Contractor and all of its subcontractors to be familiar and comply with all requirements of Public Law 91-596, 29 U.S.C. Secs. 651 et. seq., the Occupational Safety and Health Act of 1970 (OSHA), and all amendments thereto, and to enforce and comply with all of the provisions of this Act. In addition, on projects in which trench excavation will exceed a depth of five feet, the Contractor and all of its subcontractors shall comply with all requirements of 29 C.F.R. Secs., 1926.652 and 1926.653, OSHA Safety and Health Standards, which are more fully described herein.

C. The successful responsible bidder will be required to submit 4 original (wet seal) sets of trench excavation plans with a trench safety system to the Owner for review within 15 consecutive days after Award of Contract.

D. Plans must be designed and sealed by a professional engineer registered in the State of Texas with professional experience in geotechnical engineering. The Contractor is responsible for obtaining borings and soil analysis as required for the design and preparation of the trench excavation plan and trench safety system. The trench excavation plan and the trench safety system is to be designed in conformance with OSHA standards and regulations.
E. No trenching in excess of five (5) feet below existing grade will be allowed until the trench excavation plan is reviewed and returned as approved to the Contractor. Any changes in the trench excavation plan after initiation of construction will not cause an Extension of Time or Change Order but such changes will require the same review process as the original excavation plan.

F. The Contractor accepts sole responsibility for compliance with all applicable safety requirements. The review is only for general conformance with OSHA safety standards; and review of the trench excavation plan does not relieve the Contractor of any or all construction means, methods, techniques, and procedures. Any property damage or bodily injury, including death that arises from use of the trench excavation plan shall remain the sole responsibility and liability of the Contractor.

1.04 INDEMNIFICATION

A. The Contractor shall indemnify and hold harmless the Owner, its employees and agents, from any and all damages, costs (including without limitation, legal fees, court costs, and the cost of investigation), judgments or claims, by anyone, including workers or the general public, for injury or death of persons resulting from the collapse or failure of trenches constructed under this contract.

B. The Contractor acknowledges and agrees that this indemnity provision provides indemnity for the Owner in case that claims are made that the Owner 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.

C. The Contractor shall be responsible for the design of systems, and procedures such as the use of sheet piling, shoring, or other means of temporary support to protect existing buildings, streets, highways, water conveying structures, or any other structures. In the case of existing utilities, the contractor may elect to remove the utilities under the stipulated condition that the removal and subsequent replacement of these utilities shall meet with the approval of the Engineer, the Owner, the Utility Owner, and all agencies having jurisdiction of the structure or property. In all cases, the Contractor shall be fully responsible for the protection of public, or private property and for the protection of any person or persons who, as a result of the Contractor's work, may be injured.

1.05 CONSTRUCTION METHODS

A. Trench safety systems shall be accomplished in accordance with the detailed specifications set out in the provisions of Excavations, Trenching, and Shoring, Federal Occupational Safety and Health Administration (OSHA) Standards, 29 CFR, Part 1926. Subpart P, as amended including proposed Rules published in the Federal Register (Vol. 54, No. 209) on Tuesday, October 31, 1989. The sections that are incorporated into these specifications by reference include Sections 1926-650 through 1926-652. Legislation that has been enacted by the Texas Legislature (H.B. No. 662 and H.B. No. 665) with regard to Trench Safety Systems, is hereby also incorporated, by reference, into these specifications.

1.06 SAFETY PROGRAM

A. The Contractor shall submit a safety program specifically for the construction of trench excavations together with the trench excavation plans for Trench Safety Systems. The trench safety program shall be in accordance with OSHA standards governing the presence and activities of individuals working in and around trench excavation.
B. Contractors have two generally accepted methods, or combinations thereof, to meet OSHA Standards for Trench Excavations:

1. Utilization of Trench Box.
2. Shoring, Sheeting, and Bracing Methods.
3. Tank Excavations.

C. A Contractor electing to utilize a Trench Box must submit physical dimensions, materials, position in the trench, expected loads, and the strength of the box. The Trench Box shall be designed by a Professional Engineer. No claims for delay will be permitted.

D. Contractor electing to utilize Shoring, Sheeting, and Bracing must submit dimensions and materials of all uprights, stringers, cross-bracing, and spacing required to meet OSHA requirements, all designed by a Professional Engineer. No claims for delay will be permitted.

1.07 INSPECTION

A. The Contractor shall provide a qualified person to make daily inspections of the Trench Safety Systems to ensure that the systems meet OSHA requirements. The Contractor shall maintain a permanent record of daily inspections.

B. If evidence of possible cave-ins, or slides, 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. It is the sole duty, responsibility, and prerogative of the contractor, not the Owner or the Owner's designated representative, to determine the specific applicability of the designed trench safety systems to each field condition encountered on the project.

1.08 EMERGENCIES

A. In an emergency situation, which may threaten or affect the safety or welfare of persons or property, the Contractor shall act at his discretion to prevent possible damage, injury, or loss. Any additional compensation or extension of time claimed for such action shall be considered in view of the cause of the emergency and in accordance with the General Conditions.

1.09 OSHA SAFETY AND HEALTH REGULATIONS PART 1926: (see 02221)

PART 2 PRODUCTS

(NOT USED)

PART 3 EXECUTION

(NOT USED)

END OF SECTION
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SECTION 01015 – CONTROL OF WORK

PART 1    GENERAL

1.01    WORK PROGRESS

A. The Contractor shall furnish personnel and equipment which will be efficient, appropriate and skilled enough to secure a satisfactory quality of work and a rate of progress which will insure the completion of the work within the time stipulated in the Agreement. If at any time such personnel or equipment appears to the Engineer to be inefficient, inappropriate or insufficient for securing the quality of work required or for producing the rate of progress aforesaid, he may order the Contractor to increase the efficiency, change the character or increase the personnel and equipment, and the Contractor shall conform to such order. Failure of the Engineer to give such order shall in no way relieve the Contractor of his obligations to secure the quality of the work and rate of progress required.

1.02    PRIVATE LAND

A. The Contractor shall not enter or occupy private land outside of acquired rights-of-way or easements, except by written permission of the Land/Easement Owner.

1.03    WORK LOCATIONS

A. Work shall be located substantially as indicated on the Drawings, but the Engineer reserves the right to make such modifications in locations as may be found desirable to avoid interference with existing structures or utilities or for other reasons. Where fittings are noted on the Drawings, such notation is for the Contractor's convenience and does not relieve him from laying and jointing different or additional items where required to make a complete working system.

1.04    OPEN EXCAVATIONS

A. All open excavations shall be adequately safeguarded by providing temporary barricades, caution signs, lights, and other means to prevent accidents to persons and damage to property. The Contractor shall, at his own expense, provide suitable and safe bridges and other crossings for accommodating travel by pedestrians and workmen. Bridges provided for access during construction shall be removed when no longer required. The length or size of excavation will be controlled by the particular surrounding conditions, but shall always be confined to the limits prescribed by the Engineer. If the excavation becomes a hazard, or if it excessively restricts traffic at any point, the Engineer may require special construction procedures such as limiting the length of open trench, prohibiting stacking of excavated material in the street, and requiring that the trench shall not remain open overnight.

B. The Contractor shall take precautions to prevent injury to the public due to open trenches. All trenches, excavated material, equipment, or other obstacles which could be dangerous to the public shall be protected with barricades having flashing warning lights at all times when appropriate to insure safety and when construction is not in progress.

C. The Contractor shall take appropriate measures to prevent any surface flow from entering any open excavation at any time, including flow from any defined watercourse or overland flow during or following a rainfall event or storm.

1.05    TEST PITS

A. Test pits for the purpose of locating underground utilities or structures in advance of the construction shall be excavated and backfilled by the Contractor. Test pits shall be backfilled immediately after their purpose has been satisfied and the surface restored and maintained in a manner satisfactory to the Engineer.
1.06 DISTRIBUTION SYSTEMS AND SERVICES

A. The Contractor shall not interrupt water, gas, telephone, cable TV, or other utility services without the written permission of the utility owner.

B. If it appears that utility service will be interrupted for an extended period, the Engineer may order the Contractor to provide temporary service lines. Inconvenience to the users shall be minimized, consistent with existing conditions. The safety and integrity of the system is of prime importance in scheduling work.

C. The Contractor shall not move, cut, or relocate private utilities (gas, electric, telephone, cable TV, etc.) without the written permission of the appropriate utility company.

1.07 PROTECTION AND RELOCATION OF EXISTING STRUCTURES AND UTILITIES

A. The Contractor shall assume full responsibility for the protection of all buildings, structures, and utilities, public or private, including poles, signs, services to building utilities, in the street, gas pipes, water pipes, hydrants, sewers, drains, and electric and telephone cables, whether or not they are shown on the Drawings. The Contractor shall carefully support and protect all such structures and utilities from injury of any kind. Any damage resulting from the Contractor's operation shall be repaired by him at his expense, or in the case of private utilities, repaired by that utility at the Contractor's expense.

B. The Contractor shall bear full responsibility for obtaining locations of all underground structures and utilities. Services to buildings shall be maintained, and all costs or charges resulting from damage thereto shall be paid by the Contractor.

C. Protection and temporary removal and replacement of existing utilities and structures as described in this Section shall be a part of the work under the Contract and all costs in connection therewith shall be included in the unit prices established in the Bid.

D. If, in the opinion of the Engineer, permanent relocation of a utility owned by Owner is required, he may direct the Contractor in writing, to perform the work. Work so ordered will be paid for at the Contract unit prices, if applicable, or as extra work under Article 10 of the General Conditions. If relocation of a privately owned utility is required, the Owner will notify the Utility to perform the work as expeditiously as possible. The Contractor shall fully cooperate with the Owner and Utility and shall have no claim for delay due to such relocation. The Contractor shall notify public utility companies in writing at least 72 hours (excluding Saturdays, Sundays, and legal holidays) before excavating near their utilities.

1.08 MAINTENANCE OF TRAFFIC

A. Unless permission to close a street is received in writing from the appropriate authority, all excavated material shall be placed so that vehicular and pedestrian traffic may be maintained at all times. If the Contractor's operations cause traffic hazards, he shall repair the road surface, provide temporary ways, erect wheel guards or fences, or take other measures for safety satisfactory to the proper authority.

B. Detours around construction will be subject to the approval of the Traffic Control Plan. Where detours are permitted the Contractor shall provide all necessary barricades and signs as required to divert the flow of traffic. While traffic is detoured, the Contractor shall expedite construction operations, and periods when traffic is being detoured will be strictly controlled by the and/or right-of-way Owner.
C. The Contractor shall take precautions to prevent injury to the public due to open trenches and boring pits. Night watchmen may be required where special hazards exist, or police protection provided for traffic while work is in progress. The Contractor shall be fully responsible for damage or injuries whether or not police protection has been provided.

1.09 CARE AND PROTECTION OF PROPERTY

A. The Contractor shall be responsible for the preservation of all public and private property, and shall use every precaution necessary to prevent damage thereto. If any direct or indirect damage is done to public or private property by or on account of any act, omission, neglect, or misconduct in the execution of the Work on the part of the Contractor, such property shall be restored by the Contractor, at his expense, to a condition similar or equal to that existing before the damage was done, or he shall make good the damage in other manner acceptable to the Engineer.

B. The Contractor upon receipt of a complaint of damage shall within 24 hours respond in writing with a proposal to repair said damage or a letter with reasons explaining why the damage was not caused by the construction. The damage shall be repaired completely within 15 days of the complaint. If the damages are not repaired within the 15 days stated above, the owner may perform the repairs and back charge the contractor.

C. All sidewalks, which are disturbed by the Contractor's operations, shall be restored to their original or better condition by the use of similar or comparable materials. All curbing shall be restored to a condition equal to or better than the original construction and in accordance with the best modern practice.

D. Along the location of this Work all fences, walks, bushes, trees, shrubbery, and other physical features shall be protected and restored to a condition equal to or better than the original construction and in accordance with the best modern practice.

E. Trees close to the work shall be boxed or otherwise protected against injury. The Contractor shall trim all branches that are liable to damage because of his operations, but in no case shall any tree be cut or removed without prior notification of the Engineer. All injuries to bark, trunk, limbs, and roots of trees shall be repaired by dressing, cutting, and painting according to approved methods, using only approved tools and materials.

F. The protection, removal, and replacement of existing physical features along the line work, including existing utilities, of shall be a part of the work under the Contract, and all costs in connection therewith shall be included in the unit and/or lump sum prices established under the items in the Bid Form.

1.10 MAINTENANCE OF FLOW

A. The Contractor shall at his own cost, provide for the flow of sewers, drains and watercourses interrupted during the progress of the Work, and shall immediately cart away and remove all offensive matter. The entire procedure of maintaining existing flow shall be fully discussed with the Engineer and the Owner well in advance of the interruption of any flow. Restoration of water and/or sewer service, temporarily or accidentally disrupted, shall have priority over all other work. Such service shall be restored immediately.

B. Contractor shall provide sufficient personnel to assist in proper notification to all customers affected by temporary water shut-off.

C. All spillage and offensive matter to be removed from the site and disposed of by the Contractor shall be taken to waste treatment plant facilities, landfills, or other suitable facilities acceptable to the Engineer and the facility owner and in compliance with all applicable regulations. Contractor shall bear all cost of removal, transportation and disposal to the proper site.
1.11 DISPOSAL OF EXCESS EXCAVATED AND OTHER WASTE MATERIALS

A. All excess material (suitable or unsuitable) and all vegetation, trash, debris, etc., from the excavation shall be disposed of off-site at a location approved by the Owner.

B. Unacceptable disposal sites include, but are not limited to, sites within a wetland or critical habitat and sites where disposal will have a detrimental effect on surface water or groundwater quality or restrict the flows of such waters. A list of approved disposal sites can be obtained at the different state and city agencies.

C. The Contractor shall make his own arrangements for disposal subject to submission of proof to the Owner that the owner(s) of the proposed site(s) have a valid fill permit issued by the appropriate governmental agency and submission of a haul route plan including a map of the proposed route(s).

D. The Contractor shall provide watertight conveyance of any liquid, semi-liquid, or saturated solids, which tend to bleed or leak during transport. No liquid loss from transported materials will be permitted whether being delivered to the construction site or being hauled away for disposal. Fluid materials hauled for disposal must be specifically acceptable at the selected disposal site.

E. The Contractor shall comply with all necessary permits, licenses, and authorizations regarding the removal, transport and disposal of sludge as are required by all applicable Federal, State and local laws and regulations.

F. The Owner may suspend operations of the Contractor, at its discretion, for alleged non-compliance with Texas Water Commission or Environmental Protection Agency regulations.

1.12 PROTECTION OF AIR QUALITY

A. Air pollution shall be minimized by wetting down bare soils during windy periods, or as requested by Engineer by requiring the use of properly operating combustion emission control devices on construction vehicles and equipment used by Contractors, and by encouraging the shutdown of motorized equipment not actually in use.

B. Trash burning will not be permitted on the construction site without the Owner's approval.

C. If temporary heating devices are necessary for protection of the work, such devices shall be of a type that will not cause pollution of the air.

1.13 USE OF CHEMICALS

A. All chemicals used during project construction or furnished for project operation, whether herbicide, pesticide, disinfectant, polymer, reactant or of other classification, must show approval of either the U.S. Environmental Protection Agency or the U.S. Department of Agriculture or other applicable regulatory agency. Use of all such chemicals and disposal of residues shall be in conformance with the manufacturer's instructions.
1.14 NOISE AND DUST CONTROL

A. The Contractor shall so conduct his operations that they will not annoy the residents in the vicinity of the work, and shall comply with all applicable local ordinances. Compressors, hoists, and other apparatus shall be equipped with such mechanical devices as may be necessary to minimize noise and dust. Compressors shall be equipped with silencers on intake lines. All gasoline or oil operated equipment shall be equipped with silencers or mufflers on intake and exhaust lines. Storage bins and hoppers shall be lined with material that will deaden the sounds if directed by Engineer. The operation of dumping rock and of carrying rock away in trucks shall be so conducted as to cause a minimum of noise and dust. Vehicles carrying rock, concrete, or other material shall be routed over such streets as will cause the least annoyance to the public and shall not be operated on public streets between the hours of 6 p.m. and 7 a.m. or on Saturdays, Sundays or legal holidays unless approved by the Owner. The Contractor shall comply with the City of El Paso Municipal Code 9.40.030 for exterior noise standards as per applicable noise zone. The City Department of Health will ultimately determine the actual noise level readings in case of a complaint. The Contractor shall immediately correct its actions to minimize the noise and to bring it to city compliance.

B. All unpaved streets, roads, detours, or haul roads used in the construction area shall be given an approved dust-preventive treatment or periodically watered to prevent dust as directed by the R.O.W. jurisdictional agency Inspector, Owner and/or Engineer. Applicable environmental regulations for dust prevention shall be strictly enforced.

1.15 CLEANUP

A. During the course of the Work, the Contractor shall keep the site of his operations in as clean and neat a condition as is possible. He shall dispose of all residue resulting from the construction work and, at the conclusion of the work, he shall remove and haul away any surplus excavation, broken pavement, pipe, lumber, equipment, temporary structures, vegetation and any other refuse remaining from the construction operations, and shall leave the entire site of the Work in a neat and orderly condition at the end of each working day.

1.16 CONTRACTOR'S QUALITY CONTROL

A. All material shall be new and of the specified quality and equal to the accepted samples, if samples have been submitted. All work shall be done and completed in a thorough, workmanlike manner, notwithstanding any omission from these Contract Documents; and it shall be the duty of the Contractor to call the Engineer's attention to apparent errors or omissions and request instructions before proceeding with the work. The Engineer may, by appropriate instructions, correct errors and supply omissions, which instructions shall be as binding upon the Contractor as though contained in the original Contract Documents.

B. At the option of the Engineer, materials to be supplied under this Contract will be tested and/or inspected either at their place of origin or at the site of the work. The Contractor shall give the Engineer written notification well in advance of actual readiness of materials to be tested and/or inspected at point of origin. Satisfactory tests and inspections at the point of origin shall not be construed as a final acceptance of the material nor shall it preclude retesting or reinspection at the site of the work.

C. Material, which will require testing and inspection at the place of origin, shall not be shipped prior to such testing and inspection.

PART 2 PRODUCTS

NOT USED
PART 3 EXECUTION

NOT USED

END OF SECTION
SECTION 01020 – TPDES REQUIREMENTS

PART 1—GENERAL

The Texas Pollutant Discharge Elimination System (TPDES) Construction General Permit No. TXR 150000, effective March 5, 2013 (Construction General Permit). The Construction General Permit allows operators to obtain permit coverage for storm water conveyance from Small and Large Construction Activities. The TPDES program implements the federal National Pollutant Discharge Elimination System (NPDES) program in the state of Texas, which requires that operators of Small or Large Construction Activities obtain permit coverage prior to the commencement of construction activities.

The engineer has estimated that the project will disturb approximately 1.20 acres of land and has included the forms to be filled out and submitted to TCEQ for a Storm Water Pollution Prevention Plan (SWP3). It is the Contractor’s responsibility to obtain and implement a SWP3 for this project.

1.01 SECTION INCLUDES

A. Documentation to be prepared and signed by Contractor before conducting construction operations, in accordance with the Texas Pollutant Discharge Elimination System (TPDES) Construction General Permit Number TXR 150000, effective March 5, 2013 (Construction General Permit).

B. Implementation, maintenance inspection, and termination of storm water pollution prevention control measures including, but not limited to, erosion and sediment controls, storm water management plans, waste collection and disposal, and other applicable practices shown on the drawings or specified elsewhere in the Contract.

1.02 DEFINITIONS

A. Commencement of Construction Activities: The exposure of soil resulting from activities such as clearing, grading, and excavating.

B. Large Construction Activity is defined as a project that:

1. disturbs five acres or more, or

2. disturbs less than five acres but is part of a large common plan of development that will disturb five acres or more of land.

C. Small Construction Activity is a project that:

1. disturbs one or more acres but less than five acres, or

2. disturbs less than one acre but is part of a larger common plan of development that will ultimately disturb one or more acres but less than five acres.

D. Operator is a person or persons who have day-to-day operation control of the construction activities, which are necessary to ensure compliance with the SWP3 for the site.

PART 2—PRODUCTS

Not Used
PART 3—EXECUTION

3.01 STORM WATER POLLUTION PREVENTION PLAN (SWP3)

A. The Contractor shall have an SWP3 prepared in accordance with Part III of the Construction General Permit for Small or Large Construction Activities. A professional engineer licensed in the state of Texas shall prepare the SWP3, in accordance with County of El Paso and TX DOT ordinance. Contractor is responsible for all permitting processes and fees with the County of El Paso and TX DOT.

B. Support Activities within 1-mile distance of project boundary of the permitted construction site, which directly supports the project, should be included in the Storm Water Pollution Control Plan prepared for the Contractor. These activities include but are not limited to:

1. Equipment Staging Areas
2. Material Storage yards
3. Material Borrow areas
4. Excavated material disposal areas
5. Concrete batch plants
6. Asphalt batch plants

Refer to Part II, Section A of the Construction General Permit for a description of Discharges Eligible for Authorization under the Construction General Permit.

C. The SWP3 will be updated as needed during construction following Part III, Section E of the Construction General Permit.

D. The SWP3 shall be submitted to the engineer 15 days after award of the contract. Any comments provided shall be addressed prior to commencing construction activities.

E. The SWP3 shall be implemented prior to commencement of construction activities and maintained through the duration of construction.

3.02 LARGE CONSTRUCTION ACTIVITY

A. NOTICE OF INTENT (NOI)

1. The Contractor shall fill out, sign, and date the TCEQ Form 20022 (06/16) Notice of Intent for Storm Water Discharges Associated with Construction Activity under the TPDES Construction General Permit (TXR 150000), included at the end of this Section.

2. The Contractor shall submit a copy of the Notice of Intent (NOI) form, along with a signed check for $100.00, made out to the Texas Commission on Environmental Quality, and completed payment submittal form to the TCEQ. A copy of the package will be submitted to the engineer.

3. Submission of the NOI form by the Contractor to TCEQ is required a minimum of two days before Commencement of Construction Activities.

4. The Contractor shall submit to the LVWD copies of the NOI.
5. Post a signed copy of the NOI near the main entrance of a construction site in a prominent place for viewing by the general public and local, state, and federal authorities prior to commencing construction activities, and maintain it in that location until completion of the construction. Post name and telephone number of Contractor’s local contact person, brief project description and location of SWP3.

If Project is a linear construction project (e.g.: road, utilities, etc), post notice in a publicly accessible location near active construction. Move notice as necessary.

B. NOTICE OF CHANGE (NOC) LETTER

If the operator becomes aware that he failed to submit any relevant facts or submitted incorrect information in the NOI, the correct information must be provided to the executive director in a NOC letter within 14 days after discovery. If relevant information provided in the NOI changes, a NOC letter must be submitted within 14 days of the change. A copy of the NOC must be provided to the engineer and the LVWD.

C. ANNUAL WATER QUALITY FEES

Large Construction activities authorized under the construction general permit must pay the required annual Water Quality Fee as noted as per Part VII, Fees of the Construction General Permit.

D. NOTICE OF TERMINATION (NOT)

1. Submit a Notice of Termination (NOT) to the TCEQ and the engineer ten (10) days after:
   a. Final stabilization has been achieved on all portions of the site that are the responsibility of the Contractor; or
   b. Another operator has assumed control over all areas of the site that have not been stabilized.
   c. All silt fences and other temporary erosion controls have either been removed, scheduled to be removed as defined in the SWP3, or transferred to a new operator if the new operator has sought permit coverage.

2. Submittal of the NOT to the engineer is required for final acceptance of the project.

3. The Contractor shall submit a signed copy of the NOT to the LVWD.

3.03 SMALL CONSTRUCTION ACTIVITY

A. CONSTRUCTION SITE NOTICE

1. Fill out, sign, and date the Construction Site Notice, included at the end of this Section. Submit the signed copy of the Construction Site Notice to the Engineer at least two days before commencement of construction activities.

2. Post a signed copy of the Construction Site Notice near the main entrance of a construction site in a prominent place for viewing by the general public and local, state, and federal authorities prior to commencing construction activities, and maintain it in that location until completion of the construction. Post name and telephone number of Contractor’s local contact person, brief project description and location of SWP3.
If Project is a linear construction project (e.g.: road, utilities, etc), post notice in a publicly accessible location near active construction. Move notice as necessary.

3. The Contractor shall submit a signed copy of the Construction Site Notice to the County of El Paso Road & Bridges Department and TX DOT.

3.04 CERTIFICATION REQUIREMENTS

A. Fill out Pollution Prevention Plan Certification Form to include the Operator’s signature, name, title and organization.

B. Contractor and Subcontractors shall sign and date Contractor’s / Subcontractor’s Certification for TPDES Permitting included at the end of this Section including Contractor’s name, address, and telephone number, and the names of persons or firms responsible for maintenance and inspection of erosion and sediment control measures. Use multiple copies as required to document full information. Include this certification with other Project certification forms.

C. Submit properly completed certification forms to the engineer for review before commencing construction.

D. Conduct inspections in accordance with TCEQ requirements. Ensure persons or firms responsible for maintenance and inspection of erosion and sediment control measure read, fill out, sign, and date the Erosion Control Contractor’s Certification for Inspection and Maintenance. Use EPA’s NPDES Construction Inspection Form included at the end of this Section. Controls must be inspected once every fourteen (14) calendar days and within twenty four (24) hours of the end of a storm event of 0.5 inches or greater, in accordance with Part III, Section F, of the Construction General Permit.

3.05 RETENTION OF RECORDS

A. Keep a copy of this document and the SWP3 in a readily accessible location at the construction site from Commencement of Construction Activity, and maintain it in that location until completion of the construction. Contractors with day-to-day operational control over SWP3 implementation shall have a copy of the SWP3 available at a central location, on-site, for the use of all operators and those identified as having responsibilities under the SWP3.

3.06 ON-SITE WASTE MATERIAL STORAGE

A. On site waste material storage shall be self-contained and shall satisfy appropriate local, state, and federal rules and regulations.

B. Prepare list of waste material to be stored on-site. Update list as necessary to include up-to-date information. Keep a copy of the updated list with the SWP3.

C. Prepare description of controls to reduce pollutants generated from on-site storage. Include storage practices necessary to minimize exposure of materials to storm water, and spill prevention and response measures consistent with best management practices. Keep a copy of the description with the SWP3.

3.07 SUPPLEMENTS

A. The supplements listed below are part of the Specification.

1. Notice of Intent (NOI) Instructions

2. NOI Form
3. Notice of Termination (NOT) Instructions
4. NOT Form
5. Contractor’s Certification
6. Pollution Prevention Plan Certificate
7. Construction Site Notice
8. EPA’s NPDES Construction Inspection Form

END OF SECTION
CONTRACTOR’S CERTIFICATION

I certify under penalty of law that I understand the terms and conditions of the Texas Pollutant Discharge Elimination System (TPDES) Construction General Permit Number TXR 150000, issued on March 5, 2013, that authorizes the stormwater discharges associated with construction activities from the construction site identified as part of this certification.

Signed: ___________________________ Date: ______________
Name: ___________________________ Title: ___________________________
Company: ___________________________
Address: ___________________________
City, State, Zip Code: ______________ Telephone: ______________
Responsible for: ___________________________

Signed: ___________________________ Date: ______________
Name: ___________________________ Title: ___________________________
Company: ___________________________
Address: ___________________________
City, State, Zip Code: ______________ Telephone: ______________
Responsible for: ___________________________

Signed: ___________________________ Date: ______________
Name: ___________________________ Title: ___________________________
Company: ___________________________
Address: ___________________________
City, State, Zip Code: ______________ Telephone: ______________
Responsible for: ___________________________
POLLUTION PREVENTION PLAN CERTIFICATION

This certifies that this Construction Stormwater Pollution Prevention Plan is up-to-date and that the update meets the specified requirements under the Texas Pollutant Discharge Elimination System (TPDES) Construction General Permit Number TXR 150000, issued on March 5, 2013, and that the information provided herein is true, correct and complete. This also certifies that the person whose signature appears below has the authority to commit the resources necessary to implement this plan.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Signed: ___________________________ Date: _______________

Name: ___________________________________________________________________

Title: ___________________________________________________________________

Company: __________________________________________________________________

Organization: ______________________________________________________________
PART 1 GENERAL

1.01 REQUIREMENTS

A. Measurement and payment shall be as specified in this Section.

B. General scope of work under each bid item includes all labor and materials required for construction of completely functional and operational facilities as shown on the Drawings and in these Specifications.

C. All estimated quantities for unit price bid items stipulated in the bid proposal are approximate and are to be used only (a) as a basis for estimating the probable cost of the work and (b) for the purpose of comparing the bids submitted for the work. The actual amounts of work done and materials furnished under unit price items may differ from the estimated quantities. The basis of payment for unit price work and materials will be the actual amount of work done and materials furnished.

D. All measurements and payments will be based on completed and accepted work performed in strict accordance with the Drawings and Specifications and in accordance with contract-unit prices and schedule of values. Incidental work and items not listed in the contract-unit price schedule will not be paid for separately but will be included in the payment for the listed item or items and shall be full compensation for all labor, equipment, materials, testing and incidentals necessary to perform the work in accordance with these contract documents.

F. Cost of work or materials shown on the Drawings, called for in the Specifications and on which no separate payment is made shall be included in the bid price on the various pay items for which they are associated. A claim by the Contractor for extra compensation for an item shown on the Drawings or described in the Specifications will not be considered for any reason including but not limited to the claim that it does not fall within the scope of one of the Bid items.

PART 2 MEASUREMENT AND PAYMENT

2.01 MOBILIZATION/DEMOBILIZATION
(BASE BID No. 1: Bid Item #1)

A. Shall include all costs for Contractor’s mobilization and demobilization, insurance and bond, construction permits and fees, joboffice trailers, site administration expenses, and utilities to the job trailers including power, telephone, etc. for the entire project. Shall include all costs for contract closeout, site cleanup, and all costs associated with Contractor’s demobilization from the site. Payment for mobilization and demobilization shall be on a Lump Sum basis as noted in the Bid Form.
2.02 SANITARY SEWER PIPELINE  
(BASE BID No. 1: Bid Item #2)  

A. Measurement shall be the actual linear feet of new sanitary sewer pipeline installed as determined by measurement along the centerline of the pipe using horizontal stationing, with no deduction being made for manholes or fittings.

B. Payment will be made at the unit price bid for each size and type of pipe as stated in the Proposal and will be compensation in full for furnishing and installing the necessary materials and work as follows:

Construction and easement staking, construction facilities, submittals, coordination, quality control site preparation, barricades, excavation, hand excavation, testing, backfilling and successful passing of compaction test for utilities, protection and relocations of adjacent utilities and structures, relocation, removal and replacement and protection of power and/or light poles, filter fabric for trench bedding, furnishing and installation of stub-outs and plugs, temporary water and sewer bypasses, coring existing manholes, removal and replacement or repair of rock walls and fences, repair of driveways, removal and reinstallation of mailboxes, providing uninterrupted mail access, protection and reconstruction of culverts, and operation, providing temporary irrigation bypass systems, all pipe bedding material, repair/replacement of sidewalks, all pipe and accessories, restoration of TXDOT and/or County of El Paso and/or EPCWID#1 R.O.W., concrete, equipment, mechanical and electrical, access outlets, fittings and blind flanges shown and called out on the Drawings, blind flanges or dished heads and appurtenances for pressure testing, field closures, concrete encasements, concrete thrust blocks, all mechanically restrained joints or welded joints, flexible connections, tie-ins and connections to existing lines or work including the lowering or raising of existing lines to grades of new line if necessary for proper connection and cover, removal and replacement of shrubbery, miscellaneous concrete and reinforcement, brick, stone, miscellaneous painting, temporary cold mix patch where required, restoring natural drainage, protection, hanging, relocation of existing utilities, landscape improvements (removal and/or replacement) repairing and replacing broken or interfering utility mains damaged during construction, salvage operations, revegetation of easements or construction limits, flushing of existing mains as called out in the plans and all other items of the project not indicated as being covered under the other specific bid items shown in the Proposal. Such payment shall be complete compensation for the complete performance of the work in accordance with the drawings and the provisions of these specifications.

B. A maximum of 80% of the unit bid price for sanitary sewer pipe shall be paid until such time that each section of sewer line passes all tests and is accepted by the Owner.

2.03 WATER PIPELINE  
(BASE BID No. 1: Bid Item #3)  

A. Measurement shall be the actual linear feet of new water pipeline installed as determined by measurement along the centerline of the pipe using horizontal stationing, with no deduction being made for gate valves or fittings.

B. Payment will be made at the unit price bid for each size and type of pipe as stated in the Proposal and will be compensation in full for furnishing and installing the necessary materials and work as follows:
Construction and easement staking, potholing necessary to determine the location of existing fiber optic/telephone lines and other utilities, construction facilities, submittals, coordination, quality control site preparation, barricades, excavation, hand excavation, testing, backfilling and successful passing of compaction test for utilities, protection/relocation of existing services, utilities and structures, potholing to locate existing water and sewer lines, removal and replacement and protection of power and/or light poles, filter fabric for trench bedding, furnishing and installation of stub-outs and plugs, temporary water and sewer bypasses, removal and replacement or repair of rock walls and fences, repair of driveways, removal and reinstallation of mailboxes, providing uninterrupted mail access, protection and reconstruction of irrigation ditches (concrete lined or otherwise) and removal/replacement of culverts, and operation, providing temporary irrigation bypass systems, all pipe bedding material, repair/replacement of curb and gutter, header curb, repair/replacement of sidewalks, all pipe and accessories, restoration of TXDOT and/or County of El Paso and/or EPCWID#1 R.O.W. , backfill, concrete, equipment, mechanical and electrical, access outlets, fittings and blind flanges shown and called out on the Drawings, blind flanges or dished heads and appurtenances for pressure testing, field closures, concrete encasements, concrete thrust blocks, all mechanically restrained joints or welded joints, flexible connections, couplings, tie-ins, reducers and connections to existing/new lines or work including the lowering or raising of existing lines to grades of new line if necessary for proper connection and cover, removal and replacement of shrubbery, miscellaneous concrete and reinforcement, brick, stone, miscellaneous painting, temporary cold mix patch where required, restoring natural drainage, restoring existing condition of terrain, protection, hanging of existing utilities, repairing and replacing broken or interfering utility mains and fiber optic/telephone lines damaged during construction, salvage operations, revegetation of easements or construction limits, SWP3 or best management practices for storm water runoff, flushing and all other items of the project not indicated as being covered under the other specific bid items shown in the Proposal. Such payment shall be complete compensation for the complete performance of the work in accordance with the drawings and the provisions of these specifications.

2.04 WATER SERVICES OF VARIOUS SIZES  
(BASE BID No. 1: Bid Item #4 & #5)

A. Work under this item shall include all cost associated with furnishing labor, materials, equipment, required for the installation of water services and back flow preventers as shown on construction drawings. Payment of all work under this item shall be full compensation for all work and material including but not limited to any testing, inspection, or any additional excavation and backfill required, compaction, site grading, for purchasing, furnishing and placing all meters, fittings, reducers, couplings, concrete, concrete forms, and for all the labor, materials, tools, equipment, and incidentals necessary.

B. This item will be measured for payment per each.

2.05 STEEL CASING BY BORING METHODS OF VARIOUS SIZES  
(BASE BID No. 1: Bid Item #6 & #7)

A. Measurement shall be the actual linear feet of steel casing installed by boring methods. Payment will be made at the unit price bid for steel casing installed by boring and will be compensation in full for furnishing and installing such casing as shown on the plans, including boring operations and equipment, pits, shoring, insulators, end seals, vents, grout, coordination with right-of-way owners and all material, labor and equipment necessary for the work and any other appurtenances required. Carrier pipe and all installation of the carrier pipe in the casing, complete and in place shall be included in the unit price bid for pipe.

B. This item will be measured for payment by the linear foot of casing installed.
2.06 MANHOLES
   (BASE BID No. 1: Bid Item #8 & #10)
   A. Manholes of the various diameters and types (standard) shall be measured for each type installed to a depth of 6 feet for 48-inch and 72-inch diameter manholes, including bases, pipe penetrations, grout, concrete, sealant, protective coatings, frames, covers, concrete collars, testing and other appurtenances as shown on the drawings.

   B. Payment for manholes shall be at the unit price bid for each manhole installed and accepted. Payment shall include all labor, equipment, fees, and any incidentals necessary for the completion of the work. The additional depth of manhole risers shall be paid at the unit price bid per vertical foot for each accepted manhole, as determined in paragraph 2.07A.

2.07 ADDITIONAL VERTICAL DEPTH
   (BASE BID No. 1: Bid Item #9 & #11)
   A. The additional depth of manhole risers shall be measured by the vertical foot as determined by measuring the total depth of a manhole from its base to the top of its frame and subtracting 6 feet from the total measured depth.

   B. The additional depth of manhole risers shall be paid at the unit price bid per vertical foot for each accepted manhole, as determined in paragraph 2.07A.

2.08 REMOVAL AND REPLACEMENT OF ASPHALTIC PAVEMENTS INCLUDING BASE COURSE
   (BASE BID No. 1: Bid Item #12)
   A. Measurement shall be made on a square yard basis where the centerline of the pipeline is located within the pavement. Paving are to be removed and replaced per these plans and specifications and will be paid to the limits described therein.

   B. No extra payment for excess pavement cut and/or replacement shall be made without prior written approval by the Engineer. Payment will be made at the unit price bid and will be compensation in full for all removals and for furnishing and placing all material, labor, compaction, equipment, and incidentals necessary to complete the work in accordance with the plans and these specifications. Pavement and shoulder replacement cost shall include saw cutting, restriping, signage removal, replacement and base course/2-sac, and coordination and approval from TxDOT and County of El Paso. Temporary patch pavement and the use of steel plates shall be included as part of this item. Pavements damaged as a result of Contractor operations or as a result of the movement of Contractor equipment or vehicles shall be replaced to pre-existing conditions at Contractor’s expense.

   C. A maximum of 90% of the unit price bid for removal and replacement asphalt pavement shall be paid until such time that the entire Right Of Way is clean and free of excess material, broken pavement, pipe, lumber, equipment, temporary structures, vegetation and any other refuse remaining from the construction operations. The Right Of Way shall be maintained clean until the asphalt is accepted by the Owner.

   D. Asphalt pavement must be placed within 15 calendar days after all tests of the water and sanitary sewer lines have been passed.
2.09 FURNISH AND INSTALL CONCRETE ROLLED CURB. 
(BASE BID No. 1: Bid Item #13)

A. Measurement shall be made on the linear foot of concrete rolled curb installed (complete in place) to the nearest whole linear foot.

B. Payment shall be made at the stated unit price per linear foot of concrete curb installed (complete in place) to the limits identified on the plans and shall include installation in accordance with project specifications. Payment shall also include all joint and sealant material, continuously reinforced concrete pavement preparation, furnishing of reinforcement bars and installation, surplus, hauling and off-site properly disposal, subgrade preparation and compaction; and all labor, coordination, materials, deliveries, tools, equipment, and any incidentals necessary for completing the work. No extra payment for excess cut and/or replacement as called for on the plans shall be made without prior written approval by the Engineer.

2.09 TRENCH SAFETY SYSTEM FOR SANITARY SEWER and WATER PIPELINES 
(BASE BID No. 1: Bid Item #14)

A. Measurement of trench safety systems shall be determined by the actual length along the centerline of any installed pipe with no deduction being made for manholes or fittings.

B. Payment shall be made at the unit price bid per linear foot as stated in the Proposal and shall be full compensation for the trench safety system including any design, testing, inspection or additional excavation and backfill required for furnishing, placing, maintaining and removing all shoring, sheeting or bracing for required compaction, and for all other labor, materials, tools, equipment and incidentals necessary to complete the trench safety system work, as specified.

2.10 TRAFFIC CONTROL 
(BASE BID No.1: Bid Item #15)

A. Measurement of this item shall be made at the lump sum price stated in the bid form.

B. Payment shall be full compensation for the traffic control including but not limited to permits, plans, coordination, barrels, concrete barricades, water barricades, traffic cones, caution signs, warning signs, construction signs, barrels with flashing lights, speed bumps, flag man, message boards, sand bags, impact attenuators, and any other item required to have a complete and operational traffic control system and any other jurisdictional R.O.W. requirements.

2.11 LUMP SUM ITEMS

A. Lump sum items include, but are necessarily not limited to:

   1. Videotape of Project Area Before and After Construction (provide 2 copies in DVD format).

      No separate measurement will be made of any materials, equipment, supplies, testing, labor, earthworks or any other individual work item associated with the work for any individual lump sum item noted in the Proposal.

B. Lump sum items shall be paid for at the lump sum price bid for each individual work item as noted in the Proposal.
2.12 SEWAGE PUMPING SYSTEM AND EFFlUENT TANKS (ADDITIVE ALTERNATE No.1: Bid Item #1)

A. Measurement shall be made in the stated lump sum for all related work in Divisions 1 through 3 for the complete installation of the Sewage Pumping System and Effluent Tanks including all components and accessories as specified and as shown on the contract drawings, including but not limited to pumps, valves, piping, filters, meters, electrical components, safety equipment, concrete hardscape, anchors, straps, etc., including site grading, 16-foot-wide all-weather access gravel road (complete in place), reinforced concrete pipeline class V, clearing and grubbing, coordination with baseball field operations, traffic/pedestrian control and all related appurtenances and other components necessary for a complete and operational pump and haul system not noted elsewhere on the bid form. All planning, excavation, backfilling, compaction, earthworks, testing, training and start-up of equipment shall be included in this lump sum price.

B. Payment for this item shall be made at the stated lump sum price for all material, compaction, base course, labor, equipment, fees, planning, engineering, permits, shoring and any incidentals and/or coordination with the manufacturer necessary for the completion of the work. Such payment shall be complete compensation for the complete performance of the work in accordance with the drawings and the provisions of the specifications.

2.13 TIE-IN CONNECTIONS (ADDITIVE ALTERNATE No.2: Bid Item #1)

A. Measurement of this item shall be made at the stated lump sum for all related work in Divisions 1 through 3 for the complete connection of existing sanitary sewer and water pipelines into Lower Valley Water District including all components and accessories as specified and as shown on the contract drawings, including but not limited to sanitary sewer pipelines, water pipelines, manholes (cast-in place), additional vertical depth, fittings, couplings, restrainers, dewatering, testing, caps. Including all pavement removal and replacement, excavation, backfilling, compaction, testing. Trench safety system including any design, testing, inspection or additional excavation and backfill required for furnishing, placing, maintaining and removing all shoring, sheeting or bracing for required compaction, and for all other labor, materials, tools, equipment and incidentals necessary to complete the trench safety system work.

B. Payment shall be full compensation for the Tie-In Connections performed with all materials and additional fittings or improvements not shown in the plans including planning, excavation, cutting, installation, backfilling, and all labor and/or coordination required with Lower Valley Water District, County of El Paso and El Paso County WCID#4, for a complete connection to the systems.

END OF SECTION
SECTION 01040 – COORDINATION

PART 1 GENERAL

1.01 SCOPE OF WORK

A. The Contractor shall be responsible for ascertaining the nature and extent of any collateral work done by others or work by other trades. The Contractor shall include in his bid all costs associated with coordinating with others or work by other trades. The Contractor shall not be entitled to additional compensation from the Owner resulting from such simultaneous or collateral work, nor shall concurrent work be the reason extension to the contract time. Contractor shall be aware of any and all concurrent work in the area that will require coordination for tie-ins of his work. If necessary to avoid or minimize damage or delay, the Contractor shall redeploy his work force to other areas of the Work, at no cost to the Owner.

B. Bidders shall be informed of planned concurrent work at the Pre-Bid meeting. The successful bidder shall be updated at the Pre-Construction meeting.

C. The Contractor shall be responsible for the notification of property owners and residents within the project area to explain the construction to them at least 15 days prior to any construction in the area. The Contractor shall be responsible for providing access to the residences for all property owners and residents at all times. Contractor shall provide temporary parking for resident and notify him/her prior to trench operations.

D. Notification to be sent to all residents and property owners shall be by printed handout in English and Spanish, approved by the Owner. The Contractor shall furnish proof to the Owner that each resident within the project area has been notified.

E. Any resident unable to park their vehicle at their residence due to the construction shall be provided with a secure place to park as near to the residence as possible by the Contractor at no cost to the Owner.

F. The Contractor shall be responsible for the coordination between the County of El Paso, TX DOT, EPCWID#1 and the Lower Valley Water District, and for all coordination with utility companies as necessary for the timely completion of the project as specified in Section 01010 - GENERAL CONDITIONS.

G. The Contractor shall be responsible of notifying the Engineer of any variation, discrepancy, and/or inconsistency of the Construction Drawings. The Contractor shall submit a Reference for Information (RFI) to the Engineer for clarification and/or direction. The Contractor shall give the Engineer five (5) working days to respond to any RFI or to issue a Work Directive.

PART 2 PRODUCTS

NOT USED

PART 3 EXECUTION

NOT USED
PART 4  MEASUREMENT AND PAYMENT

4.01  No separate measurement will be made for any coordination required by this Section. Payment for all work covered in this section will be included as part of the unit price bid for the installation of the pipelines as indicated in the Proposal. Such payment shall be complete compensation for the complete performance of the work in accordance with the drawings and specifications.

END OF SECTION
SECTION 01050 – SURVEY INFORMATION

PART 1 GENERAL

1.01 SURVEY BY OWNER

A. The Engineer’s surveyor will establish a reference bench mark and baseline as specified. From the information provided, the Contractor shall develop and make such additional surveys as are needed for construction, such as control lines, slope stakes, batter boards, stakes for pipe locations and other working points, lines, and elevations. Survey work shall be performed under the supervision of a licensed land surveyor licensed in the State of Texas. Contractor shall reestablish reference bench marks and survey control monuments destroyed by his operations at no cost to the Owner.

1.02 SURVEY BY CONTRACTOR

A. The Contractor shall complete the layout of the work beyond that provided by the survey stakes, and shall be responsible for all measurements that may be required for the execution of the work to the location and limits prescribed on the drawings.

B. It shall be the responsibility of the Contractor to maintain and preserve all stakes and other marks established by the Owner until authorized to remove them, and if such marks are destroyed by the Contractor or through its negligence prior to their authorized removal, they may be replaced by the Engineer, at the Engineer’s discretion, and the expense of replacement will be deducted from any amounts due, or to become due the Contractor.

C. The Engineer may require that work be suspended at any time when location and limit marks established by the Contractor are not reasonably adequate to permit checking of the work.

D. Precise survey measurements shall be taken on all final locations of buried or concealed items. Coordinates and elevations shall be listed at starting and ending points and every 30 feet along any deviation from a linear line. Coordinates from the survey shall be marked on the as-built drawings. Contractor shall provide a copy of the cut sheet field survey notes to the Engineer prior to any excavation of the interceptor. Failure to provide notes will not allow Contractor to begin excavation.

1.03 PROTECTION OF EXISTING FACILITIES

A. Care shall be taken to control and minimize settlements and displacements of existing facilities. Settlement monitoring shall be installed on all utility mains. All the existing mains are active year round. The Contractor shall place settlement monitoring on the existing mains and take daily readings while all the mains are exposed. Work shall be stopped immediately if detrimental settlement is detected. The Contractor shall identify the causes, develop and install corrective measures. Measures shall be subject to review by the Engineer.

B. The Contractor may take the option of having the existing utilities be removed and replaced by the utility companies to install the sanitary sewer line, however the cost shall be borne by the Contractor. Contractor shall make all necessary arrangements with the utility companies and schedule this event if the option is taken. This option will not be considered a change in scope or change order to the work.

PART 2 PRODUCTS

NOT USED.
PART 3 EXECUTION

NOT USED.

END OF SECTION
SECTION 01062R – PERMITS

PART 1 GENERAL

1.01  GENERAL
   
   A. The Contractor shall keep itself fully informed of all local ordinances as well as state and federal laws, which in any manner affect the work herein specified. The Contractor shall at all times comply with said ordinances, laws and regulations.

1.02  PERMITS TO BE OBTAINED BY CONTRACTOR
   
   A. The Contractor shall obtain permits required to perform the work. The Contractor shall prepare and submit to the proper authority all information required, including plans and reports, for the issuance of such permits and shall pay all costs thereof, including agency inspections unless specifically provided otherwise in these Contract Documents. The Contractor shall provide a copy of each such permit to the Engineer. Such additional permits may include, but shall not be limited to:

   1. Pavement Cut and Traffic Control Permits from the TX DOT & County of El Paso.
   2. Temporary Construction Access Easements, from EPCWID#1, if necessary.

1.03  PERMITS TO BE OBTAINED BY OWNER FOR THE CONTRACTOR
   
   1. TX DOT – Boring Permit
   2. EPCWID#1- Boring Permit

1.04  POSTING PERMITS AND EASEMENTS
   
   A. Permits and easements shall be posted at the site of the work.

1.05  WASTE DISPOSAL
   
   A. All existing pavement, curb, soil, vegetation, and granular material which are removed under this contract shall be disposed of off-site at the Contractor’s expense. The Contractor shall be responsible for obtaining necessary permits from the County of El Paso, TX DOT and/or EPCWID#1 prior to disposing of the waste.

PART 2  PRODUCTS

NOT USED

PART 3  EXECUTION

NOT USED

END OF SECTION
SECTION 01110 – ENVIRONMENTAL PROTECTION PROCEDURES

PART 1 GENERAL

1.01 SCOPE OF WORK

A. The work covered by this Section consists of furnishing all labor, materials, and equipment and performing all work required for the prevention of environmental pollution in conformance with applicable laws and regulations, during and as the result of construction operations under this Contract. For the purpose of this Specification, environmental pollution is defined as the presence of chemical, physical, or biological elements or agents which adversely affect human health or welfare; unfavorably alter ecological balances of importance to human life; affect other species of importance to man; or degrade the utility of the environment for aesthetic and/or recreational purposes.

B. The control of environmental pollution requires consideration of air, water, and land, and involves management of noise and solid waste, as well as other pollutants.

C. Schedule and conduct all work in a manner that will minimize the erosion of soils in the area of the work. Provide erosion control measures such as diversion channels, sedimentation or filtration systems, berms, staked hay bales, seeding, mulching, or other special surface treatments as are required to prevent silting and muddying of streams, rivers, impoundments, lakes, etc. All erosion control measures shall be in place in an area prior to any construction activity in that area.

D. These Specifications are intended to ensure that construction is achieved with a minimum of disturbance to the existing ecological balance between a water resource and its surroundings. These are general guidelines. It is the Contractor's responsibility to determine the specific construction techniques to meet these guidelines.

E. All phases of sedimentation and erosion control shall comply with the latest U.S. Environmental Protection Agency TPDES Regulations and with any Storm Water Pollution Prevention Plan (SWPPP) indicated on the plans and/or outlined in these specifications.

1.02 APPLICABLE REGULATIONS

A. Comply with all applicable federal, state, and local laws and regulations concerning environmental pollution control and abatement.

1.03 NOTIFICATIONS

A. The Engineer may notify the Contractor in writing of any noncompliance with the foregoing provisions or of any environmentally objectionable acts and corrective action to be taken. State or local agencies responsible for verification of certain aspects of the environmental protection requirements shall notify the Contractor in writing, of any noncompliance with state or local requirements. The Contractor shall, after receipt of such notice from the Engineer or from the regulatory agency immediately take corrective action. Such notice, when delivered to the Contractor or his/her authorized representative at the site of the work, shall be deemed sufficient for the purpose.

PART 2 PRODUCTS

NOT USED
PART 3  EXECUTION

3.01 EROSION CONTROL

A. Provide positive means of erosion control such as shallow ditches around construction to carry off surface water. Erosion control measures, such as silting basins, hay check dams, mulching, jute netting and other equivalent techniques, shall be used as appropriate. Flow of surface water into excavated areas shall be prevented. At the completion of the work, ditches shall be backfilled and the ground surface restored to original condition.

3.02 PROTECTION OF STREAMS, LATERALS AND CANALS

A. Care shall be taken to prevent any damage to any stream, lateral or canal from pollution by debris, sediment, or other material, or from the manipulation of equipment and/or materials in or near such streams. Water that has been used for washing or processing, or that contains oil that may reduce the quality of the water in the stream, lateral or canal shall not be returned to the stream, lateral or canal. Such waters will be removed from the site.

B. The Contractor shall not discharge water from dewatering operations directly into any live or intermittent stream, channel, wetlands, surface water, or any lateral without the prior permitted approval.

C. All preventative measures shall be taken to avoid spillage of petroleum products and other pollutants. In the event of any spillage, prompt remedial action shall be taken in accordance with the Environmental Protection Agency and local city ordinance.

D. In the event of a water main repair required by the Contractor, the Engineer and Owner shall be immediately notified. Upon repair, water being flushed from structures or pipelines after disinfection, with a C12 residue greater that 0.099 mg/L, shall be collected and discharged in a manner approved by the Engineer.

3.03 PROTECTION OF LAND RESOURCES

A. Land resources within the project boundaries and outside the limits of permanent work shall be restored to a condition, after completion of construction that will appear to be natural and not detract from the appearance of the project. Confine all construction activities to existing public rights-of-way, permanent and temporary easements.

B. Outside of areas requiring earthwork and/or facilities for dewatering/drainage for the construction of the new facilities, the Contractor shall not deface, injure, or destroy trees or shrubs, nor remove or cut them without prior approval. No ropes, cables, or guys shall be fastened to or attached to any existing nearby trees for anchorage unless specifically authorized by the Engineer. Where such special emergency use is permitted, first wrap the trunk with sufficient thickness of burlap or rags over which softwood cleats shall be tied before any rope, cable, or wire is placed. The Contractor shall in any event be responsible for any damage resulting from such use.

C. Where trees may possibly be defaced, bruised, injured, or otherwise damaged by Contractor’s operations, protect such trees by placing boards, planks, or poles around them. Monuments and permanent markers shall be protected similarly before beginning operations near them.
D. Any tree or other landscape feature noted to remain or left undisturbed that is scarred or damaged by the Contractor’s equipment or operations shall be restored as nearly as possible to its original condition. The Engineer will decide what method of restoration shall be used and whether damaged trees shall be treated or healed or removed and disposed of. Damaged trees so removed shall be replaced at the Contractor’s expense. All scars made on trees by equipment, construction operations, or by the removal of limbs larger that 1-inch in diameter shall be coated as soon as possible with an approved tree wound dressing. All trimming or pruning shall be performed in an approved manner by experienced workmen with saws or pruning shears. Tree trimming with axes will not be permitted.

Climbing ropes shall be used where necessary for safety. Trees that are to remain, either within or outside construction limits, that are subsequently damaged by the Contractor and are beyond saving in the opinion of the Engineer, shall be immediately removed or replaced.

E. The locations of the Contractor’s staging area, storage, and other construction buildings, required temporarily in the performance of the work, shall be cleared portions of the job site. The preservation of landscape shall be an imperative consideration in the Contractor’s use of these sites and in the construction of temporary facilities.

F. For temporary roads or embankments and excavations for work areas, the Contractor shall submit the following for approval at least 10 days prior to start of such temporary work.

1. A layout of all temporary roads, excavations and embankments to be constructed within the work area.

2. Details of temporary road construction.

3. Drawings and cross sections of proposed embankments and their foundations, including a description of proposed materials.

G. Remove all signs of temporary construction facilities such as haul roads, work areas, structures, foundations of temporary structures, stockpiles of excess of waste materials, or any other vestiges of construction, in an environmentally sound manner.

3.04 PROTECTION OF AIR QUALITY

A. Burning - The use of burning at the project site for the disposal of refuse and debris will not be permitted.

B. Dust Control - The Contractor will be required to maintain all excavations, embankment, stockpiles, access roads, plant sites, waste areas, borrow areas, and all other work areas within or without the project boundaries free from dust which could cause the standards for air pollution to be exceeded and which would cause a hazard or nuisance to others.

C. Sprinkling or other similar methods will be permitted to control dust. The use of petroleum products is prohibited. The use of chlorides is not permitted.

D. Sprinkling must be repeated at such interval as to satisfactorily prevent dust, and the Contractor must have sufficient suitable equipment on the job to accomplish this at all times. The Contractor shall inhibit the creation of dust to the complete satisfaction of the Engineer.

3.05 MAINTENANCE OF POLLUTION CONTROL FACILITIES DURING CONSTRUCTION

A. During the life of this Contract, maintain all facilities constructed for pollution control as long as the operations creating the particular pollutant are being carried out or until the material concerned has become stabilized to the extent that pollution is no longer being created.
3.06 NOISE CONTROL

A. The Contractor shall make every effort to minimize noises caused by his/her operations. Equipment shall be equipped with silencers or mufflers designed to operate with the least possible noise in compliance with state and federal regulations.
SECTION 01200 – PROJECT MEETINGS

PART 1 GENERAL

1.01 PRECONSTRUCTION MEETING

A. A Pre-construction meeting shall be held in accordance with the General and Supplemental Conditions.

1.02 PROGRESS AND SPECIAL MEETINGS

A. Owner may request meetings with Contractor and its Subcontractors at any time during progress of Contract. It will be Contractor’s responsibility to provide to Owner whatever information is requested by Engineer.

B. Bi-weekly construction meetings will be held during the course of the construction at the Contractor’s Field Office.

C. All Bi-weekly construction meetings shall be mandatory for the Projects “Project Manager” and “Superintendent.”

PART 2 PRODUCTS

NOT USED

PART 3 EXECUTION

NOT USED

PART 4 MEASUREMENT AND PAYMENT

4.01 No separate measurement and payment shall be made for this item, but it shall be included in the total price bid under this Contract.

END OF SECTION
SECTION 01300 – SUBMITTALS

PART 1 GENERAL

1.01 DESCRIPTION OF REQUIREMENTS

A. This Section specifies the general methods and requirements of submissions applicable to the following work-related submittals: Shop Drawings, product data, samples, video tapes, construction and submittal schedules, Operation and Maintenance Manuals, and work plans as required under specific sections of the Specifications. Detailed submittal requirements will be specified in the Technical Specifications sections.

B. All submittals shall be clearly identified by reference to Specification Section, Paragraph, Drawing Number, or Detail as applicable. Submittals shall be clear and legible and of sufficient size for adequate presentation of data and shall be submitted to the Engineer prior to construction.

1.02 SHOP DRAWINGS, PRODUCT DATA, SAMPLES, TEST REPORTS AND CERTIFICATIONS

A. Shop drawings

1. Shop Drawings, as specified in individual work sections include, but are not necessarily limited to, custom-prepared data such as laying schedules, fabrication and erection/ installation (working) drawings, schedule information, setting diagrams, actual shop work manufacturing instructions, custom templates, special wiring diagrams, coordination drawings, individual system or equipment inspection, and test reports including performance curves and certifications, as applicable to the Work.

2. All Shop Drawings submitted by subcontractors for approval shall be sent directly to the Contractor for checking. The Contractor shall be responsible for their submission at the proper time so as to prevent delays in delivery of materials.

3. The Contractor shall check all subcontractors’ Shop Drawings regarding measurements, size of members, materials and details to determine to the Contractor’s satisfaction that they conform to the intent of the Drawings and Specifications. Shop Drawings found to be inaccurate or otherwise in error shall be returned by the Contractor to the subcontractors for correction before submission thereof.

4. All details on Shop Drawings submitted for approval shall show clearly the relation of the various parts to the main members and lines of the structure and where correct fabrication of the work depends upon field measurements, such measurements shall be made and noted on the drawings before submitted for approval.

B. Product Data

1. Product data, as specified in individual sections include, but are not necessarily limited to, standard prepared data for manufactured products (sometimes referred to as catalog data), such as the manufacturer’s product specification and installation instructions, manufacturer’s printed statements of compliances and applicability, roughing-in diagrams and templates, catalog cuts, product photographs, standard wiring diagrams, printed performance curves and operational-range diagrams, production operating and maintenance instructions, and recommended spare parts listings and printed product warranties, as applicable to the work.
C. Samples

1. Samples specified in individual sections, include but are not necessarily limited to, physical examples of the work such as sections of manufactured or fabricated work, small cuts or containers of materials, complete units of repetitively-used products, graphic symbols and units of work to be used by the Engineer or Owner for independent inspection and testing, as applicable to the work.

D. Test Reports and Certifications

1. Test reports and certifications submitted by the Contractor to the Engineer shall be as specified in individual sections. These shall include, but not necessarily limited to products, materials, compaction, and Professional Engineer certification.

1.03 CONTRACTOR’S RESPONSIBILITIES

A. The Contractor shall review Shop Drawings, product data, and samples, including those by subcontractors, prior to submission to determine and verify the following:

1. Field measurements
2. Field construction criteria
3. Catalog numbers and similar data
4. Conformance with the specifications

B. Each Shop Drawing, sample, and product data submitted by the Contractor shall have affixed to it the following Certification Statement including the Contractor’s Company name and signed by the Contractor:

“Certification Statement: By this submittal, I hereby represent that I have determined and verified all field measurements, field construction criteria, materials, dimensions, catalog numbers, and similar data, and I have checked and coordinated each item with other applicable approved Shop Drawings and all Contract requirements.”

Shop Drawings and product data sheets 11-inches x 17-inches and smaller shall be bound together in an orderly fashion and bear the above Certification Statement on the cover sheet. The cover sheet shall fully describe the packaged data and include a listing of all items within the package. Provide to the Engineer a copy of each submittal transmittal sheet for Shop Drawings, product data, and samples at the time of submittal of said drawings, product data, and samples to the Engineer. Any submittal not having the above signed Certification Statement attached to the submittal will be returned to the Contractor without review by the Engineer.

C. The Contractor shall utilize an eight-character submittal identification numbering system in the following manner:

1. The first five digits shall be the applicable Specification Section Number.
2. The next three digits shall be the 001 to 999 to sequentially number each initial separate item or drawing submitted under each specific Section number.
3. The last character shall be a letter, A to Z, indicating the submission or resubmission of the same drawing, i.e., “A = first submission, B = second submission, C = third submission, etc.” A typical submittal number would be as follows:

03300-008-B
D. Notify the Engineer in writing, at the time of submittal, of any deviations in the submittals from the requirements of the Contract Documents, and the reason for the deviation.

E. The review and approval of Shop Drawings, samples, or product data by the Engineer shall not relieve the Contractor from his responsibility with regard to the fulfillment of the terms of the Contract. All risks of error and omission are assumed by the Contractor and the Engineer will have no responsibility therewith.

F. No portion of the work requiring a Shop Drawing, sample, or product data shall be started nor shall any materials be fabricated or installed prior to the approval or qualified approval of such item. Fabrication performed, materials purchased, or onsite construction accomplished which does not conform to approved Shop Drawings and data shall be at the Contractor’s risk. The Owner will not be liable for any expense or delay due to corrections or remedies required to accomplish conformity with Shop Drawings, the Plans or Specifications.

G. Project work, materials, fabrication, and installation shall conform with approved Shop Drawings, applicable samples, and product data.

H. Prior to the first submittal of any item the Contractor shall supply the Engineer with a Schedule of Anticipated Submittals. The schedule will include all the anticipated submittals, an approximate date that the submittal will be made, and reference numbers as described in Paragraph 1.03C of this section. The Contractor shall adhere to the submittal schedule as reviewed/approved/modified by the Engineer.

1.04 SUBMISSION REQUIREMENTS

A. Make submittals promptly in accordance with approved schedule and in such sequence as to cause no delay in the Work or in the work of any subcontractor.

B. Each submittal, appropriately coded, will be returned within 15 working days following receipt of submittal by the Engineer.

C. Number of submittals required:

1. Shop Drawings as defined in Paragraph 1.02A: Contractors requirement plus 3 sets.

2. Product Data as defined in Paragraph 1.02B: Contractors requirement plus 3 sets.

3. Samples: Submit the number stated in the respective Specification Sections, but no less than 1.

4. Test Reports, Certifications and Working Drawings: Contractor’s requirement plus 3 sets.

D. Submittal shall contain:

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

2. The project title and number.

3. Contractor identification.

4. The names of:
a. Contractor  
b. Supplier  
c. Manufacturer  

5. Identification of the product, with the Specification Section Number, page, and paragraph(s).  
6. Field dimensions, clearly identified as such.  
7. Relation to adjacent or critical features of the work or materials.  
8. Applicable standards, such as ASTM or Federal Specification numbers.  
10. Identification of revisions or re-submittals.  
11. Each copy or set of each submittal shall include a blank space suitably sized for Contractor and Engineer stamps (min. of 5 ½ " x 8 ½ ").  

1.05 REVIEW OF SHOP DRAWINGS, PRODUCT DATA, WORKING DRAWINGS, AND SAMPLES  

A. The review of Shop Drawings, data, and samples will be for general conformance with the design concept and Contract Documents. They shall not be construed:  
   1. As permitting any departure from the Contract requirements.  
   2. As relieving the Contractor of responsibility for any errors, including details, dimensions and materials.  
   3. As approving departures from details furnished by the Engineer, except as otherwise provided herein.  

B. The Contractor remains responsible for details and accuracy for coordinating the work with all other associated work and trades, for selecting fabrication processes, for techniques or assembly, and for performing work in a safe manner.  

C. If the Shop Drawings, data, or samples as submitted describe variations and show departure from the Contract requirements which Engineer finds to be in the interest of the Owner and to be so minor as not to involve a change in Contract Price or time for performance, the Engineer may return the reviewed drawings without noting an exception.  

D. Submittals will be returned to the Contractor marked with one or more of the following codes:  

   Code 1 "REVIEWED" is assigned when there are no notations or comments on the submittal. When returned under this code, the Contractor may release the equipment and/or material for manufacture.  

   Code 2 "FURNISH AS CORRECTED". This code is assigned when a confirmation of the notations and comments IS NOT required from the Contractor. The Contractor may release the equipment or material for manufacture; however, all notations and comments must be incorporated into the final product.  

   Code 3 "REVISE AND RESUBMIT". This code is assigned when notations and comments are extensive enough to require a resubmittal of the package. The Contractor may release the equipment or materials for manufacture; however, all notations and comments must be incorporated into the final product. Installation and payment for equipment or materials will not be approved until resubmittal is received, reviewed, and approved.
This resubmittal is to address all comments, omissions, and nonconforming items that were noted. Resubmittal is to be received by the Engineer within 21 calendar days of the date of the Engineer’s transmittal requiring the resubmittal.

Code 4  "REJECTED" is assigned when the submittal does not meet the intent of the Contract Documents. The Contractor must resubmit the entire package revised to bring the submittal into conformance. It may be necessary to resubmit using a different manufacture/vendor to meet the Contract Documents.

E. Re-submittals will be handled in the same manner as first submittals. On re-submittals, the Contractor shall direct specific attention, in writing on the letter of transmittal and on resubmitted Shop Drawings, by use of revision triangles or other similar methods, to revisions other than the correction requested by the Engineer, on previous submissions. Any such revisions which are not clearly identified shall be made at the risk of the Contractor. The Contractor shall make corrections to any work done because of this type of revision that is not in accordance to the Contract Documents as may be required by the Engineer.

F. Partial submittals may not be reviewed. The Engineer will be the only judge as to the completeness of a submittal. Submittals not complete will be returned to the Contractor and will be considered "Not Approved" until resubmitted. The Engineer may at his/her option provide a list or make the submittal directing the Contractor to the areas that are incomplete.

G. Repetitive Review

1. Shop Drawings and other submittals will be reviewed no more than twice at the Owner's expense. All subsequent reviews will be performed at times convenient to the Engineer and at the Contractor's expense, based on the reviewing Engineer's current billing rate. The Contractor shall reimburse the Owner for all such fees invoiced to the Owner by the Engineer. Submittals are required until approved.

2. Any need for more than one resubmission, or any other delay in obtaining the Engineer's review of submittals, will not entitle Contractor to extension of the Contract Time.

H. If the Contractor considers any correction indicated on the Shop Drawings to constitute a change to the Contract Documents, the Contractor shall give written notice thereof to the Engineer at least 14 working days prior to release for manufacture.

I. When the Shop Drawings have been completed to the satisfaction of the Engineer, the Contractor shall carry out the construction in accordance therewith and shall make no further changes therein except upon written instructions from the Engineer.

1.06 DISTRIBUTION

A. Distribute reproductions of approved Shop Drawings and copies of approved product data and samples, where required, to the job site file and elsewhere as directed by the Engineer. Number of copies shall be directed by the Engineer but shall not exceed six.

1.07 PROFESSIONAL ENGINEER (P.E.) CERTIFICATION FORM

A. If specifically required in other sections of these Specifications, the Contractor shall submit a P.E. Certification for each item required, in the form attached to this Section, completely filled in and stamped.

1.08 GENERAL PROCEDURES FOR SUBMITTALS

A. Coordination of Submittal Times: Prepare and transmit each submittal sufficiently in advance of product ordering and manufacturing and of performing the related work or other applicable
activities, or within the time specified in the individual work sections of the Specifications, so that the installation will not be delayed by processing times, including disapproval and resubmittal (if required), coordination with other submittals, testing, purchasing, fabrication, delivery, and similar sequenced activities. No extension of time will be authorized because of the Contractor’s failure to transmit submittals sufficiently in advance of the Work.

PART 2 PRODUCTS

NOT USED

PART 3 EXECUTION

NOT USED

PART 4 MEASUREMENT AND PAYMENT

4.01 No separate measurement and payment shall be made for this item, but it shall be included in the total price bid under this Contract.

END OF SECTION
P.E. CERTIFICATION FORM

The undersigned hereby certifies that he/she is a Professional Engineer registered in the State of Texas and that he/she has been employed by (Name of Contractor) to design in accordance with Specification Section for the Lower Valley Water District. The undersigned further certifies that he/she has performed the design, that said design is in conformance with all applicable local, state, and federal codes, rules and regulations, and that his/her signature and P.E. stamp have been affixed to all calculations and drawings used in, and resulting from, the design.

The undersigned hereby agrees to make all original design drawings and calculations available to the Owner's representative within seven days following written request there of.

P.E. Name

Signature

Address

Contractor's Name

Signature

Title

Address
SECTION 01370 – SCHEDULE OF VALUES FOR LUMP SUM BID ITEMS

PART 1 GENERAL

1.01 REQUIREMENTS

A. Submit to the Engineer a Schedule of Values for Lump Sum bid items (a breakdown of the bid) allocated to the various portions of the Work bid as Lump Sum, in accordance with the General Conditions.

B. Upon request of the Engineer, support the values with data which will substantiate their correctness.

1.02 FORM AND CONTENT OF SCHEDULE OF VALUES

A. Type schedule on an 8½-in by 11-in or 8½-in by 14-in white paper. Contractor’s standard forms and automated printout will be considered for approval by the Engineer upon Contractor’s request. Identify schedule with:

1. Title of Project and location.

2. Engineer and Project number.

3. Name and address of Contractor.


5. Date of submission.

B. Schedule shall list the installed value of the component parts of the Lump Sum Work in sufficient detail to serve as a basis for computing values for progress payments during construction.

C. Identify each line item with the number and title of the respective major section of the specifications.

D. For each major line item, list sub-values of major products or operations under the item.

E. For the various portions of the Work:

1. Each item shall include a directly proportional amount of the Contractor’s overhead and profit.

2. For items on which progress will be requested for stored materials, prepare a sub-schedule as defined in Paragraph 1.03 below.

F. The sum of all values listed in the schedule shall equal the total Lump Sum bid for that portion of the work.

1.03 SUBSCHEDULE OF UNIT MATERIAL VALUES

A. Submit a sub-schedule of unit costs and quantities for:

1. Products on which payments will be requested for stored products.

B. The form of submittal shall parallel that of the Schedule of Values, with each item identified the same as the line item in the Schedule of Values.

C. The unit quantity for bulk materials shall include an allowance for normal waste.
D. The unit values for the materials shall be broken down into:

1. Cost of the material, delivered and unloaded at the site, with taxes paid.

2. Copies of the invoices for component material shall be included with the payment request in which the material first appears.

3. Paid invoices shall be provided with the second payment request in which the material appears or no payment shall be allowed and/or may be deleted from the request.

E. The installed unit value multiplied by the quantity listed shall equal the cost of that item in the Schedule of Values.

PART 2 PRODUCTS

NOT USED.

PART 3 EXECUTION

NOT USED.

END OF SECTION
SECTION 01500 – CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS

PART 1 GENERAL

1.01 SCOPE OF WORK

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

B. Before starting the work, the Contractor shall make his own arrangements for storage of materials and equipment in locations on or off the construction site. For the allocated space, the Contractor shall submit to the Engineer for approval, his proposed plan and layout for all temporary offices, sanitary facilities, temporary construction roads, storage buildings, storage yards, temporary water service and distribution, temporary power service and distribution, and temporary telephone service.

1.02 TEMPORARY BUILDINGS

A. The Contractor shall erect, or provide as approved, temporary storage buildings of the various sizes as required for the protection of mechanical equipment and materials as recommended by manufacturers of such equipment and materials. The buildings shall be provided with environmental control systems that meet recommendations of manufacturers of all equipment and materials stored in the buildings. The buildings shall be of sufficient size and so arranged or partitioned to provide security for their contents and provide ready access for inspection and inventory. At or near the completion of the work, and as directed by the Engineer, the temporary storage buildings shall be dismantled, removed from the site, and remain the property of the Contractor.

B. Combustible materials (paints, solvents, fuels, etc.) shall be stored in a well-ventilated building adequately separated from other buildings.

1.03 STORAGE YARDS

A. The Contractor shall construct temporary storage yards for the storage of materials that are not subject to damage by weather conditions. Materials such as pipe and reinforcing and structural steel shall be stored on pallets or racks, off the ground, and in a manner that allows ready access for inspection and inventory. Temporary gravel surfacing of the storage yards shall meet with the approval of the Engineer.

B. A temporary security fence with gates and locks shall be erected by the Contractor around the storage yard and located as approved by the Engineer.

1.04 FIRST AID FACILITIES

A. The Contractor shall maintain at his office or other well known place at the job site, all articles necessary for giving first aid to the injured, and shall make standing arrangements for the immediate removal to a hospital or a doctor’s care persons (including employees) who may be injured on the job site. In no case shall employees be permitted to work at a job site before the Contractor has made a standing arrangement for removal of injured persons to a hospital or a doctor’s care.
1.05 TEMPORARY ACCESS ROADS AND PARKING SPACE

A. The Contractor shall construct temporary construction access roads, parking areas and detours within the designated construction areas as are required to execute the Work. The roads, parking areas and detours shall meet the approval of the Engineer, and be maintained in good condition until no longer needed; at which time they shall be removed and the area left in a condition satisfactory to the Engineer.

B. The Contractor shall construct temporary parking facilities for his employees, his Subcontractor’s employees, other employees and the Engineer.

1.06 HOUSEKEEPING

A. All structures, storage areas, parking areas and the adjacent grounds shall be kept in a clean, sightly and sanitary condition at all times by the Contractor.

1.07 WATER FOR CONSTRUCTION

A. The Contractor shall make his own arrangement for a supply of potable drinking water for his employees and shall keep such supply available at all times.

B. The Contractor may, with the approval of the Engineer, make other arrangements and secure water for construction purposes from a source of his own choosing. Said water will be clean and potable.

C. The Contractor may secure a construction meter from the Owner for construction water as per the Rules and Regulations of the LVWD. Contractor shall pay LVWD for all water used.

1.08 ELECTRIC POWER FOR CONSTRUCTION

A. The Contractor shall furnish and install, at his own expense, all temporary electrical facilities required for construction and safe operation. Separate electrical metering shall be provided and power used shall be paid for by the Contractor, regardless of the source of the power.

1.09 SANITARY FACILITIES

A. The Contractor shall provide adequate toilet facilities for use by his personnel and the Engineer and shall maintain such facilities in a clean and sanitary condition throughout the construction period. Such facilities shall be conveniently located for use by the personnel and the entire area shall be maintained in a clean and sanitary condition. After completion of the work, all temporary toilet facilities shall be removed from the site.

1.10 TRAFFIC PLAN

A. Traffic control and planning for the control of traffic in all areas of the project shall be the responsibility of the Contractor. Seven days prior to commencing any work on the project the Contractor shall prepare and submit for County of El Paso and TX DOT review and approval, a Traffic Control plan for that particular work area. Five (5) copies of the approved Traffic Control Plan shall be submitted to the Engineer. The traffic control plans, devices, signage, and record keeping shall conform with the specifications and principles as required by the Texas Department of Transportation and in accordance with the requirements of the County of El Paso. Work within any specific area must be phased so that the traffic controls for the work in that particular area do not conflict with traffic flows in any other control area.

B. Coordination with Emergency Response Agencies and School Districts is the responsibility of the Contractor.
1.11 DUST CONTROL

A. The Contractor shall furnish and maintain at all times equipment necessary to effect dust control over the entire working area.

B. The Contractor shall water the streets of the project a minimum of twice a day during working days and once during non-working days including weekends and holidays.

1.12 DRAINAGE CONTROL

A. The Contractor shall have the responsibility to comply with all the necessary requirements for the Federal Register dated, September 9, 1992, Volume 57, No. 175 - FINAL NPDES GENERAL PERMITS FOR STORM DISCHARGES FROM CONSTRUCTION SITES (or latest revision thereof). The Contractor shall file the Notice of Intent (NOI) as required, a minimum of 2 days prior to commencement of any construction. The required STORM WATER POLLUTION PREVENTION PLAN (SWPPP) shall be developed for the project by the Contractor as required in the above mentioned document. The SWPPP shall be kept at the work site and updated as work progresses.

B. The Contractor shall maintain adequate drainage within and through work areas. Earth dam drainage will not be permitted in paved areas. Temporary dams of sandbags, asphaltic concrete or other acceptable materials will be permitted when necessary to protect the work and/or the public, provided such use does not create a hazard or nuisance to the public. Such dams shall be removed from the site as soon as their use is no longer necessary.

1.13 CONSTRUCTION STAGING AREA

A. The OWNER will not provide a construction staging area. The Contractor shall be responsible for obtaining at his cost a construction staging area for equipment and materials storage, construction offices, etc., that the Contractor feels is necessary for the project.

1.14 OFFICE FACILITIES

A. Provide facilities for material storage yard and sheds adequate in size for Contractor’s use. Contractor shall maintain a project office near the project site. The Contractor shall allow access for the Engineer’s and Owner’s personnel and use of the project office.

PART 2 PRODUCTS

NOT USED

PART 3 EXECUTION

NOT USED

PART 4 MEASUREMENT AND PAYMENT

4.01 No separate measurement and payment shall be made for this item, but it shall be included in the total price bid for the installation of sewer lines as indicated in the proposal.

END OF SECTION
SECTION 01600 – PROGRESS SCHEDULES

PART 1  GENERAL

1.01  REQUIREMENTS

A. The schedule of Work shall be based on the period of time within which this Contract is to be completed (Contract Completion Time).

B. Within 15 calendar days following Notice of Award, Contractor shall prepare and submit to Engineer his proposed Schedule of Work, as described in this Section, with sub-schedules of related activities which are essential to its progress. These include, but are not limited to: Submittals, fabrication, delivery, installation, testing and start-up schedules.

C. Included with the Schedule of Work, Contractor shall submit a written Traffic Control Plan, which shall identify how heavy equipment shall be routed through the construction areas throughout the construction period, as required in these Specifications. The Traffic Control Plan shall specify timing of road and street closures as required to perform the Work under this Contract.

D. Contractor shall submit updated Schedule of Work with application for payment monthly, or more frequently when required and acceptable to the Engineer.

E. All schedules and Traffic Control Plan shall be submitted to Engineer and shall be subject to coordination with requirements of work performed under other projects which may be in progress.

F. Contractor’s Schedule is to be considered and used as a working tool, and will not become part of Contract or Contract Documents.

1.02  FORM OF SCHEDULES


B. CPM shall be maintained throughout life of Contract. Contractor shall designate an authorized representative within its firm who will be responsible for preparation of CPM network plan and schedule and for monitoring progress of project.

C. Contractor is deemed to have included in the Bid Price a sum of money sufficient to pay for all costs attendant to the scheduling requirements of this Section, throughout the Contract completion time. Owner shall have right to withhold progress payments due Contractor in the event that schedules are not maintained current or submitted as specified. Preparation, content, submittal, review and use of the network plan and schedule are as set forth below.

1. Schedule submittal: Within 25 calendar days following Award of Contract, Contractor shall submit to the Engineer complete CPM network plan. Size of network plan sheet or sheets shall be limited to 24-inch x 36-inch. A schedule of estimated monthly progress payments shall be developed by Contractor and submitted with CPM network plan. A schedule of Shop Drawing submittals and reviews shall also be included.
2. Within 7 calendar days after receipt of Schedule, Engineer will meet with Contractor for joint review, and any necessary correction or adjustment of proposed network plan. Within five calendar days after joint review, Contractor shall submit three copies of revised schedule to Engineer. Re-submittal will be reviewed by Engineer and if found to be as previously agreed upon, will be accepted. Accepted schedule shall constitute Project Schedule of Work until subsequently updated in accordance with requirements of this Section. The submission of schedules by Contractor, as required herein are not only required for the verification of progress payments, but also informing Owner and Engineer of the status of the Project in order that Owner and Engineer may evaluate project progress, Contractor change order requests, or other proposed changes to the Project.

3. Acceptance of Contractor’s Schedule by Engineer will not relieve Contractor from compliance with all conditions of the Contract. Errors and omissions in accepted Contractor’s Schedule will not be cause for future claims by Contractor for extra costs or increased Contract Time. Comments made by the Engineer on the Contractor’s Construction Schedule during review will not relieve the Contractor from compliance with requirements of the Contract Documents. This review is only for general conformance with the schedule concept of the project and general compliance with the information given in the Contract Documents.

4. Network plan shall show sequence and interdependence of activities required for complete performance of all items of Work under this Contract. Contractor shall exercise sufficient care to produce a clear, legible, and accurate network plan. Network plan shall show the following for each work activity:
   a. Concise description of work represented by activity.
   b. Duration (in work days).
   c. Early and late start dates, and early and late finish dates.
   d. Percent complete.

5. Work activities in network plan shall be sufficiently detailed to identify all major items of Work included in this Contract, including procurement and delivery of materials, and including shutdowns and restarts.

6. Contractor shall also submit with network plan:
   a. Proposed number of working days per week.
   b. Holidays to be observed during duration of Contract (by day and month).
   c. Planned number of shifts per day.
   d. Number of hours per shift.
   e. Average manpower usage planned monthly by major trades. Trades shall include as a minimum: carpenters, laborers, operators, ironworkers, electricians, pipe fitters, masons, and painters.

7. Schedule is Contractor’s schedule, prepared by him and he remains solely responsible for adherence thereto.
8. **Project control**: Once a month or more frequently if warranted, Contractor shall review progress of Work to that date. He shall collect information, with aid of field superintendents for all Subcontractors, on all jobs scheduled to be worked on during previous monthly period including Shop Drawings, material procurement, and Change Orders that may have been issued in this period. Information shall be evaluated and compared with original plan and schedule. Project problems will be reviewed and Contractor shall take necessary measures to keep Project on schedule. Any changes shall be incorporated into the schedule.

9. If latest completion time for any significant job does not come within time allowed by Contract, including all extensions, sequence of jobs, and performance of jobs shall be revised by Contractor through either concurrent operations, additional manpower, additional shifts, and significant Contract completion and occupancy times will be met. No additional cost will be allowed by Owner to Contractor or to any Subcontractor for overtime, additional manpower, equipment, or additional shifts if such expediting procedures are necessary.

10. Each month, Contractor shall update the Project Schedule of Work and shall submit to Engineer three copies of updated Schedule, for Engineer’s review and acceptance. Update shall include all revisions required under item 9 above, percentage completion by work activity, as well as any revisions to Shop Drawing schedule and information included under item 6 above.

11. **Changes to Schedule**: Contractor may at any time make changes to his current plan and schedule upon notification to Engineer. Contractor shall submit changes to network plan and schedule for any of the following reasons:

   a. When delay in completion of any activity or group of activities indicates an extension of scheduled Project completion including delays which may be involved with change orders, unusual weather, etc.

   b. Delays in submittals or deliveries or work stoppages are encountered which make re-planning or rescheduling of Work necessary.

   c. Schedule does not represent actual prosecution and progress of Project.

12. Engineer’s acceptance of changes to Schedule and all relevant data is contingent upon compliance with all other paragraphs of this Section and any other previous agreements or requirements by Engineer.

13. Contractor’s cost of revisions to Schedule due to any cause shall be responsibility of Contractor.

14. **Adjustment of Contract completion**: Contract Time will be adjusted only by Change Order for causes specified in this Contract. In the event Contractor requests an extension of Contract Time, he shall furnish such justification, CPM data, and supporting evidence as follows for a determination as to whether or not Contractor is entitled to an extension of Time under provisions of Contract: all CPM logic revisions, durations changes, and cost changes for Work in question and its relationship to other activities on accepted, current network plan. Submission of proof based on network activity logic and durations is obligatory with any Contractor request for extension of time. Schedule must clearly display that Contractor has used, in full, all float time available for Work involved in this request. For other than critical path work, Contractor shall use available float times for Owner requested changes. Contractor shall not reserve float time for subsequent contracted requested changes. Engineer’s determination as to total number of days of Contract extension shall be based upon current Schedule at time of alleged delay and all other relevant information and provisions of Contract. Schedule data shall be included in next monthly updating of Schedule. Actual delays in activities which according to network plan and schedule do not affect Contract Completion Date will not be basis for a change of Contract Completion Date.
Engineer shall review facts within a reasonable time after receipt of Contractor request for extension of Time and supporting evidence, and shall advise Contractor in writing thereof.

15. Contractor shall submit a brief narrative report as part of monthly update. Narrative report shall include a description of problem areas; current and anticipated delaying factors and their estimated impact on performance of other activities and completion dates; and an explanation of corrective action taken or proposed.

E. Contractor failure to comply with this Section shall be a material breach of this Contract.

F. The initial Contractor’s payment request will be evaluated by the Engineer if the initial schedule submittal has been made. Subsequent payment requests made by the Contractor will not be evaluated by the Engineer until the revised Contractor’s schedule (as defined in paragraph 1.02.D.2) has been accepted by the Engineer.

G. All “float time” i.e. the time indicated on the Contractor’s Progress schedule between the early start time and late start time, and early finish time and late finish time is owned by the Owner.

PART 2 PRODUCTS

NOT USED

PART 3 EXECUTION

NOT USED

PART 4 MEASUREMENT AND PAYMENT

4.01 No separate measurement and payment shall be made for the work under this section, but it shall be included in the total price bid under this Contract.

END OF SECTION
SECTION 01700 – ARCHAEOLOGICAL INVESTIGATION AND MONITORING

PART 1 GENERAL

1.01 SCOPE OF WORK

A. The work covered by this Section includes steps that the Contractor must follow if buried cultural material is excavated during the installation of the pipelines of this project.

1.02 CULTURAL RESOURCE DISCOVERY

A. Upon the discovery of buried cultural materials during construction, the following steps shall be followed:

1. The construction Contractor or subcontractor shall cease work in the immediate area of the discovery;

2. The cultural materials shall be protected from further disturbance;

3. The Contractor making the discovery shall immediately notify the Engineer, who will notify the El Paso County, TX DOT, EPCWID#1 and Lower Valley Water District.

4. No activities that would further disturb the cultural materials shall be undertaken by the Contractor until authorized by the El Paso County, TX DOT, EPCWID#1 and LVWD.

5. Contractor should be prepared to move operations to another area should significant cultural resources be encountered and mitigation be required at no cost to the Owner.

PART 2 PRODUCTS

NOT USED

PART 3 EXECUTION

NOT USED

PART 4 MEASUREMENT AND PAYMENT

4.01 No separate measurement and payment shall be made for this item, but it shall be included in the total price bid under this contract.

END OF SECTION
PART 1  GENERAL

1.01  SCOPE OF WORK

A. Additional closeout requirements for specific construction activities are included in the
appropriate Sections in Divisions 2 through 3, and in the General Conditions.

1.02  SUBSTANTIAL COMPLETION

A. Before requesting inspection for certification of Substantial Completion, complete the
following:

1. Contractor shall submit an Acceptance of Work letter from all the jurisdictional agencies
involved on the Project, prior to or at the time of requesting substantial completion of the
project.

2. In the Application for Payment that coincides with, or first follows, the date Substantial
Completion is claimed, show 100 percent completion for the Work claimed as
substantially complete.
   a. Include supporting documentation for completion and an accounting of changes to
      the Contract Sum.

3. Advise the Owner of pending insurance changeover requirements, if any.

4. Submit specific warranties, workmanship bonds, maintenance agreements, final
certifications, and similar documents.

5. Submit record drawings and specifications, maintenance manuals, final project
photographs, damage to settlement surveys, property surveys and similar final record
information.

6. Deliver tools, spare parts, extra stock and similar items.

7. Change over locks and transmit keys to the Owner.

8. Complete startup testing of systems and instructions of operation and maintenance
personnel. Remove temporary facilities, mockups, construction tools and similar
elements.

9. Complete final cleanup requirements, including cleaning of all debris asphalt, dirt spoils,
broken pavement, pipe, lumber, equipment, temporary structures, vegetation and any
other refuse remaining from the construction operations.

10. Touch up and repair and restore marred, exposed finishes.

1.03  INSPECTION PROCEDURES

A. On receipt of a request for inspection, the Engineer will proceed to advise the Contractor of
unfilled requirements. The Engineer will prepare the Certificate of Substantial Completion
following inspection or advise the Contractor of construction that must be completed or
corrected before the certificate will be issued.

1. The Engineer will repeat inspection when requested and assure that the Work is
substantially complete.
2. Results of the completed inspection will form the basis of requirements for final acceptance.

1.04 FINAL ACCEPTANCE

A. Before requesting inspection for certification of final acceptance and final payments, complete the following:

1. Final payment request with releases and supporting documentation. Include insurance certificates where required.

2. Submit a statement, accounting for changes to the Contact Sum.

3. Submit a copy of the final inspection list stating that each item has been completed or otherwise resolved for acceptance.

4. Submit final meter readings for utilities and similar data as of the date of Substantial Completion.

5. Submit consent of surety to final payment.


7. Submit evidence of continuing insurance coverage complying with insurance requirements.

8. Any other documentation required by Program Manager, Owner or funding agencies.

1.05 REINSPECTION PROCEDURE

A. The Engineer will re-inspect the Work upon receipt of notice that the Work has been completed, except for items whose completion is delayed under circumstances acceptable to the Engineer.

1. Upon completion of re-inspection, the Engineer will prepare a certificate of final acceptance. If the Work is incomplete, the Engineer will advise the Contractor of Work that is incomplete or obligations that have not been fulfilled but are required.

2. If necessary, reinspection will be repeated.

1.06 RECORD DOCUMENT SUBMITTALS

A. Do not use record documents for construction. Protect from loss in secure location. Provide access to record documents for the Engineer’s reference.

B. Upon completion of the Work, submit record Drawings (2 sets) and Specifications to the Engineer for the Owner’s records.

C. Refer to Section 01720.

1.07 MAINTENANCE MANUALS (IF APPLICABLE)

A. Organize operation and maintenance data into sets of manageable size. Bind in individual, heavy-duty, 2-in (51-mmA), 3-ring, binders, with pocket folders for folded sheet information. Mark identification on front and spine of each binder. Include as a minimum the following information:
1. Emergency instructions.
2. Spare parts lists.
4. Wiring diagrams.
5. Shop Drawings and Product Data.

PART 2 PRODUCTS

NOT USED

PART 3 EXECUTION

3.01 OPERATION AND MAINTENANCE INSTRUCTIONS (IF APPLICABLE)

A. Arrange for each Installer of equipment that requires maintenance to provide instruction in proper operation and maintenance. Include a detailed review of the following items:

1. Maintenance manuals.
2. Spare parts, tools and materials.
3. Lubricants and fuels.
4. Identification systems.
5. Control sequences.
6. Hazards.
7. Warranties and bonds.
8. Maintenance agreements and similar continuing commitments.

B. As part of instruction for operating equipment, demonstrate the following:

1. Startup and shutdown.
2. Emergency operations and safety procedures.
3. Noise and vibration adjustments.

3.02 REMOVAL OF PROTECTION

A. Remove temporary protection and facilities.

3.03 COMPLIANCE

A. Comply with regulations of authorities having jurisdiction and safety standards for cleaning. Remove waste materials and dispose of lawfully.
PART 4  MEASUREMENT AND PAYMENT

4.01  No separate measurement and payment shall be made for this item, but shall be included in the unit bid price for pipelines.

END OF SECTION
SECTION 01720 – PROJECT RECORD DOCUMENTS

PART 1 GENERAL

1.01 REQUIREMENTS INCLUDED

A. Contractor shall maintain at Site for the Engineer and Owner:

1. One record copy of:
   a. Specifications
   b. Addenda
   c. Change Orders and other Modifications to Agreement
   d. Reviewed Shop Drawings and Samples
   e. Field test records

2. Two copies of Record Drawings marked and updated each working day.

1.02 RELATED REQUIREMENTS

A. Section 01300: Submittals.

1.03 MAINTENANCE OF DOCUMENTS AND SAMPLES

A. Contractor shall store documents in Contractor’s field office or other location as approved by the Owner apart from documents used for construction.

1. Provide files and racks for storage of Documents and Samples.

B. Contractor shall file Documents and Samples in accordance with construction Specifications Institute (CSI) format.

C. Contractor shall maintain Documents in clean, dry, legible condition, and in good order. Do not use Record documents for construction purposes.

D. Contractor shall make Documents available at all times for reference by Engineer or Owner.

1.04 MARKING PENS

A. Contractor shall provide felt tip marking pens for recording information in color code designated by Engineer.

1.05 RECORD DRAWINGS

A. Contractor shall label each of the two sets of Record Drawings with "PROJECT RECORD" in neat large printed letters.

B. Contractor shall record information concurrently with construction progress. Do not cover any Work until required information is recorded.

C. Drawings shall be legibly marked by Contractor to record actual construction (As-Built).
D. During progress of Project, Contractor shall keep careful record at Site of all changes and corrections from layouts shown, on two separate sets of drawings. Contractor shall enter such changes and corrections on prints of Contract Drawings (marked "PROJECT RECORD") within a day of the times the changes are made. Record Drawings shall also indicate in addition to changes and corrections, actual location of all subsurface utility lines encountered. In order that location of these lines and appurtenances may be determined in the event of surface openings or indicators become covered over or obscured, Record Drawings shall show, by installation elevation and offset dimension to two permanently fixed surface features, end of each run including each change in direction. All appurtenances shall be located by stationing along utility run from reference point. At time of Substantial Completion of each facility involved under Contract, Contractor shall submit to Engineer, Record Drawings showing aforementioned data. Engineer will not recommend interim payment or final payments for Project until above requirements have been fulfilled by Contractor.

E. Specifications and Addenda shall be legibly marked by Contractor to record:
   1. Manufacturer, trade name, catalog number, and supplier of each product and item or equipment actually installed.
   2. Changes made by field order or by Change Order.

1.06 SUBMITTAL

A. At Agreement close-out, Contractor shall deliver Record Drawings to Engineer for Owner.

B. Accompany submittal with transmittal letter in duplicate, containing:
   1. Date
   2. Project title and number
   3. Contractor's name and address
   4. Title and number of each Record Document
   5. Signature of Contractor or his/her authorized representative

PART 2 PRODUCTS

NOT USED

PART 3 EXECUTION

NOT USED

PART 4 MEASUREMENT AND PAYMENT

4.01 No separate measurement and payment shall be made for this item, but shall be included in the total price bid under this Contract.

END OF SECTION
SECTION 01740 – GUARANTEES AND WARRANTIES

PART 1 GENERAL

1.01 RELATED REQUIREMENTS

   A. General – Section 01010: General

1.02 PROJECT MAINTENANCE AND GUARANTEE

   A. The Contractor shall maintain and keep in good repair, the Work covered by these Contract Documents during the life of this Contract.

   1. The Contractor shall indemnify the Owner against any repairs which may become necessary to any part of the Work performed and to items of equipment, and system procured for or furnished under this Contract, arising from defective workmanship or materials used therein, for a period as described in the General Conditions of the Specifications.

   2. All equipment, spare parts, supplies, materials, special tools, and any other item installed or supplied by the Contractor shall be warranted by the Contractor for a period of 1 year from the date of acceptance of the work by the Owner.

   3. The Contractor shall, at his own expense, furnish all labor, materials, tools, and equipment required and shall make such repairs and removals or shall perform such work of reconstruction, as may be made necessary by any structural or functional defect or failure resulting from neglect, faulty workmanship, or faulty materials, in any part of the Work performed by him. Such repair shall also include refilling of trenches, roadways, excavations, or embankments which show undue settlement or erosion after backfilling or placement.

   4. Except as noted on the Drawings or as specified, all structures such as embankments, levees, fences, etc., shall be returned to their original condition prior to the completion of the Contract. Any and all damage to any facility, not designated for removal, resulting from the Contractor’s operations shall be promptly repaired by the Contractor at no cost to the Owner.

   5. The Contractor shall be responsible for all new and reconstructed/repaired work including the reconstruction or repair of any road, sidewalks, street, and/or entrance damaged as a consequence of his operations, and or repairs and maintenance of same for a period of one (1) year from the date of such reconstruction. In the event the repairs and maintenance are not made immediately to the satisfaction of the Engineer, and it becomes necessary for the owner of the road or street to make such repairs, the Contractor shall reimburse the owner of the road or street for the cost of such repairs.

   6. In the event the Contractor fails to proceed to remedy the defects of which he has been notified within 7 days of the date of such notice, The Owner reserves the right to cause the required materials to be procured and the work to be done, as described in the General Conditions and to hold the Contractor and his sureties liable for the cost and expense thereof.

   7. All equipment warranties for periods of longer than one year shall be assigned to the Owner after the one-year warranty period specified herein and in the General Conditions.
1.03 PROCESS WARRANTIES

A. Certain items of construction are specified as to performance. Should these items fail to perform as specified, the Contractor shall make all required modifications or replacement necessary to achieve the specified results at no additional cost to the Owner.

PART 2 PRODUCTS

NOT USED

PART 3 EXECUTION

NOT USED

PART 4 MEASUREMENT AND PAYMENT

4.01 No separate measurement and payment shall be made for this item, but shall be included in the total price bid under this Contract.

END OF SECTION
DIVISION 2
SECTION 02010 – SUBSURFACE INVESTIGATION

PART 1 GENERAL

1.01. No reports of explorations or test of subsurface conditions at or contiguous to the Site, or drawings of physical conditions relating to existing surface or subsurface structures at the Site, are known to Owner.

1.03. The Contractor is solely responsible for the successful installation of the sanitary sewer and potable water pipelines, including the required excavation and preparation of the subgrade beneath all facilities as shown on the plans. The Contractor is encouraged to obtain any and all information necessary to enable the efficient and successful completion of this work. The cost of any additional information shall be the sole responsibility of the Contractor.

PART 2 PRODUCTS

NOT USED

PART 3 EXECUTION

NOT USED

PART 4 MEASUREMENT AND PAYMENT

4.01. No separate measurement and payment shall be made for this item, but it shall be included in the total price bid under this Contract.

END OF SECTION
PART 1 GENERAL

1.01 SCOPE OF WORK

A. The work covered by this section of the specifications consists of preparing the jobsite for construction operations by the removal and disposal of all obstructions from the right-of-way and from designated easements, where removal of such obstructions is not otherwise provided for in the plans and specifications. Such obstructions shall include abandoned structures and utility lines, fences, trees, shrubs, vegetation, curbs, gutters, sidewalks, driveways, pavement, concrete and stone rubble, rubbish and all other miscellaneous debris.

B. The Contractor shall adhere to individual specific requirements concerning existing improvements as noted on the plans. These requirements include: removal, removal and replacement and protection of existing improvements.

C. The Contractor shall furnish all materials, equipment, tools, labor, superintendence and incidentals required to perform the work as indicated on the drawings, as required by the Engineer, and as specified herein.

1.02 RELATED WORK

A. Section 02221 Excavating, Backfilling and Compacting for Utilities

B. Section 02222 Excavating, Backfilling and Compaction for Asphaltic Pavement

PART 2 PRODUCTS

NOT USED

PART 3 EXECUTION

3.01 OBSTRUCTIONS OTHER THAN VEGETATION

A. All concrete, pavement, fences, rubble, trash and miscellaneous debris shall be removed to a depth of 1 foot below natural ground. All remaining holes shall be backfilled with material meeting the requirements for fill and backfill material as stipulated in Section 02222 and then tamped. The Contractor shall complete this operation by blading, bulldozing, or other approved methods so that the job site shall be free of holes, ditches, and other abrupt changes in elevation and irregularities of contour.

B. Abandoned storm sewers, culverts, sanitary sewers, conduits and water pipes over 3 inches in diameter, which lay in the path of construction shall be removed from the limits of construction and plugged with concrete to form a tight closure. All debris and/or rubble from removing any abandoned item from the path of construction will be immediately removed from the site at no cost to the Owner.

3.02 CLEARING AND GRUBBING

A. Clearing shall consist of removal and disposal of trees and other vegetation as well as down timber, snags, brush and rubbish within the working areas as shown in the drawings. Individual trees, groups of trees or other vegetation not required to be removed and occurring outside the earthwork area shall be protected against unnecessary cutting, breaking or skinning of roots, skinning and brushing of bark, or smothering of trees by stockpiling construction materials or excavated materials within drip lines.
B. Stumps, matted roots and roots larger than 2 inches in diameter shall be removed from within 6 inches of the surface of areas on which fills are to be constructed except in roadways. Materials as described above within 18 inches of finished subgrade of road ways in either cut or fill sections shall be removed. Areas disturbed by grubbing will be filled as specified in Section 02221 - Excavating, Backfilling and Compacting for Utilities.

3.03 DISPOSAL

A. The Contractor shall dispose of all materials removed from the job site in accordance with local law, rules and regulations.

PART 4 MEASUREMENT AND PAYMENT

4.01 No separate measurement and payment shall be made for this item, but it shall be in accordance with Section 01025 of these specifications.

END OF SECTION
PART 1 GENERAL

1.01 SCOPE OF WORK

A. The work covered by this section of the Specifications consists of all earthwork required to prepare ground surfaces upon which asphaltic pavement and concrete items such as curbs, gutters, sidewalks and driveways are to be constructed or replaced. The work shall include removal and disposal of any unacceptable or excess materials and any necessary dewatering or rock excavation.

B. The Contractor shall furnish all materials, equipment, tools, labor, superintendence and incidentals required to perform the work as indicated on the drawings, as required by the Engineer, and as specified herein.

C. The work shall be performed to the dimensions, typical sections, and lines and grades indicated on the drawings or established by the Engineer and in accordance with these Specifications.

D. It shall be the responsibility of the Contractor to become familiar with job site conditions, and materials to be encountered prior to submitting his Proposal. The Contractor shall include in the proposal all costs of such preliminary investigations, as well as all costs for performing the work covered by this section, including any necessary dewatering or rock excavation.

E. The use of explosives in performing this work will not be permitted.

1.02 SUBMITTALS

A. Imported materials must have prior approval by the Engineer in the form of accepted certification from the material supplier that the proposed material meets all the requirements of this Section.

1.03 REFERENCE TO STANDARDS


B. No reports of explorations or tests of subsurface conditions at or contiguous to the Site, or drawings of physical conditions relating to existing surface or subsurface structures at the Site, are known to Owner.

PART 2 PRODUCTS

2.01 IMPORTED MATERIAL

A. Imported backfill and subgrade materials shall conform to Section 02235 of these Specifications.
PART 3  EXECUTION

3.01 GRADING AND EXCAVATION

A. This work shall consist of removing all materials to the dimensions, typical sections, lines and grades shown on the drawings or established by the Engineer. The work shall include removal of all materials encountered, regardless of their nature, removal of materials which are unsuitable for use in subgrades, fills and backfills; stockpiling of suitable soils for use in fills or backfills; and the satisfactory disposal of unsuitable soil, vegetation, debris, or any other deleterious materials encountered within areas of excavation.

B. All areas involved in the construction shall be graded as shown on the drawings or as required by the Engineer. These areas shall be shaped to drain away from the construction area and shall be maintained free of trash and debris until final completion and acceptance of the work by the Owner.

C. If unsuitable soils such as clay, or silty sands or trash are exposed at the depths to which excavation is required by the Contract Drawings, these unacceptable soils or trash will be removed to a depth of 1 foot below the required excavation. The full cost of excavation required to remove unacceptable materials and to fill in these areas with acceptable material shall be borne by the Contractor. The Contractor may review the available boring logs, if any, and may perform additional soils investigations at Contractors expense to ascertain whether removal of such undesirable soils or trash will be required in any area of the construction.

D. Unauthorized excavation consists of removal of materials beyond indicated elevations or dimensions without specific written authorization of the Engineer. Unauthorized excavation, as well as remedial work performed outside of the contract limits, and not authorized by the Engineer, shall be corrected at the expense of the Contractor.

E. Excavation walls should be suitably sloped as per the approved Trench Safety System plan. The Contractor shall be responsible for maintaining, at all times, safe embankment slopes during the work.

F. Prior to placement of fill or backfill, all excavations and potential fill materials shall be inspected and approved by the Engineer. The excavation shall be underlain by natural non-expansive soils and not be undesirable soil materials or clay soils.

G. After excavation to the required elevation and/or prior to placement of fill, the upper 6 inches of the excavated area shall be scarified and compacted to the density required by this Section. Fill materials, if required, shall be incorporated into the scarified surface during the compaction operation.

3.02 BORROW MATERIAL

A. If sufficient suitable material is not available from the excavated areas at the job site, the Contractor shall provide additional suitable materials as required to complete backfills and to construct all fills to the typical sections, lines and grades shown on the drawings or established by the Engineer. The Contractor shall obtain the additional material from the owners of outside borrow areas. The Contractor shall be responsible for locating the sources of material and for obtaining the right to excavate and remove the material. All costs of providing the borrow material, including payment of royalties, developing the source of borrow, and excavating and hauling the material to the job site shall be paid by the Contractor at no cost to the Owner. Borrow material shall conform to Section 02235.
3.03 FILLING AND BACKFILLING

A. Filling and backfilling shall be performed as necessary to complete the preparation of ground surfaces to the typical sections and the lines and grades shown on the drawings or established by the Engineer.

B. Fill and backfill material shall be free of any organic or deleterious substances and shall not contain cobbles or lumps over four inches in greatest dimension. It shall contain no more than 12 percent by weight of material passing a No. 200 sieve. The fill material shall show low shrinkage or swelling when subjected to changes in moisture content, and its plasticity index shall not exceed 12.

C. Suitability of potential fill material shall be determined by grain size analysis and tests for liquid limit, plastic limit, and shrinkage performed in accordance with ASTM D522, D423, D424 and D427, respectively.

D. Soils at the site will be considered suitable for use as engineered fill, provided all of the above criteria are met. Under no circumstances shall rubble material, frozen soil, or deposits of clay be used to compromise any part of the engineered fill. Undesirable materials encountered during excavation shall be removed from the job site and disposed of at the Contractors expense. All excess excavation which cannot be reused as backfill shall be disposed of at the Contractors expense.

E. No frozen material shall be placed in fills or backfills, and no material shall be placed and compacted during periods when freshly placed material would become frozen.

3.04 INSTALLATION OF FILL AND BASE MATERIALS

A. The bottom of excavations shall be moistened and shall be compacted to a dry density which is not less than 90 percent of maximum as determined by ASTM D1556 or D2167. Fill material shall be placed in lifts not to exceed eight inches (loose measure) in depth and then compacted. The moisture content of the material shall be uniform and within, plus or minus, 3 percent of optimum, as determined by ASTM D1557. Water shall not be pooled or jetted onto the in-place fill, but shall be distributed uniformly over its surface.

B. Compaction of fill material shall be with approved types of pneumatic or tamping equipment. Self-propelled or heavy duty vibratory compaction equipment should not be used adjacent to previously completed buildings or structures. Each lift of fill material shall be compacted to a dry density as shown in the plans and as determined by ASTM D1557 or D2167.

C. Control of filling operations shall consist of field inspection and testing to determine that each lift of fill has been compacted to the required density. Should any lift or portion of a lift not conform to density requirements, it shall be scarified, wetted, if necessary, and then re-compact until the required density is attained. If the Contractor is unable to attain the required compaction with the material in place, the material shall be removed, replaced with new material, and the site re-compacted until the required density is attained.

D. When illustrated in the Drawings, Flowable Fill shall be used in lieu of base course as per El Paso County and TXDOT Standards.

3.05 SUBGRADE

A. After completion of excavation or filling and backfilling, the surfaces of the excavated or filled areas shall be prepared as subgrade for pavement base course, for the construction of concrete items or for the placement of the all-weather roadway finish course. The subgrade shall be the thicknesses
shown on the drawings. Any clay encountered within two feet of the wearing course shall be removed and replaced with engineered fill.

B. The subgrade shall be scarified, plowed or otherwise loosened; shall be wetted, shaped and rolled with approved rollers. The rolling shall be continued until the required density shown in the plans is attained. Where conflicts exist between project specifications and project drawings, the most stringent requirement shall apply. The testing will be as outlined in ASTM D1557; method to be selected by the testing laboratory and approved by the Engineer.

C. When the required compaction is achieved the subgrade shall be finished to the lines and grades as shown on the plans or as required by the Engineer. The subgrade shall be kept in good condition as required and shall be safe for traffic until such time as the remaining courses are constructed. Periodic wetting of the subgrade may be required to maintain density and to control dust. Upon commencement of the base course, the Contractor will ensure that the subgrade continues to maintain the same density as the day it passed, and remains finished to the lines and grades as shown on the plans and as required by the Engineer, and if not, all requirements will be re-established at no cost to the Owner. The above mentioned requirements pertaining to the subgrade, shall also apply to the base course upon commencement of the Paving (HMAC) replacement.

PART 4 MEASUREMENT AND PAYMENT

4.01 No separate measurement and payment shall be made for this work item, but shall be included in the unit price bid for pipeline as noted in the Proposal.

END OF SECTION
SECTION 02221 – EXCAVATING, BACKFILLING, AND COMPACTING FOR UTILITIES

PART 1   GENERAL

1.01 STATUTORY REQUIREMENTS

A. All excavation, trenching and related sheeting, bracing, etc. shall comply with the requirements of OSHA excavation safety standards (29 CFR part 1926.650 Subpart P) and any State or local requirements. Where conflicts between OSHA, State, and local regulations exist, the most stringent requirements shall apply.

1.02 SCOPE OF WORK

A. Furnish all labor, materials, equipment, superintendence, tools and incidentals necessary to perform trenching for water lines and appurtenances, including drainage, filling, backfilling, disposal of surplus material, and restoration of trench surfaces and easements.

B. Excavation shall extend to the width and depth shown on the drawings or as specified and shall provide suitable room for placing shoring, pipe embedment and installing pipe, structures, and appurtenances.

C. Furnish and place all sheeting, bracing, and supports and remove from the excavation all materials which the Engineer may deem unsuitable for backfilling.

D. Whatever the requirement for any percentage of compaction is referred to herein shall mean "at least that percentage of maximum density as determined by ASTM D1557, Method D."

1.03 RELATED WORK

A. Environmental protection is included in Section 01110.

B. Granular fill materials is included in Section 02235.

C. Asphalitc concrete paving is included in Section 02510.

D. Schedule of Pipe is included in Section 02600.

1.04 SUBMITTALS

A. Trench excavation support system designs shall be prepared by a licensed Professional Engineer, registered in the State of Texas, having a minimum of five years of professional experience in the design and construction of excavation support systems. Submit an original and a minimum of three copies of the licensed Professional Engineer’s certification, on the P.E. form included in Section 01300, stating that the excavation support systems designs have been prepared by the Professional Engineer and that the Professional Engineer will be responsible for their execution.

1.05 REFERENCE STANDARDS, QUALITY ASSURANCE, PROJECT/SITE REQUIREMENTS AND DEFINITIONS

A. American Society for Testing and Materials (ASTM)

1. ASTM D698 Standard Test Methods for Moisture-Density Relations of Soils and Soil-Aggregates Mixtures Using 5.5 lbs (2.49 kg) Rammer and 12-inch (305 mm) Drop (also known as Standard Proctor Analysis)
2. ASTM D1557 Standard Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using 10-lb (4.54 kg) Rammer and 18-inch (457 mm) Drop (also known as Modified Proctor Analysis)

B. Where reference is made to one of the above standards, the revision in effect at the time of bid opening shall apply.

1.06 QUALITY ASSURANCE

A. Prior to and during the placement of backfill and fill, cooperate with the Engineer and soils testing laboratory in their performance of in-place soil density tests to verify that the backfill/fill material have been compacted in accordance with the compaction requirements specified herein. The Engineer may designate areas to be tested.

1.07 PROJECT/SITE REQUIREMENTS

A. No reports of explorations or test of subsurface conditions at or contiguous to the Site, or drawings of physical conditions relating to existing surface structures at the Site, are known to Owner.

1.08 DEFINITIONS

A. Where the phrase "in-the-dry" is used in these specifications, it shall be defined to mean a soil condition such that the in-place moisture content of the soil at that time is no more than 2 percentage points above the optimum moisture content of that soil as determined by the laboratory test of the moisture-density relation appropriate to the specified level of compaction.

B. Where the phrase "at or near its optimum moisture content" is used in this Section, it shall be defined as being within plus or minus 2 percentage points of the optimum moisture content of that soil as determined by laboratory testing, as determined in the report.

C. Where used in this Section, "modified proctor" refers to soil density testing in accordance with ASTM D1557.

PART 2 PRODUCTS

2.01 GENERAL

A. Timber used for excavation support systems shall be pressure treated with wood preservative for ground contact.

PART 3 EXECUTION

3.01 TRENCH EXCAVATION SUPPORT

A. This item covers the requirements for the Contractor to provide the design and construction of trench safety for all trenches excavated. Refer to SUPPLEMENTARY CONDITIONS and Section 01010 - General, of these specifications for additional information regarding TRENCH EXCAVATION SAFETY SYSTEM.
B. The Contractor shall furnish, put in place, and maintain a trench safety system to support the sides of the excavations where required, to prevent movement which could in any way diminish the width of the excavation below that necessary for proper construction, and to protect structures, pipelines, streets, drains, canals and utilities from damage due to lateral movement or settlement of ground.

C. The trench safety system shall be suitable for construction of pipelines, utilities, etc. that are installed below grade and shall be sufficient to fully protect public or private property including other existing utilities and structures below, or above grade. Trench safety systems include, but are not limited to, sloping of side excavation, sheeting, trench boxes or trench shields, sheet piling, cribbing, bracing, shoring, dewatering, or diversion of water to provide adequate drainage.

D. The Contractor shall be responsible for the design of systems, and procedures such as the use of sheet piling, shoring, or other means of temporary support to protect existing buildings, streets, highways, water conveying structures, and any other structures. In the case of existing utilities, the Contractor may elect to remove the utilities under the stipulated condition that the removal and subsequent replacement of these utilities shall meet with the approval of the Engineer, the Owner, the utility owner, and all agencies having jurisdiction of the structure or property. In all cases, the Contractor shall be fully responsible for the protection of any person or persons who, as a result of the Contractor's work, may be injured.

E. Trench safety systems shall be accomplished in accordance with the detailed specifications set out in the provisions of Excavations, Trenching, and Shoring, Federal Occupational Safety and Health Administration (OSHA) Standards, 29 CFR, Part 1926, Subpart P, as amended including proposed Rules published in the Federal Register (Vol. 54, No. 209) on Tuesday, October 31, 1989. The sections that are incorporated into these specifications by reference include Sections 1926-650 through 1926-653. Legislation that has been enacted by the Texas Legislature (H.B. No. 662 and H.B. 665) with regard to trench safety systems, is hereby also incorporated, by reference, into these specifications.

F. The Contractor shall submit a safety program specifically for the construction of trench excavations together with the trench excavation plans for trench safety systems. The trench safety program shall be in accordance with OSHA Standards governing the presence and activities of individuals working in and around trench excavation.

1. Contractors shall have three generally accepted methods, or combinations thereof, to meet OSHA Standards for Trench Excavation:
   a. Minimum angle of Repose for sloping of the side of excavations.
   b. Utilization of Trench Box.
   c. Shoring, Sheetig, and Bracing Methods.

2. A Contractor electing to utilize the Minimum Angle of repose must submit:
   a. Soil Classification according to the unified Soil Classification System including water content and plasticity index, and minimum angle of the slope of excavation for the trench.

3. A Contractor electing to utilize a trench box must submit physical dimensions, materials, position in the trench, expected loads, and the strength of the box. No claims for delay will be permitted.

4. A Contractor electing to utilize shoring, sheeting, and bracing must submit dimensions and materials of all uprights, stringers, cross bracing, and spacing required to meet OSHA requirements. No claims for delay will be permitted.
G. Sheeting and Bracing

1. The Contractor shall furnish, put in place, and maintain such sheeting and bracing as may be required to protect personnel, to support the sides of excavations, to prevent any movement which could in any way diminish the width of the excavation below that necessary for proper construction, and to protect adjacent structures from undermining or other damage. Care shall be taken to prevent voids outside of the sheeting, but if voids are formed, they shall be immediately filled and rammed and the cause of such voids investigated. Where soil cannot be properly compacted to fill void, and where acceptable to the Engineer, lean concrete shall be used to fill the void at no additional cost to the Owner.

2. The Contractor shall leave in place to be embedded in the backfill all sheeting the Engineer may direct him in writing to leave in place at any time during the progress of the work for the purpose of preventing injury to structures, utilities, or property. The Engineer may direct that timber used for sheeting and bracing be cut off at any specified elevation.

3. All sheeting and bracing not left in place shall be carefully removed in such manner as not to cause excessive loading on the installed piping, and to not endanger the construction or other structures, utilities, or property. All voids left or caused by withdrawal of sheeting shall be immediately refilled with sand by ramming with tools especially adapted for that purpose, or otherwise as may be directed.

4. The right of the Engineer to order sheeting and bracing left in place shall not be construed as creating any obligation on his part to issue such orders, and his failure to exercise his right to do so shall not relieve the Contractor from liability for damages to persons or property occurring from or upon the work occasioned by negligence or otherwise, growing out of failure on the part of Contractor to leave in place sufficient sheeting and bracing to prevent any caving in or moving of the ground.

5. No wood sheeting is to be completely withdrawn if driven below mid-diameter of any pipe, and under no circumstances shall any wood sheeting be cut off at a level lower than 1 foot above the top of any pipe.

6. When movable trench bracing such as trench boxes, moveable sheeting, shoring, or plates are used to support the sides of the trench, care shall be taken in placing and moving the boxes or supporting bracing to prevent movement of the pipe, or disturbance of the pipe bedding or backfill.

   a. When installing rigid pipe, any portion of the box extending below mid-diameter shall be raised above this point prior to moving the box ahead to install the next pipe. This is to prevent the separation of installed pipe joints due to movement of the box.

   b. When installing flexible pipe, trench boxes, moveable sheeting, shoring, or plates shall not be allowed to extend below mid-diameter of the pipe. As trench boxes, moveable sheeting, shoring or plates are moved, screened gravel shall be placed to fill any voids created and the screened gravel and backfill shall be re-compacted to provide uniform side support for the pipe.

H. The Contractor shall provide a qualified person to make daily inspections of the trench safety systems to ensure that the systems meet OSHA requirements. The contractor shall maintain a permanent record of these daily inspections.

If the evidence of possible cave-ins, or slides, 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. It is the sole duty, responsibility, and prerogative of the Contractor, not the Owner, the Owner’s designated representative, or the Engineer to determine the specific applicability of the designed trench safety systems to each field condition encountered on the project.
I. In any emergency situation which may threaten or affect the safety or welfare of persons or property, the Contractor shall act at his discretion to prevent possible damage, injury, or loss. Any additional compensation or extension of time claimed for such action shall be considered in view of the cause of the emergency and in accordance with the general conditions.
J. OSHA Safety and Health Regulation Part 1926:
If it is necessary to stand at the outboard or inboard edge of the deckload where less than 24 inches of bulwark, rail, coaming, or other protection exists, all employees shall be provided with a suitable means of protection against falling from the deckload.

(d) First-aid and lifesaving equipment.

(1) Provisions for rendering first aid and medical assistance shall be in accordance with subpart D of this part.

(2) The employer shall ensure that there is in the vicinity of each barge in use at least one U.S. Coast Guard-approved 30-inch lifering with not less than 90 feet of line attached, and at least one portable or permanent ladder which will reach the top of the apron to the surface of the water. If the above equipment is not available at the pier, the employer shall furnish it during the time that he is working the barge.

(3) Employees walking or working on the unguarded decks of barges shall be protected with U.S. Coast Guard-approved work vests or buoyant vests.

(e) Commercial diving operations. Commercial diving operations shall be subject to subpart T of part 1910, §§1910.401–1910.441, of this chapter.

§ 1926.606 Definitions applicable to this subpart.

(a) Apron—The area along the waterfront edge of the pier or wharf.

(b) Bulwark—The side of a ship above the upper deck.

(c) Coaming—The raised frame, as around a hatchway in the deck, to keep out water.

(d) Jacob's ladder—A marine ladder of rope or chain with wooden or metal rungs.

(e) Rail, for the purpose of § 1926.605, means a light structure serving as a guard at the outer edge of a ship's deck.

Subpart P—Excavations

AUTHORITY: Sec. 107, Contract Worker Hours and Safety Standards Act (Construction Safety Act) (40 U.S.C. 333); Secs. 4, 6, 8, Occupational Safety and Health Act of 1970 (25 U.S.C. 653, 653, 657); Secretary of Labor's Order No. 12-71 (36 FR 8058), 5-78 (43 FR 35059), or 9-83 (48 FR 35736), as applicable, and 29 CFR part 1911.

SOURCE: 54 FR 45959, Oct. 31, 1989, unless otherwise noted.
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Excavation means any man-made cut, cavity, trench, or depression in an earth surface, formed by earth removal.

Faces or sides means the vertical or inclined earth surfaces formed as a result of excavation work.

Failure means the breakage, displacement, or permanent deformation of a structural member or connection so as to reduce its structural integrity and its supportive capabilities.

Hazardous atmosphere means an atmosphere which, by reason of being explosive, flammable, poisonous, corrosive, oxidizing, irritating, oxygen deficient, toxic, or otherwise harmful, may cause death, illness, or injury.

Kickout means the accidental release or failure of a cross brace.

Protective system means a method of protecting employees from cave-ins, from material that could fall or roll from an excavation face or into an excavation, or from the collapse of adjacent structures. Protective systems include support systems, sloping and benching systems, shield systems, and other systems that provide the necessary protection.

Ramp means an inclined walking or working surface that is used to gain access to one point from another, and is constructed from earth or from structural materials such as steel or wood.

Registered Professional Engineer means a person who is registered as a professional engineer in the state where the work is to be performed. However, a professional engineer, registered in any state is deemed to be a "registered professional engineer" within the meaning of this standard when approving designs for "manufactured protective systems" or "tabulated data" to be used in interstate commerce.

Sheeting means the members of a shoring system that retain the earth in position and in turn are supported by other members of the shoring system.

Shield (Shield system) means a structure that is able to withstand the forces imposed on it by a cave-in and thereby protect employees within the structure. Shields can be permanent structures or can be designed to be portable and moved along as work progresses. Additionally, shields can be either premanufactured or job-built in accordance with §1926.652 (c)(3) or (c)(4). Shields used in trenches are usually referred to as "trench boxes" or "trench shields."

Shoring (Shoring system) means a structure such as a metal hydraulic, mechanical or timber shoring system that supports the sides of an excavation and which is designed to prevent cave-ins.

Sides. See "Faces."

Sloping (Sloping system) means a method of protecting employees from cave-ins by excavating to form sides of an excavation that are inclined away from the excavation so as to prevent cave-ins. The angle of incline required to prevent a cave-in varies with differences in such factors as the soil type, environmental conditions of exposure, and application or support loads.

Stable rock means natural, solid mineral material that can be excavated with vertical sides and will remain intact while exposed. Unstable rock is considered to be stable when the rock material on the side or sides of the excavation is secured against caving-in or movement by rock bolts or by another protective system that has been designed by a registered professional engineer.

Structural ramp means a ramp built of steel or wood, usually used for vehicle access. Ramps made of soil or rock are not considered structural ramps.

Support system means a structure such as underpinning, bracing, or shoring, which provides support to an adjacent structure, underground installation, or the sides of an excavation.

Tabulated data means tables and charts approved by a registered professional engineer and used to design and construct a protective system.

Trench (Trench excavation) means a narrow excavation (in relation to its length) made below the surface of the ground. In general, the depth is greater than the width, but the width of a trench (measured at the bottom) is not greater than 15 feet (4.6 m). If forms or other structures are installed or constructed in an excavation so as to reduce the dimension measured from the forms or structure to the side of the excavation to 15 feet (4.6 m) or less
(measured at the bottom of the excavation), the excavation is also considered to be a trench.

_Trench box._ See "Shield."

_Trench shield._ See "Shield."

_Uprights_ means the vertical members of a trench shoring system placed in contact with the earth and usually positioned so that individual members do not contact each other. Uprights placed so that individual members are closely spaced, in contact with or interconnected to each other, are often called "sheeting."

_Wales_ means horizontal members of a shoring system placed parallel to the excavation face whose sides bear against the vertical members of the shoring system or earth.

§ 1926.651 Specific excavation requirements.

(a) _Surface encumbrances._ All surface encumbrances that are located so as to create a hazard to employees shall be removed or supported, as necessary, to safeguard employees.

(b) _Underground installations._ (1) The estimated location of utility installations, such as sewer, telephone, fuel, electric, water lines, or any other underground installation that reasonably may be expected to be encountered during excavation work, shall be determined prior to opening an excavation.

(2) Utility companies or owners shall be contacted within established or customary local response times, advised of the proposed work, and asked to establish the location of the utility underground installations prior to the start of actual excavation. When utility companies or owners cannot respond to a request to locate underground utility installations within 24 hours (unless a longer period is required by state or local law), or cannot establish the exact location of these installations, the employer may proceed, provided the employer does so with caution, and provided detection equipment or other acceptable means to locate utility installations are used.

(3) When excavation operations approach the estimated location of underground installations, the exact location of the installations shall be determined by safe and acceptable means.

(4) While the excavation is open, underground installations shall be protected, supported or removed as necessary to safeguard employees.

(c) _Access and egress._ (1) _Structural ramps._ (i) Structural ramps that are used solely by employees as a means of access or egress from excavations shall be designed by a competent person. Structural ramps used for access or egress of equipment shall be designed by a competent person qualified in structural design, and shall be constructed in accordance with the design.

(ii) Ramps and runways constructed of two or more structural members shall have the structural members connected together to prevent displacement.

(iii) Structural members used for ramps and runways shall be of uniform thickness.

(iv) Cleats or other appropriate means used to connect runaway structural members shall be attached to the bottom of the runway or shall be attached in a manner to prevent tripping.

(v) Structural ramps used in lieu of steps shall be provided with cleats or other surface treatments on the top surface to prevent slipping.

(2) _Means of egress from trench excavations._ A stairway, ladder, ramp or other means of egress shall be located in trench excavations that are 4 feet (1.22 m) or more in depth so as to require no more than 25 feet (7.62 m) of lateral travel for employees.

(d) _Exposure to vehicular traffic._ Employees exposed to public vehicular traffic shall be provided with, and shall wear, warning vests or other suitable garments marked with or made of reflectorized or high-visibility material.

(e) _Exposure to falling loads._ No employee shall be permitted underneath loads handled by lifting or digging equipment. Employees shall be required to stand away from any vehicle being loaded or unloaded to avoid being struck by any spillage or falling materials. Operators may remain in the cabs of vehicles being loaded or unloaded when the vehicles are equipped, in accordance with §1926.501(b)(6), to provide adequate protection for the operator during loading and unloading operations.

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(f) Warning system for mobile equipment. When mobile equipment is operated adjacent to an excavation, or when such equipment is required to approach the edge of an excavation, and the operator does not have a clear and direct view of the edge of the excavation, a warning system shall be utilized such as barricades, hand or mechanical signals, or stop logs. If possible, the grade should be away from the excavation.

(g) Hazardous atmospheres—(1) Testing and controls. In addition to the requirements set forth in subparts D and E of this part (29 CFR 1926.50-1926.167) to prevent exposure to harmful levels of atmospheric contaminants and to assure acceptable atmospheric conditions, the following requirements shall apply:

(i) Where oxygen deficiency (atmospheres containing less than 19.5 percent oxygen) or a hazardous atmosphere exists or could reasonably be expected to exist, such as in excavations in landfill areas or excavations in areas where hazardous substances are stored nearby, the atmospheres in the excavation shall be tested before employees enter excavations greater than 4 feet (1.22 m) in depth.

(ii) Adequate precautions shall be taken to prevent employee exposure to atmospheres containing less than 19.5 percent oxygen and other hazardous atmospheres. These precautions include providing proper respiratory protection or ventilation in accordance with subparts D and E of this part respectively.

(iii) Adequate precaution shall be taken such as providing ventilation, to prevent employee exposure to an atmosphere containing a concentration of a flammable gas in excess of 20 percent of the lower flammable limit of the gas.

(iv) When controls are used that are intended to reduce the level of atmospheric contaminants to acceptable levels, testing shall be conducted as often as necessary to ensure that the atmosphere remains safe.

(h) Stability of adjacent structures. (1) Where the stability of adjoining buildings, walls, or other structures is endangered by excavation operations, support systems such as shoring, bracing, or underpinning shall be provided to ensure the stability of such structures for the protection of employees.

(ii) Excavation below the level of the base or footing of any foundation or retaining wall that could be reasonably
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expected to pose a hazard to employees shall not be permitted except when:

(i) A support system, such as underpinning, is provided to ensure the safety of employees and the stability of the structure; or

(ii) The excavation is in stable rock; or

(iii) A registered professional engineer has approved the determination that the structure is sufficiently removed from the excavation so as to be unaffected by the excavation activity; or

(iv) A registered professional engineer has approved the determination that such excavation work will not pose a hazard to employees.

(3) Sidewalks, pavements, and appurtenant structure shall not be undermined unless a support system or another method of protection is provided to protect employees from the possible collapse of such structures.

(j) Protection of employees from loose rock or soil. (1) Adequate protection shall be provided to protect employees from loose rock or soil that could pose a hazard by falling or rolling from an excavation face. Such protection shall consist of scaling to remove loose material; installation of protective barricades at intervals as necessary on the face to stop and contain falling material; or other means that provide equivalent protection.

(2) Employees shall be protected from excavated or other materials or equipment that could pose a hazard by falling or rolling into excavations. Protection shall be provided by placing and keeping such materials or equipment at least 2 feet (61 m) from the edge of excavations, or by the use of retaining devices that are sufficient to prevent materials or equipment from falling or rolling into excavations, or by a combination of both if necessary.

(k) Inspections. (1) Daily inspections of excavations, the adjacent areas, and protective systems shall be made by a competent person for evidence of a situation that could result in possible cave-ins, indications of failure of protective systems, hazardous atmospheres, or other hazardous conditions. An inspection shall be conducted by the competent person prior to the start of work and as needed throughout the shift. Inspections shall also be made after every rainstorm or other hazard increasing occurrence. These inspections are only required when employee exposure can be reasonably anticipated.

(2) Where the competent person finds evidence of a situation that could result in a possible cave-in, indications of failure of protective systems, hazardous atmospheres, or other hazardous conditions, exposed employees shall be removed from the hazardous area until the necessary precautions have been taken to ensure their safety.

(l) Walkways shall be provided where employees or equipment are required or permitted to cross over excavations. Guardrails which comply with §1926.502(b) shall be provided where walkways are 6 feet (1.8 m) or more above lower levels.

[54 FR 45959, Oct. 31, 1989, as amended by 59 FR 40730, Aug. 9, 1994]

§ 1926.652 Requirements for protective systems.

(a) Protection of employees in excavations. (1) Each employee in an excavation shall be protected from cave-ins by an adequate protective system designed in accordance with paragraph (b) or (c) of this section except when:

(i) Excavations are made entirely in stable rock; or

(ii) Excavations are less than 5 feet (1.52 m) in depth and examination of the ground by a competent person provides no indication of a potential cave-in.

(b) Design of sloping and benching systems. The slopes and configurations of sloping and benching systems shall be selected and constructed by the employer or his designee and shall be in accordance with the requirements of paragraph (b)(1); or, in the alternative, paragraph (b)(2); or, in the alternative, paragraph (b)(3), or, in the alternative, paragraph (b)(4), as follows:

(1) Option (1)—Allowable configurations and slopes. (i) Excavations shall be sloped at an angle not steeper than one and one-half horizontal to one vertical
(34 degrees measured from the horizontal), unless the employer uses one of the other options listed below.

(ii) Slopes specified in paragraph (b)(1)(i) of this section, shall be excavated to form configurations that are in accordance with the slopes shown for Type C soil in Appendix B to this subpart.

(2) Option (2)—Determination of slopes and configurations using Appendices A and B. Maximum allowable slopes, and allowable configurations for sloping and benching systems, shall be determined in accordance with the conditions and requirements set forth in appendices A and B to this subpart.

(3) Option (3)—Designs using other tabulated data. (i) Designs of sloping or benching systems shall be selected from and be in accordance with tabulated data, such as tables and charts.

(ii) The tabulated data shall be in written form and shall include all of the following:

(A) Identification of the parameters that affect the selection of a sloping or benching system drawn from such data;

(B) Identification of the limits of use of the data, to include the magnitude and configuration of slopes determined to be safe;

(C) Explanatory information as may be necessary to aid the user in making a correct selection of a protective system from the data.

(iii) At least one copy of the tabulated data which identifies the registered professional engineer who approved the data, shall be maintained at the jobsite during construction of the protective system. After that time the data may be stored off the jobsite, but a copy of the data shall be made available to the Secretary upon request.

(4) Option (4)—Design by a registered professional engineer. (i) Sloping and benching systems not utilizing Option (1) or Option (2) or Option (3) under paragraph (b) of this section shall be approved by a registered professional engineer.

(ii) Designs shall be in written form and shall include at least the following:

(A) The magnitude of the slopes that were determined to be safe for the particular project;

(B) The configurations that were determined to be safe for the particular project; and

(C) The identity of the registered professional engineer approving the design.

(iii) At least one copy of the design shall be maintained at the jobsite while the slope is being constructed. After that time the design need not be at the jobsite, but a copy shall be made available to the Secretary upon request.

(c) Design of support systems, shield systems, and other protective systems. Designs of support systems shield systems, and other protective systems shall be designed and constructed by the employer or his designee and shall be in accordance with the requirements of paragraph (c)(1): or, in the alternative, paragraph (c)(2): or, in the alternative, paragraph (c)(3): or, in the alternative, paragraph (c)(4): as follows:

(1) Option (1)—Designs using appendices A, C and D. Designs for timber shoring in trenches shall be determined in accordance with the conditions and requirements set forth in appendices A and C to this subpart. Designs for aluminum hydraulic shoring shall be in accordance with paragraph (c)(2) of this section, but if manufacturer’s tabulated data cannot be utilized, designs shall be in accordance with appendix D.

(2) Option (2)—Designs Using Manufacturer’s Tabulated Data. (i) Design of support systems, shield systems, or other protective systems that are drawn from manufacturer’s tabulated data shall be in accordance with all specifications, recommendations, and limitations issued or made by the manufacturer.

(ii) Deviation from the specifications, recommendations, and limitations issued or made by the manufacturer shall only be allowed after the manufacturer issues specific written approval.

(iii) Manufacturer’s specifications, recommendations, and limitations, and manufacturer’s approval to deviate from the specifications, recommendations, and limitations shall be in written form at the jobsite during construction of the protective system. After that time this data may be stored off the jobsite, but a copy shall
be made available to the Secretary upon request.

(3) Option (3)—Designs using other tabulated data. (i) Designs of support systems, shield systems, or other protective systems shall be selected from and be in accordance with tabulated data, such as tables and charts.

(ii) The tabulated data shall be in written form and include all of the following:

(A) Identification of the parameters that affect the selection of a protective system drawn from such data.

(B) Identification of the limits of use of the data.

(C) Explanatory information as may be necessary to aid the user in making a correct selection of a protective system from the data.

(iii) At least one copy of the tabulated data, which identifies the registered professional engineer who approved the data, shall be maintained at the jobsite during construction of the protective system. After that time the data may be stored off the jobsite, but a copy of the data shall be made available to the Secretary upon request.

(4) Option (4)—Design by a registered professional engineer. (i) Support systems, shield systems, and other protective systems not utilizing Option 1, Option 2 or Option 3, above, shall be approved by a registered professional engineer.

(ii) Designs shall be in written form and shall include the following:

(A) A plan indicating the sizes, types, and configurations of the materials to be used in the protective system; and

(B) The identity of the registered professional engineer approving the design.

(iii) At least one copy of the design shall be maintained at the jobsite during construction of the protective system. After that time, the design may be stored off the jobsite, but a copy of the design shall be made available to the Secretary upon request.

(d) Materials and equipment. (i) Materials and equipment used for protective systems shall be free from damage or defects that might impair their proper function.

(2) Manufactured materials and equipment used for protective systems shall be used and maintained in a manner that is consistent with the recommendations of the manufacturer, and in a manner that will prevent employee exposure to hazards.

(3) When material or equipment that is used for protective systems is damaged, a competent person shall examine the material or equipment and evaluate its suitability for continued use. If the competent person cannot assure the material or equipment is able to support the intended loads or is otherwise suitable for safe use, then such material or equipment shall be removed from service, and shall be evaluated and approved by a registered professional engineer before being returned to service.

(e) Installation and removal of support—(1) General. (i) Members of support systems shall be securely connected together to prevent sliding, falling, kickouts, or other predictable failure.

(ii) Support systems shall be installed and removed in a manner that protects employees from cave-ins, structural collapses, or from being struck by members of the support system.

(iii) Individual members of support systems shall not be subjected to loads exceeding those which those members were designed to withstand.

(iv) Before temporary removal of individual members begins, additional precautions shall be taken to ensure the safety of employees, such as installing other structural members to carry the loads imposed on the support system.

(v) Removal shall begin at, and progress from, the bottom of the excavation. Members shall be released slowly so as to note any indication of possible failure of the remaining members of the structure or possible cave-in of the sides of the excavation.

(vi) Backfilling shall progress together with the removal of support systems from excavations.

(2) Additional requirements for support systems for trench excavations. (i) Excavation of material to a level no greater than 2 feet (61 m) below the bottom of the members of a support system shall be permitted, but only if the system is designed to resist the forces calculated for the full depth of the trench, and
there are no indications while the trench is open of a possible loss of soil from behind or below the bottom of the support system.

(ii) Installation of a support system shall be closely coordinated with the excavation of trenches.

(f) Sloping and benching systems. Employees shall not be permitted to work on the faces of slopes or excavations at levels above other employees except when employees at the lower levels are adequately protected from the hazard of falling, rolling, or sliding material or equipment.

(g) Shield systems—(1) General. Shield systems shall not be subjected to loads exceeding those which the system was designed to withstand.

(ii) Shields shall be installed in a manner to restrict lateral or other hazardous movement of the shield in the event of the application of sudden lateral loads.

(iii) Employees shall be protected from the hazard of cave-ins when entering or exiting the areas protected by shields.

(iv) Employees shall not be allowed in shields when shields are being installed, removed, or moved vertically.

(2) Additional requirement for shield systems used in trench excavations. Excavations of earth material to a level not greater than 2 feet (61 m) below the bottom of a shield shall be permitted, but only if the shield is designed to resist the forces calculated for the full depth of the trench, and there are no indications while the trench is open of a possible loss of soil from behind or below the bottom of the shield.

APPENDIX A TO SUBPART P OF PART 1526—SOIL CLASSIFICATION

(a) Scope and application—(1) Scope. This appendix describes a method of classifying soil and rock deposits based on site and environmental conditions, and on the structure and composition of the earth deposits. The appendix contains definitions, sets forth requirements, and describes acceptable visual and manual tests for use in classifying soils.

(2) Application. This appendix applies when a sloping or benching system is designed in accordance with the requirements set forth in §1526.652(b)(2) as a method of protection for employees from cave-ins. This appendix also applies when timber shoring for excavations is designed as a method of protection from cave-ins in accordance with appendix C to subpart P of part 1526, and when aluminum hydraulic shoring is designed in accordance with appendix D of this part. This Appendix also applies if other protective systems are designed and selected for use from data prepared in accordance with the requirements set forth in §1526.652(c), and the use of the data is predicated on the use of the soil classification system set forth in this appendix.

(b) Definitions. The definitions and examples given below are based on, in whole or in part, the following: American Society for Testing Materials [ASTM] Standards D653-85 and E2488; The Unified Soils Classification System, The U.S. Department of Agriculture (USDA) Textural Classification Schema; and The National Bureau of Standards Report BSS-121.

Cemented soil means a soil in which the particles are held together by a chemical agent, such as calcium carbonate, such that a hand sample cannot be crushed into powder or individual soil particles by finger pressure.

Cohesive soil means clay (fine grained soil), or soil with a high clay content, which has cohesive strength. Cohesive soil does not crumble, can be excavated with vertical sideslips, and is plastic when moist. Cohesive soil is hard to break up when dry, and exhibits significant cohesion when submerged. Cohesive soils include clayey silt, sandy clay, silty clay, clay and organic clay.

Dry soil means soil that does not exhibit visible signs of moisture content.

Fissured soil is a material that has a tendency to break along definite planes of fracture with little resistance, or a material that exhibits open cracks, such as tension cracks, in an exposed surface.

Granular soil means gravel, sand, or silt, (coarse grained soil) with little or no clay content. Granular soil has no cohesive strength. Some moist granular soils exhibit apparent cohesion. Granular soil cannot be molded when moist and crumbles easily when dry.

Layered system means two or more distinctly different soil or rock types arranged in layers. Micaceous seams or weakened planes in rock or shale are considered layered.

Moist soil means a condition in which a soil looks and feels damp. Moist cohesive soil can easily be shaped into a ball and rolled into small diameter threads before crumbling. Moist granular soil that contains some cohesive material will exhibit signs of cohesion between particles.

Plastic means a property of a soil which allows the soil to be deformed or molded without cracking, or appreciable volume change.

Saturated soil means a soil in which the voids are filled with water. Saturation does not require flow. Saturation, or near saturation, is necessary for the proper use of instruments such as a pocket penetrometer or shear vane.
Soil classification system means, for the purpose of this subpart, a method of categorizing soil and rock deposits in a hierarchy of Stable Rock, Type A, Type B, and Type C, in decreasing order of stability. The categories are determined based on an analysis of the properties and performance characteristics of the deposits and the environmental conditions and stress. Stable rock means natural solid mineral matter that can be excavated with vertical sides and remain intact while exposed. Submerged soil means soil which is underwater or is free seeping.

Type A means cohesive soils with an unconfined compressive strength of 1.5 tons per square foot (tsf) (144 kPa) or greater. Examples of cohesive soils are: clay, silty clay, sandy clay, clay loam, and, in some cases, silty clay loam and sandy clay loam. Cemented soils such as caliche and hardpan are also considered Type A. However, no soil is Type A if:

(i) The soil is fissured; or
(ii) The soil is subject to vibration from heavy traffic, pile driving, or similar effects; or
(iii) The soil has been previously disturbed; or
(iv) The soil is part of a sloped, layered system where the layers dip into the excavation on a slope of four horizontal to one vertical (4H:1V) or greater; or
(v) The material is subject to other factors that would require it to be classified as a less stable material.

Type B means:

(i) Cohesive soil with an unconfined compressive strength greater than 0.5 tsf (48 kPa) but less than 1.5 tsf (144 kPa); or
(ii) Granular cohesionless soils including angular gravel (similar to crushed rock), silt, silt loam, sandy loam and, in some cases, silty clay loam and sandy clay loam.

Type C means:

(i) Cohesive soil with an unconfined compressive strength of 0.5 tsf (48 kPa) or less; or
(ii) Granular soils including gravel, sand, and loamy sand; or
(iii) Submerged soil or soil from which water is freely seeping; or
(iv) Submerged rock that is not stable, or
(v) Material in a sloped, layered system where the layers dip into the excavation or a slope of four horizontal to one vertical (4H:1V) or steeper.

Unconfined compressive strength means the load per unit area at which a soil will fail in compression. It can be determined by laboratory testing, or estimated in the field using a pocket penetrometer, by thumb penetration tests, and other methods.

Wet soil means soil that contains significantly more moisture than moist soil, but in such a range of values that cohesive material will slump or begin to flow when vibrated. Granular material that would exhibit cohesive properties when moist will lose those cohesive properties when wet.

(i) Requirements—(i) Classification of soil and rock deposits. Each soil and rock deposit shall be classified by a competent person as Stable Rock, Type A, Type B, or Type C in accordance with the definitions set forth in paragraph (b) of this appendix.

(ii) Basis of classification. The classification of the deposits shall be made based on the results of at least one visual and at least one manual analysis. Such analyses shall be conducted by a competent person using tests described in paragraph (d) below, or in other recognized methods of soil classification and testing such as those adopted by the American Society for Testing Materials, or the U.S. Department of Agriculture textural classification system.

(2) Visual and manual analyses. The visual and manual analyses, such as those noted as being acceptable in paragraph (d) of this appendix, shall be designed and conducted to provide sufficient quantitative and qualitative information as may be necessary to identify properly the properties, factors, and conditions affecting the classification of the deposits.

(4) Layered systems. In a layered system, the system shall be classified in accordance with its weakest layer. However, each layer may be classified individually where a more stable layer lies under a less stable layer.

(5) Reclassification. If, after classifying a deposit, the properties, factors, or conditions affecting its classification change in any way, the changes shall be evaluated by a competent person. The deposit shall be reclassified as necessary to reflect the changed circumstances.

(d) Acceptable visual and manual tests—(1) Visual tests. Visual analysis is conducted to determine qualitative information regarding the excavation site in general, the soil adjacent to the excavation, the soil forming the sides of the open excavation, and the soil taken as samples from excavated material.

(i) Observe samples of soil that are excavated and soil in the sides of the excavation. Estimate the range of particle sizes and the relative amounts of the particle sizes. Soil that is primarily composed of fine-grained
material is cohesive material. Soil composed primarily of coarse-grained sand or gravel is granular material.

(ii) Observe soil as it is excavated. Soil that remains in clumps when excavated is cohesive. Soil that breaks up easily and does not stay in clumps is granular.

(iii) Observe the side of the opened excavation and the surface area adjacent to the excavation. Crack-like openings such as tension cracks could indicate fissured material. If chunks of soil stall off a vertical side, the soil could be fissured. Small spills are evidence of moving ground and are indications of potentially hazardous situations.

(iv) Observe the area adjacent to the excavation and the excavation itself for evidence of existing utility and other underground structures, and to identify previously disturbed soil.

(v) Observe the opened side of the excavation to identify layered systems. Examine layered systems to identify if the layers slope toward the excavation. Estimate the degree of slope of the layers.

(vi) Observe the area adjacent to the excavation and the sides of the opened excavation for evidence of surface water, water seeping from the sides of the excavation, or the location of the level of the water table.

(vii) Observe the area adjacent to the excavation and the area within the excavation for sources of vibration that may affect the stability of the excavation face.

(ii) Manual tests. Manual analysis of soil samples is conducted to determine quantitative as well as qualitative properties of soil and to provide more information in order to classify soil properly.

(i) Plasticity. Mold a moist or wet sample of soil into a ball and attempt to roll it into threads as thin as 0.1-inch in diameter. Cohesive material can be successfully rolled into threads without crumbling. For example, if at least a two inch (50 mm) length of 0.1-inch thread can be held on one end without tearing, the soil is cohesive.

(ii) Dry strength. If the soil is dry and crumbles on its own or with moderate pressure into individual grins or fine powder, it is granular (any combination of gravel, sand, or silt). If the soil is dry and falls into clumps which break up into smaller clumps, but the smaller clumps can only be broken up with difficulty, it may be clay in any combination with gravel, sand or silt. If the dry soil breaks into clumps which do not break up into small clumps and which can only be broken with difficulty, and there is no visual indication the soil is fissured, the soil may be considered unsullured.

(iii) Thumb penetration. The thumb penetration test can be used to estimate the unconfined compressive strength of cohesive soils. (This test is based on the thumb penetration test described in American Society for Testing and Materials (ASTM) Standard designation D2488—"Standard Recommended Practice for Description of Soils (Visual—Manual Procedure).") Type A soils with an unconfined compressive strength of 1.5 tsf can be readily indented by the thumb; however, they can be penetrated by the thumb only with very great effort. Type C soils with an unconfined compressive strength of 0.3 tsf can be easily penetrated several inches by the thumb, and can be molded by light finger pressure. This test should be conducted on an undisturbed soil sample, such as a large clump of soil, as soon as practicable after excavation to keep to a minimum the effects of exposure to drying influences. If the excavation is later exposed to wetting influences (rain, flooding), the classification of the soil must be changed accordingly.

(iv) Other strength tests. Estimates of unconfined compressive strength of soils can also be obtained by use of a pocket penetrometer and by using a hand-operated shearvane.

(v) Drying test. The basic purpose of the drying test is to differentiate between cohesive material with fissures, unsullured cohesive material, and granular material. The procedure for the drying test involves drying a sample of soil that is approximately one inch thick (2.54 cm) and six inches (15.24 cm) in diameter until it is thoroughly dry:

(A) If the sample develops cracks as it dries, significant fissures are indicated.

(B) Samples that dry without cracking are to be broken by hand. If considerable force is necessary to break a sample, the soil has significant cohesive material content. The soil can be classified as a fissured cohesive material and the unconfined compressive strength should be determined.

(C) If a sample breaks easily by hand, it is either a fissured cohesive material or a granular material. To distinguish between the two, pulverize the dried clumps of the sample by hand or by stepping on them. If the clumps do not pulverize easily, the material is cohesive with fissures. If they pulverize easily into very small fragments, the material is granular.

APPENDIX B TO SUBPART P OF PART 1926—SLOPING AND BENCHING

(a) Scope and application. This appendix contains specifications for sloping and benching when used as methods of protecting employees working in excavations from cave-ins. The requirements of this appendix apply when the design of sloping and benching protective systems is to be performed in accordance with the requirements set forth in §1926.652(b)(2).

(b) Definitions.

Actual slope means the slope to which an excavation face is excavated. Distress means that the soil is in a condition where a cave-in is imminent or is likely
(2) **Maximum allowable slope.** The maximum allowable slope for a soil or rock deposit shall be determined from Table B-1 of this appendix.

(3) **Actual slope.** (i) The actual slope shall not be steeper than the maximum allowable slope.

(ii) The actual slope shall be less steep than the maximum allowable slope, when there are signs of distress. If that situation occurs, the slope shall be cut back to an actual slope which is at least $1/2$ horizontal to one vertical ($45^\circ$) less steep than the maximum allowable slope.

(iii) When surcharge loads from stored material or equipment, operating equipment, or traffic are present, a competent person shall determine the degree to which the actual slope must be reduced below the maximum allowable slope, and shall assure that such reduction is achieved. Surcharge loads from adjacent structures shall be evaluated in accordance with § 1926.65(3).

(4) **Configurations.** Configurations of sloping and benching systems shall be in accordance with Figure B-1.

### Table B-1

**Maximum Allowable Slopes**

<table>
<thead>
<tr>
<th>Soil or Rock Type</th>
<th>Maximum Allowable Slopes ($H:V$) for Excavations Less Than 20 Feet</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stable Rock</td>
<td>Vertical ($90^\circ$)</td>
</tr>
<tr>
<td>Type A</td>
<td>$3:1 : 1$ ($53^\circ$)</td>
</tr>
<tr>
<td>Type B</td>
<td>$1:1$ ($45^\circ$)</td>
</tr>
<tr>
<td>Type C</td>
<td>$1:2:1$ ($34^\circ$)</td>
</tr>
</tbody>
</table>

### Notes:

1. Numbers shown in parentheses next to maximum allowable slopes are angles expressed in degrees from the horizontal. Angles have been rounded off.

2. A short-term maximum allowable slope of 1/2H:1V ($63^\circ$) is allowed in excavations in Type A soil that are 12 feet ($3.67$ m) or less in depth. Short-term maximum allowable slopes for excavations greater than 12 feet ($3.67$ m) in depth shall be 3/4H:1V ($53^\circ$).

3. Sloping or benching for excavations greater than 20 feet deep shall be designed by a registered professional engineer.
Figure B-1

Slope Configurations

(All slopes stated below are in the horizontal to vertical ratio)

B-1.1 Excavations made in Type A soil.

1. All simple slope excavation 20 feet or less in depth shall have a maximum allowable slope of 3/4:1.

Simple Slope—General

Exception: Simple slope excavations which are open 24 hours or less (short term) and which are 12 feet or less in depth shall have a maximum allowable slope of 1/2:1.

Simple Slope—Short Term

2. All benched excavations 20 feet or less in depth shall have a maximum allowable slope of 3/4 to 1 and maximum bench dimensions as follows:
Simple Bench

Multiple Bench

3. All excavations 8 feet or less in depth which have unsupported vertically sided lower portions shall have a maximum vertical side of 3 1/2 feet.

Unsupported Vertically Sided Lower Portion—Maximum 8 Feet in Depth

All excavations more than 8 feet but not more than 12 feet in depth which unsupported vertically sided lower portions shall have a maximum allowable slope of 1:1 and a maximum vertical side of 3 1/2 feet.
UNSUPPORTED VERTICALLY SIDED LOWER PORTION—MAXIMUM 12 FEET IN DEPTH

All excavations 20 feet or less in depth which have vertically sided lower portions that are supported or shielded shall have a maximum allowable slope of \(4\pi\). The support or shield system must extend at least 18 inches above the top of the vertical side.

\[ \text{Support or shield system} \]

\[ 20' \text{ Max.} \]

\[ 3/4 \]

\[ 18'' \text{ Min.} \]

\[ \text{Total height of vertical side} \]

SUPPORTED OR SHIELDED VERTICALLY SIDED LOWER PORTION

4. All other simple slope, compound slope, and vertically sided lower portion excavations shall be in accordance with the other options permitted under §1926.652(b).

B-1.2 Excavations Made in Type B Soil

1. All simple slope excavations 20 feet or less in depth shall have a maximum allowable slope of 1:1.

\[ \text{Simple Slope} \]

2. All benched excavations 20 feet or less in depth shall have a maximum allowable slope of 1:1 and maximum bench dimensions as follows:
This bench allowed in cohesive soil only.

SINGLE BENCH

20' Max

4' Max.

MULTIPLE BENCH

This bench allowed in cohesive soil only

20' Max.

4' Max.

3. All excavations 20 feet or less in depth which have vertically sided lower portions shall be shielded or supported to a height at least 18 inches above the top of the vertical side. All such excavations shall have a maximum allowable slope of 1:1.

Support or shield system

20' Max.

18" Min.

VERTICALLY SIDED LOWER PORTION

4. All other sloped excavations shall be in accordance with the other options permitted in §1926.652(b).

B-1.3 EXCAVATIONS MADE IN TYPE C SOIL

1. All simple slope excavations 20 feet or less in depth shall have a maximum allowable slope of 1:1.
2. All excavations 20 feet or less in depth which have vertically sided lower portions shall be shielded or supported to a height at least 18 inches above the top of the vertical side. All such excavations shall have a maximum allowable slope of 1½:1.

3. All other sloped excavations shall be in accordance with the other options permitted in §1926.652(b).

B-1.4 Excavations Made in Layered Soils

1. All excavations 20 feet or less in depth made in layered soils shall have a maximum allowable slope for each layer as set forth below.
APPENDIX C TO SUBPART P OF PART 1926—TIMBER SHORING FOR TRENCHES

(a) Scope. This appendix contains information that can be used timber shoring is provided as a method of protection from cav- ings in trenches that do not exceed 20 feet (6.1 m) in depth. This appendix must be used when design of timber shoring protective systems is to be performed in accordance with §1926.652(c)(1). Other timber shoring configurations; other systems of support such as hydraulic and pneumatic systems; and other protective systems such as slop- ing, benching, shielding, and freezing sys- tems must be designed in accordance with the requirements set forth in §1926.652(b) and §1926.652(c).

(b) Soil Classification. In order to use the data presented in this appendix, the soil type or types in which the excavation is made must first be determined using the soil classification method set forth in appendix A of subpart P of this part. Information is presented in several forms as follows:

(1) Information is presented in tabular form in Tables C-1.1, C-1.2, and C-1.3, and Ta- bles C-2.1, C-2.2 and C-2.3 following para- graph (g) of the appendix. Each table pre- sent the minimum sizes of timber members to use in a shoring system, and each table contains data only for the particular soil type in which the excavation or portion of
the excavation is made. The data are arranged to allow the user the flexibility to select from among several acceptable configurations of members based on varying the horizontal spacing of the crossbraces. Stable rock is exempt from shoring requirements and therefore, no data are presented for this condition.

(b) Information concerning the basis of the tabular data and the limitations of the data is presented in paragraph (d) of this appendix, and on the tables themselves.

(c) Information explaining the use of the tabular data is presented in paragraph (e) of this appendix.

(d) Information illustrating the use of the tabular data is presented in paragraph (f) of this appendix.

(e) Miscellaneous notations regarding Tables C-1.1 through C-1.3 and Tables C-2.1 through C-2.3 are presented in paragraph (g) of this Appendix.

(2) Basic and limitations of the data.--(1) Dimensions of timber members. (i) The sizes of the timber members listed in Tables C-1.1 through C-1.3 are taken from the National Bureau of Standards (NBS) report, "Recommended Technical Provisions for Construction Practice in Shoring and Sloping of Trenches and Excavations." In addition, where NBS did not recommend specific sizes of members, member sizes are based on an analysis of the sizes required for use by existing codes and on empirical practice.

(ii) The required dimensions of the members listed in Tables C-1.1 through C-1.3 refer to actual dimensions and not nominal dimensions of the timber. Employers wanting to use nominal size shoring are directed to Tables C-2.1 through C-2.3, or have this choice under §1926.652(c)(3), and are referred to The Corps of Engineers, The Bureau of Reclamation or data from other acceptable sources.

(2) Limitation of application. (i) It is not intended that the timber shoring specification apply to every situation that may be experienced in the field. These data were developed to apply to the situations that are most commonly experienced in current trenching practice. Shoring systems for use in situations that are not covered by the data in this appendix must be designed as specified in §1926.652(c).

(ii) When any of the following conditions are present, the members specified in the tables are not considered adequate. Either an alternate timber shoring system must be designed or another type of protective system designed in accordance with §1926.652.

(A) When loads imposed by structures or by stored material adjacent to the trench weigh in excess of the load imposed by a two-foot soil surcharge. The term 'adjacent' as used here means the area within a horizontal distance from the edge of the trench equal to the depth of the trench.

(B) When vertical loads imposed on cross braces exceed a 240-pound gravity load distributed on a one-foot section of the center of the crossbrace.

(C) When surcharge loads are present from equipment weighing in excess of 20,000 pounds.

(D) When only the lower portion of a trench is shored and the remaining portion of the trench is sloped or benched unless: The sloped portion is sloped at an angle less steep than three horizontal to one vertical; or the members are selected from the tables for use at a depth which is determined from the top of the overall trench, and not from the toe of the sloped portion.

(e) Use of Tables. The members of the shoring system that are to be selected using this information are the cross braces, the uprights, and the wales, where wales are required. Minimum sizes of members are specified for use in different types of soil. There are six tables of information, two for each soil type. The soil type must first be determined in accordance with the soil classification system described in appendix A to subpart P of part 1926. Using the appropriate table, the selection of the size and spacing of the members is then made. The selection is based on the depth and width of the trench where the members are to be installed and, in most instances, the selection is also based on the horizontal spacing of the crossbraces. Instances where a choice of horizontal spacing of crossbracing is available, the horizontal spacing of the crossbraces must be chosen by the user before the size of any member can be determined. When the soil type, the width and depth of the trench, and the horizontal spacing of the crossbraces are known, the size and vertical spacing of the crossbraces, the size and vertical spacing of the wales, and the size and horizontal spacing of the uprights can be read from the appropriate table.

(f) Examples to Illustrate the Use of Tables C-1.1 through C-1.3.

(i) Example 1

A trench dug in Type A soil is 13 feet deep and five feet wide.

From Table C-1.1, for acceptable arrangements of timber can be used.

Arrangement #B1

Space 4 x 4 crossbraces at six feet horizontally and four feet vertically.

Wales are not required.

Space 3 x 8 uprights at six feet horizontally. This arrangement is commonly called 'skip shoring.'

Arrangement #B2

Space 4 x 8 crossbraces at eight feet horizontally and four feet vertically.

Space 8 x 8 wales at four feet vertically.
Space 2 x 6 uprights at four feet horizontally.

**Arrangement #B3**
- Space 6 x 6 crossbraces at 10 feet horizontally and four feet vertically.
- Space 8 x 8 wales at four feet vertically.
- Space 2 x 6 uprights at five feet horizontally.

**Arrangement #B4**
- Space 6 x 6 crossbraces at 12 feet horizontally and four feet vertically.
- Space 10 x 10 wales at four feet vertically.
- Spaces 3 x 8 uprights at six feet horizontally.

*(3) Example 2.*

A trench dug in Type B soil in 13 feet deep and five feet wide. From Table C-1.3 three acceptable arrangements of members are listed.

**Arrangement #B1**
- Space 6 x 6 crossbraces at six feet horizontally and five feet vertically.
- Space 8 x 8 wales at five feet vertically.
- Space 2 x 6 uprights at two feet horizontally.

**Arrangement #B2**
- Space 6 x 8 crossbraces at eight feet horizontally and five feet vertically.
- Space 10 x 10 wales at five feet vertically.
- Space 2 x 6 uprights at two feet horizontally.

**Arrangement #B3**
- Space 8 x 8 crossbraces at 10 feet horizontally and five feet vertically.
- Space 10 x 12 wales at five feet vertically.
- Space 2 x 6 uprights at two feet vertically.

*(3) Example 3.*

A trench dug in Type C soil is 13 feet deep and five feet wide.
From Table C-1.3 two acceptable arrangements of members can be used.

**Arrangement #B1**
- Space 8 x 8 crossbraces at six feet horizontally and five feet vertically.
- Space 10 x 12 wales at five feet vertically.
- Position 2 x 6 uprights as closely together as possible.

If water must be retained use special tongue and groove uprights to form tight sheeting.

**Arrangement #B2**
- Space 8 x 10 crossbraces at eight feet horizontally and five feet vertically.

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Space 12 x 12 wales at five feet vertically.

Position 2 x 6 uprights in a close sheeting configuration unless water pressure must be retained. Tight sheeting must be used where water must be retained.

*(4) Example 4.*

A trench dug in Type C soil is 20 feet deep and 11 feet wide. The size and spacing of members for the section of trench that is over 15 feet in depth is determined using Table C-1.3. Only one arrangement of members is provided.

- Space 8 x 10 crossbraces at six feet horizontally and five feet vertically.
- Space 12 x 12 wales at five feet vertically.

Use 3 x 6 tight sheeting.

Use of Tables C-2.1 through C-2.3 would follow the same procedures.

*(g) Notes for all Tables.*

1. Member sizes at spacings other than indicated are to be determined as specified in §1926.652(c), "Design of Protective Systems.

2. When conditions are saturated or submerged use Tight Sheet Construction. Tight Sheet Construction refers to the use of specially-edged timber planks (e.g., tongue and groove) at least three inches thick, steel sheet piling, or similar construction that when driven or placed in position provide a tight wall to resist the lateral pressure of water and to prevent the loss of backfill material. Close Sheet Construction refers to the placement of planks side-by-side allowing as little space as possible between them.

3. All spacing indicated is measured center to center.

4. Wale to be installed with greater dimension horizontal.

5. If the vertical distance from the center of the lowest crossbrace to the bottom of the trench exceeds two and one-half feet, uprights shall be firmly embedded or a mudskirt shall be used. Where uprights are embedded, the vertical distance from the center of the lowest crossbrace to the bottom of the trench shall not exceed 36 inches. When mudsills are used, the vertical distance shall not exceed 42 inches. Mudsills are wales that are installed at the toe of the trench side.

6. Trench jacks may be used in lieu of or in combination with timber crossbraces.

7. Placement of crossbraces. When the vertical spacing of crossbraces is four feet, place the top crossbrace no more than two feet below the top of the trench. When the vertical spacing of crossbraces is five feet, place the top crossbrace no more than 2.5 feet below the top of the trench.

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<table>
<thead>
<tr>
<th>DEPTH OF TRENCH (FEET)</th>
<th>CROSS BRACES</th>
<th>WALLS</th>
<th>UPRIGHTS</th>
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<tbody>
<tr>
<td></td>
<td>SIZE (ACTUAL) AND SPACING OF MEMBERS **</td>
<td></td>
<td>MAXIMUM ALLOWABLE HORIZONTAL SPACING (FEET)</td>
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<td>OVER 20</td>
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* Mixed oak or equivalent with a bending strength not less than 850 psi.
** Manufactured members of equivalent strength may be substituted for wood.
<table>
<thead>
<tr>
<th>Depth of Trench (Feet)</th>
<th>Size (Actual) and Spacing of Members**</th>
<th>Cross Braces</th>
<th>Walls</th>
<th>Uprights</th>
<th>Maximum Allowable Horizontal Spacing (Feet)</th>
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<tr>
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<td>Width of Trench (Feet)</td>
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<td>3x6</td>
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* Mixed oak or equivalent with a bending strength not less than 850 psi.
** Manufactured members of equivalent strength may be substituted for wood.
<table>
<thead>
<tr>
<th>DEPTH OF TRENCH (FEET)</th>
<th>CROSS BRACES</th>
<th>UPRIGHTS</th>
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<td>WIDTH OF TRENCH (FEET)</td>
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* Mixed Oak or equivalent with a bending strength not less than 850 psi.

** Manufactured members of equivalent strength may be substituted for wood.
<table>
<thead>
<tr>
<th>Depth of Trench (Feet)</th>
<th>Horiz. Spacing (Feet)</th>
<th>Uprights</th>
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*Douglas fir or equivalent with a bending strength not less than 1500 psf.*

**Manufactured members of equivalent strength may be substituted for wood.
<table>
<thead>
<tr>
<th>DEPTH OF TRENCH (FEET)</th>
<th>SIZE (2x4) AND SPACING OF MEMBERS **</th>
<th>CROSS BRACTS</th>
<th>WAIST</th>
<th>UPRIGHTS</th>
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* Douglas fir or equivalent with a bending strength not less than 1300 psi.
** Manufactured members of equivalent strength may be substituted for wood.
### Table 1-13

Timber Trench Shoring -- Minimum Timber Requirements

<table>
<thead>
<tr>
<th>Trench Depth (Feet)</th>
<th>Sides (Angle)</th>
<th>HORIZ. SPACING (Feet)</th>
<th>VERT. SPACING (Feet)</th>
<th>Maximum Allowable Horizontal Spacing (Feet)</th>
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</table>

**Notes:**
- Douglas fir or equivalent with a bending strength not less than 1500 psi.
- Manufactured members of equivalent strength may be substituted for wood.
Occupational Safety and Health Admin., Labor

first be determined using the soil classification method set forth in appendix A of subpart P of part 1926.
(c) Presentation of Information. Information is presented in several forms as follows:
(i) Information is presented in tabular form in Tables D-1.1, D-1.2, D-1.3 and E-1.4. Each table presents the maximum vertical and horizontal spacings that may be used with various aluminum member sizes and various hydraulic cylinder sizes. Each table contains data only for the particular soil type in which the excavation or portion of the excavation is made. Tables D-1.1 and D-1.2 are for vertical shores in Types A and B soils. Tables D-1.3 and D-1.4 are for horizontal waler systems in Types B and C soils.
(ii) Information concerning the basis of the tabular data and the limitations of the data is presented in paragraph (d) of this appendix.
(iii) Information explaining the use of the tabular data is presented in paragraph (e) of this appendix.
(iv) Information illustrating the use of the tabular data is presented in paragraph (f) of this appendix.
(v) Miscellaneous notations (footnotes) regarding Table D-1.1 through D-1.4 are presented in paragraph (g) of this appendix.
(vi) Figures, illustrating typical installations of hydraulic shoring, are included just prior to the Tables. The illustrations page is entitled "Aluminum Hydraulic Shoring: Typical Installations."
(d) Basis and limitations of the data.
(i) Vertical shore rails and horizontal wales are those that meet the Section Module requirements in the D-1 Tables. Aluminum material is 6061-T6 or material of equivalent strength and properties.
(ii) Hydraulic cylinders specifications. (i) 2-inch cylinders shall be a minimum 2-inch inside diameter with a minimum safe working capacity of 10,000 pounds axial compressive load at maximum extension. Maximum extension is to include full range of cylinder extensions as recommended by product manufacturer.
(ii) 3-inch cylinders shall be a minimum 3-inch inside diameter with a safe working capacity of not less than 20,000 pounds axial compressive load at extensions as recommended by product manufacturer.
(iii) Limitation of application. (i) It is not intended that the aluminum hydraulic specification apply to every situation that may be experienced in the field. These data were developed to apply to the situations that are most commonly experienced in current trenching practice. Shoring systems for use in situations that are not covered by the data in this appendix must be otherwise designed as specified in §1926.652(c).
(ii) When any of the following conditions are present, the members specified in the Tables are not considered adequate. In this case, an alternative aluminum hydraulic shoring system or other type of protective system must be designed in accordance with §1926.652.
(A) When vertical loads imposed on cross braces exceed a 100 pound gravity load distributed on a one foot section of the center of the hydraulic cylinder.
(B) When surcharge loads are present from equipment weighing in excess of 20,000 pounds.
(C) When only the lower portion or a trench is shored and the remaining portion of the trench is sloped or benchless unless the sloped portion is sloped at an angle less steep than three horizontal to one vertical; or the members are selected from the tables for use at a depth which is determined from the top of the overall trench, and not from the toe of the sloped portion.
(e) Use of Tables D-1.1, D-1.2, D-1.3 and D-1.4. The members of the shoring system that are to be selected using this information are the hydraulic cylinders, and either the vertical shores or the horizontal wales. When a waler system is used the vertical timber sheeting to be used is also selected from these tables. The Tables D-1.1 and D-1.2 for vertical shores are used in Type A and B soils that do not require sheeting. Type B soils that may require sheeting, and Type C soils that always require sheeting are found in the horizontal waler Tables D-1.3 and D-1.4. The soil type must first be determined in accordance with the soil classification system described in appendix A to subpart P of part 1926. Using the appropriate table, the selection of the size and spacing of the members is made. The selection is based on the depth and width of the trench where the members are to be installed. In these tables the vertical spacing is held constant at four feet on center. The tables show the maximum horizontal spacing of cylinders allowed for each size of wale in the wale system tables, and in the vertical shore tables, the hydraulic cylinder horizontal spacing is the same as the vertical shore spacing.
(f) Example to Illustrate the Use of the Tables.
(i) Example 1: A trench dug in Type A soil is 6 feet deep and 3 feet wide. From Table D-1.1: Find vertical shores and 2 inch diameter cylinders spaced 8 feet on center (o.c.) (See Figures 1 & 3 for typical installations.)
(ii) Example 2: A trench in dug in Type B soil that does not require sheeting, 13 feet deep and 5 feet wide. From Table D-1.2: Find vertical shores and 2 inch diameter cylinders spaced 6.5 feet (o.c.) horizontally and 4 feet (o.c.) vertically. (See Figures 1 & 3 for typical installations.)
(iii) Example 3: A trench is dug in Type B soil that does not require sheeting, but does experience some minor raveling of the trench face. The
trench is 16 feet deep and 9 feet wide. From Table D-1.2: Find vertical shores and 2 inch diameter cylinder (with special oversleeves as designated by footnote #B3) spaced 5.5 feet o.c. horizontally and 4 feet o.c. vertically, plywood (per footnote (g)7 to the D-1 Table) should be used behind the shores. (See Figures 2 & 3 for typical installations.)

(4) Example 4: A trench is dug in previously disturbed Type B soil, with characteristics of a Type C soil, and will require sheeting. The trench is 18 feet deep and 12 feet wide, 8 foot horizontal spacing between cylinders is desired for working space. From Table D-1.3: Find horizontal wale with a section modulus of 14.0 spaced at 4 feet o.c. vertically and 3 inch diameter cylinder spaced at 9 feet maximum o.c. horizontally. 3x12 timber sheeting is required at close spacing vertically. (See Figure 4 for typical installation.)

(5) Example 5: A trench is dug in Type C soil, 9 feet deep and 4 feet wide. Horizontal cylinder spacing in excess of 8 feet is desired for working space. From Table D-1.4: Find horizontal wale with a section modulus of 7.0 and 2 inch diameter cylinders spaced at 6.5 feet o.c. horizontally. Or, find horizontal wale with a 14.0 section modulus and 3 inch diameter cylinder spaced at 10 feet o.c. horizontally. Both wales are spaced 4 feet o.c. vertically. 3x12 timber sheeting is required at close spacing vertically. (See Figure 4 for typical installation.)

(g) Footnotes, and general notes, for Tables D-1.1, D-1.2, D-1.3, and D-1.4.

(1) For applications other than those listed in the tables, refer to §1926.652(c)(2) for use of manufacturer’s tabulated data. For trench depths in excess of 20 feet, refer to §1926.652(c)(2) and §1926.652(c)(3).

(2) 2 inch diameter cylinders, at this width, shall have structural steel tube (3.5 x 3.5 x 0.175) oversleeves, or structural oversleeves of manufacturer’s specification, extending the full, collapsed length.

(3) Hydraulic cylinders capacities. (i) 2 inch cylinders shall be a minimum 2-inch inside diameter with a safe working capacity of not less than 18,000 pounds axial compressive load at maximum extension. Maximum extension is to include full range of cylinder extensions as recommended by product manufacturer.

(ii) 3-inch cylinders shall be a minimum 3-inch inside diameter with a safe working capacity of not less than 30,000 pounds axial compressive load at maximum extension. Maximum extension is to include full range of cylinder extensions as recommended by product manufacturer.

(4) All spacing indicated is measured center to center.

(5) Vertical shoring rails shall have a minimum section modulus of 0.40 inch.

(6) When vertical shores are used, there must be a minimum of three shores spaced equally, horizontally, in a group.

(7) Plywood shall be 1.125 in. thick softwood or 0.75 inch thick, 14 ply, arctic white birch (Finland form). Please note that plywood is not intended as a structural member, but only for prevention of local raveling (sloughing of the trench face) between shores.

(8) See appendix C for timber specifications.

(9) Wakes are calculated for simple span conditions.

(10) See appendix D, item (d), for basis and limitations of the data.
<table>
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Footnotes to tables, and general notes on hydraulic shoring, are found in Appendix D, Item (g).

Note (1): See Appendix D, Item (g) (1)
Note (2): See Appendix D, Item (g) (2)
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Note (2): See Appendix D, Item (g) (2)
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NOTE (1)  

Footnotes to tables, and general notes on hydraulic shoring, are found in Appendix D, item (g).  
Notes (1): See Appendix D, item (g) (1)  
Notes (2): See Appendix D, item (g) (2)  
* Consult product manufacturer and/or qualified engineer for Section Modulus of available wales.
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Figure 1. Aluminum Hydraulic Shoring

Figure 2. Pneumatic/hydraulic Shoring
Figure 3. Trench Jacks (Screw Jacks)

Figure 4. Trench Shields

APPENDIX F TO SUBPART P OF PART 1926—SELECTION OF PROTECTIVE SYSTEMS

The following figures are a graphic summary of the requirements contained in subpart P for excavations 20 feet or less in depth. Protective systems for use in excavations more than 20 feet in depth must be designed by a registered professional engineer in accordance with §1926.652 (b) and (c).
Figure 1 - Preliminary Decisions

1. Is the excavation more than 5 feet in depth?
   - Yes: Is the excavation entirely in stable rock?
     - Yes: Excavation must be sloped, shored, or shielded.
     - No: Shoring or shielding selected.
   - No: Excavation may be made with vertical sides.
   - Sloping selected.

Go to Figure 2

Go to Figure 3
Sloping selected as the method of protection

Will soil classification be made in accordance with §1926.652(b)?

YES

Excavation must comply with one of the following three options:

Option 1:
§1926.652 (b)(2) which requires Appendices A and B to be followed.

Option 2:
§1926.652 (b)(3) which requires other tabulated data (see definition) to be followed.

Option 3:
§1926.652 (b)(4) which requires the excavation to be designed by a registered professional engineer.

NO

Excavations must comply with §1926.652 (b)(1) which requires a slope of 1H:1V (34°).

FIGURE 2 - SLOPING OPTIONS
Shoring or shielding selected as the method of protection.

Soil classification is required when shoring or shielding is used. The excavation must comply with one of the following four options:

**Option 1**
§1926.652 (c)(1) which requires Appendices A and C to be followed (e.g. timber shoring).

**Option 2**
§1926.652 (c)(2) which requires manufacturers data to be followed (e.g. hydraulic shoring, trench jacks, air shores, shields).

**Option 3**
§1926.652 (c)(3) which requires tabulated data (see definition) to be followed (e.g. any system as per the tabulated data).

**Option 4**
§1926.652 (c)(4) which requires the excavation to be designed by a registered professional engineer (e.g. any designed system).

*Figure 3 - Shoring and Shielding Options*
3.02 TRENCH EXCAVATION PROCEDURES

A. Existing concrete and asphalt pavement, sidewalk, curb, or driveway removed in connection with construction shall be replaced to neatly sawed edges. Saw cuts shall be made to a minimum depth of 1½-inches or ¼ the thickness of the concrete, whichever is greater. Cuts shall be neat and to true straight lines with no shatter outside the removal area. If a saw cut would fall within 30-inches of a construction joint, cold joint, expansion joint, or edge, the concrete shall be removed and replaced to the joint or edge. Concrete sidewalk and/or driveway may be removed so that a minimum 30-inch square is replaced. If the saw cut would fall within 12 inches of score mark, the concrete shall be removed and replaced to the score mark. Existing bituminous pavement removed in connection with construction shall be cut with a saw, cutting wheel, or other similar and suitable tool. Care shall be taken to assure that the edge of the removed pavement does not vary from a straight line more than 2 inches from the mean. The Contractor shall furnish all material, labor, equipment, and supplies necessary to do the work required in removal of pavement and disposal of same where required. Saw cutting is required on all paving. The cutting shall be carried in a vertical plane through the pavement along a straight line marking the limits of the cut. Any unnecessarily irregular breakage or cracking caused by the Contractor shall be removed and replaced by the Contractor without added expense to the Owner. Paving cuts for manholes and valve boxes shall be SQUARE and at adequate distances from outside diameter to manholes and valve boxes to allow installation.

B. Strip and stockpile topsoil from farm areas crossed by trenches.

C. Trench digging machinery may be used to make trench excavation except in places where operation of same would cause damage to existing structures either above or below ground. In such instances, hand methods shall be employed. The Contractor shall locate all existing underground lines, whether or not they are shown on the drawings, sufficiently in advance of trenching operations to prevent any damage thereto. Extreme care shall be taken to prevent such damage and the Contractor shall be fully responsible for damage to any such lines. The Contractor shall locate the elevation of all major damage to any such lines. The Contractor shall locate the elevation of all major utility lines at least 1,000 feet ahead of pipeline placement operations and notify the Engineer in writing of any conflicts that are found or expected.

D. There will be no classification of excavated materials and all materials encountered shall be excavated as required. Adjacent structures shall be protected from damage by construction equipment. All excavated material shall be piled along the trench in a manner which will not endanger the work.

E. Excavation for manholes and other appurtenances shall be made as required to provide space for constructing the structure and trench safety system.

F. The use of explosives will not be permitted.

G. Trenches shall be excavated to the depth indicated on the drawings and in widths sufficient for laying and bedding the pipe, constructing concrete easement, bracing and for pumping and drainage facilities. The Engineer or Contractor may order testing by the soils testing laboratory to verify the suitability of the existing subgrade soils for the anticipated loadings. If the existing subgrade soils are determined to be unsuitable, direction will be provided by the Engineer regarding removal and replacement with suitable materials. The bottom of the excavations shall be firm and dry and in all respects acceptable to the Engineer.

H. Excavation shall be performed in-the-dry by methods which preserve the undisturbed state of subgrade soils. The trench may be excavated by machinery to, or just below the designated subgrade, provided that material remaining in the bottom of the trench is no more than slightly disturbed. Subgrade soils which become soft, loose, "quick," or otherwise unsatisfactory as a result of inadequate excavation, dewatering or other construction methods shall be removed and replaced by crushed stone fill as required by the Engineer at the Contractor's expense.
I. The Contractor shall not open up more trench in advance of pipe laying than is necessary to expedite the work, and in no event shall the length of a continuous open trench at the job site exceed 300 feet; however, trenching shall be done far enough in advance of pipe laying to allow the Engineer to make necessary grade changes without the use of extra fittings.

J. Any excavated areas shall be considered as "open trench" until all pavement replacements have been made, or until all trenches outside of pavement replacement areas have been backfilled and compacted in accordance with these Contract Documents. Trenches across streets shall be completely backfilled with temporary or permanent pavement in place within 24 hours after laying the pipe.

K. The Contractor shall provide substantial steel plates with adequate trench bracing which shall be used to bridge across trenches at street and alley crossings and at commercial driveways, where trench backfill and temporary patches have not been completed before the end of the Contractor’s regular working hours. Safe and convenient passage for pedestrians shall be provided at all times. The Engineer may designate an enclosed or railed passage for the safe access of pedestrian traffic at any location adjacent to construction activities as he deems necessary. Access to fire stations, fire hydrants, schools, and hospitals shall be maintained at all times.

L. Trench widths from the bottom of the trench to a point 12 inches above the top of the pipe shall be kept to the practical minimum required for properly bedding, laying, aligning, grading, and jointing of the pipe. Trench widths shall follow LVWD Standards.

M. If the maximum recommended trench width must be exceeded or if the pipe is installed in a compacted embankment, then pipe embedment shall be compacted to a point of at least 2½ pipe diameters from the pipe on both sides of the pipe or to the trench walls.

N. Whenever the prescribed maximum trench width is exceeded, the Contractor shall use an embedment or encasement as required by the Engineer for the trench width as actually cut. For trench widths in excess of the prescribed maximum, excavated by the Contractor for his own convenience, the additional cost incurred will be borne by the Contractor.

O. In all cases, any accumulated water in the trench shall be removed before laying pipe, placing concrete, or backfilling.

P. If the Contractor excavates below grade through error or for the Contractor’s own convenience, or through failure to properly dewater the trench, or disturbs the subgrade before dewatering is sufficiently complete, he may be directed by the Engineer to excavate below grade as set forth in the following paragraph, in which case the work of excavating below grade and furnishing and placing the refill shall be performed at the Contractor’s expense.

If the material at the level of trench bottom consists of fine sand, sand and silt, or soft earth which may work into the pipe embedment material notwithstanding effective drainage, the subgrade material shall be removed to the extent directed by the Engineer and the excavation refilled with a 6-inch layer of coarse sand, or a mixture graded from coarse sand to fine peastone, as approved by the Engineer, to form a filter layer preserving the voids in the pipe embedment material. The composition and gradation of the filter layer shall be approved by the Engineer prior to placement. Pipe embedment material shall then be placed in 6-inch layers thoroughly compacted up to the normal grade of the pipe. If approved by the Engineer, bank-run gravel shall be used for refill of excavation below grade. Geotextile filter fabric may be substituted for filter layer if approved by the Engineer. Filter fabric shall be Mirafi 140N, Supac equivalent, or approved equal.
3.03 PIPE EMBEDMENT AND TRENCH BACKFILL PROCEDURES

A. After completion of the trench excavation in accordance with article 3.03 above, bedding material shall be placed on the trench bottom for support under the pipe. Bell holes and similar excavations for appurtenances shall be hand excavated. All pipe shall be installed in such manner as to insure full support of the pipe barrel over its entire length and under appurtenances.

B. Bedding, laying and joining of pipe shall be as specified for the individual type of pipe. After joining pipe it shall be adjusted to the line and grade indicated on the drawings.

C. As soon as practicable after pipe has been installed and joined, bedding material shall be placed and compacted, and either bedding or select fill as specified for the pipe shall be placed and compacted to at least 12 inches over the pipe. The bedding material shall be hand packed and tamped in 8-inch lifts paying particular attention to bell holes, sling holes, elimination of voids and to insure uniform support for the pipe. The Contractor may at his option use pipe embedment material in place of select fill to a height of 12 inches over the pipe.

D. In the event special pipe bedding is not required, the trench shall be excavated to an even grade so that the bottom of the pipe will rest on the bottom of the trench throughout the entire length of the pipe. In order to obtain a true even grade, the trench shall be fine graded and shaped to fit the bottom 90 degrees of the pipe. Any part of the trench excavated below grade shall be corrected by filling with approved materials and thoroughly compacted. If clay, rock or other unyielding material is encountered in the bottom of the trench, it shall be removed to a depth of six (6) inches below grade, refilled with selected materials, and thoroughly compacted to grade. Bell holes of ample dimensions shall be dug at each joint to permit the jointing of the pipe to be made properly.

E. Backfilling over pipes shall begin as soon as practicable after the pipe has been laid, jointed and inspected and the bedding material placed as specified, trenches shall not be left open overnight.

F. Allow three days before placing backfill over concrete encasement.

G. All backfilling shall be prosecuted expeditiously and as specified.

H. The remainder of the trench from a point 12 inches above the pipe, or above the concrete encasement, shall be backfilled to match and maintain existing grades and thoroughly compacted as herein specified. To prevent longitudinal movement of the pipe, dumping backfill material into the trench and then spreading will not be permitted until the bedding or select fill has been placed and compacted to a level 1 foot over the pipe.

I. If the bedding requirements do not require bedding zone material to the top or above the pipe, the first lift of backfill material shall be placed carefully under and around the pipe and thoroughly compacted by means of mechanical tamps to the spring line of the pipe. When the first lift above the top of the pipe has been compacted as specified, the backfilling of the remainder of the trench, shall be done in the following manner: The backfill material shall be placed in the trench in layers not to exceed 8 inches, moistened or aerated as necessary to obtain optimum moisture, and compacted with approved mechanical compaction equipment until the required density is obtained. Vibratory rollers may not be used in city streets. Density requirements shall be as follows:

1. For all backfill in areas to be paved, a density of no less than 95 percent per ASTM D1557 shall be obtained from bottom of subgrade to top of the embedment zone. Where conflicts exist between the project plans/specifications and the Geotechnical Investigation Report, the most stringent requirement shall apply.

2. For all backfill not in paved areas, density of not less than 95 percent per ASTM D1557 shall be obtained from top of the embedment zone to ground surface. Where conflicts exist
between the project plans/specifications and the Geotechnical Investigation Report, the most stringent requirement shall apply.

3. The jetting method of water tamping or the water ponding method will NOT be allowed.

J. Following the completion of backfilling, the Contractor will maintain the trench surface in a satisfactory manner until final completion and acceptance of the finished project. The maintenance shall include blading from time to time as necessary, filling depressions caused by settlement, and other work required to keep the areas and roads in satisfactory condition. Any settlement of the paved surface which occurs before and during the 1 year warranty period shall be repaired by the Contractor at his expense.

K. Backfill around structures shall be selected common fill material, and shall be compacted, especially over pipes connected to the structures.

L. When moveable trench bracing such as trench boxes, moveable sheeting, shoring, or plates are used to support the sides of the trench, care shall be taken in placing and moving the boxes or supporting bracing to prevent movement of the pipe, or disturbance of the pipe bedding and the backfill. Trench boxes, moveable sheeting, shoring, or plates shall not be allowed to extend below top of the pipe. As trench boxes, moveable sheeting, shoring, or plates are moved, pipe bedding shall be placed to fill any voids created and the backfill shall be recomp acted as specified to provide uniform side support for the pipe access to the entire trench width.

M. Any new or relocated sewer, potable water, natural gas, buried telephone, reuse water line, or other utility shall be marked by installing the appropriate marking tape in the trench. Marking tape for water and sewer pipelines shall be metallic. All other marking tape shall consist of a minimum of 4.0 mil inert polyethylene plastic. The tape shall be imprinted continuously over its entire length in permanent black ink to identify the type of line. The tape shall be 6-inches in width and colored High Visibility Safety Yellow for gas pipelines, High Visibility Blue for potable water pipelines and High Visibility Brown for sanitary sewer pipelines.

The pipelines shall be marked by concurrently installing the appropriate marking tape in the trench for detecting purposes. The marking tape shall be as manufactured by Alarm-Tapes, Inc. or approved equal. Installation in the trench shall be as recommended by the manufacturer and as shown on the Drawings.

N. Construction Tests

1. Tests of all the materials may be made during construction to determine conformity with the specifications. Such tests may include field densities on base coarse and grading analysis of material. The frequency and type of testing will be determined by the Engineer. The Contractor shall cooperate in securing samples and shall furnish materials required for sampling.

2. Should construction testing reveal that the item tested does not meet the requirements of the Construction Documents, retesting shall be required until the item does meet the requirements. All failing tests shall be at the Contractor’s expense. The Contractor may obtain any additional tests which he may require for quality control, using his testing laboratory, at his expense.

3. Backfilling and Compaction will not be allowed prior to a proctor being available at the project site. “Blind densities will not be allowed. The Contractor shall plan accordingly as to avoid any delays.
3.04 RESTORING TRENCH SURFACE

A. Where the trench occurs adjacent to a paved street, in shoulders, or in sidewalks, thoroughly consolidate the backfill and maintain the surface as the work progresses. If settlement takes place, immediately deposit additional fill to restore the level of the ground.

B. In and adjacent to streets, the upper portion of trenches shall be backfilled with base material and pavement replaced.

C. In sections where the pipeline passes through grassed areas, and at the Contractor’s own expense, remove and replace the sod, or loam and seed the surface to the satisfaction of the Engineer.

3.05 EXCAVATION AND BACKFILLING FOR PIPES UNDER OR ADJACENT TO STRUCTURES

A. Excavation for all pipe lines beneath structures shall be carried out with the excavating equipment operating from the subgrade for the structure. The excavation shall be carried out "in-the-dry" and in a manner which will preserve the undisturbed state of the subgrade soils.

B. In order to minimize any differential settlement, all pipe within the excavation limits of structures shall be adequately supported on structural fill. The Contractor shall provide a suitable transition zone of this backfill under the pipelines or ducts from the structure wall to the beginning of the normal trench as shown on the drawings and as acceptable to the Engineer.

C. In locations where pipes pass through fill area, the Contractor shall take the following precautions to consolidate the refill up to an elevation of at least 1 foot above the bottom of the pipes:

1. Place and compact structural fill in such areas for a distance of not less that 3 feet either side of the centerline of the pipe in level layers not exceeding 8 inches in depth, and extending from the structure wall to the end of fill.

2. Excavate for pipe trench and backfill as specified above.

3.06 DISPOSAL OF SURPLUS MATERIAL

A. Excavated material may be stacked without excessive surcharge on the trench bank. Excavated material shall be segregated for use in backfilling.

B. Unsuitable waste and surplus excavated material shall be removed and disposed of offsite in accordance with all applicable regulations. Materials may be temporarily stockpiled in an area within the limits of construction that does not disrupt neighborhood activities, construction activities, create any nuisances or safety hazards, or otherwise restrict access to the site of the work.

PART 4 MEASUREMENT AND PAYMENT

4.01 No separate measurement will made for this work item and payment for all work covered in this Section, will be included as part of the unit price for the installation of pipelines as shown in the Proposal. Such payment shall be complete compensation for the complete performance of the work in accordance with the drawings and Specifications.

END OF SECTION
PART 1 GENERAL

1.01 SECTION INCLUDES

A. Scope of Work.
B. Products.
C. Execution.

1.02 SCOPE OF WORK

A. The work covered by this section of the specifications consists of constructing the flexible base course at cut and removed portions of existing roadways, as shown in the plans. The Contractor shall furnish all materials, equipment, tools, labor, superintendence and incidentals for the complete construction of the base course in accordance with the drawings and these specifications.

B. The flexible base course shall be constructed upon compacted subgrades as specified in Section 02222. The base course shall provide the foundation course for asphaltic concrete surface courses and shall be constructed in one or more courses in conformity with the typical section shown on the drawings and to the lines and grades established.

C. The base course shall be constructed in the locations indicated on the drawing or as necessary to reconstruct or repair pavement damaged or removed during construction of the pipelines and their accessories.

PART 2 PRODUCTS

2.01 PRODUCTS

A. The material shall be crushed and shall consist of durable particles of stone mixed with approved binding material. The base material shall be screened or partially screened or otherwise manipulated, prior to crushing, in order that all soil, clay and other objectionable material will be removed. Samples for testing the material may be taken prior to the compaction operations.


D. No reports of explorations or tests of subsurface conditions at or contiguous to the Site, or drawings of physical conditions relating to existing surface or subsurface structures at the Site, are known to Owner.
PART 3  EXECUTION

3.01  EXECUTION


B. The width of base course material for pavement replacement at the pipeline trenches shall be as shown on the Drawings.

C. Construction Tests

1. Tests of all the materials may be made during construction to determine conformity with the specifications. Such tests may include field densities on base course and grading analysis of material. The frequency and type of testing will be determined by the Engineer. The Contractor shall cooperate in securing samples and shall furnish materials required for sampling.

2. Should construction testing reveal that the item tested does not meet the requirements of the Construction Documents, retesting shall be required until the item does meet the requirements. All failing tests shall be at the Contractor's expense. The Contractor may obtain any additional tests which he may require for quality control, using his testing laboratory, at his expense.

PART 4  MEASUREMENT AND PAYMENT

A. No separate measurement or payment will be made for this work item, but will be included in the unit price bid for Removal and Replacement of HMAC as noted in the proposal. Measurement of pavement replacement width will depend on the depth of the trench bed relative to the existing ground. The applicable schedule for measurement and payment of pavement replacement shall be as shown in the plans.

B. Contractor shall coordinate with the Engineer the estimated pavement replacement prior to demolishing and executing.

END OF SECTION
PART 1  GENERAL

1.01  SCOPE OF WORK

   A. Furnish all labor, materials, equipment, and incidentals necessary to obtain materials for filling and backfilling, grading and miscellaneous site work, for the uses shown on the drawings and as specified herein.

1.02  RELATED WORK

   A. Site Preparation is included in Section 02100.
   B. Control of water is included in Section 02140.
   C. Excavating, Backfilling, and Compacting for Utilities is included in Section 02221.
   D. Asphalitic Concrete Paving is included in Section 02510.
   E. Pipelines are included in Sections 02622.
   F. Excavating, Backfill and Compaction for roadways and pavements is included in Section 02222.

1.03  SUBMITTALS

   A. Submit in accordance with Section 01300, Complete Product Data, for materials specified in this Section.
   B. Test Results
      1. Sieve analysis for fill and pipe embedment materials.
      2. Plasticity index for material proposed for use as structural or common fill.
      3. USCS Classification.
   C. Samples
      1. One 10 pound sample of each material specified herein delivered to the Engineer together with the submittals noted in A and B above. Samples shall be delivered in a plastic sack.

1.04  REFERENCE STANDARDS

   A. American Society for Testing and Materials (ASTM)
      1. ASTM C33 Standard Specification for Concrete Aggregates
      2. ASTM D75 Methods for Sampling Aggregates
      3. ASTM C136 Method for Sieve Analyses for Fine and Course Aggregates
      4. ASTM D4318 Liquid Limit, Plastic Limit and Plasticity Index of Soils
      5. ASTM D698 Standard Test Method for Moisture-Density Relations for Soils and Soil-Aggregate Mixtures, Using 5.5-pound (2.49-kg) Rammer and 12-inches (305 mm) Drop.
B. Where reference is made to one of the above standards, the revision in effect at the time of bid opening shall apply.

1.05 QUALITY ASSURANCE

A. Laboratory Testing

1. At least 14 days prior to the placement of any backfill and fill materials, deliver a representative sample of the proposed materials weighing at least 50 pounds to the Owner's Testing Laboratory.

2. The soils testing laboratory will perform:

   a. Grain-size analyses and soil classification of the samples to determine their suitability for use as backfill or fill material in conformance to the material requirements specified hereinafter.

   b. The appropriate Proctor analyses to determine the moisture density relationship curve for the material submitted.

3. Test results shall be delivered to the Engineer and to the Contractor no later than three days prior to the placement of backfill or fill materials.

4. The Contractor will pay for all tests to determine suitability of off-site or on-site excavation material proposed for use as backfill or fill.

1.06 DELIVERY, STOCKPILING, AND HANDLING

A. The Engineer shall be notified of all deliveries of granular material a minimum of 72 hours in advance of the scheduled delivery time.

B. Stockpile granular material within areas allowed for construction and at locations acceptable to the Engineer. The Contractor shall construct a pad of the stockpile material at the stockpile location(s) and shall utilize equipment capable of properly stacking each stockpile in a neat and regular shape. Contaminated or unsatisfactory stockpile material shall be replaced at no additional cost to the Owner. The Engineer shall be the sole authority determining the acceptability of stockpiled material.

C. Limit the handling of stockpiled material to prevent segregation and unnecessary material loss. Material to be stockpiled shall be covered with a waterproof tarp secured to the ground with weights or snaps, in the event of wet weather.

PART 2 PRODUCTS

2.01 MATERIALS

A. Select Fill and backfill materials should be granular and free of clay lumps, deleterious materials, cobbles or boulders over 3-inches in nominal size. Fill materials should meet requirements of this section and/or the project plans and specifications, whichever is more stringent. Select Fill materials should have a liquid limit less than 40 and a plasticity index less than or equal to 12. Soils classified in the following list according to the USCS can be considered satisfactory for use as Select Fill and backfill above the pipe zone: SM, SW, SC, SP-SM, SPSC, SC-SM, GW, GP, GM, GC, GP-GM and GP-GC, provided that these soils also meet the requirements above. Soils classified as CH, CL, MH, ML, OH, OL and PT under the USCS classification are not considered suitable for use as Select Fill and backfill soil materials.
B. Select Fill materials should be placed in accordance with this report and/or the project plans, whichever is more stringent. Select Fill should also meet the minimum gradation requirements tabulated below.

<table>
<thead>
<tr>
<th>Sieve Size (square opening)</th>
<th>% Passing by Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>3-inch</td>
<td>100</td>
</tr>
<tr>
<td>3/4-inch</td>
<td>70 – 100</td>
</tr>
<tr>
<td>No. 4</td>
<td>45 – 100</td>
</tr>
<tr>
<td>No. 200</td>
<td>5 – 45</td>
</tr>
</tbody>
</table>

C. Class I, Class II, Class III and Class IV materials may be defined as follows:

1. CLASS I material may be manufactured angular, well-graded, crushed stone per ASTM D-2321 with a maximum particle size of 1½ inches. The following materials shall be acceptable under this class designation: ASTM D-448 – Stone Sizes 4, 46, 5, 56, 57, and 6. Pea Gravel and other uniformly graded material are not acceptable under this class. A gradation of Class I material shall be submitted by the Contractor to the Engineer for approval prior to use.

2. CLASS II material may be coarse sands and gravels per ASTM D-2487 with maximum particle size of 1½ inches, including variously graded sands and gravels, containing less than 12 percent fines (material passing the #200 sieve) generally granular and non-cohesive, either wet or dry. Soil types GW, GP, SW and SP are included in this class. (i.e., typically required within pipe zone)

3. CLASS III material may be fine sand and clayey (clay filled) gravels, per ASTM D-2487, including fine sands, sand-clay mixtures, and gravel-clay mixtures. Soil types GM, GC, SM and SC are included in this class. (i.e., typically suitable above the pipe zone)

4. CLASS IV and V material may be classified as CH, CL, MH, ML, OH, OL and PT under the USCS.

D. Subgrade Material

1. Shall be Suitable Select Fill or backfill materials. The existing soils should be cleared of all asphalt, vegetation, organic matter, topsoil, construction debris and/or any foreign matter. The cleared subgrade should be thoroughly proof rolled in order to densify any weak and compressible zones. The finished subgrade should be compacted to a minimum of 95 percent of maximum dry density per ASTM D-1557 at ±2 percent of optimum moisture.

E. No reports of explorations or tests of subsurface conditions at or contiguous to the Site, or drawings of physical conditions relating to existing surface or subsurface structures at the Site, are known to Owner

PART 3 EXECUTION

NOT USED.
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SECTION 02300 – BORING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. The work covered by this section of the Specifications consists of all boring required to install casings; all installation of carrier pipes within the casings; and all installation of casing or carrier pipe accessories necessary to construct water line crossings under laterals, highways, or other pipelines. The work shall also include excavation of boring pits, removal and disposal of excess materials, and any necessary dewatering.

B. The Contractor shall furnish all materials, equipment, tools, labor, superintendence and incidentals, including all necessary field welding, to install the casings, carrier pipe and accessories as indicated on the drawings and as specified herein.

C. The Contractor shall be responsible for inspecting the location where the pipes are to be installed and to familiarize with the conditions under which the work will be performed.

D. The Contractor shall be prepared to work at night and on Saturday and Sunday, if required to complete this work. After the boring or tunneling operation has begun, the Contractor shall work continuously (24 hours a day) until the complete lengths of casing have been installed.

E. If any movement or settlement occurs which might cause damage to existing facilities or structures over or adjacent to the work, the Contractor shall immediately stop all work except that required to make the work secure and to prevent further damage. The Contractor shall resume boring or tunneling only after necessary precautions have been taken to prevent further movement, settlement or damage, and shall repair any damage, at his own cost.

F. Construction shall not interfere with the operation of the street or highway, nor weaken or damage any embankment or structure. Barricades and lights shall be furnished and maintained to safeguard traffic and pedestrians until such time as the backfill has been completed.

1.02 RELATED WORK

A. Excavating, Backfill and Compacting for Utilities, Section 02221.

1.03 SUBMITTALS

A. Plans and details of the equipment, materials and the method of construction to complete the work shall be submitted by the Contractor and must be approved by the Engineer. Submittal shall include plans of pits, details of shields and the intended method to maintain proper grade and/or restrict movement of the pipe within the casing.

PART 2 PRODUCTS

2.01 MATERIALS

A. Casing material shall be steel with yield strength of 36,000 psi and minimum 3/8-inch wall thickness.

B. Carrier pipe shall be as specified in Section 02600 as applicable. All joints of carrier pipe within casing shall be restrained type.

C. Casing End Enclosures shall be Model "C" pull-on type seal with stainless steel bands and clamps as manufactured by Pipeline Seal and Insulator, Inc. or approved equal. The annular
space between the carrier pipe and the casing shall be sealed at each end of the casing using casing end enclosures. Casing end enclosures must be installed in accordance with the manufacturer's instructions.

D. Mortar grout shall consist of one part cement, 1/4 part lime, and two parts sand. Sand for mortar grout shall comply with ASTM C-144; lime shall comply with ASTM C-207, Type S; cement shall comply with ASTM C-150, Type II.

E. Casing Insulators shall be Model A8G-1 as manufactured by Pipeline Seal and Insulator, Inc. or approved equal. The runners shall be made of glass-reinforced plastic and be firmly attached to the carrier pipe according to the recommendations of the insulator manufacturer prior to installing the carrier pipe in the casing. The insulators shall be spaced so that any insulator is located a maximum of twelve (12) inches from each pipe joint, so that there is a maximum spacing of eight (8) feet between insulators, and so that one full insulator is located within six (6) inches of each end of the casing. Casing Insulators must be installed in accordance with the manufacturer's instructions.

PART 3 EXECUTION

3.01 BORING PITS

A. Boring shall be to the limits, lines and grades shown on the Drawings and the Contractor’s approved submittal, and shall utilize methods which include due regard for the safety of workmen, adjacent structures, utilities and the public. The location of boring pits shall be approved by the Engineer.

B. The Contractor is advised of the proximity of buildings, structures, roads, drains, canals and utilities to the work as shown on the Drawings. The work of excavating, lining, grouting and construction of the casing shall be so executed that ground settlement is minimized. Precautions shall include the use of construction methods and equipment to minimize the loss of earth materials at the casing face and settlement of earth around the casing. The completed casing will have full bearing against earth and no voids or pockets will be left in any portion of work.

C. The Contractor shall be required to furnish, install and remove shoring, sheeting, thrust blocks or other provisions required in driving the casings and pipe forward.

D. All boring pits shall be fenced or barricaded to prohibit public access to the work site.

E. Prior to any construction of this work item, and prior to any submittals for this work item, the Contractor shall verify the horizontal and vertical locations of all utility lines that may exist within the path of boring or within the shafts. Any conflict found to exist shall be brought to the Engineer’s attention immediately, so that a course of further action can be devised.

F. Upon completion of casing and pipe installation, Contractor shall backfill pits per Section 02221 of the specifications.

G. For additional boring requirements within TXDOT Right-of-Way, the Contractor shall refer to the Texas Department of Transportation Standard Specifications for Construction and Maintenance of Highways, Streets and Bridges, 2004, when conflicts arise.
3.02 BORING OPERATIONS

A. The holes are to be bored mechanically, using a pilot hole as a guide. A two inch pilot hole shall be bored the entire length of the crossing and shall be checked for line and grade on the opposite end of the bore from the work pit. This pilot hole shall serve as the centerline of the large diameter hole to be bored. The use of water or other fluids in connection with the boring operation will be permitted only to the extent necessary to lubricate cuttings. Water jetting will not be permitted.

B. In unconsolidated soil formations, a gel-forming colloidal drilling fluid consisting of at least 10 percent bentonite may be used to consolidate cuttings of the bit, seal the walls of the hole, and furnish lubrication for subsequent removal of cuttings and installation of the casing.

C. Overcutting in excess of one inch shall be remedied by pressure grouting the entire length of the bore, with 7-sack mix, immediately after bore is completed.

3.03 INSTALLING CARRIER PIPE

A. After the casing has been installed, the Contractor shall thoroughly clean the interior, then install the carrier pipe within the casing using insulated spacers. Method of installation of carrier pipe shall be in accordance with pipe manufacturer recommendations.

B. After pipe is installed within the casing the Contractor shall conduct the required pressure and leakage test on the carrier pipe. Any leaks discovered during the testing phase shall be repaired to the satisfaction of the Engineer.

C. The carrier pipe shall be installed to the line and grade required within the casing.

D. Rubber end seals shall be installed at each end of the casing after the pipe has been installed and tested.

PART 4 MEASUREMENT AND PAYMENT

4.01 Measurement and payment for this work item shall be in accordance with Section 01025 of these Specifications.

END OF SECTION
SECTION 02331 – CRUSHED STONE BASE COURSE

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Crushed Stone Base Course.

1.2 REFERENCES

A. ASTM D1557 - Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using 10 lb (4.54 Kg) Rammer and 18 inch (457 mm) Drop.

B. ASTM D2922 - Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).


PART 2 - PRODUCTS

2.1 MATERIALS

A. Crushed Stone Base Course: Conforming to Type A, Grade 3, Item 247 of the Texas Department of Transportation Standard Specifications for Construction and Maintenance of Highways, Streets and Bridges, 2014.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify substrate has been inspected, gradients and elevations are correct, and are dry.

3.2 PREPARATION

A. Correct irregularities in substrate gradient and elevation by scarifying, reshaping, and re-compacting.

B. Do not place fill on soft, muddy, or frozen surfaces.

C. To protect the underlying course and to insure proper drainage, the spreading of the base shall begin along the centerline of the pavement on, a crowned section, or on the high side of the pavement with a one-way slope.

3.3 AGGREGATE PLACEMENT

A. Spread aggregate over prepared substrate to a total compacted thickness as indicated on the Drawings.

B. The aggregate, as spread, shall be of uniform gradation with no segregation or pockets of fine or coarse materials. The aggregate shall not be spread more than 2,000 square yards or 500 linear feet in advance of the rolling.

C. Place aggregate in maximum 8-inch loose layers and compact to 98% maximum dry density and a moisture content within plus or minus 2%, in accordance with ASTM D1557. If more than one layer is required, the construction procedure described herein shall apply similarly to each layer.
D. Level and contour surfaces to elevations and gradients indicated.

E. Add small quantities of fine aggregate to coarse aggregate to assist compaction.

F. Add water to assist compaction. If excess water is apparent, remove aggregate and aerate to reduce moisture content.

G. Use mechanical tamping equipment in areas inaccessible to compaction equipment.

3.4 FINISHING AND COMPACTING

A. After spreading, the crushed aggregate shall be thoroughly compacted by rolling. The rolling shall progress gradually from the sides to the center of the lane under construction, or from one side toward previously placed material by lapping uniformly each preceding rear wheel track by one half the width of such track.

B. Rolling shall continue until the rear wheels have rolled the entire area of the course. The rolling shall continue until the stone is thoroughly set, the interstices of the material reduced to a minimum, and until creeping of the stone ahead of the roller is no longer visible.

C. The Crushed Stone Base Course shall be moisture conditioned and compacted to a minimum of 98 percent of maximum dry density as determined by ASTM D1557, unless otherwise indicated on drawings.

D. The Crushed Stone Base Course for the full depth shall be within plus or minus 2 percent of optimum moisture content as determined by ASTM D1557.

3.5 TOLERANCES

A. Flatness: Maximum variation of 1/4 inch measured with 16 foot straight edge when applied to the surface parallel with, and at right angles to, the centerline.

B. Scheduled Compacted Thickness: Within 1/4 inch.

3.6 FIELD QUALITY CONTROL

A. Compaction testing will be performed in accordance with ASTM D1557.

B. Density tests will be taken at every 500 square yards or at every 150 linear feet of street with a minimum of two (2) density tests taken for each street.

C. After the course has been completely compacted, the surface shall be tested for smoothness and accuracy of grade and crown. Surface tests will be taken at every 500 square yards or at every 150 linear feet of street with a minimum of two (2) tests taken for each street.

D. The thickness of the Crushed Stone Base Course shall be determined by depth tests or cores taken at every 500 square yards or at every 150 linear feet of street with a minimum of two (2) tests taken for each street.

E. If tests indicate Work does not meet specified requirements, remove Work, replace and retest.

3.6 SCHEDULES

A. Under Asphalt Pavement:

1. Compact placed aggregate materials to achieve compaction of 98 percent.
B. Under Concrete Paving (Driveways & Sidewalks):
   1. Compact placed aggregate materials to achieve compaction of 95 percent.

C. Soil Materials
   1. Natural subgrades to support structural fill or pavements shall be stripped of organic matter or any unsuitable particles. The moisture content of the subgrade shall be maintained within 2 percentage points above or below optimum moisture content until permanently covered.

END OF SECTION
SECTION 02510 – HOT MIX ASPHALTIC CONCRETE PAVING

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Asphaltic concrete paving, wearing binder or Base Course.
B. Surface sealer.
C. Aggregate base course.

1.2 RELATED SECTIONS

A. Section 022310 - Crushed Stone Base Course.

1.3 PERFORMANCE REQUIREMENTS

A. Paving: Designed for parking lot improvements.

1.4 QUALITY ASSURANCE

A. Perform Work in accordance with Texas Department of Transportation (TxDOT) Standard Specifications for Construction of Highways, Streets and Bridges, 2014.
B. Mixing Plant: Conform to above TxDOT Standard.
C. Obtain materials from same source throughout.

1.5 REGULATORY REQUIREMENTS

A. Conform to applicable code for paving work on public property.

1.6 ENVIRONMENTAL REQUIREMENTS

A. Do not place asphalt when ambient air or base surface temperature is less than 40 degrees F, or surface is wet or frozen.
B. Place bitumen mixture when temperature is not more than 15 F degrees below bitumen supplier’s bill of lading and not more than maximum specified temperature.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Hot Mix Asphalt Concrete: In accordance with Item 340, Type C, of the above TxDOT Standard.
B. The HMAC surface course shall have a minimum of 1500 pounds of Marshall Stability when compacted at 75 blows in accordance with ASTM D-1559, and a flow between 8 and 16.
C. Densification of the material shall be 98% of the maximum theoretical specific gravity of the mix (rice).
D. The mix design criteria shall be within the in-place air void requirements ranging between 2 and 3 percent.
E. Aggregate for Wearing Course Mix: Item 340 of the above TxDOT Standard.
F. Fine Aggregate: Item 340 of the above TxDOT Standard.
G. Mineral Filler: In accordance with Item 340 of the above TxDOT Standard.
H. Primer: Cut-back petroleum asphalt.
I. Tack Coat: Emulsified asphalt.

2.2 ASPHALT PAVING MIX
A. Use dry material to avoid foaming. Mix uniformly.
B. In accordance with Item 340, Type C of the above TxDOT Standard.

2.3 SOURCE QUALITY CONTROL AND TESTS
A. Provide mix design for asphalt.
B. Submit proposed mix design of each class of mix for review prior to beginning of work.

PART 3 - EXECUTION

3.1 EXAMINATION
A. Verify base conditions.
B. Verify that compacted subgrade and sub-base is dry and ready to support paving and imposed loads.
C. Verify gradients and elevations of base are correct.

3.2 SUB-BASE
A. Section 022310 - Crushed Stone Base Course forms the base construction for work of this section.

3.3 PREPARATION – PRIMER
A. Prior to placement of the asphaltic-concrete layer, the base course shall be cleaned and tack coat of diluted emulsified asphalt (TxDOT Standard) shall be applied at the rate of 0.05 to 0.10 gal. per square yard.
B. Apply primer to contact surfaces of curbs, gutters, and site structures.
C. Use clean sand to blot excess primer.

3.4 PLACING ASPHALT PAVEMENT - SINGLE COURSE
A. Install Work in accordance with above TxDOT Standard.
B. Place asphalt within 24 hours of applying primer.
C. Asphalt pavement must be placed within 15 calendar days after mandrel test of sewer mains has been passed.
D. Place to compacted thickness as indicted on the Drawings.
E. Compact pavement by rolling to specified density. Do not displace or extrude pavement from position. Hand compact in areas inaccessible to rolling equipment. Vibrating rollers will not be permitted.

F. Perform rolling with consecutive passes to achieve even and smooth finish without roller marks.

G. Saw cut the existing pavement along a single plane.

3.5 TOLERANCES

A. Flatness: Maximum variation of 1/4 inch measured with 10 foot straight edge.

B. Scheduled Compacted Thickness: Within 1/4 inch.

C. Variation from True Elevation: Within 1/2 inch.

3.6 PROTECTION

A. Immediately after placement, protect pavement from mechanical injury for 7 days.

PART 4 - MEASUREMENT AND PAYMENT

A. Measurement and payment for this work item shall be as specified in Section 01025 of these specifications. No separate measurement and payment will be made for pavement marking, but shall be included in the unit price bid for the Asphaltic Concrete Pavement work specified herein. The applicable schedule for measurement and payment of pavement replacement shall be as follows:

<table>
<thead>
<tr>
<th>Trench Depth</th>
<th>Maximum Acceptable Cut for Pavement Width</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.0’-7.9’</td>
<td>6’</td>
</tr>
<tr>
<td>8.0’-9.9’</td>
<td>8’</td>
</tr>
<tr>
<td>10.0’-11.0’</td>
<td>10’</td>
</tr>
<tr>
<td>11.0’-Greater</td>
<td>12’</td>
</tr>
</tbody>
</table>

B. Contractor shall coordinate with the Engineer the estimated pavement replacement prior to demolishing and executing.

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SECTION 02600 – SCHEDULE OF PIPE

PART 1 GENERAL

1.01 SCOPE OF WORK

   A. Furnish all labor, materials, equipment, tools, superintendence and incidentals required to install, test, and perform any other specified or drawn work required to construct and install the pipeline systems under this Contract.

   B. Only approved pipe shall be used for the construction of all pipelines and connections under this Contract. The only type of pipe that will be considered for use, and for the uses specified, are those listed in Part 2 of this Section. All pipe shall be the same type, class and manufacturer.

1.02 SUBMITTALS

   A. Before beginning fabrication of the pipe, the Contractor shall submit to the Engineer, in accordance with Section 01300, manufacturer’s certification and supporting calculations that the pipe materials and thickness specified herein are adequate for the depths shown on the Drawings, and for the intended use.

PART 2 PRODUCTS

2.01 SCHEDULE OF PIPE

   A. Gravity Sanitary Sewer Pipelines, 8-inch diameter (Green)
      1. PVC, SDR 35, ASTM D3034 Solid Wall Pipe

   B. Potable Water Main, 12-inch diameter (Blue)
      1. PVC, AWWA C-900, DR 18

   C. Potable Water Service Main, 2-Inch diameter (Copper)
      1. Type K

2.02 CASING

   A. As Specified in Section 02300

PART 3 EXECUTION

   NOT USED

PART 4 MEASUREMENT AND PAYMENT

4.01 Measurement and payment for pipelines shall be in accordance with Section 01025 of these Specifications.

END OF SECTION
SECTION 02603 – CONNECTIONS TO AND WORK ON THE EXISTING SYSTEM

PART 1 GENERAL

1.01 SCOPE OF WORK

A. Furnish all labor, materials, and equipment required to maintain flow in the existing pipelines, construct and maintain all temporary connections and bypasses, and construct the permanent connections to the new system as shown on the drawings as directed by the Engineer.

B. Furnish all labor, materials, and equipment required to plug existing pipelines, all work on existing manholes (including all work and materials required to cut, plug, reshape existing manhole inverts with mortar or concrete, and/or connect pipelines to existing manholes), and all additional work required.

C. Should damage of any kind occur to any existing system, the Contractor, at the Contractor’s own expense, and as part of the work under this Item, shall make repairs to the satisfaction of the Engineer.

D. Notify the Engineer immediately of any discrepancies in elevations of existing facilities between those shown on the drawings and those established during construction in order that the Engineer can make the necessary modifications.

E. All new pipe for connection shall conform to the pipe specifications for this project.

1.02 RELATED WORK

A. Coordination requirements are included in Section 01040

B. Excavating, Backfilling, and Compaction for Utilities is included in Section 02221.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

3.01 REMOVING INFILTRATION

A. Furnish all labor, equipment, and materials necessary to remove water from infiltration, including all pumping that may be required. Remove all offensive matter at Contractor’s own Expense.

PART 4 MEASUREMENT AND PAYMENT

4.01 No separate measurement or payment shall be made for this work item, but it shall be included in the unit price bid for the pipeline work as noted in the proposal.

END OF SECTION
SECTION 02605 – MANHOLES

PART 1 GENERAL

1.01 SCOPE OF WORK

A. Furnish all labor, materials, and equipment to install standard and drop precast concrete manholes, cast-in-place concrete manhole bases, frames and covers and appurtenances as shown on the drawings and as specified herein.

1.02 RELATED WORK

A. Excavating, Backfilling, and Compacting for Utilities is included in Section 02221.

B. Granular Fill Material is included in Section 02235.

1.03 SUBMITTALS

A. Shop drawings, product data, materials of construction, and details of installation shall be submitted in accordance with Section 01300. Submittals shall include the following:

1. Details of base sections, riser sections, concentric conical top sections, flat slab tops, and grade rings, with certificate indicating compliance with ASTM C478.

2. Pipe connection to manhole details.

3. Manhole frame and cover with certificate indicating compliance with ASTM A48, Class 30.

4. Method of repair for minor damage to precast concrete sections.

B. Design Data

1. Precast concrete structures:
   a. 5 copies plus Contractor’s requirements of sections plan(s) and elevations showing dimensions, reinforcing steel placement and pipe connections to manhole.
   b. 5 copies plus Contractor’s requirements of concrete design mix.
   c. Manhole frame and cover.

1.04 REFERENCE STANDARDS

A. American Society for Testing and Materials (ASTM)

1. ASTM A48 Specification for Gray Iron Castings

2. ASTM A615 Standard Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement

3. ASTM C32 Specification for Sewer and Manhole Brick (made from clay or shale)

4. ASTM C33 Specification for Concrete Aggregates

5. ASTM C62 Standard Specifications for Building Brick (solid masonry units made from clay or shale)
7. ASTM C207  Specification for Hydrated Lime for Masonry Purposes
9. ASTM C478  Standard Specification for Precast Reinforced Concrete Manhole Sections
10. ASTM D4101  Specification for Propylene Plastic Injection and Extrusion Materials

B. American Concrete Institute (ACI)
   1. ACI 318  Building Code Requirements for Reinforced Concrete
   2. ACI 350 R  Concrete Sanitary Engineering Structures

C. American Association of State Highway and Transportation Officials (AASHTO)
   1. Standard Specifications for Highway Bridges

D. Occupational Safety and Health Administration (OSHA)

E. Where reference is made to one of the above standards, the revision in effect at the time of bid opening shall apply.

1.05 QUALITY ASSURANCE

A. All material shall be new and unused, and supplied by a single manufacturer for each product.

B. Material quality, manufacturing process, and finished sections are subject to inspection and approval by Engineer or other Owner representative. Inspection may be made at place of manufacture, at worksite following delivery, or both.

C. Materials will be examined for compliance with ASTM specifications, these specifications, and approved manufacturer’s drawings. Additional inspection criteria shall include: appearance, dimension(s), blisters, cracks, and soundness.

D. Materials shall be rejected for failure to meet any specification requirement. Rejection may occur at place of manufacture, at worksite, or following installation. Mark for identification rejected materials and remove from worksite immediately. Rejected materials shall be replaced at no cost to Owner.

E. Repair minor damage to precast concrete sections by approved method, if repair is authorized by Engineer.

PART 2 PRODUCTS

2.01 GENERAL

A. Manholes shall be Lower Valley Water District Standard, Type "A" (48" inside diameter), Type "B" (72" inside diameter), constructed at the locations designated, in accordance with LVWD Standard Details, and as otherwise indicated in the project drawings.

B. Manholes shall be constructed of pre-cast concrete sections, as herein specified.

C. Provide lifting lugs or holes in each precast section for proper handling.
2.02 PRECAST CONCRETE MANHOLE SECTIONS

A. The manhole riser and conical section shall be designed for sewer installations in the diameter specified or shown. All manhole sections shall have a 5-inch wall thickness with tongue and groove joints. Rings shall be available in various lengths from 6 inches to 4 feet. The conical sections shall be concentric and adapted to the ring at one end and to Lower Valley Water District standard cast iron frame at the other. The base ring shall have a flat bottom joint. Steps or rungs are not required. Manufacturing of manhole section(s) shall comply with ASTM C478 and any additional specifications listed hereforth:

1. Bottom slab thickness shall be 8-inches thick for depths 0-12 feet and 12-inches thick for depths greater than 12 feet.

2. Top section shall be a concentric cone placed upon a 48" diameter section as shown in the drawings.

3. Base, riser and top sections shall have tongue and groove joints.

4. Sections shall be cured by an approved method, in accordance with referenced standards.

5. Concrete shall have a minimum 28 day compressive strength of 4,000 psi. Water cement ratio shall be 0.5 or less by weight or not more than 5.5 gallons per sack.

6. All aggregates fine and coarse other than lightweight aggregate shall conform to specifications outlined by ASTM C33. Aggregates shall be free of deleterious substances causing reactivity with oxidized hydrogen sulfide. Both types of aggregates shall be graded in order to produce a homogeneous concrete mix. All materials are to be accurately weighed at a central batching facility for mixing.

7. All cement shall be Portland Cement conforming to ASTM C150, Type V (sulfate resistant) for sewer applications. Cement content shall be sufficient to produce a minimum strength of 4,000 psi.

8. Design precast concrete base, riser, top, and grade ring for a minimum H-20 loading plus earth load. Calculate earth load with a unit weight of 130 pcf.

9. Mark date of manufacture, name, and trademark for manufacture on the inside of each precast section.

10. Install precast concrete base as shown on the drawings.

11. Provide integrally cast knock-out panels in precast concrete manhole sections at locations and with sizes shown on drawings. Knock-out panels shall have no steel reinforcing.

12. All concrete shall be handled from the mixer or transport vehicle to the place of final deposit in a continuous manner, as rapidly as practicable, and without segregation or loss of ingredients, until (the approved unit operation) is completed. Concrete shall be placed in layers not over two feet deep. Each layer shall be compacted by mechanical internal or external vibrating equipment. Duration of the vibration cycle shall be limited to the time necessary to produce satisfactory consolidation without causing objectionable segregation.

13. Concrete may be heated in the mold after the initial set has taken place. The temperature shall not exceed 160 degrees and shall be raised from normal ambient temperature at a rate not to exceed 40 degrees per hour. The cured unit shall not be removed from forms until sufficient strength is obtained for the unit to withstand any structural strain that may be subjected during the form stripping operation.
After the stripping of forms, further curing by means of water spraying or a membrane curing compound may be used and shall be of a clear or white type, conforming to ASTM C309.

14. Reinforcing steel shall be as outlined in ASTM C478 and any additional specifications herein. The minimum steel area of 0.12 square inches shall apply to both risers and cone sections and the maximum center to center spacing of 6 inches shall apply as well. Placing of reinforcing steel for one line circumferential reinforcement shall be on the tension side of the wall (the inner half part of the wall with a minimum 1-inch cover) for two lines circular reinforcement, refer to ASTM C478. All reinforcing shall be sufficiently tied to withstand any displacement during the pouring operation.

15. Both tongue and groove shall contain a #4 rebar.

16. Lifters shall be designed to handle the imposed weights, and shall be placed per manufacturer’s requirements.

17. All joints to be sealed using Ram-Nek joint sealer. Joint sealer to be provided in sufficient quantities by the vendor as part of the manhole section(s). Size shall be per manufacturer’s recommendations. Completed joint shall withstand 15 psi internal water pressure without leakage.

18. All manholes shall be internally coated with 50 MIL of Dura-Plate 5800 by Sherwin Williams or approved equal.

19. All manholes shall be externally coated with 50 MIL of cold tar bituminous epoxy.

2.03 MANHOLES COATING

A. Concrete and mortar to be dry and clean with all oil, grease, form release agents, curing compounds, sealers, hardeners and any other contaminants removed. Verify dryness by testing with “Tape Down Test”.

1. All manholes shall be internally coated with 50 MIL of Dura-Plate 5800 by Sherwin Williams or approved equal.

2. All manholes shall be externally coated with 50 MIL of cold tar bituminous epoxy.

2.04 MANHOLE FRAME AND COVER

A. Manhole frames and covers shall be of good quality, strong, tough, even-grained cast iron, smooth, free from scale, lumps, blisters, sand holes, and defects of any kind which render them unfit for the service for which are intended. Manhole covers and frame seats shall be machined to a true surface. Castings shall be thoroughly cleaned and subject to hammer inspection. Cast iron shall conform to ASTM A48, Class 30.

B. No holes shall be in the cover, but edge notches for embedded rings shall be used for lifting. The word “LVWD SANITARY SEWER” is to be on the cover as shown in the drawings. Mating surfaces shall be machined to assure a snug fit of the cover and frame.

2.05 PIPE CONNECTIONS TO MANHOLE

A. At manholes, a water-tight resilient connection shall be made between the wall and the pipe. This shall be accomplished by use of a manhole water stop adaptor such as Indiana Seal Manhole Adaptor, Kor-N-Seal, or approved equal, meeting the requirements of ASTM C923. The connector must be compatible to both the type of pipe wall and manhole wall, and shall be installed in strict accordance with recommendations of the connector manufacturer.
PART 3 EXECUTION

3.01 INSTALLATION

A. Manhole Installation

1. The manholes shall be constructed at the location shown on the plans or as directed by the Engineer and in accordance with the details shown on the plans and as specified herein. After the excavation has been completed, the concrete base or bottom shall be poured. When the concrete has sufficiently set, the riser work may proceed. After the manhole rise has been completed, the invert shall be neatly formed in the bottom of the manhole with concrete. The invert shall have a true curve of as large a radius as the size of the manhole will permit and shall be given a smooth trowel finish. Manhole inverts containing sewer pipe passing through with no change in direction may be formed by using up to ½ of the pipe line diameter (pipe spring line) as the channel. Concrete will be placed around the pass-through pipeline, and a bench formed above the pipe sloping at ¼-inch per foot toward the pipe.

2. The subgrade under manhole bases shall be compacted to 95 percent density in accordance with ASTM D1557. Compaction limits shall be one foot beyond the perimeter of the concrete base and shall be a minimum of one foot in depth.

3. Drop connections shall be constructed when sewer entering a manhole is more than 30-inches above the invert.

4. Set precast concrete barrel sections and structures plumb with a ¼-inch maximum out of plum tolerance allowed. Seal joints of precast barrel sections as specified. Fill the outside and inside joint with non-shrink mortar and finished flush with the adjoining surfaces. Caulk the inside of any leaking barrel section joint with non-shrink grout to the satisfaction of the Engineer.

5. Allow joints to set for 14 hours before backfilling.

6. Plug holes in the concrete barrel sections required for handling with a non-shrinking grout or non-shrinking grout in combination with concrete plugs. Finish flush on the inside.

7. Cut holes in precast sections to accommodate pipes prior to setting manhole sections in place to prevent jarring which may loosen the mortar joints.

8. All manholes that shall be internally and externally coated with 50 MIL as called out in the details.

9. Backfill carefully and evenly around manhole sections.

10. Manholes installed inside farmland shall be buried above flow depth, typically 18"-36" in height. Contractor shall provide a green painted concrete marker post at the right-of-way with an offset distance shown to the center of the manhole location. A tractor tire painted green shall be placed around manhole to protect manhole.

B. Manhole Pipe Connections

1. Construct manhole pipe connections, including any pipe stubs, as specified. Close or seal pipe stubs for future connections with a gasketed watertight plug.

C. Setting Manhole Frame and Cover
1. Set manhole covers and frames in a full mortar bed. Utilize grade rings, a maximum of eight-inches thick, to assure frame and cover are set to the finished grade. Set manhole frame and cover to final grade prior to placement of permanent paving.

3.02 LEAKAGE TESTS

A. Test each manhole for leakage. Engineer shall observe each test. Manholes shall be tested separately and independently of sewer lines they are attached to.

1. Vacuum Test

   a. Vacuum testing in accordance with ASTM C1244.

B. Test each manhole for leakage. Engineer shall observe each test.

C. A complete write up on the vacuum testing procedure shall be presented to the Engineer for review prior to commencing any manhole testing.

3.03 CLEANING

A. Thoroughly clean all new manholes of all silt, debris, and foreign matter of any kind, prior to final inspection.

PART 4 MEASUREMENT AND PAYMENT

4.01 Measurement and payment for this work item shall be in accordance with Section 01025 of these Specifications.

END OF SECTION
PART 1 GENERAL

1.01 SCOPE OF WORK

A. Furnish all labor, materials, equipment, tools, superintendence, and incidentals required for the complete construction of the work shown on the drawings and specified herein.

1.02 RELATED WORK

A. Excavating, Backfilling and Compacting for Utilities is included in Section 02221.
B. Granular Fill Materials is included in Section 02235.
C. Manholes are included in Section 02605.
D. Repair of Paved Surfaces is included in Sections 02222, 02230 and 02510.
E. Schedule of Pipe is included in Section 02600.

1.03 SUBMITTALS

A. Submit no more than 15 days after receipt of the Notice of Award the name of the pipe and fittings suppliers and manufacturers, and a list of materials to be furnished. All pipe shall be manufactured in the United States.
B. The gravity sewer lines of the project were designed with a Manning "n" factor of 0.011. All gravity sewer lines to be furnished and installed for this project shall have an "n" factor of 0.011 or less. Any materials with a known "n" factor of greater than 0.011 will be considered unacceptable for this project. Prior to the manufacturing of any proposed pipe for this project, the manufacturer shall submit adequate information and data substantiating that the pipe proposed for the project has an "n" factor of 0.011 or less. If the Engineer does not believe that the information submitted is adequate to substantiate the required "n" factor of 0.011 or less, the Engineer may at his option require verification testing of the "n" factor. Manufacturer shall have the option of testing existing lines in place with all testing being at no additional cost to the OWNER.

1.04 REFERENCE STANDARDS

A. American Society for Testing and Materials (ASTM)
   2. ASTM D2241 Poly(Vinyl Chloride) (PVC) Plastic Pipe (SDR-PR)
   3. ASTM D2464 Threaded Poly(Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 80
   4. ASTM D2729 Poly(Vinyl Chloride) (PVC) Sewer Pipe and Fittings
   5. ASTM D3034 Type PSM Poly(Vinyl Chloride) (PVC) Sewer Pipe and Fittings
   6. ASTM D3139 Joints for Plastic Pressure Pipes Using Flexible Elastomeric Seals
   7. ASTM D3212 Joints for Drain and Sewer Plastic Pressure Pipes Using Flexible Elastomeric Seals
8. ASTM F477 Standard Specifications for Elastomeric Seals (Gaskets) for Joining Plastic Pipe.
12. ASTM D2321 Practice for Underground Installation of Flexible Thermoplastic Sewer Pipe.
13. ASTM F798 Type PS-46 Poly(Vinyl Chloride) (PVC) Plastic Gravity Flow Sewer Pipe and Fittings
14. ASTM F949 Poly(Vinyl Chloride) (PVC) Ribbed Gravity Sewer Pipe and Fittings Based on Controlled Inside Diameter.

B. Uni-Bell Recommended Standards Practices
1. UNI-B-3 Recommended Practice for the Installation of Polyvinyl Chloride (PVC) Pressure Pipe (Nominal Diameters 4-36 inch)
2. UNI-B-9 Recommended Performance Specification for Polyvinyl Chloride (PVC) Profile Wall Gravity Sewer Pipe and Fittings Based on Controlled Inside Diameter (Nominal Pipe Sizes 4-48 inch)
3. UNI-B-10 Recommended Specification for Type PS46 Polyvinyl Chloride (PVC) Plastic Gravity Sewer Pipe and Fittings (Based on Performance Requirements) (Nominal Diameters 4-18 inches)
5. UNI-PUB-6 Installation Guide for PVC Sewer Pipe

C. Where reference is made to one of the above standards, the revision in effect at the time of bid opening shall apply.

1.05 QUALITY ASSURANCE

A. All PVC pipe and fittings in this section shall be from the same manufacturer. The supplier shall be responsible for the provisions of all test requirements specified in the referenced ASTM standards as applicable. In addition, all PVC pipe to be installed under this Contract may be inspected at the plant for compliance with these specifications by an independent testing laboratory provided by the Owner. The Contractor shall require the manufacturer’s cooperation in these inspections. The cost of plant inspection of all pipe approved for this Contract, plus the cost of inspection of a reasonable amount of disapproved will be borne by the Owner. The Contractor shall reimburse the Owner for excessive inspection costs. Excessive inspection costs are defined as the costs of inspections of that amount of pipe which exceeds 125 percent of the aggregate length of pipe under this Section.
B. Inspections of the pipe may also be made by the Engineer or other representative of the Owner after delivery. The pipe shall be subject to rejection at any time on account of failure to meet any of the requirements specified herein, even though sample pipe may have been accepted as satisfactory at the place of manufacture. Pipe rejected after delivery shall be marked for identification and shall be removed from the job at once.

1.06 DELIVERY, STORAGE AND HANDLING

A. All items shall be bundled or packaged in such a manner as to provide adequate protection of the ends during transportation to the site. Any pipe damaged in shipment shall be replaced as directed by the Engineer.

B. PVC items deteriorate in sunlight and are slightly brittle, especially at lower temperatures, so care shall be taken in loading, transporting, and unloading items to prevent injury to the items. All items shall be examined before installation and no piece shall be installed which is found to be defective. Handling and installation of pipe and fittings shall be in accordance with the manufacturer’s instructions, referenced standards, and as specified herein. Owner has the right to reject any pipe section experiencing excessive fading due to direct sunlight.

C. Any pipe or fittings showing a crack or which has received a blow that may have caused an incident fracture, even though no such fracture can be seen, shall be marked as rejected and removed at once from the work.

D. While stored, pipe shall be adequately support off the ground and from below at not more than 3-ft intervals to prevent deformation. The pipe shall be stored in stacks no higher than 2 rows.

E. Pipe and fittings shall be stored in a manner which will keep them at ambient outdoor temperatures and out of the sunlight. Temporary shading as required to meet this requirement shall be the responsibility of the Contractor. Covering of the pipe and fittings that allows direct or indirect sunlight will not be permitted.

F. If any defective item is discovered after it has been installed, it shall be removed and replaced with an exact replacement item in a satisfactory manner by the Contractor, at the Contractor’s own expense. All pipe and fittings shall be thoroughly cleaned before installation and the interior shall be kept clean until testing.

G. In handling the items, use special devices and methods as required to achieve the results specified herein. No uncushioned devices shall be used in handling the item.

PART 2 PRODUCTS

2.01 POLYVINYL CHLORIDE (PVC) GRAVITY SEWER PIPE AND FITTINGS GRAVITY SEWER PIPE AND FITTINGS

A. 4” – 6” diameter gravity sewer pipe shall be:

1. Poly(vinyl chloride) PVC plastic solid wall, SDR-35, pipe, with fitting in conformance with ASTM D3034 and ASTM D3212. The minimum pipe stiffness shall meet or exceed 46 psi in conformance with ASTM D2412.

2. Where necessary, PVC pressure pipe shall conform to the requirements of AWWA C900-07 or AWWA C905. All pipe shall be Pressure Class 150 with a Dimension Ratio of 18. The pipe shall be PVC 1120 made from PVC compounds Class 12454-A or Class 12454-B as defined in ASTM D1784. Each pipe length shall be marked with the manufacturer's name or trademark, size, material code, pressure class and AWWA designation number. In addition, all pipes for use in public water systems must also bear the National Sanitation Foundation Seal of Approval (NSF-pw).
B. 8” – 12” diameter gravity sewer pipe shall be:
   1. Poly(vinyl chloride) PVC plastic solid wall, SDR-35 pipe, with fittings in conformance with
      ASTM D3034 and ASTM D3212. The minimum pipe stiffness shall meet or exceed 46 psi in
      conformance with ASTM D2412.
   2. Poly(vinyl chloride) PVC gravity sewer pipe shall be installed according to the manufacturer's
      recommendations. The pipe shall be furnished in either 13-feet or 20-feet standard lengths
      with no more than 10% variance of the standard length.

C. All fittings and accessories for sewers shall have bell and/or spigot configuration compatible with
   the pipe.

PART 3 EXECUTION

3.01 INSTALLATION OF PVC PIPE AND FITTINGS

A. No single piece of pipe shall be laid unless it is straight. The centerline of the pipe shall not deviate
   from a straight line drawn between the centers of the openings at the ends of the pipe by more than
   1/16-inch per foot of length. If a piece of pipe fails to meet this requirement check for straightness, it
   shall be rejected and removed from the site. Laying instructions of the manufacturer shall be
   explicitly followed.

B. If any defective pipe is discovered after it has been installed, it shall be removed in its entirety and
   replaced with sound pipe in a satisfactory manner at no additional cost to the Owner. No couplings
   will be allowed at any time for any reason. All pipe and fittings shall be cleaned before installation,
   shall be kept clean until they are used in the work and when laid, shall conform to the lines and
   grades required. PVC pipe and fittings shall be installed in accordance with requirements of the
   manufacturer and referenced ASTM standards.

C. As soon as the excavation is complete to normal grade of the bottom of the trench, bedding shall
   be placed, compacted and graded to provide firm, uniform and continuous support for the pipe.
   Bell holes shall be excavated so that only the barrel of the pipe bears upon the bedding. The pipe
   shall be laid accurately to the lines and grades indicated on the drawings. Blocking under the pipe
   will not be permitted. Bedding shall be placed evenly on each side of the pipe to mid-diameter and
   hand tools shall be used to force the bedding under the haunches of the pipe and into the bell
   holes to give firm continuous support for the pipe. Trench bedding and backfill shall conform to
   Sections 02221 and 02235.

D. All pipe shall be sound and clean before installation. Good alignment shall be preserved during
   installation. Upon the Engineer's written approval, fittings, in addition to those shown on the
   drawings, shall be provided, if required, in crossing utilities which may be encountered upon
   opening the trench.

E. When cutting pipe is required, the cutting shall be done by machine, leaving a smooth cut at right
   angles to the axis of the pipe. Cut ends of pipe to be used with a bell shall be beveled to conform
   to the manufactured spigot end.

F. The Engineer may examine each bell and spigot end to determine whether any preformed joint has
   been damaged prior to installation. Any pipe having defective joint surfaces shall be rejected,
   marked as such, and immediately removed from the job site.

G. Each length of the pipe shall have the assembly mark aligned with the pipe previously laid and held
   securely until enough backfill has been placed to hold the pipe in place. Joints shall not be "pulled"
   or "cramped."
H. Before any joint is made, the pipe shall be checked to assure that a close joint with the next adjoining pipe has been maintained and the inverts are matched and conform to the required grade. The pipe shall not be driven down to grade by striking it.

I. Special bedding conditions will be required whenever the invert of the pipe is less than 1.5 feet above “Normal Groundwater Table”. “Normal Water Table” is defined as the groundwater elevation indicated on the Drawings. For this class of bedding a filter fabric shall be laid along the bottom of a well graded trench. Placing of the bedding material and installation of the pipe shall proceed as described above. The filter fabric shall then be lapped over the top of the bedding material and secured. Once the filter fabric has been secured, trench backfilling may proceed. Filter fabric will be installed with all pipe 8-inches in diameter and greater whenever the Normal Groundwater Table is less than 1.5 feet below the invert of the pipe.

J. After the fabric has been placed in the trench, the bedding and pipe installation shall proceed as specified herein. Upon completion of the pipe and bedding installation of the fabric shall be lapped over itself a minimum of three feet. The material shall also be lapped a minimum of three feet in the longitudinal direction at the end of one roll and the beginning of the next. Final backfilling shall then occur to the finish grade. The Contractor shall follow the recommendations of the manufacturer for installation of the fabric.

K. Precautions shall be taken to prevent flotation of the pipe in the trench.

L. When moveable trench bracing such as trench boxes, moveable sheeting, shoring, or plates are used to support the sides of the trench, care shall be taken in placing and moving the boxes or supporting bracing to prevent movement of the pipe, or disturbance of the pipe bedding and the backfill. Trench boxes, moveable sheeting, shoring, or plates shall not be allowed to extend below top of the pipe. As trench boxes, moveable sheeting, shoring, or plates are moved, pipe bedding shall be placed to fill any voids created and the backfill shall be re-compacted to provide uniform side support for the pipe.

M. All service waterlines damaged during the pipe installation shall be replaced in accordance with LVWD standards. The pipe shall be replaced in its entirety, from main to water meter, with Type “K” copper pipe of existing diameter size.

3.02 JOINTING POLYVINYL CHLORIDE (PVC) SEWER PIPE AND FITTINGS

A. PVC sewer pipe and fittings shall be jointed in accordance with the recommendations of the latest ASTM Standards and detailed instructions of the manufacturer. (The pipe manufacturer shall furnish all appropriate installation information).

B. All manhole connections shall be as shown on the Drawings except that concrete and mortared connections shall be equipped with an integral O-ring or other sealant such that a positive watertight seal is established.

3.03 SEWER TESTING

A. General

1. Test the first section of pipeline as soon as it is installed to demonstrate that the work conforms to this Section. The initial test section shall not be less than 500-ft and not more than 1000-ft of pipeline.

2. Testing of pipe shall closely follow pipe laying.
B. Infiltration Test

1. Infiltration testing of all gravity sewer lines installed below groundwater level is mandatory, and the Contractor shall conduct a Zero-Leakage test on those lines. There will be zero tolerance for any infiltration leakage into the sewer lines and manholes. If the sewer line is beneath a roadway, the testing shall be conducted prior to resurfacing the roadway.

2. Prior to testing the sewer line for infiltration leakage all dewatering shall be discontinued in the area for a minimum of three days. Each section of sewer line to be tested shall be plugged sufficiently to prevent water from entering the line. The test shall be conducted for 48 hours. If at the end of that period there is any evidence of leakage into the sewer line, the Contractor shall correct the problem and re-conduct the test and shall continue to do so until leakage is eliminated.

C. Exfiltration Test

1. Exfiltration tests shall be performed only in instances where groundwater does not exist to an elevation of at least 2 feet above the sewer line.

2. Leakage test by exfiltration shall be made before or after backfilling at the discretion of the Engineer. The length of the pipe to be tested shall be such that the head over the crown at the upstream crown is not less than 2-ft and the head over the downstream crown is not more than 6-ft. The pipe shall be plugged by pneumatic bags or mechanical plugs in such a manner that the air can be released from the pipe while it is being filled with water. Before any measurements are made, the pipe shall be kept full of water long enough to allow the escape of any trapped air to take place. Following this, a test period of at least 1 hour shall begin. Provisions shall be made for measuring the amount of water required to maintain the water at a constant level during the test period.

3. The leakage in the section of pipeline being tested shall be zero.

4. If leakage exceeds the allowable amount, the Contractor shall immediately determine the cause and repair the broken or faulty pipe in a manner satisfactory to the Engineer.

D. Air Testing

1. An air test may be used in lieu of the exfiltration test. If air testing is selected submit the proposed method of testing to the Engineer for approval. Air testing shall be performed in accordance with the procedures described in ASTM C828. The equipment shall be specifically designed and manufactured for testing pipelines with low-pressure air and shall be provided with an air regulator valve or air safety valve set to prevent the air pressure in the pipeline from exceeding 2.6 psig. If the results of the air test are unsatisfactory, perform the exfiltration test as outlined above.

E. Deflection Test

1. Deflection tests shall be performed on all flexible sewer pipes including cleanouts. A rigid mandrel shall be used to measure deflection for sewer lines. Adjustable or flexible mandrels are prohibited.

2. The test shall be conducted 30 days after the final backfill has been in place and compaction testing has passed. No pipe shall exceed a deflection of 5 percent of the pipe diameter. If a pipe should fail to pass the deflection test, the problem shall be corrected by the contractor and a second test shall be conducted after the corrected area has been backfilled and compaction testing has passed. The test shall be conducted without the use of a mechanical pulling device.
3. The mandrel shall be constructed of metal or a rigid plastic that can withstand a 200 psi force without being deformed. The mandrel shall have at least nine runners or more, as long as the number of runners is an odd number. The barrel section of the mandrel shall have a length of at least 75 percent of the inside diameter of the pipe. A proving ring shall be provided and used for each mandrel in use.

4. The rigid mandrel shall have an outside diameter equal to 95 percent of the inside diameter of the pipe. The inside diameter of the pipe shall be the average outside diameter minus two minimum wall thicknesses for OD controlled pipe, and the average inside diameter for ID controlled pipe. All dimensions shall be per appropriate standards. Statistical or tolerance methods shall not be considered in mandrel sizing.

3.04 CLEANING

A. At the conclusion of the work, the Contractor shall thoroughly clean all pipelines by flushing with water or other means to remove all dirt, stones, pieces of wood, or other materials which may have entered the pipes during the construction period. Debris cleaned from the lines shall be removed from the low end of the pipeline. If after this cleaning, obstructions remain, they shall be removed. After the pipelines are cleaned and if the groundwater level is above the pipe or following a heavy rain, the Engineer will examine the pipes for leaks. If any defective pipes or joints are discovered, they shall be repaired as directed by the Engineer.

PART 4 MEASUREMENT AND PAYMENT

4.01 Measurement and payment for all pipelines and appurtenances shall be in accordance with Section 01025 of these specifications.

END OF SECTION
SECTION 02630 – VALVES AND FITTINGS

PART 1 GENERAL

1.1 SCOPE OF WORK

A. The CONTRACTOR shall furnish all valves and fittings where indicated on the Plans, as called for in these Specifications, or as required for proper operation of the equipment in general. Unless otherwise indicated on the Plans or specified in other sections of these Specifications, valves and fittings shall conform to the requirements as specified herein and shall be provided and installed in accordance with the LVWD Standards.

Where proper operation and utilization of equipment and facilities require installation of valves not indicated or specified, the CONTRACTOR shall provide and install, upon acceptance by the ENGINEER, valves similar and comparable to valves specified for similar and comparable duty in other parts of the project.

B. Valves shall conform to American National Standards Institute / National Sanitation Foundation (ANSI/NSF) Standard 61 “Drinking Water system Components - Health Effects” and be certified by an organization accredited by ANSI. Such compliance shall be evidenced by an affidavit from the manufacturer or vendor. If the pipe does not presently conform to this standard, information from the manufacturer regarding action being taken to comply with this standard must be submitted. All valves installed in a given line shall be designed to withstand the test pressure for that particular line and shall be fabricated with ends to fit the piping.

PART 2 PRODUCTS

2.1 GENERAL

A. All materials shall conform to the pertinent material requirements of the following Items. Complete shop drawings and specifications shall be furnished prior to acceptance and approval of the bid proposal. If requested, the valve manufacturer shall also submit a list of similar installations that have been in satisfactory operation for at least three years.

The manufacturer shall furnish a complete set of installation, operation, and maintenance instructions for each type of valve furnished. Instructions shall be bound in a cover.

1. Valves.

   a) Non-Rising Stem Double Disc Gate Valves. Non-Rising Stem Gate Valves are to be iron-body, bronze mounted, parallel seat internal wedging type with non-rising stem and designed for a gauge working pressure of 200 psig. NRS gate valves shall comply with AWWA C-500 “Gate Valves for Water and Sewage Systems”, latest revision.

   Valves 12-inches or smaller shall be for horizontal installation. The number of turns to open shall be a minimum of three times the valve diameter.

Acceptable manufacturers and models shall be:

American-Darling 52NRS (Flanged Ends), 55NRS (Mechanical Joint Ends)
Clow F5065 (Mechanical Joint Ends), F5070 (Flanged Ends)
Kennedy 561X (Flanged Ends), 571X (Mechanical Joint Ends)
M&H Style 67NRS
Mueller A-2380-6 (Flanged), A-2380-20 (Mechanical Joint Ends)
2. **Submittals.** Submittals shall be provided for approval. Also, the manufacturer shall provide an Affidavit of Compliance in accordance with Section 1.4 of AWWA Standard C-500. Records of all tests performed in accordance with Section 2.2 and Section 5.1 of AWWA Standard C-500 shall be provided. These records will be representative test results for Section 2.2 and certificate of testing for Section 5.1 of AWWA Standard C-500. An affidavit of testing for the valve assembly as outlined in Section 3.1 of AWWA Standard C-500 300 ft-lbs shall also be provided.

**Markings.** Shall be cast on the bonnet or body of each valve. Markings shall include the manufacturer’s name or mark, the year the valve casting was made, the size of the valves, and the designated working pressure.

**Valve Ends.** Valve ends shall be mechanical joint or flanged with drilling in compliance with ANSI B16.1. Valve ends and size as specified.

**Valve Body and Bonnet.** Shall be cast iron conforming to ASTM A-126 Class B, or ductile iron conforming to ASTM A-395 or ASTM A-536.

**Gate.** Shall be cast iron or Grade A bronze. Gate rings, constructed of Grade A bronze, shall be rolled, peened, or pressed into grooves machined in the discs, or may be fastened by some other accepted method.

**Body-Seat Ring.** Shall be constructed of Grade A bronze, and shall be back-faced threaded and machined screwed into the valve body.

**Wedges.** Single-disc gate valves shall be equipped with a free and positive-operating internal device that will press the disc seats firmly against the body seats when the valve is closed and release the load before the discs begin to move when the valve is opened. Wedges shall be simple and rugged in design. The wedge material shall be as specified in AWWA C-500 and contact surface shall not be iron to iron.

**Valve Stem.** Shall be constructed of low zinc bronze CDA Copper Alloy No. C99500 with a minimum yield strength of 40,000 psi and minimum elongation in 2-inches of 10%.

**Stem Seals.** Shall consist of two O-rings such that the seal above the stem collar can be replaced with the valve under pressure in the fully open position. O-rings shall meet the requirements of ASTM D-2000 and have physical properties suitable for the application.

**Valve Operator.** Shall be a cast iron, ASTM A-126 Class B, wrench nut. The nut shall have a 2-inch square base and shall be 1-15/16" square at the top and be 1-3/4 inch high and shall open counterclockwise (left). The wrench nut shall be painted black and an arrow indicating direction of opening shall be cast on the nut, according to AWWA C-509.

**Protective Coating.** An epoxy coating shall be applied to all exterior and all stationary interior ferrous surfaces including all interior openings in the valves body. The coating shall not be applied to the gasket surfaces of the end flanges.

The coating shall be applied in accordance with AWWA C-550 and the manufacturer’s instructions. After the coating is completely cured, the coated surface shall be tested for porosity, holidays, and pinholes using a holiday detector. All holidays or irregularities shall be repaired and the coating again tested.
3. **Outside Screw and Yoke (OS&Y) Gate Valves.** Outside Screw and Yoke Gate Valves are to be iron-body, bronze mounted, parallel seat internal wedging type with outside screw and yoke and shall comply with AWWA C-500 “Gate Valves for Water and Sewage Systems”. OS&Y Gate Valves shall be provided for the size specified.

Acceptable manufacturers and models shall be:

- American Darling 52 OS&Y
- Clow F5072
- Kennedy 566
- M&H STYLE 68
- Mueller A-2483-6

**Submittals.** Submittals shall be provided for approval. Also, the manufacturer shall provide an Affidavit of Compliance in accordance with AWWA Standard C-500 Section 1.4. Records of all tests performed in accordance with AWWA Standard C-500 Section 2.2 and Section 5.1, shall be provided. These records will be representative test results for AWWA Standard C-500 Section 2.2 and certificate of testing for Section 5.1. An affidavit of testing for the valve assembly as outlined in Section 3.1 of AWWA Standard C-500 300 ft-lbs, shall also be provided.

**Markings.** Shall be cast on the bonnet or body of each valve. Markings shall include the manufacture’s name or mark, the year the valve casting was made, the size of the valves and the designated working pressure.

**Valve Ends.** Valves ends shall be flanged, with drilling in compliance with ANSI B16.1, or as otherwise specified.

**Valve Body and Bonnet.** Shall be cast iron conforming to ASTM A-126 Class B, or ductile iron conforming to ASTM A-395 or ASTM A-536.

**Gate.** Shall be cast iron or Grade A bronze. Gate rings, constructed of Grade A bronze, shall be rolled, peened, or pressed into grooves machined in the discs, or may be fastened by some other accepted method.

**Body-Seat Ring.** Shall be constructed of Grade A bronze, and shall be back-faced threaded and machined screwed into the valve body.

**Wedges.** Double-disc gate valves shall be equipped with a free and positive-operating internal device that will press the disc seats firmly against the body seats when the valve is closed and release the load before the discs begin to move when the valve is opened. Wedges shall be simple and rugged in design. The wedge material shall be as specified in AWWA C-500 and contact surface shall not be iron to iron.

**Valve Stem.** Shall be constructed of low zinc bronze CDA Copper Alloy No. C99500 with a minimum yield strength of 40,000 psi and minimum elongation in 2-inches of 10%. The opening through the bonnet for the stem shall be bushed with grade A, B, C, D or E bronze as defined in AWWA C-500.

**Yoke.** The yoke may be either integral or bolted on to bonnet. The design shall be such that a hand may not be jammed between the yoke and handwheel.
Valve Operator. Shall be a cast iron, ASTM A-126 Class B, wrench nut. The nut shall have a 2-inch square base and shall be 1-15/16” square at the top and be 1-3/4 inch high and shall open counterclockwise (left). The wrench nut shall be painted black and an arrow indicating direction of opening shall be cast on the nut, according to AWWA C-509.

Protective Coating. An epoxy coating shall be applied to all exterior and all stationary interior ferrous surfaces including all interior openings in the valves body. The coating shall not be applied to the gasket surfaces of the end flanges.

The coating shall be applied in accordance with AWWA C-550 and the manufacturer’s instructions. After the coating is completely cured, the coated surface shall be tested for porosity, holidays, and pinholes using a holiday detector. All holidays or irregularities shall be repaired and the coating again tested.

4. Tapping Valves. Tapping Valves are to be iron-body, bronze mounted, parallel seat internal wedging type with non-rising stem. Tapping Valves shall conform to AWWA C-500 “Gate Valves for Water and Sewage Systems” except that tapping valves shall have oversized seat rings to accommodate full size cutters. Tapping Valves shall be provided for the size specified.

Acceptable manufacturers and models shall be:

- American Darling 565
- Clow 5093
- Kennedy 950-X
- M&H STYLE 751
- Mueller H-667

The number of turns to open shall be a minimum of three times the valve diameter.

Submittals. Submittals shall be provided for approval. Also, the manufacturer shall provide an Affidavit of Compliance in accordance with AWWA Standard C-500 Section 1.4. Records of all tests performed in accordance with AWWA Standard C-500 Section 2.2 and Section 5.1 shall be provided. These records will be representative test results for AWWA Standard C-500 Section 2.2 and certificate of testing for Section 5.1. An affidavit of testing for the valve assembly as outlined in Section 3.1 of AWWA Standard C-500 300 ft-lbs., shall also be provided.

Markings. Shall be cast on the bonnet or body of each valve. Markings shall include the manufacturer’s name or mark, the year the valve casting was made, the size of the valves, and the designated working pressure.

Valve Ends. Outlet end of the valve shall be mechanical joint or as otherwise specified.

Valve Body and Bonnet. Shall be cast iron conforming to ASTM A-126 Class B, or ductile iron conforming to ASTM A-395 or ASTM A-536.

Gate. Shall be cast iron or Grade A bronze. Gate rings, constructed of Grade A bronze, shall be rolled, peened, or pressed into grooves machined in the discs, or may be fastened by some other accepted method.

Body-Seat Ring. Shall be constructed of Grade A bronze, and shall be back-faced threaded and machined screwed into the valve body.
**Wedges.** Double-disc gate valves shall be equipped with a free and positive-operating internal device that will press the disc seats firmly against the body seats when the valve is closed and release the load before the discs begin to move when the valve is opened. Wedges shall be simple and rugged in design. The wedge material shall be as specified in AWWA C-500 and contact surface shall not be iron to iron.

**Valve Stem.** Shall be constructed of low zinc bronze CDA Copper Alloy no. C99500 with a minimum yield strength of 40,000 psi and minimum elongation in 2-inches of 10%.

**Stem Seals.** Shall consist of two O-rings such that the seal above the stem collar can be replaced with the valve under pressure in the fully open position. O-rings shall meet the requirements of ASTM D-2000 and have physical properties suitable for the application.

**Valve Operator.** Shall be a cast iron, ASTM A-126 Class B, wrench nut. The nut shall have a 2-inch square base and shall be 1-15/16” square at the top and be 1-3/4 inch high and shall open counterclockwise (left). The wrench nut shall be painted black and an arrow indicating direction of opening shall be cast on the nut, according to AWWA C-509.

**Protective Coating.** An epoxy coating shall be applied to all exterior and all stationary interior ferrous surfaces including all interior openings in the valves body. The coating shall be applied in accordance with AWWA C-550 and the manufacturer’s instructions. After the coating is completely cured, the coated surface shall be tested for porosity, holidays, and pinholes using a holiday detector. All holidays or irregularities shall be repaired and the coating again tested.

5. **Non-Rising Stem (NRS) Resilient-Seated Gate Valves.** Non-Rising Stem Gate Valves are to be resilient seat, non-rising stem and shall have a minimum rated gauge working pressure of 200 psig and shall comply with AWWA C-509 “Resilient-Seated Gate Valves for Water and Sewage Systems” and AWWA C-550 “Standard for Protective Coatings for Valves and Hydrants”. The valves design shall not have any recesses, insets in the bottom of the waterway that would promote build-up or collection of residue and debris. Resilient Seated Gate Valves shall be provided for the size specified.

With the valve open, the valve shall provide an unobstructed waterway that has a diameter not less than the full nominal diameter of the valve. The minimum number of turns to open the valve shall be three times the valve diameter.

Acceptable manufacturers and models shall be:

- American Flow Control Series 500, Series 2500
- Clow F-6100, F-6102
- Kennedy KEN-SEAL II
- M&H 3067
- US Pipe METROSEAL 250
- Mueller A-2360-20

**Submittals.** Submittals shall be provided for approval. Also, the manufacturer shall provide approved certified test data or an affidavit stating that the valve complies with AWWA C-509 Section 6.1 and the following, in accordance with AWWA C-509 Section 6.2:

**Hydrostatic Test.** The manufacturer shall pressure test one valve of each size and class with 400 psi applied to one side and zero to the other. The test shall be made in each direction across the closed gate.
**Torque Test.** The manufacturer shall over-torque a valve of each size to demonstrate that no distortion of the valve stem occurs. The applied torque shall be 250 ft-lb for a 4-inch valve and 350 ft-lb for the larger valves in both the open and closed position.

**Leakage Test.** The manufacturer shall select two valves of each size to be fully opened and closed for 500 complete cycles with a 200 psi differential pressure across the gate. The valve shall be drip tight upon completion of the test.

**Pressure Test.** One valve of each size shall be tested, with the gate fully open, to a pressure of 500 psi. There shall be no evidence of rupture or cracking of valve body, bonnet or seal plated.

**Markings.** Shall be cast on the bonnet or body of each valve. Markings shall include the manufacturer’s name or mark, the year the valve casting was made, the size of the valves, and the designated working pressure.

**Valve Ends.** Shall be mechanical joint or flanged ends as specified.

**Valve Body and Bonnet.** Shall be cast iron conforming to ASTM A-126, or ductile iron conforming to ASTM A-536 or A-395.

**Bolts.** All bonnet and seal plate bolts shall be factory installed and made from stainless steel ASTM A-276 with either regular-square or hexagonal heads with dimensions conforming to ANSI B18.2.1.

**Wedge.** The wedge shall be cast iron or ductile iron fully encapsulated with resilient rubber material bonded to the disc. The method for bonding the resilient material shall be confirmed by ASTM D-429 as required by AWWA C-509.

**Valve Stem.** Shall be constructed of low zinc bronze CDA Copper Alloy No. C99500 with a minimum yield strength of 40,000 psi and minimum elongation in 2-inches of 10%.

**Stem Seals.** Shall consist of two O-rings such that the seal above the stem collar can be replaced with the valve under pressure in the fully open position. O-rings shall meet the requirements of ASTM D-2000 and have physical properties suitable for the application.

**Valve Operator.** Shall be a cast iron, ASTM A-126 Class B, wrench nut. The nut shall have a 2-inch square base and shall be 1-15/16” square at the top and be 1-3/4 inch high and shall open counterclockwise (left). The wrench nut shall be painted black and an arrow indicating direction of opening shall be cast on the nut, according to AWWA C-509.

**Protective Coating.** An epoxy coating shall be applied to all exterior and all stationary interior ferrous surfaces including all interior openings in the valves body. The coating shall not be applied to the gasket surfaces of the end flanges.

The coating shall be applied in accordance with AWWA C-550 and the manufacturer’s instructions. The epoxy coating shall have a minimum dry film thickness of 8 mils. After the coating is completely cured, the coated surface shall be tested for porosity, holidays, and pinholes using a holiday detector. All holidays or irregularities shall be repaired and the coating again tested.
6. **Butterfly Valves.** Shall be of the tight-closing, rubber-seated type for Class 150B service. Butterfly valves shall comply with the requirements of AWWA C-504, "Standard for Rubber-Seated Butterfly Valves". Butterfly valves shall be provided for the size specified.

Acceptable manufacturers and models shall be:

- American-Darling  Class 150B Flanged or Mechanical Joint
- M&H  450, 4500, 1450
- Kennedy  30A, 30C
- Mueller  Lineseal III
- Pratt  Groundhog Flanged

**Submittals.** Submittals shall be provided for approval. Also, the Manufacturer shall provide approved certified test data or an affidavit stating that the valve complies with the performance tests, leakage tests, hydrostatic test and proof-of-design tests as described in Section 5.2 of AWWA C-504.

**Valve Ends.** Shall be short body flanged, mechanical joint or as otherwise specified.

**Valve Bodies.** Shall be constructed of cast iron ASTM A-126, Class B, or ASTM A-48, Class 40 or Ductile Iron, ASTM A-536, Grade 65/45/12.

**Valve Discs.** Shall be cast iron conforming to ASTM A-126, Class B or Ductile Iron conforming to ASTM A-536, Grade 65/45/12. Valve disc shall seat in a position of 90 degrees to the pipe axis and shall rotate 90 degrees between full open and tight closed position. Dimensions of clearance for valve discs are required.

**Valve Shafts**, keys, dowel pins, or taper pins used for attaching valve shaft to the valve disc shall be Type 304 or 316 Stainless Steel, conforming to ASTM A-276, or equivalent corrosion resistant material. All portions of shaft bearings shall be stainless steel or bronze.

Valve shafts may consist of a one-piece unit extending completely through the valve disc, or may be of the "stub shaft" type as defined in AWWA C-504.

Butterfly valves shall be provided with an extended bonnet, unless otherwise specified.

**Shaft Seals.** Shall be a Split-V or O-ring type. Replacement shall be possible without removing the valve shaft.

**Valve Seats.** Shall be new natural or synthetic rubber resilient seats to provide tight shut off at the specified pressure. Seats shall be attached to either the disc or the body. Seats shall be clamped, mechanically secured, bonded or vulcanized to either the disc or body. Seat rings shall be stainless steel and fastened by stainless steel cap screws.

**Mating Seat Surface.** Shall be ASTM A-276, stainless steel 18-8, Type 304, or have a 95% pure nickel overlay.

**Valve Bearings.** Shall be sleeve type. Bearings shall be manufactured from corrosion resistant, and "self lubricated" materials that will not damage natural or synthetic rubber.

**Valve Operators.** Shall be manual with a 2-inch square operating-nut and turn left (counterclockwise) to open. Operators shall have all gearing totally enclosed and shall be pre-lubricated or grease packed. Operators shall be of the worm gear or traveling nut and link type with field adjustable stops capable of withstanding 300 ft. lbs. input torque, as required by AWWA C-504.
Protective Coating. Except as otherwise specified, all interior steel or cast iron surfaces shall be shop coated in accordance with the requirements of AWWA Standard C-504. All external surfaces for buried valves shall be shop coated with two coats of asphalt varnish according to AWWA C-504.

When specified, a standard epoxy interior coating shall be applied in accordance with AWWA Standard C-550, “Standard for Protective Interior Coatings for Valves and Hydrants”.

7. Air Release, Air/Vacuum, and Combination Air Valves. Air-Release, Air/Vacuum and Combination Air Valves shall comply with AWWA C-512 and the following specifications. These specifications shall apply to valve sizes 6 inch and smaller.

Air Release Valves (AR) shall be designed to automatically release accumulated air pockets within the pipeline while in operation and under pressure. Air release valves shall be APCO Model 200, Val-Matic Model 38, or Crispin Model P.

Air/Vacuum Valves (AV) shall be designed to allow large volumes of air to escape through the valve orifice when filling a pipeline and to close watertight once the air has been expelled. Air and vacuum valves shall also permit large volumes of air to enter through the valve orifice when the pipeline is being drained to break the vacuum. Air and vacuum valves shall be APCO Series 140, Val-Matic Series 100, or Crispin Model AL.

Combination Air Valves (CAV) shall be heavy-duty air and vacuum valves with air release. Combination Air Valves shall be designed to release accumulations of air at high points within a pipeline by exhausting large volumes of air as the pipeline is being filled and by releasing accumulated pockets of air while the pipeline is in operation and under pressure. Combination air valves shall also be designed to permit large volumes of air to enter the pipeline during pipeline drainage. Combination Air Valves shall be APCO, Val-Matic Series 200, or Crispin Model C.

Submittals. The manufacturer shall provide an affidavit stating that the valve and all materials used in its construction conform to the applicable requirements of AWWA C-512 and these specifications. When required, the manufacturer shall provide and affidavit stating that the valve has been tested and is in compliance with the requirements specified in Section 5.1 of AWWA C-512.

Markings. Manufacturer’s name or trademark, size of valve, and the designated maximum working pressure rating shall be cast in the body or marked on a corrosion-resistant name plate.

Body and Cover. Each air valve shall have a cast or ductile iron body and cover. Cast iron shall comply with ASTM A-126 Class B, or ASTM A-48 Class 35. Ductile iron shall comply with the requirements of ASTM A-536, Grade 65-45-12. Bolting material shall meet or exceed the strength requirements of ASTM A-307. All internal trim shall be of stainless steel.

Float. Shall be stainless steel. Float shall be baffled to prevent air from blowing valve closed until air is exhausted. Valve body, float, etc., shall be designed for a working pressure equal to that of the system in which it is installed. Floats for valves with inlet sizes less than 100 mm (4 inch) shall be capable of withstanding a collapse gauge pressure of 1,000 psig. For larger inlet sizes, floats shall be capable of withstand ing a collapse gauge pressure of 750 psig.

Valve Outlet. Shall be fitted to attach discharge pipe as indicated. Valve inlet shall be N.P.T. for 2-inch and smaller valves. Valve inlet shall be ANSI flange for 3-inch and larger valves. Flange rating shall equal or exceed the maximum working pressure of the system in which it is installed.
**Installation.** Air release and air/vacuum valves shall be installed within valve vaults, or manhole, in accordance with Utility Standard Details 263-1, 263-2, 263-3, 263-4 and plans.

**Protective Coatings.** Interior surface coatings shall not be required unless otherwise specified. External surfaces shall be coated with the manufacturer’s standard primer.

8. **Fittings.** Fittings as specified herein shall be ductile iron (DI) for use with ductile iron and polyvinyl chloride (PVC) water pressure or transmission pipe.

All fittings shall be smooth cement lined in accordance with AWWA C-104 and shall be outside asphaltic coated per AWWA C-110. The size, body type, type of joint ends, and applicable reference standard, shall be as shown on engineering drawings or as specified.

**Standards.** Fittings shall comply with applicable requirements of the following:


**Minimum Requirements.** The following minimum requirements of TABLE A and TABLE B shall apply to the specified fittings.

All joint accessories such as gaskets, glands, bolts, and nuts shall be furnished with mechanical joints, and gaskets and lubricant shall be furnished with push-on joints in sufficient quantity for assembly of each joint.

Push-on joint fittings shall be marked with the proprietary name or trademark of the joint.

Fittings shall be marked on the outside with their applicable AWWA Standard and information called for by the Standard.

Fittings shall be polyethylene wrapped in accordance with AWWA C-105.

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**TABLE A – STANDARD SHORT-BODY FITTINGS PER AWWA C-110**

<table>
<thead>
<tr>
<th>TYPE OF JOINT</th>
<th>DIAMETER</th>
<th>RATED WORKING PRESSURE</th>
<th>MATERIAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mechanical (Rubber Gasket/C-111)</td>
<td>4 - 24 inches</td>
<td>350 psi</td>
<td>DI</td>
</tr>
<tr>
<td>Flanged</td>
<td>4 - 24 inches</td>
<td>250 psi</td>
<td>DI</td>
</tr>
<tr>
<td>All types</td>
<td>30 - 80 inches</td>
<td>250 psi</td>
<td>DI</td>
</tr>
<tr>
<td>Push-On (Rubber Gasket/C-111)</td>
<td>4 - 24 inches</td>
<td>250 psi</td>
<td>DI</td>
</tr>
</tbody>
</table>
TABLE B - COMPACT SHORT-BODY FITTINGS
PER AWWA C-153

<table>
<thead>
<tr>
<th>TYPE OF JOINT</th>
<th>DIAMETER</th>
<th>RATED WORKING PRESSURE</th>
<th>MATERIAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mechanical or Push-On (Rubber Gasket/C-111)</td>
<td>4 - 24 inches</td>
<td>350 psi</td>
<td>DI</td>
</tr>
</tbody>
</table>

PART 3 EXECUTION

3.1 INSTALLATION

A. Valve Installation. Carefully handle and install valves horizontally in such a manner as to prevent damage to any parts of the valves. Installation shall be in accordance with manufacturer’s instruction. Valves delivered closed to the site shall be opened by the CONTRACTOR prior to installation. The CONTRACTOR shall record the number of turns required to open the valve. This information shall be submitted to the Utility on the standard valve report.

B. Valves shall be polyethylene-wrapped in accordance with AWWA C-105, unless otherwise specified. Thrust blocking shall be provided as specified.

3.2 TESTING

A. Valve Testing. Upon completion of installation of the valves, an acceptance test shall be conducted to verify the satisfactory operation of the valves. The unit shall be checked for operation and leakage. The valves must perform in a manner acceptable to the ENGINEER and LVWD before the Owner makes final acceptance.

PART 4 MEASUREMENT AND PAYMENT

4.1 No separate measurement or payment shall be made for this work item, but it shall be included in the unit price bid for the pipeline work as noted in the proposal.

END OF SECTION
SECTION 02640 – POLYVINYL CHLORIDE (PVC) PRESSURE PIPE AND FITTINGS FOR WATERLINES

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Scope of Work.
B. Submittals.
C. Reference Standards.
D. Quality Assurance.
E. System Description.
F. Delivery, Storage and Handling.
G. Polyvinyl Chloride (PVC) Pipe and Fittings.
H. Installation of PVC Pipe and Fittings.
I. Jointing PVC Pipe.
J. Testing (Pressure Pipeline).

1.2 SCOPE OF WORK

A. Furnish all labor, materials, equipment and incidentals required and install and test polyvinyl chloride PVC pressure pipe and fittings, complete as shown on the Drawings and as specified herein.
B. Pipe or piping refers to all pipe, fittings, material, and appurtenances required to construct PVC waterlines complete, in place.

1.3 SUBMITTALS

A. No later than 10 calendar days after the Effective Date of the Agreement, submit the name of the pipe and fitting manufacturers and a list of materials to be furnished by each manufacturer. Also, include information on local representative for each manufacturer, if product is sold through a distributor.
B. Shop drawings including piping layouts and schedules shall include dimensioning, fittings, types and locations of valves and appurtenances, joint details, restraint joints/fittings, gasket material, grade of material, and all other pertinent technical information for all items to be furnished.
C. Prior to shipment of pipe, certified test reports that the pipe for this Contract was manufactured and tested in accordance with the ASTM and AWWA Standards specified herein shall be submitted.

1.4 REFERENCE STANDARDS

A. American Society for Testing and Materials (ASTM)

B. American Water Works Association (AWWA)
1. AWWA C110 Ductile-Iron and Gray-Iron Fittings, 3-inches through 48-inches for Water and Other Liquids.
2. AWWA C111 Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings.
3. AWWA C605 Underground Installation of Polyvinyl Chloride (PVC) Pressure Pipe and Fittings for Water.
4. AWWA C905 Polyvinyl Chloride (PVC) Water Transmission Pipe, Nominal Diameters 14 in. through 36 in.
5. AWWA C900 Polyvinyl Chloride (PVC) Water Transmission Pipe, Nominal Diameters 4 in. through 12 in, for water distribution.

C. Texas Commission on Environmental Quality (TCEQ)

D. American National Standards Institute/National Sanitation Foundation (ANSI/NSF)
2. Standard No. 61 - Drinking Water System Components

E. Where reference is made to one of the above standards, the revision in effect at the time of bid opening shall apply.

1.5 QUALITY ASSURANCE

A. All PVC pipe and fittings shall be from a single manufacturer. The supplier shall be responsible for the provisions of all test requirements specified in AWWA C905 and NSF Standard No. 14, as applicable. In addition, all PVC pipe to be installed under this Contract may be inspected at the plant for compliance with the requirements specified herein by an independent testing laboratory. The Contractor shall require the manufacturer's cooperation in these inspections.

B. Inspections of the pipe may also be made by the Engineer or other representatives of the Owner after delivery. The pipe shall be subject to rejection at any time on account of failure to meet any of the Specification requirements, even though pipe may have been accepted as satisfactory at the place of manufacture. Pipe rejected after delivery shall be marked for identification and shall be removed from the job at once.

C. All newly installed pipes and related products must conform to American National Standards Institute/National Sanitation Foundation (ANSI/NSF) Standard 61 and must be certified by an organization accredited by ANSI.
D. All C900 polyvinyl chloride pipe (PVC) and fittings shall be from a single manufacturer. Each length of PVC pipe supplied for the project shall be hydrostatically tested at the point of manufacturer to four times its rating class for a duration of 5 seconds in accordance with AWWA C900. Testing may be performed prior to machining bell and spigot. Failure of polyvinyl chloride (PVC) pipe shall be defined as any rupture or bulging of the pipe wall. Certified test results shall be furnished in triplicate to the Engineer prior to time of shipment.

1.6 SYSTEM DESCRIPTION

A. The equipment and materials specified herein are intended to be of standard types suitable for use in transporting potable water.

B. Note information given on the drawings and in this section, especially concerning pressure, minimum thickness, etc. In case of a conflict, information given in the Specification shall govern.

C. Contractor is responsible for compatibility between pipe materials, fittings and appurtenances.

D. Unless otherwise noted, PVC pipe for the waterlines shall be designed for the following condition(s).

   1. Class: AWWA C900 DR-18
      Pressure
      Operating: 150 psi
      Testing: 215 psi

1.7 DELIVERY, STORAGE AND HANDLING

A. All items shall be bundled or packaged in such a manner as to provide adequate protection of the ends during transportation to the site. Any pipe damaged in shipment shall be replaced as directed by the Engineer.

B. PVC items deteriorate in sunlight and are slightly brittle, especially at lower temperatures, so care shall be taken in loading, transporting, and unloading items to prevent injury to the items. All items shall be examined before installation and no piece shall be installed which is found to be defective. Handling and installation of pipe and fittings shall be in accordance with the manufacturer's instructions, referenced standards, and as specified herein.

C. Any pipe or fitting showing a crack or which has received a blow that may have caused an incident fracture, even though no such fracture can be seen, shall be marked as rejected and removed at once form the work.

D. While stored, pipe shall be adequately supported from below at not more that 3-ft intervals to prevent deformation. The pipe shall be stored in stacks no higher than 2 rows.

E. Pipe and fittings shall be stored in a manner, which will keep them at ambient outdoor temperatures and out of the sunlight. Temporary shading as required to meet this requirement shall be the responsibility of the Contractor. Covering of the pipe and fittings that allows direct or indirect sunlight will not be permitted.

F. If any defective item is discovered after it has been installed, it shall be removed and replaced with an exact approved replacement item in a satisfactory manner by the Contractor, at the Contractor's own expense. All pipe and fittings shall be thoroughly cleaned before installation and the interior shall be kept clean until testing. At the end of the workday, the end of the last pipe installed shall be covered to avoid dust/solids from entering the pipe.

G. In handling the items, use special devices and methods as required to achieve the results specified herein. No un-cushioned devices shall be used in handling the item.
PART 2  PRODUCTS

2.1  POLYVINYL CHLORIDE (PVC) PIPE AND FITTINGS

A. PVC pressure pipe shall conform to the requirements of AWWA C900. All pipe shall be Pressure Class 150 with a Dimension Ratio of 18. The pipe shall be PVC 1120 made from PVC compounds Class 12454-A or Class 12454-B as defined in ASTM D1784. Each pipe length shall be marked with the manufacturer's name or trademark, size, material code, pressure class and AWWA designation number. In addition, all pipes for use in public water systems must also bear the National Sanitation Foundation Seal of Approval (NSF-pw).

B. PVC pipe shall have bell and spigot push-on joints. The bell shall consist of an integral wall section with a solid cross-section elastomeric gasket securely locked in place to prevent displacement during assembly. Installation of elastomeric gasketed joints and performance of the joint shall conform to ASTM F477 and ASTM D3139.

C. All pipes and fittings shall contain no more than 8.0% lead conforming to Section §290.44(a) (2) of TCEQ Rules and Regulations for Public Water Systems.

D. All fittings shall be cast or ductile iron conforming to AWWA C110 for mechanical joints. All adaptors, fittings and transition gaskets necessary to connect cast or ductile iron fittings to PVC shall be furnished.

E. Mechanically restrained joints shall be used at all changes in direction and as per manufacturer's recommendations. The Contractor shall submit adequate calculations substantiating their effectiveness to withstand the anticipated test pressure.

PART 3  EXECUTION

3.1  INSTALLATION OF PVC PIPE AND FITTINGS

A. No single piece of pipe shall be laid unless it is straight. The centerline of the pipe shall not deviate from a straight line drawn between the centers of the openings at the ends of the pipe by more than 1/16-in per foot of length. If a piece of pipe fails to meet this requirement check for straightness, it shall be rejected and removed from the site. Laying instructions of the manufacturer shall be explicitly followed.

B. If any defective pipe is discovered after it has been installed, it shall be removed and replaced with a sound approved pipe in a satisfactory manner at no additional cost to the Owner. No couplings will be allowed at any time. All pipe and fittings shall be thoroughly cleaned before installation, shall be kept clean until they are used in the work and when laid, shall conform to the lines and grades required. PVC pipe and fittings shall be installed in accordance with requirements of the manufacturer, AWWA C605 or as otherwise provided herein.

C. As soon as the excavation is complete to normal grade of the bottom of the trench, screened gravel bedding shall be placed, compacted and graded to provide firm, uniform and continuous support for the pipe. Bell holes shall be excavated so that only the barrel of the pipe bears upon the bedding. The pipe shall be laid accurately to the lines and grades indicated on the drawings. Blocking under the pipe will not be permitted. Screened gravel shall be placed evenly on each side of the pipe to mid-diameter and hand tools shall be used to force the screened gravel under the haunches of the pipe and into the bell holes to give firm continuous support for the pipe. Screened gravel shall then be placed to 12-in above the top of the pipe. The initial 3-ft of backfill above the screened gravel backfill shall be placed in 1-ft layers and carefully compacted. Generally the compaction shall be done evenly on each side of the pipe and compaction equipment shall not be operated directly over the pipe until sufficient backfill has been placed to ensure that such compaction equipment will not have a damaging effect on the pipe. Equipment used in compacting the initial 3-ft of backfill shall be approved by the pipe manufacturer's representative prior to use.
D. All pipe shall be sound and clean before installation. Good alignment shall be preserved during installation. The deflection at joints shall not exceed that recommended by manufacturer. Fittings, in addition to those shown on the plans, shall be provided, if required, in crossing utilities, which may be encountered upon opening the trench.

E. When cutting pipe is required, the cutting shall be done by machine, leaving a smooth cut at right angles to the axis of the pipe. Cut ends of pipe to be used with a bell shall be beveled to conform to the manufactured spigot end.

F. The Engineer may examine each bell and spigot end to determine whether any preformed joint has been damaged prior to installation. Any pipe having defective joint surfaces shall be rejected, marked as such, and immediately removed from the job site.

G. Each length of the pipe shall have the assembly mark aligned with the pipe previously laid and held securely until enough backfill has been placed to hold the pipe in place. Joints shall not be "pulled" or "cramped".

H. Before any joint is made, the pipe shall be checked to assure that a close joint with the next adjoining pipe has been maintained and that the inverts are matched and conform to the required grade. The pipe shall not be driven down to grade by striking it.

I. Precautions shall be taken to prevent flotation of the pipe in the trench.

J. When moveable trench bracing such as trench boxes, moveable sheeting, shoring or plates are used to support the sides of the trench, care shall be taken in placing and moving the boxes or supporting bracing to prevent movement of the pipe, or disturbance of the pipe bedding and the screened gravel backfill. Trench boxes, moveable sheeting, shoring or plates shall not be allowed to extend below the top of the pipe. As trench boxes, moveable sheeting, shoring or plates are moved, screened gravel shall be placed to fill any voids created and the screened gravel and backfill shall be recompacted to provide uniform side support for the pipe.

L. Restrained joints shall be employed a specified herein.

3.2 JOINTING PVC PIPE (Push-on type)

A. Joints shall be made in strict accordance with the manufacturer’s instructions. Pipe shall be laid with bell ends looking ahead. A rubber gasket shall be inserted in the groove of the bell end of the pipe and the joint surfaces cleaned and lubricated. The plain end of the pipe to be entered shall then be inserted in alignment with the bell of the pipe to which it is to be joined and pushed home with a come-along or by other means. Check that the reference mark on the spigot end is flush with the end of the bell.

3.3 TESTING (PRESSURE PIPELINE)

A. Testing of waterlines shall be as per section 02675 of these specifications.

PART 4 MEASUREMENT AND PAYMENT

4.1 No separate measurement or payment shall be made for this work item, but it shall be included in the unit price bid for the pipeline work as noted in the proposal.

END OF SECTION
SECTION 02675 – DISINFECTION AND TESTING OF WATER LINES

PART 1 – GENERAL

1.01 SECTION INCLUDES

A. Scope of Work.

B. References.

C. Submittals.

D. Scheduling.

E. Quality Assurance.

F. Equipment.

G. Performance Requirements.

1.02 SCOPE OF WORK

A. Contractor shall furnish all labor, materials, tools, equipment and related items required to test domestic water line systems.

B. All domestic water lines installed in this Contract, including waterlines, which are installed between or connected to existing water lines, shall be tested in accordance with Lower Valley Water District requirements.

C. Work shall include furnishing all pumps, meters, gauges, and other appurtenances, including taps to expel air, required for conducting tests. The Contractor shall furnish equipment, piping and appurtenances required to transport water used in testing from source to test location.

D. The Contractor shall provide adequate labor, tools and equipment to operate valves and to locate and repair any leaks discovered during the initial filling of a piping system and during testing.

E. Specifications for this project state that construction shall be in accordance with standard specifications for the Lower Valley Water District. Please note that TCEQ’s specification for the location of waterlines as required in Title 30 TAC, Chapter 290.44(e) (Rules and Regulations for Public Water Systems) are minimum requirements. When conflicts are noted with local standards, the more stringent shall be applied. Construction for public water system must always, at a minimum, meet TCEQ’s “Rules and Regulations for Public Water Systems”.

1.03 REFERENCES

A. American Water Works Association (AWWA).

B. Texas Commission on Environmental Quality (TCEQ) - Rules and Regulations for Public Water Systems.
1.04 SUBMITTALS

A. Test Reports Shall Include:

1. Date of test.
2. Identification of piping tested.
3. Test fluid.
4. Test pressure.
5. Remarks, to include such items as:
   a. Leaks (type, location).
   b. Repairs made on leaks.
6. Contractor's signature certifying the results.

B. Submit under provisions of Division 01 Section “Submittal Procedures”.

1.05 SCHEDULING

A. Time and sequence of testing shall be scheduled by the Contractor, subject to review and approval by the Owner or designated representative. Submit testing plan to Owner or designated representative at least ten (10) days before starting testing operations.

B. Notify Owner or designated representative 24 hours in advance of testing.

1.06 QUALITY ASSURANCE

A. Conduct tests on buried piping that is to be hydrostatically tested after the trench has been completely backfilled. The Contractor may, if field conditions permit and if approved by the Owner or designated representative, partially backfill the trench and leave the joints open for inspection and conduct an initial service leak test. The acceptance test shall not, however, be conducted until all backfilling has been completed.

B. Conduct testing on exposed piping after the piping has been completely installed, including all supports, hangers, and anchors, but prior to insulation.

C. Testing of pipe with concrete thrust blocking shall not be performed until the concrete has cured at least five days.

D. If any pipe fails to meet the specified pressure/leakage requirements the piping shall be repaired at the expense of the Contractor, including retesting.

E. No pipe installation will be accepted until all known leaks have been repaired whether or not leakage is within allowable limits. Locating and repairing of leaks shall be performed by the Contractor at no additional cost to the Owner.

F. The Contractor shall certify that all required tests have been successfully completed before the piping is accepted.

G. All pressure and leakage tests shall be observed by the Owner or designated representative.
H. Specifications for this project state that construction shall be in accordance with standard specifications for the Lower Valley Water District. Please note that TCEQ’s specification for the location of waterlines as required in Title 30 TAC, Chapter 290.44(e) (Rules and Regulations for Public Water Systems) are minimum requirements. When conflicts are noted with local standards, the more stringent shall be applied. Construction for public water system must always, at a minimum, meet TCEQ’s “Rules and Regulations for Public Water Systems”.

PART 2 – PRODUCTS

2.01 EQUIPMENT

A. Portable Pressure Pump System: Including pump, motor, 2 isolation valves, quick connect/disconnect fittings at pump intake and discharge and 250 pound per square inch (psi) oil damped pressure gage (reading in 5 psi increments) mounted downstream of discharge side isolation valve.

B. Supply water tank with meter or gauge to measure water quantities used during test.

PART 3 – EXECUTION

3.01 GENERAL

A. After completion of all pipe line section, the following procedure will be used to clean, sterilize and pressure test the pipeline. The pipeline shall be filled and flushed until all evidence of dirt or debris has been washed from the pipeline. The line shall then be refilled if necessary, introducing the chlorinating material. Each valved section shall then be brought up to test pressure and the leakage test performed. After all sections have been accepted, all valves shall be cleaned and the line left full of sterilizing water.

Water for disinfection and testing of water mains will be provided at the Contractor’s expense, as described in “Water for Construction”.

B. Quality Assurance. The Contractor shall take special care to keep the interior of the pipe clean during storing, handling, and laying operations in order to reduce the need for flushing to an absolute minimum. In addition, all open ends shall be tightly covered whenever unattended to prevent small animals and dirt from entering the pipeline after it is in place. Testing firm shall be a company specializing in testing and examining potable water systems and be approved by the State of Texas. Submit bacteriologist's signature and authority associated with testing.

C. Sterilization/Disinfection. Before acceptance for operation, each unit of completed water system shall be sterilized as specified below or as prescribed by Chapter 290 of TCEQ Rules and Regulations for Public Water Systems and AWWA Standard C-651. New mains shall be thoroughly disinfected and then flushed and sampled before being placed in service. Samples shall be collected for microbiological analysis to check the effectiveness of the disinfection procedure. Sampling shall be repeated if contamination persists. A minimum of one sample for each 1,000 feet of completed waterline will be required. The unit to be sterilized shall be thoroughly flushed with water until all entrained dirt and mud have been removed before introducing the chlorinating material. The Contractor shall provide all chlorination material for sterilization at his cost. The chlorinating material shall provide a dosage of not less than 50 parts per million and shall be introduce into the water line in an approved manner. The treated water shall be retained in the pipe long enough to destroy all nonspore-forming bacteria. Except where a shorter period is approved, the retention time shall be at least 25 hours after which the lines shall be flushed clean until the chlorine concentration in the water leaving the lines is no higher than that generally prevailing in the system, or less than 1 ppm. Chlorine solution with a higher residual may remain in the line, without flushing, if approved by the Owner or designated representative.
Procedure. During installation, the interior of all pipe, fittings and other accessories shall be kept as free as possible from dirt and foreign matter at all times. If, in the opinion of the Owner or its designated representative, the pipe contains dirt or foreign matter that could not be removed during the flushing operation, the interior of the pipe shall be cleaned and swabbed with a bactericidal solution. When pipe laying is not in progress, the open ends of pipe shall be sealed with watertight plugs. If water has accumulated in the trench, the seal shall remain in place until the trench water has been removed to such an extent that it will not enter the pipe.

After the completion of hydrostatic pressure tests and prior to disinfection, the pipeline shall be flushed, as thoroughly as possible with the water pressure and outlets available. If feasible, flushing rate should develop a velocity in the pipeline of at least 2.5 fps. The minimum quantity of water used for flushing shall be in excess of the storage capacity of the pipeline, to insure that clean water has traversed the entire length of the line.

After flushing has been completed to the point that all apparent dirt and foreign matter have been removed from the pipeline, calcium hypochlorite solution shall be injected into the pipeline as provided in AWWA Standard C-651.

Following chlorination, all treated water shall be flushed from the newly laid pipeline at its extremities until the replacement water throughout its length is proved by test to be: a) comparable in quality to the potable water served from the existing water supply system, or b) as approved by the public health authority having jurisdiction. Should the initial treatment fail to achieve the satisfactory quality described above, the original chlorination procedure shall be repeated until satisfactory results are obtained.

Contractor shall not discharge water used for disinfection purposes to any waterway or water course known to support fish or wildlife, if the water contains more than 4 ppm of chlorine. Dechlorination by methods acceptable to the Owner and/or its designated representative must be used if Contractor proposes discharge to waterways or water courses known to support fish or wildlife. Discharge to holding ponds so that evaporation or infiltration will occur, or use in obtaining optimum moisture content in trench backfill or embankments, or other approved discharge methods may be used in lieu of dechlorination.

Bacteriological report shall include, at minimum, the following information:

1. Date issued, project name, and testing laboratory name, address, and telephone number.
2. Time and date of water sample collection.
3. Name of person collecting samples.
4. Test locations.
5. Initial and 24 hour disinfectant residuals in ppm for each outlet tested.
6. Coliform bacteria test results for each outlet tested.

D. Hydrostatic Pressure and Leakage Testing. All valves and hydrants shall be checked for proper operation and pressure the pipe system shall be subjected to a hydrostatic pressure and leakage test. After completion of each valved section and following the filling and disinfection of the section, the system shall be subjected to this test. The meter, pressure gauges, pump, small piping and hose connections, and all labor necessary for conducting the test, shall be furnished by the Contractor.
After the section of pipeline has been filled, water shall be pumped into the section and the pressure raised to 150 psi. This test pressure shall be maintained for a period of at least two (2) hours. The water required to maintain this pressure shall be delivered into the pipe through the meter. The amount of water through the meter during the two-hour test period will be the total leakage. Should this leakage exceed the allowable amount, as specified herein, the Contractor shall make such repairs as may be required until the actual leakage, as determined by succeeding tests, is no greater than the allowable as determined by TCEQ Rules and Regulations for Public Water Systems Section §290.44(a)(5) or by the following formula, whichever is more stringent:

\[ L = \frac{S \times D \times (P^{1/2})}{133,200} \]

L = Allowable Leakage in gallons/hour

S = Length of pipe tested in feet

D = Nominal diameter of pipe in inches

P = Average test pressure during the test, in pounds per square inch, gage; determined by computing the weighted average of actual pressures on various portions of the section.

After all sections of the pipeline have been tested, as described above, all valves shall be closed and the line left filled with the water to be used for disinfection and testing. Under no circumstances will the Contractor be allowed to open/close existing valves on the existing potable water system.

END OF SECTION
DIVISION 3
SECTION 03200 – CEMENT STABILIZED BACKFILL

PART 1 GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work of this section.

1.02 DESCRIPTION OF WORK

A. This Section includes the following:

1. Flowable Fill.
2. “2-Sac” Cement Stabilized Backfill.

1.03 SUBMITTALS

A. Material Certificates: Provide copies of materials certificates signed by material producer and Contractor certifying that each material item complies with, or exceed specified requirements.

1.04 QUALITY ASSURANCE

A. Codes and Standards: Comply with the Texas Department of Transportation and County Department standard specifications, latest edition, and with local governing regulations if more stringent than herein specified.

PART 2 PRODUCTS

2.01 MATERIALS

A. Flowable Fill:

1. Shall consist of cement, graded limestone aggregate, water, and an air entraining admixture.
2. Must be of such consistency after it has cured, that it can be excavated with standard excavation power and/or hand equipment.
3. Not more than 125 lbs. or less than 75 lbs. of cement per cubic yard of flowable fill.
4. Twenty eight day compressive strength of test sample made in standard 6 x 12 concrete cylinder mold to be no more than 150 psi or less than 100 psi.
5. Ph shall be greater than 8.
6. No fly ash will be permitted.
7. Stable air content of 20 to 35 percent, admixture for maintaining stable air content shall be designed specifically for cement slurry.
8. Aggregate shall be graded screenings with 3/8” maximum size aggregate.
9. Slump shall be 8 inches.
10. Water cement ratio shall not exceed 2.5.

11. Field test must be submitted and approved by Engineer showing the designed mix meets the required properties.

12. Test excavations as directed by the Engineer shall be made to confirm that material can be excavated as described in 2 above. Material that does not comply shall be removed at no cost to the Owner.

B. “2-Sac” Cement Stabilized Backfill

1. Shall comply with Item 400.6 of the Texas Department of Transportation Standard Specifications for Construction of Highways, Streets and Bridges 2004, and El Paso City.

2. Shall consist of cement, graded limestone aggregate, water, and an air entraining admixture.

3. Must be of such consistency after it has cured, that it can be excavated with standard excavation power and/or hand equipment.

4. Shall consist of 188 lbs. of cement per cubic yard of cement stabilized backfill.

5. Twenty eight day compressive strength of test sample made in standard 6 x 12 concrete cylinder mold to be 400 psi.

6. Ph shall be greater than 8.

7. No fly ash will be permitted.

8. Stable air content of 20 to 35 percent, admixture for maintaining stable air content shall be designed specifically for cement slurry.

9. Aggregate shall be graded screenings with 3/8” maximum size aggregate.

10. Slump shall be 8 inches.

11. Water cement ratio shall not exceed 2.5.

12. Field test must be submitted and approved by Engineer showing the designed mix meets the required properties.

13. Test excavations as directed by the Engineer shall be made to confirm that material can be excavated as described in 2 above. Material that does not comply shall be removed at no cost to the owner.

PART 3 EXECUTION

3.01 CONSTRUCTION

A. Flowable fill shall be allowed to cure sufficiently to prevent displacement prior to placing fill or base course over the cement slurry. Flowable Fill must be of consistency during placement such that mix is highly flowable with no signs of segregation.
B. “2-Sac” Cement Stabilized Backfill shall be placed in accordance with Item 400.6 of the Texas Department of Transportation Standard Specifications for Construction of Highways, Streets and Bridges 2004, and El Paso City.

C. Equipment: All equipment necessary for the proper construction of this work shall be on the project, in first class working condition, and approved by the Engineer before construction is permitted to start.

END OF SECTION
PART 1  GENERAL

1.01  SCOPE

A. This section of the specifications covers all of the work required for constructing concrete structures, curbs, headers, sidewalks, driveways, manhole bases, cast-in-place manholes, and other miscellaneous work.

B. Concrete for this project shall conform to the requirements of this section. The Contractor shall furnish all materials, equipment, tools, labor, superintendence, and incidentals necessary to perform the work in accordance with the drawings and these specifications.

1.02  RELATED SECTIONS

A. Section 02510 – Hot Mix Asphaltic Concrete Pavement Type ‘C’

1.03  REFERENCES

A. ACI 301  Specifications for Structural Concrete for Buildings
B. ACI 304  Recommended Practice for Measuring, Mixing, Transporting and Placing Concrete
C. ASTM A185  Welded Steel Wire Fabric for Concrete Reinforcement
D. ASTM A497  Welded Deformed Steel Wire Fabric for Concrete Reinforcement
E. ASTM A615  Deformed and Plain Billet-Steel for Concrete Reinforcement
F. ASTM C33  Concrete Aggregates
G. ASTM C94  Ready Mix Concrete
H. ASTM C150  Portland Cement
I. ASTM C260  Air-Entraining Admixtures for Concrete
J. ASTM C309  Liquid Membrane-Forming Compounds for Curing Concrete
K. ASTM C494  Chemical Admixtures for Concrete
L. ASTM D1751  Preformed Expansion Joint Fillers for Concrete Paving and Structural Construction

1.04  SUBMITTALS FOR REVIEW

A. Section 01300 - Submittals: Procedures for submittals.
B. Product Data: Provide data on joint filler, admixtures and curing compounds.
C. Provide test reports and materials’ certification as required in referenced sections for concrete.
1.05 QUALITY ASSURANCE
   A. Perform work in accordance with ACI 301.
   B. Obtain cementitious materials from same source throughout.

1.06 REGULATORY REQUIREMENTS
   A. Conform to applicable standards for paving work on public property.

1.07 ENVIRONMENTAL REQUIREMENTS
   A. Do not place concrete when base surface temperature is less than 40 degrees F, or surface is wet or frozen.

PART 2 PRODUCTS

2.01 FORM MATERIALS
   A. Form Materials:
      1. Steel or other suitable material of size and strength to resist movement during concrete placement and to retain horizontal and vertical alignment until removal. Use straight forms, free of distortion and defects.
      2. Use flexible spring steel forms or laminated boards to form radius bends as required.
      3. Coat forms with a non-staining form release agent that will not discolor or deface of concrete.

2.02 REINFORCEMENT
   A. Reinforcing Steel: ASTM A615; 60 ksi yield grade; deformed billet steel bars; unfinished finish.
   B. Welded Steel Wire Fabric: Plain type, ASTM A185; in coiled rolls finish.
   C. Dowels: ASTM A615; 60 ksi yield grade, plain steel, unfinished finish.

2.03 CONCRETE MATERIALS
   A. Concrete Materials: As specified herein.

2.04 ACCESSORIES
   A. Curing Compound: ASTM C309, Type 1, Class A, White.
   B. Joint Materials: AASHTO M-33, ½” bituminous type preformed joint filler.

2.05 CONCRETE MIX - BY PERFORMANCE CRITERIA
   A. Mix concrete in accordance with ACI 304. Deliver concrete in accordance with ASTM C94.
   B. Select proportions for normal weight concrete in accordance with ACI 301 Method 3.
   C. Provide Type I/II concrete to the following criteria:
      1. Compressive Strength: 3,000 psi @ 28 days.
2. Slump: 4 inches (± 1).
3. Minimum Water/Cement Ratio: 0.45.
4. Air Entrained: 4.5 percent (± 1.5%).

D. Provide Type I/II Concrete to the following criteria:
   1. Compressive Strength: 3,500 psi and 4,000 psi @ 28 days.
   2. Slump: 4 inches (± 1).
   3. Minimum Water/Cement Ratio: 0.45.
   5. Air Entrained: 4.5 percent (± 1.5%).

E. Use accelerating admixtures in cold weather only when approved by Engineer. Use of admixtures will not relax cold weather placement requirements.

F. Use calcium chloride only when approved by Engineer.

G. Use set retarding admixtures during hot weather only when approved by Engineer.

2.06 SOURCE QUALITY CONTROL AND TESTS
A. Provide mix design for concrete to the Engineer for approval prior to placing any concrete.
B. Submit proposed mix design to the Engineer for review and approval prior to commencement of work.
C. Tests on cement and aggregates will be performed to ensure conformance with specified requirements.
D. Test samples in accordance with ACI 301.

PART 3 EXECUTION

3.01 EXAMINATION
A. Verify compacted subgrade is acceptable and ready to support paving and imposed loads.
B. Verify gradients and elevations of base are correct.

3.02 PREPARATION
A. Moisten base to minimize absorption of water from fresh concrete.
B. Notify Engineer minimum 24 hours prior to commencement of concreting operations.

3.03 FORMING
A. Place and secure forms to correct location, dimension, profile, and gradient.
B. Assemble formwork to permit easy stripping and dismantling without damaging concrete.
C. Place joint filler vertical in position, in straight lines. Secure to formwork during concrete placement.

D. Clean forms after each use and coat with form releasing agent as required to ensure separation from concrete without damage.

3.04 REINFORCEMENT

A. Interrupt reinforcement at expansion joints.

B. Place dowels and reinforcement to achieve pavement and curb alignment as detailed.

C. Provide doweled joints 12 inch oc at transverse joints and interruptions of concrete.

3.05 PLACING CONCRETE

A. Place concrete by methods that prevent segregation of mix. Consolidate concrete along face of forms and adjacent to transverse joints with internal vibrator. Keep vibrator away from joint assemblies, reinforcement, or side forms. Use only square-faced shovels for hand spreading and consolidation. Consolidate with care to prevent dislocation of reinforcing, dowels and joint devices.

B. Use bonding agent at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.

C. Ensure reinforcement, inserts, embedded parts, formed joints are not disturbed during concrete placement.

D. Place concrete continuously over the full width of the panel and between predetermined construction joints.

E. Deposit and spread concrete in a continuous operation between transverse joints as far as possible. If interrupted for more than ½ hour, place a construction joint.

F. Curb and Gutter: Automatic machines may be used for curb and gutter placement at the Contractor’s option. If machine placement is to be used, submit revised mix design and laboratory test results that meet or exceed the minimums specified. Machine placement must produce curbs and gutters to required cross sections, lines, grades, finish, and jointing as specified for formed concrete. If results are not acceptable, the Contractor will be required to remove and replace with formed concrete, as specified, at the Contractor’s expense.

3.06 JOINTS

A. Expansion Joints

1. Place expansion joints at 20 foot intervals. Align curb, gutter, and sidewalk joints.

2. Place joint filler between paving components and building or other appurtenances. Recess top of filler 1/4 inch for sealant placement.

3. Provide scored joints at 5 feet intervals between sidewalks.

4. Provide keyed joints as indicated.

5. Provide premolded joint filler for expansion joints abutting concrete curbs, structures, walks and other fixed objects, unless otherwise indicated.
6. Furnish joint fillers in one piece lengths for full width being placed wherever possible. When more than one length is required, or clip joint filler sections together.

7. Protect top edge of joint filler during concrete placement with a metal cap or other temporary materials.

8. Remove protection after concrete has been placed on both sides of joint.

B. Construction Joints

1. Place construction joints at and of placements and at locations where placement operations are stopped for more than ½ hour.

2. Where load transfer-slip dowel devices are used, install so that one end of each dowel bar is free to move.

C. Fillers and Sealants

1. Where joints in concrete construction are shown to be sealed, the joint sealing compound shall be a cold-applied two-component poly-sulfide sealant.

2. The handling, mixing, and placing of the material and preparation of the joint prior to sealing shall be in strict accordance with the recommendations of the manufacturer.

3. A two component epoxy primer compatible with the sealer shall be used in all joints.

4. Provide joint sealers and other related materials that are compatible with one another and with joint substrates.

3.07 FINISHING

A. Area Paving: Rake finish or as directed by the El Paso County.

B. Sidewalk Paving: Light broom, radius to 1/2 inch radius, and trowel joint edges.

C. Curbs and Gutters: Light broom.

D. Direction of Texturing: Transverse to pavement direction.

E. Inclined Vehicular Ramps: Broomed perpendicular to slope.

F. Place curing compound on exposed concrete surfaces immediately after finishing. Apply in accordance with manufacturer’s instructions.

3.08 CURING AND PROTECTION

A. Immediately after placement, protect concrete from premature drying, excessively hot or cold temperatures, and mechanical injury.

B. Maintain concrete with minimal moisture loss at relatively constant temperature for period necessary for hydration of cement and hardening of concrete.

C. Cure floor surfaces in accordance with ACI 308.

D. Ponding: Maintain 100 percent coverage of water over slab areas continuously for 4 days.

E. Spraying: Spray water over floor slab areas and maintain wet for 7 days.
3.09 TOLERANCES
   A. Maximum Variation of Surface Flatness: 1/4 inch in 10 ft.
   B. Maximum Variation From True Position: 1/4 inch.

3.10 PATCHING
   A. Allow Engineer to inspect concrete surfaces immediately upon removal of forms.
   B. Excessive honeycomb or embedded debris in concrete is not acceptable. Notify Engineer upon discovery.
   C. Patch imperfections as directed.

3.11 DEFECTIVE CONCRETE
   A. Defective Concrete: Concrete not conforming to required lines, details, dimensions, tolerances or specified requirements.
   B. Repair or replacement of defective concrete will be determined by the Engineer.
   C. Do not patch, fill, touch-up, repair, or replace exposed concrete except upon express direction of Engineer for each individual area.

3.12 FIELD QUALITY CONTROL
   A. Three concrete test cylinders will be taken for every 50 or less cubic yards of concrete placed each day.
   B. One additional test cylinder will be taken during cold weather and cured on site under same conditions as concrete it represents.
   C. One slump test will be taken for each set of test cylinders taken.
   D. Maintain records of placed concrete items. Record date, location of pour, quantity, air temperature, and test samples taken.

3.13 PROTECTION
   A. Immediately after placement, protect pavement from premature drying, excessive hot or cold temperatures, and mechanical injury.
   B. Do not permit pedestrian and vehicular traffic over pavement until 75 percent design strength of concrete has been achieved.

END OF SECTION
SECTION 03610 – FLOWABLE FILL

PART 1 GENERAL

1.01 DEFINITION

Flowable Fill, also known as Controlled Low Strength Material (CLSM), Controlled Density Fill (CDF), 2-Sack or 2-Sack Grout, Flowcrete, Liquid Dirt, and various other trademark names is a self-compacting, self-leveling cementitious backfill material that is used in lieu of compacted soil fill material. Flowable Fill should not be considered as, or tested like, a type of low strength concrete. Applications of Flowable Fill under this specification are considered “excavatable” and require 28 day strengths less than 200 psi. Upon curing, Flowable Fill has the properties of high quality, well compacted, load bearing soil.

1.02 DESCRIPTION

Furnish and place Flowable Fill as backfill for trench, foundation, hole, tank pipeline abandonment, or void filling. The material may also be used where long flowable horizontal movements are required such as pipe filling, annular rings, in jacked pipes, and difficult to access areas requiring long lateral placements.

1.03 SAMPLING

Sampling of Flowable Fill will be in accordance with ASTM D5971.

PART 2 MATERIALS

2.01 CEMENT

Cement shall conform to ASTM C150 Type II, or Type I/II.

2.01.1 Source Approval and Acceptance

Lower Valley Water District (LVWD) will accept Portland cement based on certification of the approved sources and satisfactory test results from verification samples. The following information shall be included in the request for source approval:

1. Supplier or company
2. Cement plant location
3. Storage facility type and capacity
4. Average and maximum production capabilities
5. Production procedures
6. In-house Quality Control Program information:

6.1. Routine sampling and testing frequency;

6.2. Documentation that the laboratory responsible for the certified ASTM C150, ASTM C595, and ASTM C1157 test results is currently participating in the Cement and Concrete Reference Laboratory (CCRL) proficiency sample and pozzolan inspection programs;
6.3. A copy of the Laboratory’s letter authorizing CCRL to send copies of the CCRL inspection programs and proficiency result reports directly to LVWD;

6.4. Documentation that measures have been taken to assure that the Supplier keeps unacceptable cement separated from acceptable cement.

7. Copies of Quality Control program test reports for the previous six (6) months.

2.02 FLY ASH

Use fly ash that will comply with the physical and chemical requirements of ASTM C618, Class F. Fly ash may be used to increase flowability and/or pumpability. Type C fly ash or high lime fly ash is not to be used as it tends to increase the long-term strength and may, with time, cause the mix to become unexcavatable. The use of fly ash is not required in the mix design.

2.02.1 Source Approval and Acceptance

Documentation concerning test results shall be supplied to LVWD for acceptance. The request for approval of the fly ash source shall include:

1. Supplier or company
2. Source Power plant location
3. Coal type and origin
4. Combustion process
5. Storage facility type and capacity
6. Production procedures
7. In-house Quality Control Program information:
   7.1. Routine sampling and testing frequency;
   7.2. Documentation that the laboratory responsible for the certified ASTM C618 test results is currently participating in the CCRL proficiency sample and pozzolan inspection programs;
   7.3. A copy of the Laboratory’s letter authorizing CCRL to send copies of the CCRL inspection programs and proficiency result reports directly LVWD;
   7.4. Documentation that measures have been taken to assure that the Supplier keeps unacceptable fly ash separated from acceptable fly ash.

8. Copies of Quality Control program test reports for the previous six (6) months.
2.03 Aggregate

Provide a mixture of aggregate with a uniform gradation range in accordance with Table 2.3.1, “Aggregate Mixture Gradation Requirements”. Test aggregates in accordance with ASTM C117 and ASTM C136.

<table>
<thead>
<tr>
<th>Sieve Size</th>
<th>Percent Passing</th>
</tr>
</thead>
<tbody>
<tr>
<td>½”</td>
<td>100</td>
</tr>
<tr>
<td>#4</td>
<td>80-100</td>
</tr>
<tr>
<td>#200</td>
<td>0-30</td>
</tr>
</tbody>
</table>

The Plasticity Index (PI) shall not exceed six (6) when tested in accordance with ASTM 4318.

2.04 Mixing Water

Mixing water from potable water supplies approved by a public health department may be used without further testing. The producer shall provide test data of water samples from other sources. To determine chemical properties, use a laboratory accredited by the National Environmental Laboratory or Construction Engineering Council Accreditation Program.

2.4.1 Non-Potable Water Testing

Water to be used as mixing water from non-potable sources such as recycled water, reclaimed water, water from open bodies, and water taken from untreated wells, whether used individually or in combination, shall be tested before use and shall not exceed the limits in Table 2.4.1.1:

<table>
<thead>
<tr>
<th>Chemical Test</th>
<th>Limits</th>
<th>ASTM Test Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Solids by Mass</td>
<td>50,000 ppm</td>
<td>C1603</td>
</tr>
<tr>
<td>Chloride as Cl⁻ (ppm)</td>
<td>1,000 ppm</td>
<td>C114</td>
</tr>
<tr>
<td>Sulfate as SO₄²⁻ (ppm)</td>
<td>3,000 ppm</td>
<td>C114</td>
</tr>
<tr>
<td>Alkalis as Na₂O + 0.658 (K₂) (ppm)</td>
<td>600 ppm</td>
<td>C114</td>
</tr>
</tbody>
</table>

2.05 Chemical Admixtures

The Flowable Fill producer may use any admixtures meeting the requirements identified below in their mix designs, as they may require, to provide the desired product properties. Air-entraining admixtures may be added to the mix to increase flowability and/or reduce strength. Other specialty admixtures may also be used to increase flowability, reduce shrinkage, and reduce segregation by maintaining solids in suspension, or accelerate set and curing times as required. Use and proportion all admixtures in accordance with the manufacturer’s recommendations.

Water reducing admixtures may be used; however, where it is demonstrated that any admixture can increase the strength of the mix over time, it shall not be used. The use of calcium chloride is allowable provided the flowable fill will not contact metallic materials such as reinforcing, conduits, piping, or any other element that may be affected by the potential for corrosion. Calcium chloride may be introduced when fully dissolved in the mixing water or when in a liquid form. Calcium chloride shall meet the criteria set forth in ASTM D98 as well as a Type C Additive in accordance with ASTM C494. Mix designs utilizing calcium chloride shall be submitted for approval that demonstrates rapid set time and that it will not reach a strength greater than the maximum 28-day requirement.
Air entraining admixtures shall meet the requirements of ASTM C260 – Standard Specification for Air
Entraining Admixtures for Concrete.

All other concrete chemical admixtures shall meet the requirements of ASTM C494 – Standard
Specification for Chemical Admixtures for Concrete.

PART 3 MIX DESIGN REQUIREMENTS

3.01 General

The following are general physical properties of the mix design. Mix designs submitted by the supplier
may vary somewhat depending on the application required for various projects. Multiple mix designs
may be required to satisfy the needs for any given project.

3.02 Physical Property Requirements

Unless otherwise shown on the plans, furnish a mix design meeting the following requirements:

<table>
<thead>
<tr>
<th>Property</th>
<th>Excavatable</th>
<th>Test Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>28-day Compressive Strength, (psi)</td>
<td>60 – 200</td>
<td>ASTM D4832</td>
</tr>
<tr>
<td>Flow Consistency, (in)</td>
<td>8 – 11</td>
<td>ASTM D6103*</td>
</tr>
<tr>
<td>Unit Weight, (pcf)</td>
<td>90 – 125</td>
<td>ASTM D6023</td>
</tr>
<tr>
<td>Air Content (%&lt;30</td>
<td></td>
<td>ASTM D6023</td>
</tr>
</tbody>
</table>

*Withdrawn Standard

Mix designs will be referred to based on flowability using the flow consistency as determined using
ASTM D6103.

<table>
<thead>
<tr>
<th>Classification</th>
<th>Flow Consistency (in)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low Flowability</td>
<td>6 Maximum</td>
</tr>
<tr>
<td>Normal Flowability</td>
<td>6 – 8</td>
</tr>
<tr>
<td>High Flowability</td>
<td>8 Minimum</td>
</tr>
</tbody>
</table>

PART 4 CONSTRUCTION

4.01 General

Mix the Flowable Fill using a central-mixed concrete plant, ready-mix concrete truck, pug mill, or, other
approved method. Documentation in the form of a "Batch Ticket" showing the supplier name, batch
time, mix design identification, materials, batch scale weights, water volume, additives and amounts
and any other information necessary to convey that the delivered product meets the requirements of
the proportions required in the approved mix design.

Submit a mix design to LVWD for approval.

4.02 Placement

When required by LVWD submit for approval a construction method, plan, means of filling the entire
void volume, and method of demonstration the void area is filled.
Filling below pipe annulus may be demonstrated by placing the pipe on sand bags then placing Flowable fill on one side of the pipe and allowing the fill to flow beneath the pipe so that it may be observed on the other side. All pipe should be secured to prevent displacement during the flowable fill placement.

Flowable Fill may be placed using chutes, pump, or buckets to its final location. The contractor is responsible for assuring the delivery and placement method and equipment is adequate for the application.

Contractor, at their expense, shall assure the prevention of movement, or flotation, of any inserted or backfilled structure, pipe, or other appurtenances from their designated location. This may be accomplished by using adequate tie-down structures or devices, or, by limiting the lift thickness of the Flowable Fill to prevent the fluid material from lifting (or floating) the pipe or other structure until the Flowable Fill has hardened.

Because the Flowable Fill generates significant hydraulic loads when fluid, individual lift thicknesses that will load structures or pipe should be limited to four (4) feet unless pipe loading calculations indicate more loading can be applied without damage.

Curing time prior to the addition of additional lifts should be a minimum of eight (8) hours. Cure time prior to placement of other structural elements should be a minimum of twenty (24) hours.

4.03 Addition of Water

Water may be added one time on the site to bring the flow consistency to that required to achieve the needed flowability for the application as long as there is no evidence of segregation of the mix components. If there is evidence of segregation, as evidenced visually by separation of aggregate from the cement paste matrix, the mix shall not be placed. The contractor shall take sole responsibility for performance of the Flowable Fill if water is added on the site, unless specifically directed to do so by the project inspector.

Flowable Fill shall not be placed in areas containing standing water such that the water can mix or be blended with the Flowable Fill material.

4.04 Temperature Requirements

Flowable Fill does not require curing like concrete, but should be protected from freezing until it has hardened. Ambient air temperature must remain above 40°F (4°C) when placing Flowable Fill. The temperature of the flowable fill shall not be less than 50°F (10°C) at the time of placement. Flowable Fill must not be placed such that the material is in contact with frozen ground, nor, should the Flowable Fill be placed in areas containing frozen material. If the Flowable Fill will be exposed to freezing temperatures during the first twenty-four (24) hours after placement, it should be protected from freezing using concrete blankets, or, after the initial set a minimum of twelve (12) inches of moist soil cover.

PART 5 QUALITY

5.01 General

"Flowable Fill" placement shall be witnessed by the Owner’s designated representative (Project Inspector).

All testing of Flowable Fill will be authorized by the Owner’s representative in advance of the placement. Need for testing will be determined by the Owner. Material testing performed by the Owner’s Laboratory of Record for the project will determine compliance with project specifications.
Material testing frequency may be determined based on Table 5.1.1; however, the project inspector shall have the authority to increase, reduce, or eliminate testing as the project needs dictate.

Table 5.1.1

<table>
<thead>
<tr>
<th>Property</th>
<th>Test Method</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>28-day Compressive Strength, (psi)</td>
<td>ASTM D4832</td>
<td>**1 set/50yd³ or portion thereof</td>
</tr>
<tr>
<td>Flow Consistency, (in)</td>
<td>ASTM D6103*</td>
<td>**1 per 50yd³ or portion thereof</td>
</tr>
<tr>
<td>Unit Weight, (pcf)</td>
<td>ASTM D6023</td>
<td>**1 per 100yd³ or portion thereof</td>
</tr>
<tr>
<td>Air Content, (%)</td>
<td>ASTM D6023</td>
<td>**1 per 50yd³ or portion thereof</td>
</tr>
<tr>
<td>Temperature (F)</td>
<td>ASTM C1064</td>
<td>**1 per 50yd³ or portion thereof</td>
</tr>
</tbody>
</table>

*Withdrawn Standard
**Or As Requested by Owner

Quality assurance may be subject to City or Governmental Agency regulations and standards.

5.02 Non-Compliance

At the option of the owner, Flowable Fill material may be required to be removed at the contractor’s expense if it is found to be non-compliant with the requirements of the contract documents.

PART 6 MEASUREMENT

“Flowable Fill” will be measured by the cubic yard of material placed. Measurement will not include additional volume caused by slips, slides, cave-ins, and or form failures resulting from the Contractor’s operations.

PART 7 PAYMENT

The work performed and materials furnished in accordance with this item and measured as provided under Section 6.0 “Measurement” will be paid for at the unit price bid for “Flowable Fill”. This price is full compensation for furnishing, hauling, and placing materials and for equipment, tools, labor, and incidentals.

END OF SECTION