MPUD

CONTRACT DOCUMENTS

AND

TECHNICAL SPECIFICATIONS

FOR

THE CONSTRUCTION OF THE

SEWER PUMP STATION RELOCATION PROJECT

MPUD PROJECT NO. 24-01

STATE FUNDING AGREEMENT NO. D2201022
STATE PROJECT NO. C-06-8426-110

Prepared by
Dave Harden, P.E.

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September 2024

SEWER PUMP STATION RELOCATION PROJECT

CONTRACT DOCUMENTS

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MARKLEEVILLE PUBLIC UTILITY DISTRICT
MARKLEEVILLE, CALIFORNIA
SEWER PUMP STATION RELOCATION PROJECT

ADVERTISEMENT FOR BIDS

Separate sealed Bids for the construction of the **SEWER PUMP STATION RELOCATION PROJECT** will be received by **Markleeville Public Utility District** at the Alpine Watershed Group, 50 Diamond Valley Rd., Markleeville, CA 96120, until **1:00 p.m.** local time on **Wednesday, November 6, 2024**, at which time the Bids received will be publicly opened and read. Mailed bids may be sent to the **Markleeville Public Utility District** at P.O. Box 222 Markleeville, CA 96120. It is the Contractor's responsibility to mail bids in a timely manner so they are received in the District mailbox prior to the time of bid opening.

The Project consists of removing and abandoning an existing sewer pump station and installing a new sewer pump station including all site improvements, electrical, and piping work required to tie the sewer pump station into the existing sewer system.

Bids will be received for a single prime Contract. Bids shall be on a lump sum and unit price basis as indicated in the Bid Form.

Prospective bidders may obtain copies of the Bidding Documents through the following sources and their respective online platforms:

- Valley Contractor's Exchange: https://vceonline.com/virtual-plan-room/
- CIP List: https://www.ciplist.com/
- Valley Builder's Exchange (VBE): https://www.valleybx.com/
- Sierra Contractors Source: https://www.scsplanroom.com/

Neither Owner nor Engineer will be responsible for full or partial sets of Bidding Documents, including Addenda if any, obtained from sources other than those described above.

Bidders are notified that financing for this project is provided by the State Water Board's Clean Water State Revolving Fund. The program, including this project, is financed by the Bipartisan Infrastructure Law of 2021. Bidders are required to comply with all provisions set forth by the project financing.

Prospective Bidders shall be licensed Contractors in the State of California and shall be skilled and regularly engaged in the general class or type of work called for under the Contract. Each Bidder shall have a Class A – General Engineering California Contractor's license.

This is a Public Works Project. Pursuant to CA Labor Code 1771 for contracts over $1,000.00 prevailing wage requirements are enforced. Markleeville Public Utility District is required to enforce a state approved labor compliance program. CA Labor Code requires that all contractors and subcontractors working on this project keep certified payroll records in accordance with Labor Code 1776. Pursuant to SB 854 (effective June 20, 2014), all contractors must be registered with the State in order to bid or work on a public works project.

In accordance with the Davis-Bacon and Related Acts for contracts exceeding $100,000 under EPA grants, the requirements and overtime provisions of the Contract Work Hours and Safety Standards Act (40 U.S.C. §§ 3702 and 3704) apply. These are supplemented by the Department of Labor regulations outlined in 29 CFR Part 5 and 2 CFR 200 Appendix II(E).

In accordance with the provisions of section 1720 et seq. of the Labor Code, the Division of Labor Standards and Research has determined the general prevailing rates or wages and employer payments for health and welfare, pension, vacation, travel time, and subsistence pay

as provided for in section 1773.8. The prevailing wage sheets can be found online at https://www.dir.ca.gov/OPRL/DPreWageDetermination.htm.

It shall be mandatory upon the Contractor herein and upon any Subcontractor to pay not less than the said specified rates to all laborers, workers and mechanics employed by them in the execution of the Agreement pursuant to CA Labor Code 1774, including owner operators.

Attention is directed to the provisions in section 1777.5 and sections 1777.6 of the Labor Code concerning the requirement to employ apprentices by the Contractor or any Subcontractor under it. Please refer to Section 230.1 of Article 10 of Subchapter One of Chapter 2 of Title 8 of the California Code of Regulations for requirements.

An optional pre-bid meeting will be held at **11:00 a.m.** local time on **Friday, October 11, 2024,** at Heritage Park and Nature Area, 14601 Alpine State Hwy, Markleeville, CA 96120.

Owner: Markleeville Public Utility District

By: Dave Harden, PE

Title: Project Engineer

Date: September 19, 2024

END OF ADVERTISEMENT FOR BIDS

MARKLEEVILLE PULIC UTILITY DISTRICT
MARKLEEVILLE, CALIFORNIA
SEWER PUMP STATION RELOCATION PROJECT

INSTRUCTIONS TO BIDDERS

TABLE OF ARTICLES

ARTICLE 1: DEFINED TERMS

1.01 Terms used in these instructions to bidders have the meanings indicated in the general conditions and supplemental conditions.

ARTICLE 2: COPIES OF BIDDING DOCUMENTS

2.01 Complete sets of the bidding documents may be obtained digitally in the locations set forth in the advertisement for bids. Bid documents will only be made available digitally; print copies may be prepared by bidders at their own expense.

2.02 Complete sets of bidding documents shall be used in preparing bids; neither owner nor engineer assumes any responsibility for errors or misinterpretations resulting from the use of incomplete sets of bidding documents.

2.03 Owner and engineer, in making copies of bidding documents available on the above terms, do so only for the purpose of obtaining bids for the work and do not confer a license or grant for any other use.

ARTICLE 3: QUALIFICATIONS OF BIDDERS

3.01 To demonstrate Bidder's qualifications to perform the Work, within five days of Owner's request, Bidder shall submit written evidence such as financial data, previous experience, present commitments, and such other data as may be called for below.

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

B. Bidder's State or other contractor license number, if applicable.

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

D. Other required information regarding qualifications.

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

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

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

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

4.01 Subsurface and Physical Conditions

A. A geotechnical investigation, dated January 2021, was prepared by Geocon

Consultants for this project. See Appendix A of these Specifications.

4.02 Underground Facilities

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

4.03 Hazardous Environmental Condition

A. No reports and drawings of hazardous environmental conditions at or contiguous to the Site are known to the Owner or Engineer. The Contractor shall comply with the General and Supplemental Conditions if hazardous environmental conditions are identified during construction.

4.04 Provisions concerning responsibilities for the adequacy of data furnished to prospective Bidders with respect to subsurface conditions, other physical conditions and Underground Facilities, and possible changes in the Bidding Documents due to differing or unanticipated conditions appear in Paragraphs 5.03, 5.04, and 5.05 of the General Conditions. Provisions concerning responsibilities for the adequacy of data furnished to prospective Bidders with respect to a Hazardous Environmental Condition at the Site, if any, and possible changes in the Contract Documents due to any Hazardous Environmental Condition uncovered or revealed at the Site which was not shown or indicated in the Drawings or Specifications or identified in the Contract Documents to be within the scope of the Work appear in Paragraph 5.06 of the General Conditions.

4.05 On request, Owner will provide Bidder access to the Site to conduct such examinations, investigations, explorations, tests, and studies as Bidder deems necessary for submission of a Bid. Bidder shall fill all holes and clean up and restore the Site to its former condition upon completion of such explorations, investigations, tests, and studies. Bidder shall comply with all applicable Laws and Regulations relative to locating of excavation and utility.

4.06 Additional Owner Provided Information

A. Reference is made to the Supplementary Conditions for the identification of the general nature of other work that is to be performed at the Site by Owner or others (such as Utility and other prime contractors) that relates to the Work contemplated by these Bidding Documents. On request, Owner will provide to each Bidder for examination access to or copies of Contract Documents (other than portions thereof related to price) for such other work.

B. Paragraph 9.12.B of the General Conditions states that if an Owner Safety program exists it will be noted in the Supplementary Conditions.

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

A. Examine and carefully study the Bidding Documents, the other related data identified in the Bidding Documents, and any Addenda;

B. Visit the Site and become familiar with and satisfy Bidder as to the general, local, and Site conditions that may affect cost, progress, and performance of the Work;

C. Become familiar with and satisfy Bidder as to all Federal, State, and local Laws and Regulations that may affect cost, progress, and performance of the Work;

D. Carefully study all: (1) reports of explorations and tests of subsurface conditions at or contiguous to the Site and all drawings of physical conditions in or relating to existing surface or subsurface structures at or contiguous to the Site (except Underground Facilities) which have been identified in the Supplementary Conditions as provided in Paragraph 5.03 of the General Conditions, and (2) reports and drawings of Hazardous Environmental Conditions at the Site which have been identified in the Supplementary Conditions as provided in Paragraph 5.06 of the General Conditions;

E. Obtain and carefully study (or accept consequences of not doing so) all additional or supplementary examinations, investigations, explorations, tests, studies, and data concerning conditions (surface, subsurface, and Underground Facilities) at or contiguous to the Site which may affect cost, progress, or performance of the Work or which relate to any aspect of the means, methods, techniques, sequences, and procedures of construction to be employed by Bidder, including applying any specific means, methods, techniques, sequences, and procedures of construction expressly required by the Bidding Documents, and safety precautions and programs incident thereto;

F. Agree at the time of submitting its Bid that no further examinations, investigations, explorations, tests, studies, or data are necessary for the determination of its Bid for performance of the Work at the price(s) bid and within the times and in accordance with the other terms and conditions of the Bidding Documents;

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

H. Correlate the information known to Bidder, information and observations obtained from visits to the Site, reports and drawings identified in the Bidding Documents, and all additional examinations, investigations, explorations, tests, studies, and data with the Bidding Documents;

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

J. Determine that the Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for the performance of the Work.

4.08 The submission of a Bid will constitute an incontrovertible representation by Bidder that Bidder has complied with every requirement of this Article 4, that without exception the Bid is premised upon performing and furnishing the Work required by the Bidding Documents and applying any specific means, methods, techniques sequences, and procedures of construction that may be shown or indicated or expressly required by the Bidding Documents, that Bidder has given Engineer written

notice of all conflicts, errors, ambiguities, and discrepancies that Bidder has discovered in the Bidding Documents and the written resolutions thereof by Engineer are acceptable to Bidder, and that the Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performing and furnishing the Work.

ARTICLE 5: PRE-BID CONFERENCE

5.01 An optional pre-bid conference will be held at 11:00 a.m. local time on Friday, October 11, 2024 at Heritage Park and Nature Area, 14601 Alpine State Hwy, Markleeville, CA 96120. Representatives of Owner and Engineer will be present to discuss the Project. Bidders are not required to attend and participate in the conference. Engineer will transmit to all prospective Bidders of record such Addenda as Engineer considers necessary in response to questions arising at the conference. Oral statements may not be relied upon and will not be binding or legally effective.

ARTICLE 6: SITE AND OTHER AREAS

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

ARTICLE 7: INTERPRETATIONS AND ADDENDA

7.01 All questions about the meaning or intent of the Bidding Documents are to be submitted to Engineer in writing. Interpretations or clarifications considered necessary by Engineer in response to such questions will be issued by Addenda mailed or delivered to all parties recorded by Engineer as having received the Bidding Documents. Questions received after October 22, 2024, may not be answered. Only questions answered by Addenda will be binding. Oral and other interpretations or clarifications will be without legal effect.

7.02 Addenda may be issued to clarify, correct, or change the Bidding Documents as deemed advisable by Owner or Engineer. The final date for release of addendum will be October 25, 2024.

ARTICLE 8: BID SECURITY

8.01 A Bid must be accompanied by Bid security made payable to Owner in an amount of 10 percent of Bidder's maximum Bid price and in the form of a certified check or bank money order or a Bid bond (EJCDC No. C-430, 2013 Edition) issued by a surety meeting the requirements of Paragraphs 6.01 and 6.02 of the General Conditions.

8.02 The Bid security of the Successful Bidder will be retained until such Bidder has executed the Contract Documents, furnished the required contract security and met the other conditions of the Notice of Award, whereupon the Bid security will be returned. If the Successful Bidder fails to execute and deliver the Contract Documents and furnish the required contract security within 15 calendar 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 seven days after the Effective Date of the Agreement or 61 days after the Bid opening, whereupon Bid security furnished by such Bidders will be returned. However, the return of Bid security is contingent upon final budget approval from the funding authority.

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

ARTICLE 9: CONTRACT TIMES

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

ARTICLE 10: LIQUIDATED DAMAGES

10.01 Provisions for liquidated damages are set forth in the Agreement.

ARTICLE 11: SUBSTITUTE AND "OR-EQUAL" ITEMS

11.01 The Contract, if awarded, will be on the basis of materials and equipment specified or described in the Bidding Documents, or "or-equal" materials and equipment as described in paragraph 6.05 of the General Conditions, or those substitute materials and equipment approved by Engineer and identified by Addendum. The materials and equipment described in the Bidding Documents establish a standard of required type, function and quality to be met by any proposed substitute or "or-equal" item. Request for Engineer's clarification of materials and equipment considered "or-equal" prior to the Effective Date of Agreement must be received by the Engineer at least 5 days prior to the date for receipt of Bids or at any time after Bid Award. No item of material or equipment will be considered by Engineer as a substitute unless written request for approval has been submitted by Bidder and has been received by Engineer at least 15 days prior to the date for receipt of Bids. Each such request shall conform to the requirements of Paragraph 7.05 of the General Conditions. The burden of proof of the merit of the proposed item is upon Bidder. Engineer's decision of approval or disapproval of a proposed item will be final. If Engineer approves any proposed substitute item, such approval will be set forth in an Addendum issued to all prospective Bidders. Bidders shall not rely upon approvals made in any other manner.

ARTICLE 12: SUBCONTRACTORS, SUPPLIERS, AND OTHERS

12.01 If the Supplementary Conditions require the identity of certain Subcontractors, Suppliers, individuals, or entities to be submitted to Owner in advance of a specified date prior to the Effective Date of the Agreement, the apparent Successful Bidder, and any other Bidder so requested, shall within five days after Bid opening, submit to Owner a list of all such Subcontractors, Suppliers, individuals, or entities proposed for those portions of the Work for which such identification is required. Such list shall be accompanied by an experience statement with pertinent information regarding similar projects and other evidence of qualification for each such Subcontractor, Supplier, individual, or entity if requested by Owner. If Owner or Engineer, after due

investigation, has reasonable objection to any proposed Subcontractor, Supplier, individual, or entity, Owner may, before the Notice of Award is given, request apparent Successful Bidder to submit a substitute, without an increase in the Bid.

12.02 If apparent Successful Bidder declines to make any such substitution, Owner may award the Contract to the next lowest responsible Bidder that proposes to use acceptable Subcontractors, Suppliers, individuals, or entities. Declining to make requested substitutions will not constitute grounds for forfeiture of the Bid security of any Bidder. Any Subcontractor, Supplier, individual, or entity so listed and against which Owner or Engineer makes no written objection prior to the giving of the Notice of Award will be deemed acceptable to Owner and Engineer subject to revocation of such acceptance after the Effective Date of the Agreement as provided in Paragraph 7.06 of the General Conditions.

12.03 Contractor shall not be required to employ any Subcontractor, Supplier, individual, or entity against whom Contractor has reasonable objection.

12.04 The Contractor shall not award work to Subcontractor(s) in excess of the limits stated in SC 7.06.

ARTICLE 13: PREPARATION OF BID

13.01 The Bid Form is included with the Bidding Documents. Additional copies may be obtained from Engineer.

13.02 All blanks on the Bid Form shall be completed in ink and the Bid signed in ink. Erasures or alterations shall be initialed in ink by the person signing the Bid Form. A Bid price shall be indicated for each Bid item, alternative, and unit price item listed therein, or the words “No Bid,” “No Change,” or “Not Applicable” entered.

13.03 A Bid by a corporation shall be executed in the corporate name by the president or a vice-president or other corporate officer accompanied by evidence of authority to sign. The corporate seal shall be affixed and attested by the secretary or an assistant secretary. The corporate address and state of incorporation shall be provided on the Bid Form.

13.04 A Bid by a partnership shall be executed in the partnership name and signed by a partner (whose title must appear under the signature), accompanied by evidence of authority to sign. The official address of the partnership shall be provided on the Bid Form.

13.05 A Bid by a limited liability company shall be executed in the name of the firm by a member and accompanied by evidence of authority to sign. The state of formation of the firm and the official address of the firm shall be shown.

13.06 A Bid by an individual shall show the Bidder’s name and business address.

13.07 A Bid by a joint venture shall be executed by each joint venturer in the manner indicated on the Bid Form. The official address of the joint venture must be provided on the Bid Form.

13.08 A bid must include all components of the Six Good Faith Efforts as outlined in SC-18.12.A.4.

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

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

13.11 The postal and email addresses and telephone number for communications regarding the Bid shall be shown.

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

ARTICLE 14: BASIS OF BID; COMPARISON OF BIDS

14.01 Unit Price

A. Bidders shall submit a Bid on a unit price basis for each item of Work listed in the Bid schedule and for each alternate described in the Bidding Documents as provided for in the Bid Form.

B. The total of all bid prices will be the sum of the products of the estimated quantity of each item and the corresponding unit price. The final quantities and Contract Price will be determined in accordance with Paragraph 13.03 of the General Conditions.

C. Discrepancies between the multiplication of units of Work and unit prices will be resolved in favor of the unit prices. Discrepancies between the indicated sum of any column of figures and the correct sum thereof will be resolved in favor of the correct sum. Discrepancies between words and figures will be resolved in favor of the words.

ARTICLE 15: SUBMITTAL OF BID

15.01 With each copy of the Bidding Documents, a Bidder is furnished one separate unbound copy of the Bid Form, and the Bid Bond Form. The unbound copy of the Bid Form is to be completed and submitted with all of the attachments outlined in Article 7 of the Bid Form.

15.02 A Bid shall be submitted no later than the date and time prescribed and at the place indicated in the Advertisement for Bids and shall be enclosed in an opaque sealed envelope plainly marked with the Project title (and, if applicable, the designated portion of the Project for which the Bid is submitted), the name and address of Bidder, and shall be accompanied by the Bid security and other required documents. If a Bid is sent by mail or other delivery system, the sealed envelope containing the Bid shall be enclosed in a separate envelope plainly marked on the outside with the notation "BID ENCLOSED." When using the mail or other delivery system, the Bidder is totally

responsible for the mail or other delivery system delivering the Bid at the place and prior to the time indicated in the Advertisement for Bid. Bids shall be mailed and shall be addressed to Markleeville Public Utility District, P.O. Box 222, Markleeville, CA 96120.

ARTICLE 16: MODIFICATION AND WITHDRAWAL OF BID

16.01 A Bid 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 prior to the date and time for the opening of Bids.

16.02 If within 24 hours after Bids are opened, any Bidder files a duly signed written notice with Owner and promptly thereafter demonstrates to the reasonable satisfaction of Owner that there was a material and substantial mistake in the preparation of its Bid, that Bidder may withdraw its Bid, and the Bid security will be returned. Thereafter, if the Work is rebid or negotiated, that Bidder will be disqualified from further bidding on the Work. This provision to withdraw a Bid without forfeiting the Bid security does not apply to Bidder's errors in judgment in preparing the Bid.

ARTICLE 17: OPENING OF BIDS

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

ARTICLE 18: BIDS TO REMAIN SUBJECT TO ACCEPTANCE

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

ARTICLE 19: EVALUATION OF BIDS AND AWARD OF CONTRACT

19.01 Owner reserves the right to reject any or all Bids, including without limitation, nonconforming, nonresponsive, unbalanced, or conditional Bids. Owner further reserves the right to reject the Bid of any Bidder whom it finds, after reasonable inquiry and evaluation, to be non-responsible. Owner also reserves the right to waive all informalities not involving price, time, or changes in the Work and to negotiate contract terms with the Successful Bidder.

19.02 More than one Bid for the same Work from an individual or entity under the same or different names will not be considered. Reasonable grounds for believing that any Bidder has an interest in more than one Bid for the Work may be cause for disqualification of that Bidder and the rejection of all Bids in which that Bidder has an interest.

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

19.04 In evaluating Bidders, Owner will consider the qualifications of Bidders and may consider the qualifications and experience of Subcontractors, Suppliers, and other individuals or entities proposed for those portions of the Work for which the identity of Subcontractors, Suppliers, and other individuals or entities must be submitted as provided in the Supplementary Conditions.

19.05 Owner may conduct such investigations as Owner deems necessary to establish the responsibility, qualifications, and financial ability of Bidders, proposed Subcontractors, Suppliers, individuals, or entities to perform the Work in accordance with the Contract Documents.

19.06 If the Contract is to be awarded, Owner will award the Contract, after final budget approval from the Water Board, to the responsible Bidder whose Bid, conforming with all the material terms and conditions of the Instructions to Bidders, is lowest, price and other factors considered. If detailed in the Bid Form, factors such as discounts, transportation costs, and life cycle costs may be used to determine which bidder, if any, is to be offered the award.

19.07 The bid documents include a Base Bid. The lowest bid shall be lowest total of the combined bid prices for the Base Bid.

ARTICLE 20: CONTRACT SECURITY AND INSURANCE

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

ARTICLE 21: SIGNING OF AGREEMENT

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

21.02 This Contract is expected to be funded with funds provided by the State Water Board's Clean Water State Revolving Fund, which is financed by the Bipartisan Infrastructure Law of 2021. Refer to the Supplementary Conditions for State Requirements.

ARTICLE 22: SALES AND USE TAXES

22.01 Contractor shall pay all sales, use and other taxes as specified in Paragraph 7.09 of the General Conditions.

ARTICLE 23: AGENCY REQUIREMENTS

23.01 Bidders are to base their bids on the project funding being provided in whole or in part by the State Water Board which will review and approve the contract award, contract

agreement, partial and final payments, and contract change orders.

23.02 Payment and retainage will comply with the contract agreement section 6.02 “Progress Payments; Retainage.” Bidders are notified that this contract does not permit retainage to be placed in escrow nor to be invested for the benefit of the contractor.

23.03 Bidders are notified of the requirement for affirmative action to ensure equal employment opportunity (Executive Order No. 11246) as set forth in the Equal Opportunity Requirements found in the Equal Employment Opportunity Certification.

ARTICLE 24: WORKERS’ COMPENSATION REQUIREMENTS

24.01 As required by Section 1860 of the California Labor Code and in accordance with the provisions of Section 3700 of the Labor Code, every contractor will be required to secure the payment of workers’ compensation to its employees.

24.02 In accordance with Section 1861 of the California Labor Code, the contractor shall furnish the owner with a statement as follows: “I am aware of the provisions of 3700 of the Labor Code which requires every employer to be insured against liability for worker’s compensation or to undertake self-insurance in accordance with the provisions of that code, and I will comply with such provisions before commencing the performance of the work of this contract.”

ARTICLE 25: WAGE RATE REQUIREMENTS

25.01 The prevailing wage rates of the State of California apply to this contract as do any requirements of the State of California associated with the use of these State Prevailing wages.

25.02 Prevailing Wages: Notice is hereby given that, pursuant to 1773 of the Labor Code of the State of California, the owner has obtained from the Director of the Department of Industrial Relations the general prevailing rate of per diem wages and the general prevailing rate for holidays and overtime work for each craft, classification, or type of worker required to execute the contract. A copy of said prevailing rate of per diem wages is on file in the principal office of the owner, to which reference is hereby made for further particulars. Said prevailing rate of per diem wages will be made available to any interested party upon request, and a copy thereof shall be posted at each job site.

25.03 Statutory Penalty For Failure to Pay Minimum Wages: In accordance with 1775 (a) through (c) of the California Labor Code, the contractor shall as a penalty to the State of political subdivision on whose behalf a contract is made or awarded, forfeit not more than two hundred dollars ($200.00) for each calendar day or portion thereof, for each worker paid less than the prevailing wage rates as determined by the director for the work or craft in which the worker is employed for any public work done under the contract by the contractor or, except as provided in subdivision 1775 (b), by any subcontractor under the contractor.

25.04 Statutory Penalty for Unauthorized Overtime Work: In accordance with Section 1813 of the California Labor Code, the contractor shall as a penalty to the State or political

subdivision on whose behalf the contract is made or awarded, forfeit twenty-five dollars ($25.00) for each worker employed in the execution of the contract by the respective contractor or subcontractor for each calendar day during which said worker is required or permitted to work more than 8 hours in any one calendar day and 40 hours in any one calendar week in violation of Sections 1810-1815 of the California Labor Code.

25.05 Apprenticeship Requirements: Contractor agrees to comply with Sections 1777.5, 1777.6 and 1777.7 of the California Labor Code relating to the employment of apprentices. The responsibility for compliance with these provisions is fixed with the prime contractor for all apprenticeship occupations. Under these sections of the law, contractors and subcontractors must employ apprentices in apprenticeship occupations, where journeymen in the craft are employed on the public work, in a ratio of not less than one apprentice hour for each five journeymen hours (unless an exemption is granted in accordance with 1777.5) and contractors and subcontractors shall not discriminate among otherwise qualified employees as indentured apprentices on any public work solely on the ground of race, religious creed, color, national origin, ancestry, sex, or age, except as provided in 3077 of the Labor Code. Only apprentices, as defined in 3077, which provides that an apprentice must be at least 16 years of age, who are in training under apprenticeship standards and who have signed written apprentice agreements will be employed on public works in apprenticeship occupations.

25.06 Payroll Records: Contractor shall keep accurate payroll records in format specified by the Division of Labor Standards Enforcement. Said information shall include, but not be limited to, a record of the name, address, social security number, work classification, straight time and overtime hours worked each day and week, and actual per diem wages paid to each journeyman, apprentice, or worker employed by the contractor. Copies of such record shall be made available for inspection at all reasonable hours, and a copy shall be made available to employee or his authorized representative, the Division of Labor Standards Enforcement, and the Division of Apprenticeship Standards in compliance with California Labor Code, Section 1776. Contractor and subcontractors shall furnish and submit electronic certified payrolls directly to the Labor Commissioner, and duplicate copies available to the owner.

ARTICLE 26: SUBCONTRACTOR LISTING LAW

26.01 In accordance with Section 4104 of the California Public Contract Code, each bidder, in his or her bid, shall set forth the name and the location of the place of business of each subcontractor who will perform work or labor or render service to the prime contractor in or about the construction of the work or improvement, or a subcontractor licensed by the State of California who, under subcontract to the prime contractor, specially fabricates and installs a portion of the work or improvement according to detailed drawings contained in the plans and specifications, in an amount in excess of one-half of one percent of the prime contractor's total bid.

26.02 In accordance with Section 4107 of the California Public Contract Code, no contractor whose bid is accepted shall without consent of the owner either: (a) substitute a person as a subcontractor in place of the subcontractor listed in the original bid; or (b) permit a subcontract to be voluntarily assigned or transferred or allow it to be performed by anyone other than the original subcontractor listed in the original bid; or

(c) sublet or subcontract any portion of the work in excess of one-half of one percent of the prime contractor's total bid as to which his or her original bid did not designate a subcontractor.

26.03 Penalties for failure to comply with the foregoing sections of the California Public Contract Code are set forth in Sections 4106, 4110, and 4111 of the Public Contract Code. A prime contractor violating this law violates his or her contract and the awarding authority may exercise the option, in its own discretion, of (1) canceling his or her contract or (2) assessing the prime contractor a penalty in an amount of not more than 10 percent of the amount of the subcontract involved, and this penalty shall be deposited in the fund out of which the prime contract is awarded. In any proceedings under this section the prime contractor shall be entitled to a public hearing and to five day's notice of the time and place thereof.

ARTICLE 27: REGISTRATION WITH DEPARTMENT OF INDUSTRIAL RELATIONS

27.01 This project is subject to compliance monitoring and enforcement by the Department of Industrial Relations. No contractor or subcontractor may be listed on a bid proposal for a public works project unless registered with the Department of Industrial Relations pursuant to Labor Code Section 1725.5 [with limited exceptions from this requirement for bid purposes only under Labor Code Section 1711.1(a)]. No contractor or subcontractor may be awarded a contract for public work on a public work on a public works project unless registered with the Department of Industrial Relations pursuant to Labor Code Section 1725.5.

ARTICLE 28: SAFETY OF OPEN EXCAVATIONS

28.01 Pursuant to the Provisions of the California Labor Code, Section 6707, each proposal submitted in response to this invitation shall contain as a bid item the cost of all works, materials, and labor of whatsoever kind, required in regard to providing adequate sheeting, shoring and bracing (or equivalent methods for protecting life and limb) which shall conform to all applicable safety requirements and orders in regard to the construction and installation of pipelines, boring and jacking pits, and all similar trenches, tunnels, and open excavations of any kind.

BID FORM

MAKRLEEVILLE PUBLIC UTILITY DISTRICT
MARKLEEVILLE, CALIFORNIA
SEWER PUMP STATION RELOCATION PROJECT

TABLE OF ARTICLES

ARTICLE 1: BID RECIPIENT

1.01 This bid is submitted to:

Markleeville Public Utility District
P.O. Box 222
Markleeville, CA 96120

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

ARTICLE 2: BIDDER'S ACKNOWLEDGEMENTS

2.01 Bidder accepts all of the terms and conditions of the instructions to bidders, including without limitation those dealing with the disposition of bid security. This bid will remain subject to acceptance for 90 days after the bid opening, or for such longer period of time that bidder may agree to in writing upon request of owner. The bid will remain subject to acceptance until final budget approval is granted by the California Water Board Department of Financial Assistance.

ARTICLE 3: BIDDER'S REPRESENTATIONS

3.01 In submitting this Bid, Bidder represents that:

A. Bidder has examined and carefully studied the Bidding Documents, the other related data identified in the Bidding Documents, and the following Addenda, receipt of which is hereby acknowledged.

Addendum No.	Addendum Date
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

B. Bidder has visited the Site and become familiar with and is satisfied as to the general, local and Site conditions that may affect cost, progress, and performance of the Work.

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

D. Bidder has carefully studied all: (1) reports of explorations and tests of subsurface conditions at or contiguous to the Site and all drawings of physical conditions in or relating to existing surface or subsurface structures at or contiguous to the Site (except Underground Facilities) which have been identified in Instruction to Bidders, Article 4, paragraph 4.01, and (2) reports and drawings of Hazardous Environmental Conditions, if any, at the Site that have been identified in

Instruction to Bidders, Article 4, paragraph 4.03, as containing reliable "technical data."

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

F. Based on the information and observations referred to in Paragraph 3.01.E above, Bidder does not consider that any further examinations, explorations, tests, studies, or data are necessary for the determination of this Bid for performance of the Work at the price(s) bid and within the times and in accordance with the other terms and conditions of the Bidding Documents.

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

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

I. The Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for the performance of the Work for which this Bid is submitted.

J. Bidder will submit written evidence of its authority to do business in the State or other jurisdiction where the Project is located not later than the date of its execution of the Agreement.

ARTICLE 4: BIDDER'S CERTIFICATION

4.01 Bidder further represents that:

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

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

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

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

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

ARTICLE 5: BASIS OF BID

5.01 Bidder will complete the work in accordance with the contract documents for the following price(s):

BASE BID

Item No.	Description	Unit	Estimated Quantity	Bid Unit Price	Bid Price
1	Mobilization & Demobilization	LS	1		
2	Traffic Control	LS	1		
3	Stormwater Pollution Prevention Plan	LS	1		
4	Sewer Bypass Pumping	LS	1		
5	Dewatering	LS	1		
6	Remove Existing Sanitary Sewer Facilities at Grade	LS	1		
7	Abandon Existing Pump Station	LS	1		
8	Sanitary Sewer Pump Station	LS	1		
9	Electrical	LS	1		
10	8'x10' Shed	LS	1		
11	Propane Piping	LS	1		
12	Abandon Sanitary Sewer Pipe	LF	470		
13	8-inch Sanitary Sewer Gravity Pipe (PVC)	LF	360		
14	3-inch Sanitary Sewer Force Main (HDPE)	LF	100		
15	4-inch Sanitary Sewer Force Main (HDPE)	LF	730		
16	Cured-In-Place-Pipe	LF	220		
17	Abandon 48-inch Sanitary Sewer Manhole	EA	2		
18	Remove 48-inch Sanitary Sewer Manhole	EA	3		
19	48-inch Sanitary Sewer Manhole	EA	2		
20	Solid Screen	EA	2		
21	1-inch Air Release Valve	EA	1		
22	4-inch Electromagnetic Flow Meter	EA	1		
23	Bollards	EA	9		
24	Minor Concrete	CY	9		
25	Imported Fill	CY	335		
26	Excavation & Grading	CY	3,320		
27	Hard Rock Excavation	CY	40		
28	3-inch Minus Crushed Rock	CY	248		
29	Electrical Service	LF	200		
TOTAL OF LUMP SUM AND UNIT PRICE BIDS = TOTAL BASE BID PRICE					$

TOTAL OF BASE BID PRICE _____

(in words)

Bidder acknowledges that (1) each Bid Unit Price includes an amount considered by Bidder to be adequate to cover Contractor's overhead and profit for each separately identified item, and (2) estimated quantities are not guaranteed, and are solely for the purpose of comparison of Bids, and final payment for all unit price Bid items will be based on actual quantities, determined as provided in the Contract Documents.

TOTAL OF BASE BID **$_____**
(use figures only)

5.02 Unit Prices have been computed in accordance with Paragraph 11.04.B of the General Conditions

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

ARTICLE 6: TIME OF COMPLETION

6.01 Bidder agrees that the Work will be substantially complete and will be completed and ready for final payment in accordance with Paragraph 15.06 of the General Conditions on or before the dates or within the number of working days indicated in the Agreement.

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

ARTICLE 7: ATTACHMENTS TO THIS BID

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

A. Required Bid security in the form of a Bid Bond (EJCDC No. C-430) or Certified Check;

B. If Bid amount exceeds $10,000, signed Equal Employer Opportunity Certification. Refer to specific equal opportunity requirements set forth in the Supplementary Conditions;

C. If Bid amount exceeds $25,000, signed Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion- Lower Tiered Covered Transactions (AD-1048);

D. Non-Collusion Affidavit;

E. Workers Compensation Certification;

F. List of Subcontractors;

G. Required Bidder Qualification Statement with supporting data;

H. Proof of Contractors' and Subcontractors' current registration under Labor Code sections 1725.5 and 1771.1.

ARTICLE 8: DEFINED TERMS

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

ARTICLE 9: BID SUBMITTAL

9.01 This Bid is submitted by: _____

Bidder's Business address: _____

_____

Phone: _____ Facsimile:_____

Submitted on _____, 20_____.

State Contractor License No. _____

Employer's Tax ID No. _____

If Bidder is:

An Individual

Name (typed or printed): _____

By: _____
(Individual's signature)

Doing business as: _____

A Partnership

Partnership Name:
_____
_____ (SEAL)

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

Name (typed or printed): _____

A Corporation

Corporation Name:
_____
_____ (SEAL)

State of Incorporation: _____

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

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

Name (typed or printed): _____

Title: _____

Attest: _____
(Signature of Corporate Secretary)

Date of Qualification to do business in California is ____________.

A Joint Venture

Name of Joint Venturer: _____

First Joint Venturer Name:
_____
_____ (SEAL)

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

Name (typed or printed): _____

Title: _____

Second Joint Venturer Name:
_____
_____ (SEAL)

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

Name (typed or printed): _____

Title: _____

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

LIST OF SUBCONTRACTORS

NOTE: In accordance with Supplementary Condition SC-7.06.A- the Contractor shall not award work valued at more than fifty percent (50%) of the Contract Price to Subcontractors without prior written approval of the Owner.

Work to be Performed	Percent of Total Contract	Subcontractor's Name and Location of Business

(Add additional sheets if necessary)

BIDDER: _____

Date: _____

MARKLEEVILLE PUBLIC UTILITY DISTRICT
MARKLEEVILLE, CALIFORNIA
SEWER PUMP STATION RELOCATION PROJECT

QUALIFICATIONS STATEMENT

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

1. SUBMITTED BY:

Official Name of Firm: _____

Address: _____

_____

_____

2. SUBMITTED TO: _____

3. SUBMITTED FOR: _____

Owner: Markleeville Public Utility District

Project Name: Sewer Pump Station Relocation Project

_____

_____

_____

TYPE OF WORK: Removing and abandoning an existing sewer pump station and installing a new sewer pump station including all site improvements, electrical, and piping work required to tie the sewer pump station into the existing water system.

4. CONTRACTOR'S CONTACT INFORMATION

Contact Person: _____

Title: _____

Phone: _____

Email: _____

5. AFFILIATED COMPANIES:

Name: _____

Address: _____

_____

_____

6. TYPE OF ORGANIZATION:

☐ SOLE PROPRIETORSHIP

Name of Owner: _____

Doing Business As: _____

Date of Organization: _____

☐ PARTNERSHIP

Date of Organization: _____

Type of Partnership: _____

Name of General Partner(s): _____

_____

_____

☐ CORPORATION

State of Organization: _____

Date of Organization: _____

Executive Officers:

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

_____

_____

- Treasurer: _____
- Secretary: _____

☐ LIMITED LIABILITY COMPANY

State of Organization: _____

Date of Organization: _____

Members: _____

_____

_____

_____

☐ JOINT VENTURE

Sate of Organization: _____

Date of Organization: _____

Form of Organization: _____

Joint Venture Managing Partner

- Name: _____

- Address: _____

_____

_____

Joint Venture Managing Partner

- Name: _____

- Address: _____

_____

Joint Venture Managing Partner

- Name: _____

- Address: _____

_____

7. LICENSING

Jurisdiction: _____

Type of License: _____

License Number: _____

Jurisdiction: _____

Type of License: _____

License Number: _____

8. CERTIFICATIONS

CERTIFIED BY:

Disadvantage Business Enterprise: _____

Minority Business Enterprise: _____

Woman Owned Enterprise: _____

Small Business Enterprise: _____

Other (_____): _____

9. BONDING INFORMATION

Bonding Company: _____

Address: _____

_____

Bonding Agent: _____

Address: _____

_____

_____

Contact Name: _____

Phone: _____

Aggregate Bonding Capacity: _____

Available Bonding Capacity as of date of this submittal: _____

10. FINANCIAL INFORMATION

Financial Institution: _____

Address: _____

_____

Account Manager: _____

Phone: _____

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

11. CONSTRUCTION EXPERIENCE:

Current Experience:

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

Previous Experience:

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

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

☐ YES ☐ NO

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

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

☐ YES ☐ NO

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

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

☐ YES ☐ NO

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

12. SAFETY PROGRAM:

Name of Contractor's Safety Officer: _____

Include the following as attachments:

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

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

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

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

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

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

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

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

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

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

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

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

13. EQUIPMENT:

MAJOR EQUIPMENT:

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

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

NAME OF ORGANIZATION: _____

BY: _____

TITLE: _____

DATED: _____

NOTARY ATTEST:

SUBSCRIBED AND SWORN TO BEFORE ME

THIS _____ DAY OF _____, 20___

NOTARY PUBLIC - STATE OF _____

MY COMMISSION EXPIRES:_____

REQUIRED ATTACHMENTS

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

SCHEDULE A

CURRENT EXPERIENCE

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

SCHEDULE B

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

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

SCHEDULE B

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

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

SCHEDULE C - LIST OF MAJOR EQUIPMENT AVAILABLE

ITEM	PURCHASE DATE	CONDITION	ACQUIRED VALUE

NON-COLLUSION AFFIDAVIT
(TITLE 23 UNITED STATES CODE SECTION 112 AND PUBLIC CONTRACT CODE SECTION 7106)

To the MARKLEEVILLE PUBLIC UTILITY DISTRICT

In accordance with Title 23 United States Code Section 112 and Public Contract Code 7106, the bidder declares under penalty of perjury that the bid is not made in the interest of, or on behalf of, any undisclosed person, partnership, company, association, organization, or corporation; that the bid is genuine and not collusive or sham; that the bidder has not directly or indirectly induced or solicited any other bidder to put in a false or sham bid, and has not directly or indirectly colluded, conspired, connived, or agreed with any bidder or anyone else to put in a sham bid, or that anyone shall refrain from bidding; that the bidder has not in any manner, directly or indirectly, sought by agreement, communication, or conference with anyone to fix the bid price of the bidder or any other bidder, or to fix any overhead, profit, or cost element of the bid price, or of that of any other bidder, or to secure any advantage against the public body awarding the contract of anyone interested in the proposed contract; that all statements contained in the bid are true; and, further, that the bidder has not, directly or indirectly, submitted his or her bid price or any breakdown thereof, or the contents thereof, or divulged information or data relative thereto, or paid, and will not pay, any fee to any corporation, partnership, company association, organization, bid depository, or to any member or agent thereof to effectuate a collusive or sham bid.

Note: The above Non-collusion Affidavit is part of the Proposal. Signing this Proposal on the signature portion thereof shall also constitute signature of this Non-collusion Affidavit. Bidders are cautioned that making a false certification may subject the certifier to criminal prosecution.

WORKER'S COMPENSATION CERTIFICATION
(CALIFORNIA LABOR CODE SECTION: 1861)

STATE OF CALIFORNIA)
) ss
COUNTY OF ALPINE)

I, the undersigned, do hereby certify:

That I am aware of the provision of Section 3700 of the Labor Code of the State of California, which requires every employer to be insured against liability for Workers Compensation or to undertake self-insurance in accordance with the provisions of that section, and I will comply with such provision before commencing the performance of the work of this Contract.

Executed at _____

on the _____ day of _____ 20 _____

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

_____
Signature of Contractor-Employer

_____
Print name signed above

_____
Title

_____
Company Name

EQUAL EMPLOYMENT OPPORTUNITY CERTIFICATION

(THE BIDDER'S EXECUTION OF THE SIGNATURE PORTION OF THIS PROPOSAL SHALL ALSO CONSTITUTE AN ENDORSEMENT AND EXECUTION OF THOSE CERTIFICATIONS WHICH ARE A PART OF THIS PROPOSAL)

The bidder _____,

proposed subcontractor_____, hereby certifies that he has _____, has not _____, participated in a previous contract or subcontract subject to the equal opportunity clause, as required by Executive Orders 10925, 11114, or 11246, and that, where required, he has filed with the Joint Reporting Committee, the Director of the Office of Federal Contract Compliance, a Federal Government contracting or administering agency, or the former President's Committee on Equal Employment Opportunity, all reports due under the applicable filing requirements.

Note: The above certification is required by the Equal Employment Opportunity Regulations of the Secretary of Labor (41 CFR 60-1.07(b)(1) and must be submitted by bidders and proposed subcontractors only in connection with contracts and subcontracts which are subject to the equal opportunity clause. Contracts and subcontracts which are exempt from the equal opportunity clause are set forth in 41 CFR 60-1.5. (Generally only contracts or subcontracts of $10,000 or under are exempt).

Currently, Standard Form 100 (EEO-1) is the only report required by the Executive Orders of their implementing regulations.

Proposed prime contractors and subcontractors who have participated in a previous contract or subcontract subject to the Executive Orders and have not filed the required reports should note that 41 CFR 60-1.7(b)(1) prevents the award of contracts and subcontracts unless such contractor submits a report covering the delinquent period or such other period specified by the Federal Highway Administration or by the Director, Office of Federal Contract Compliance, U.S. Department of Labor.

Public Contract Code Section 10285.1 Statement

In conformance with Public Contract Code Section 10285.1 (Chapter 376, Stats. 1985), the bidder hereby declares under penalty of perjury under the laws of the State of California that the bidder has_____, has not _____ been convicted within the preceding three years of any offenses referred to in that section, including any charge of fraud, bribery, collusion, conspiracy, or any other act in violation of any state or federal antitrust law in connection with the bidding upon, award of, or performance of, any public works contract, as defined in Public Contract code Section 1101, with any public entity, as defined in Public Contract Code Section 1100, including the Regents of the University of California or the Trustees of the California State University. The term "Bidder" is understood to include any partner, member, officer, director, responsible managing officer, or responsible managing employee thereof, as referred to in Section 10285.1

NOTE: The bidder must place a check mark after "has" or "has not" in one of the blank spaces provided. The above Statement is part of the Proposal. Signing this Proposal on the signature portion thereof shall also constitute signature of this Statement. Bidders are cautioned that making a false certification may subject the certifier to criminal prosecution.

Public Contract Code Section 10162 Questionnaire

In conformance with Public Contract Code Section 10162, the Bidder shall complete, under penalty of perjury, the following questionnaire:

Has the bidder, any officer of the bidder, or any employee of the bidder who has a proprietary interest in the bidder, ever been disqualified, removed, or otherwise prevented from bidding on, or completing a federal, state, or local government project because of a violation of law or a safety regulation?

Yes_____ No_____

If the answer is yes, explain the circumstances in the following space.

Note: The above Statement and Questionnaire are part of the Proposal. Signing this Proposal on the signature portion thereof shall also constitute signature of this Statement and Questionnaire.
Bidders are cautioned that making a false certification may subject the certifier to criminal prosecution.

Public Contract Code 10232 Statement

In conformance with Public Contract Code Section 10232, the Contractor, hereby states under penalty of perjury, that no more than one final unappealable finding of contempt of court by a Federal court has been issued against the Contractor within the immediately preceding two year period because of the Contractor's failure to comply with an order of a federal court which orders the Contractor to comply with an order of the National Labor Relations Board.

Note: The above Statement and Questionnaire are part of the Proposal. Signing this Proposal on the signature portion thereof shall also constitute signature of this Statement and Questionnaire.
Bidders are cautioned that making a false certification may subject the certifier to criminal prosecution.

DEBARMENT AND SUSPENSION CERTIFICATION
(TITLE 49, CODE OF FEDERAL REGULATIONS, PART 29)

The bidder, under penalty of perjury, certifies that, except as noted below, he/she or any person associated therewith in the capacity of owner, partner, director, officer, manager:

- is not currently under suspension, debarment, voluntary exclusion, or determination of ineligibility by any federal agency;
- has not been suspended, debarred, voluntarily excluded or determined ineligible by a federal agency within the past 3 years;
- does not have a proposed debarment pending; and
- has not been indicted, convicted, or had a civil judgment rendered against it by a court of competent jurisdiction in any matter involving fraud or official misconduct within the past 3 years.

If there are any exceptions to this certification, insert the exceptions in the following space.

Exception will not necessarily result in denial of award but will be considered in determining bidder responsibility. For any exception noted above, indicate below to whom it applies, initiating agency, and dates of action.

Notes: Providing false information may result in criminal prosecution or administrative sanctions.
The above certification is part of the Proposal. Signing this Proposal on the signature portion thereof shall also constitute signature of this Certification.

NOTICE OF AWARD

Date of Issuance:			
Owner:	Markleeville Public Utility District	Owner's Contract No.:	2024-01
Engineer:	Bennett Engineering Services, Inc.	Engineer's Project No.:	14-202-200
Project:	Sewer Pump Station Relocation Project	Contract Name:	
Bidder:			
Bidder's Address:			

TO BIDDER:

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

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

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

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

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

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

1. Deliver to Owner [____] counterparts of the Agreement, fully executed by Bidder.
2. Deliver with the executed Agreement(s) the Contract security *[e.g., performance and payment bonds]* and insurance documentation as specified in the Instructions to Bidders and General Conditions, Articles 2 and 6.
3. Other conditions precedent (if any): None

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

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

Owner

Authorized Signature

By:

Title:

Copy: Engineer

MARKLEEVILLE PUBLIC UTILITY DISTRICT
MARKLEEVILLE, CALIFORNIA
SEWER PUMP STATION RELOCATION PROJECT

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

THIS AGREEMENT is by and between Markleeville Public Utility District ("Owner") and _____ ("Contractor").

Owner and Contractor hereby agree as follows:

ARTICLE 1 – WORK

1.01 The Work shall include the work covered by the Base Bid. Contractor shall complete the Work in accordance with the Contract Documents.

The Work is otherwise subject to additions, deletions, and changes as provided in the Contract Documents.

ARTICLE 2 – THE PROJECT

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

A. The Project consists of removing and abandoning an existing sewer pump station and installing a new sewer pump station including all site improvements, electrical, and piping work required to tie the sewer pump station into the existing water system.

ARTICLE 3 – ENGINEER

3.01 The Project has been designed by Bennett Engineering Services, Inc.____.

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

ARTICLE 4 – CONTRACT TIMES

4.01 *Time of the Essence*

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

4.02 *Contract Times: Days*

A. The Work will be substantially completed within _75_ working days after the date when the Contract Times commence to run as provided in Paragraph 4.01 of the General Conditions. Under all circumstances, construction within the 100-year floodplain must be complete by July 31, 2025 to allow County construction activity in the project area to commence.

4.03 *Liquidated Damages*

A. Contractor and Owner recognize that time is of the essence as stated in Paragraph 4.01 above and that Owner will suffer financial and other losses if the Work is not completed ~~and Milestones not achieved~~ within the times specified in Paragraph 4.02 above, plus any extensions thereof allowed in accordance with the Contract. The parties also recognize the delays, expense, and difficulties involved in proving in a legal or arbitration proceeding the actual loss suffered by Owner if the Work is not completed on time. Accordingly, instead of requiring any such proof, Owner and Contractor agree that as liquidated damages for delay (but not as a penalty):

1. Substantial Completion: Contractor shall pay Owner $_1,300_ for each calendar day that expires after the time (as duly adjusted pursuant to the Contract) specified in Paragraph 4.02.A above for Substantial Completion until the Work is substantially complete.

2. Completion of Remaining Work: After Substantial Completion, if Contractor shall neglect, refuse, or fail to complete the remaining Work within the Contract Time (as duly adjusted pursuant to the Contract) for completion and readiness for final payment, Contractor shall pay Owner $_500_ for each calendar day that expires after such time until the Work is completed and ready for final payment.

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

ARTICLE 5 – CONTRACT PRICE

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

~~A. For all Work other than Unit Price Work, a lump sum of: $_____.~~

~~All specific cash allowances are included in the above price in accordance with Paragraph 13.02 of the General Conditions.~~

~~B. For all Unit Price Work, an amount equal to the sum of the extended prices (established for each separately identified item of Unit Price Work by multiplying the unit price times the actual quantity of that item):~~

~~Unit Price Work~~					
~~Item No.~~	~~Description~~	~~Unit~~	~~Estimated Quantity~~	~~Unit Price~~	~~Extended Price~~
~~Total of all Extended Prices for Unit Price Work (subject to final adjustment based on actual quantities)~~					~~$~~

~~The extended prices for Unit Price Work set forth as of the Effective Date of the Contract are based on estimated quantities. As provided in Paragraph 13.03 of the General~~

~~Conditions, estimated quantities are not guaranteed, and determinations of actual quantities and classifications are to be made by Engineer.~~

~~C. Total of Lump Sum Amount and Unit Price Work (subject to final Unit Price adjustment) $_____.~~

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

E. For the Work covered by the Base Bid, Owner shall pay to Contractor _____.

The Contract Price is subject to adjustment as provided in the Contract Documents.

ARTICLE 6 – PAYMENT PROCEDURES

6.01 *Submittal and Processing of Payments*

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

6.02 *Progress Payments; Retainage*

~~A. Owner shall make progress payments on account of the Contract Price on the basis of Contractor's Applications for Payment on or about the _5th_ day of each month during performance of the Work as provided in Paragraph 6.02.A.1 below, provided that such Applications for Payment have been submitted in a timely manner and otherwise meet the requirements of the Contract. All such payments will be measured by the Schedule of Values established as provided in the General Conditions (and in the case of Unit Price Work based on the number of units completed) or, in the event there is no Schedule of Values, as provided elsewhere in the Contract.~~

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

~~a. __95__ percent of Work completed (with the balance being retainage). If the Work has been 50 percent completed as determined by Engineer, and if the character and progress of the Work have been satisfactory to Owner and Engineer, then as long as the character and progress of the Work remain satisfactory to Owner and Engineer, there will be no additional retainage; and~~

~~b. _95__ percent of cost of materials and equipment not incorporated in the Work (with the balance being retainage).~~

~~B. Upon Substantial Completion, Owner shall pay an amount sufficient to increase total payments to Contractor to _100_ percent of the Work completed, less such amounts set off by Owner pursuant to Paragraph 15.01.E of the General Conditions, and less _200_ percent of Engineer's estimate of the value of Work to be completed or corrected as shown on the punch list of items to be completed or corrected prior to final payment.~~

A. Progress Payments.

Owner shall make progress payments in accordance with Article 15 of the General Conditions.

B. Performance Retention.

The Owner shall retain five percent (5%) of all progress payments as part security for fulfillment of the Contract. In any contract between Contractor and a subcontractor the percentage of the retention proceeds withheld may not exceed the percentage specified in this Contract between Owner and Contractor.

This Section shall not be construed to limit the ability of the District to withhold 150 percent of the value of any disputed amount of Work from the final payment, as provided for in subdivision (c) of Section 7107 of the Public Contract Code. Nothing in this section shall be construed to require Owner to pay for work that is not approved or accepted in accordance with the Contract Documents.

~~**C. Substitution of Securities; Escrow Agreement.**~~

~~**Contractor may substitute securities for any moneys withheld by Owner to ensure performance under the Contract. At the request and expense of Contractor, securities equivalent to the amount withheld shall be deposited with Owner, or with a state or federally chartered bank in this state as the escrow agent, who shall then pay those moneys to Contractor. Contractor shall be the beneficial owner of any securities substituted for moneys withheld and shall receive any interest thereon. Upon satisfactory completion of the contract, the securities shall be returned to Contractor.**~~

~~**Alternatively, Contractor may request and Owner shall make payment of retentions earned directly to the escrow agent at the expense of Contractor. At the expense of Contractor, Contractor may direct the investment of the payments into securities and Contractor shall receive the interest earned on the investments upon the same terms provided for in this section for securities deposited by Contractor. Upon satisfactory completion of the Contract, Contractor shall receive from the escrow agent all securities, interest, and payments received by the escrow agent from Owner, pursuant to the terms of this section.**~~

~~**Securities eligible for investment under this Section shall include those listed in Section 16430 of the Government Code, bank or savings and loan certificates of deposit, interest-bearing demand-deposit accounts, standby letters of credit, or any other security mutually agreed to by Contractor and Owner.**~~

~~**The escrow agreement used hereunder shall be null, void, and unenforceable unless it is substantially similar to the form set forth in Public Contract Code Section 223000(f).**~~

6.03 *Final Payment*

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

ARTICLE 7 – INTEREST

7.01 All amounts not paid when due shall bear interest at the rate of 10 percent per annum as provided in Supplementary Condition 15.01.C.

ARTICLE 8 – CONTRACTOR'S REPRESENTATIONS

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

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

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

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

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

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

F. Based on the information and observations referred to in the preceding paragraph, Contractor agrees that no further examinations, investigations, explorations, tests, studies, or data are necessary for the performance of the Work at the Contract Price, within the Contract Times, and in accordance with the other terms and conditions of the Contract.

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

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

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

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

K. Contractor and its subcontractors listed in accordance with the provisions of Public Contract Code section 4104 are, and at all times while performing the Work shall remain, registered and qualified to perform public work, pursuant to Labor Code sections 1725.5 and 1771.1. This Contract is subject to cancellation by Owner upon determination that Contractor or any of its subcontractors is not in compliance with the provisions of those sections.

L. This Project is subject to compliance monitoring and enforcement by the Department of Industrial Relations. Contractor shall post job site notices, as prescribed by regulation. Contractor shall furnish the records specified in Labor Code section 1776 directly to the Labor Commissioner, as required by Labor Code section 1771.4.

ARTICLE 9 – CONTRACT DOCUMENTS

9.01 *Contents*

A. The Contract Documents consist of the following:

1. This Agreement (pages 1 to 8, inclusive).

~~2. Performance bond (pages ___ to ___, inclusive).~~

~~3. Payment bond (pages ___ to ___, inclusive).~~

~~4. Other bonds.~~

~~a. ___ (pages ___ to ___, inclusive).~~

5. General Conditions (pages _1_ to _66_, inclusive).

6. Supplementary Conditions (pages _1__ to _19_, inclusive).

7. Specifications as listed in the table of contents of the Project Manual.

8. Drawings (not attached but incorporated by reference) consisting of 5 sheets with each sheet bearing the following general title: _Markleeville Sewer Pump Station Relocation Project_ **[or]** the Drawings listed on the attached sheet index.

9. Addenda (numbers __ to __, inclusive).

10. Exhibits to this Agreement (enumerated as follows):

a. Contractor's Bid ~~(pages ___ to ___, inclusive).~~ As Submitted

11. The following which may be delivered or issued on or after the Effective Date of the Contract and are not attached hereto:

a. Notice to Proceed.

b. Work Change Directives.

c. Change Orders.

d. Field Orders.

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

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

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

ARTICLE 10 – MISCELLANEOUS

10.01 *Terms*

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

10.02 *Assignment of Contract*

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

10.03 *Successors and Assigns*

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

10.04 *Severability*

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

10.05 *Contractor's Certifications*

A. Contractor certifies that it has not engaged in corrupt, fraudulent, collusive, or coercive practices in competing for or in executing the Contract. For the purposes of this Paragraph 10.05:

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

2. "fraudulent practice" means an intentional misrepresentation of facts made (a) to influence the bidding process or the execution of the Contract to the detriment of Owner, (b) to establish Bid or Contract prices at artificial non-competitive levels, or (c) to deprive Owner of the benefits of free and open competition;

3. "collusive practice" means a scheme or arrangement between two or more Bidders, with or without the knowledge of Owner, a purpose of which is to establish Bid prices at artificial, non-competitive levels; and

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

10.06 *Other Provisions*

A. Owner stipulates that if the General Conditions that are made a part of this Contract are based on EJCDC® C-700, Standard General Conditions for the Construction Contract, published by the Engineers Joint Contract Documents Committee®, and if Owner is the party that has furnished said General Conditions, then Owner has plainly shown all modifications to the standard wording of such published document to the Contractor, through a process such as highlighting or "track changes" (redline/strikeout), or in the Supplementary Conditions.

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

This Agreement will be effective on _____, 20____ (which is the Effective Date of the Contract).

OWNER:	CONTRACTOR:
Markleeville Public Utility District	.
By: _____	By: _____
Title: _____	Title: _____
	(If Contractor is a corporation, a partnership, or a joint venture, attach evidence of authority to sign.)
Attest: _____	Attest: _____
Title: _____	Title: _____
Address for giving notices:	Address for giving notices:
P.O. Box 222	
Markleeville, CA 96120	
	License No.: _____ *(where applicable)*
(If Owner is a corporation, attach evidence of authority to sign. If Owner is a public body, attach evidence of authority to sign and resolution or other documents authorizing execution of this Agreement.)	*NOTE TO USER: Use in those states or other jurisdictions where applicable or required.*

MARKLEEVILLE PUBLIC UTILITY DISTRICT
MARKLEEVILLE, CALIFORNIA
SEWER PUMP STATION RELOCATION PROJECT

NOTICE TO PROCEED

Owner:	Markleeville Public Utility District	Owner's Contract No.:	2024-01
Contractor:		Contractor's Project No.:	
Engineer:	Bennett Engineering Services, Inc.	Engineer's Project No.:	14-202-200
Project:	Sewer Pump Station Relocation Project	Contract Name:	
		Effective Date of Contract:	

TO CONTRACTOR:

Owner hereby notifies Contractor that the Contract Times under the above Contract will commence to run on [_____, 20__]. *[see Paragraph 4.01 of the General Conditions]*

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

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

Owner**:**

Authorized Signature

By:

Title:

Date Issued:

Copy: Engineer

BID BOND

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

BIDDER *(Name and Address)*:

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

OWNER *(Name and Address)*:
Markleeville Public Utility District
P.O. Box 222
Markleeville, CA 96120

BID
Bid Due Date:
Description *(Project Name— Include Location)*:

BOND
Bond Number:
Date:
Penal sum _____ $ _____
(Words) (Figures)

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

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

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

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

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

3. This obligation shall be null and void if:

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

3.2 All Bids are rejected by Owner, or

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

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

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

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

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

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

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

10. This Bond is intended to conform to all applicable statutory requirements. Any applicable requirement of any

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

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

PERFORMANCE BOND

KNOW ALL MEN BY THESE PRESENTS:

THAT WHEREAS, The Board of Directors of the Markleeville Public Utility District, State of California, and _____(hereinafter designated as "**PRINCIPAL**") have entered into an agreement whereby principal agrees to install and complete certain designated public improvements, which said agreement, dated_____, 20__, and identified as project

SEWER PUMP STATION RELOCATION PROJECT,

Is hereby referred to and made a part hereof; and,

Whereas, said principal is required under the terms of said agreement to furnish a bond for the faithful performance of said agreement.

Now, therefore, we, the principal and _____as surety, are held and firmly bound unto the Markleeville Public Utility District (hereinafter called "**DISTRICT**"), in the penal sum of _____ dollars ($_____) (which amount is not less than one hundred percent (100%) of the Contract price) lawful money of the United States, for the payment of which sum well and truly to be made, we bind ourselves, our heirs, successors, executors and administrators, jointly and severally, firmly by these presents.

The condition of this obligation is such that if the above bounded principal, his or its heirs, executors, administrators, successors or assigns, shall in all things stand to and abide by, and well and truly keep and perform the covenants, conditions and provisions in the said agreement and any alteration thereof made as therein provided, on his or their part, to be kept and performed at the time and in the manner therein specified, and in all respects according to their true intent and meaning, and shall indemnify and save harmless, its officers, agents and employees, as therein stipulated, then this obligation shalt become null and void; otherwise it shall be and remain in full force and effect.

As a part of the obligation secured hereby and in addition to the face amount specified therefore, there shall be included costs and reasonable expenses and fees, including reasonable attorney's fees, incurred by the District in successfully enforcing such obligation, all to be taxed as costs and included

in any judgment rendered.

The surety hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the agreement or to the work to be performed thereunder or the specifications accompanying the same shall in anywise affect its obligations on this bond, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the agreement or to the work or to the specifications.

The surety's obligations to the District arise immediately upon the default of the principal, without demand or notice.

In the event the principal defaults in the performance of its obligations, the surety may elect, either directly or through appropriate contractors, to perform in the place of the principal. If the surety elects to proceed in this fashion, it shall provide written notice of such election to the District within thirty (30) days after surety becomes aware of the principal's default. If the surety elects to complete the obligations of the principal (as opposed to paying money damages *to* the District occasioned by such breach) the surety shall cause the obligations of the principal to the performed as soon as is reasonably possible, but in no event later than nine (9) months following knowledge of the breach by the principal. In the event the surety elects to perform the principal's obligations, the District shall be entitled to compel the surety, by way of specific performance, to perform such obligations.

If the surety does not elect to perform the principals' obligations, the surety shall deposit with the District a sum equal to the cost of the uncompleted portion of the work which comprises the principal's obligation. The District shall determine the estimated cost of the uncompleted portion of the work and the surety shall make such deposit with the District within five (5) days of receipt of the District's estimate. The District shall not be required to expend any of its own funds to complete the work nor to incur "out-of-pocket" damages inasmuch as the District's damages are measured by the value of its unfulfilled right, namely the cost of completing the obligations of the principal by installing the bargained-for improvements. Upon deposit of the estimated cost of completion with the District, the District may proceed to bid the remainder of the work as a public project pursuant to the Public Contracts Code and the surety shall be obligated to continue to deposit such additional sums as may be necessary from time-to-time until the improvements are complete and accepted by the District or until the surety has exhausted the penal sum of the bond. Should the surety deposit more funds than are necessary to satisfy the principal's obligation, then the District shall refund any balance remaining upon final acceptance of the improvements. No interest shall be paid on any deposits made with the District.

Underwriting assumptions and cost estimates of the Surety shall not have any bearing, whatsoever, on the Surety's liability under this bond. By way of example, if, when making underwriting decisions regarding issuing this bond, a cost estimate was prepared regarding the principal's obligations to the

District, the fact that an item was omitted from the cost estimate (which item was an obligation of the principal to the District), shall in no way defeat or diminish the Surety's obligation to the District with respect to this omitted item. By way of further example, if the underwriting decision to issue this bond included a cost estimate of items and a particular item was estimated at a cost significantly less than the amount actually required to perform such item, this fact shall in no way defeat or diminish the Surety's obligation to the District. Namely, the Surety shall be obligated to the full amount of the penal sum of the bond, with respect to all matters which are the principal's obligation to the District, whether such items are actually included in any cost estimate (or it so included, are estimated at a cost far less than the actual cost to perform such items).

Likewise, the adequacy and amount of any premium (and whether or not such premium was sufficient for the risk assumed by Surety) shall have no bearing on Surety's absolute and unconditional obligation to the District upon the principal's default of its obligations under this bond.

IN WITNESS WHEREOF, the instrument of this **PERFORMANCE BOND** has been duly executed by the principal and surety above named, on

Signed and sealed this _____ day of _____ 20 ____

ATTEST:

_____
Principal

_____ By _____
(Principle Secretary)

_____ _____
(Witness as to Principal) (Address)

_____ _____
(Address)

ATTEST:

_____
Surety

_____ By _____
(Surety Secretary) Attorney-in-Fact

_____ _____
(Witness as to Surety) (Address)

NOTES:

1. If Contractor is a Partnership, all partners should execute the bond.
2. Bidder must attach Power of Attorney and Certificate of Authority for Surety and a Notary Acknowledgment for all Surety's signatures. The California Department of Insurance must authorize the Surety to be an admitted Surety Insurer.

PAYMENT BOND

KNOW ALL MEN BY THESE PRESENTS:

THAT WHEREAS, The Board of Directors of the Markleeville Public Utility District, State of California, and _____(hereinafter designated as "**PRINCIPAL**") have entered into an agreement whereby principal agrees to install and complete certain designated public improvements, which said agreement, dated_____, 20__, and identified as project

SEWER PUMP STATION RELOCATION PROJECT,

is hereby referred to and made a part hereof; and,

Whereas, Under the terms of the agreement, the principal is required before entering upon the performance of the work, to file a good and sufficient Payment Bond with the Markleeville Public Utility District to secure the claims to which reference is made in Title 3 (commencing with Section 9000) of Part 6 of Division 4 of the Civil Code.

Now, therefore, the principal and the undersigned as corporate surety, are held firmly bound unto the Markleeville Public Utility District and all contractors, subcontractors, laborers, material suppliers, and other persons employed in the performance of the agreement and referred to in Title 3 (commencing with Section 9000) of Part 6 of Division 4 of the Civil Code in the penal sum of

_____

dollars ($_____) (which amount is not less than one hundred percent (100%) of the Contract price) lawful money of the United States, for materials furnished or labor thereon of any kind, or for amounts due under the Unemployment Insurance Act with respect to this work or labor, that the surety will pay the same in an amount not exceeding the amount hereinabove set forth, and also in case suit is brought upon this bond, will pay, in addition to the face amount thereof, costs and reasonable expenses and fees, including reasonable attorney's fees, incurred by county (or district) in successfully enforcing this obligation, to be awarded and fixed by the court, and to be taxed as costs and to be included in the judgment therein *rendered*, we bind

ourselves, our heirs, successors, executors and administrators, jointly and severally, firmly by these presents.

It is hereby expressly stipulated and agreed that this bond shall inure to the benefit of any and all persons, companies, and corporations entitled to file claims under Title 3 (commencing with Section 9000) of Part 6 of Division 4 of the Civil Code, so as to give a right of action to them or their assigns in any suit brought upon this bond.

Should the condition of this bond be fully performed, then this obligation shall become null and void, otherwise it shall be and remain in full force and effect.

The surety hereby stipulates and agrees that no change, extension of time, alteration, or addition *to* the terms of the agreement or the specifications accompanying the same shall in any manner affect its obligations on this bond, and it does hereby waive notice of any such change, extension, alteration, or addition.

IN WITNESS WHEREOF, the instrument of this **PAYMENT BOND** has been duly executed by the principal and surety above named, on

Signed and sealed this _____ day of _____ 20 ____

ATTEST:

_____
Principal

_____ By _____
(Principle Secretary)

_____ _____
(Witness as to Principal) (Address)

_____ _____
(Address)

ATTEST:

_____
Surety

_____ By _____
(Surety Secretary) Attorney-in-Fact

_____ _____
(Witness as to Surety) (Address)

NOTES:

1. If Contractor is a Partnership, all partners should execute the bond.
2. Bidder must attach Power of Attorney and Certificate of Authority for Surety and a Notary Acknowledgment for all Surety's signatures. The California Department of Insurance must authorize the Surety to be an admitted Surety Insurer.

Contractor's Application for Payment No. _____

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

Application For Payment

Change Order Summary

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

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

Contractor's Certification

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

Contractor Signature

By:	Date:

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

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

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

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

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

WORK CHANGE DIRECTIVE FORM **Work Change Directive No.**

Date of Issuance:		Effective Date:	
Owner:	Markleeville Public Utility District	Owner's Contract No.:	2024-01
Contractor:		Contractor's Project No.:	
Engineer:	Bennett Engineering Services	Engineer's Project No.:	14-202-200
Project:	Sewer Pump Station Relocation Project	Contract Name:	

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

Description:

Attachments: *[List documents supporting change]*

Purpose for Work Change Directive:

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

☐ Non-agreement on pricing of proposed change.

☐ Necessity to proceed for schedule or other Project reasons.

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

Contract Price $ [increase] [decrease].

Contract Time days [increase] [decrease].

Basis of estimated change in Contract Price:

☐ Lump Sum ☐ Unit Price

☐ Cost of the Work ☐ Other

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

Approved by Funding Agency (if applicable)

By: Date:

Title:

CHANGE ORDER FORM **Change Order No.** _____

Date of Issuance:		Effective Date:	
Owner:	Markleeville Public Utility District	Owner's Contract No.:	2024-01
Contractor:		Contractor's Project No.:	
Engineer:	Bennett Engineering Services	Engineer's Project No.:	14-202-200
Project:	Sewer Pump Station Relocation Project	Contract Name:	

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

Description:

Attachments: *[List documents supporting change]*

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

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

Approved by Funding Agency (if applicable)

By: _____ Date:

Title: _____

CERTIFICATE OF SUBSTANTIAL COMPLETION

Owner:	Markleeville Public Utility District	Owner's Contract No.:	2024-01
Contractor:		Contractor's Project No.:	
Engineer:	Bennett Engineering Services, Inc.	Engineer's Project No.:	14-202-200
Project:	Sewer Pump Station Relocation Project	Contract Name:	

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

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

Date of Substantial Completion

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

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

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

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

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

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

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

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

MARKLEEVILLE PUBLIC UTILTY DISTRICT
MARKLEEVILLE, CALIFORNIA
SEWER PUMP STATION RELOCATION PROJECT

STANDARD GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

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ARTICLE 1 – DEFINITIONS AND TERMINOLOGY

1.01 *Defined Terms*

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

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

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

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

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

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

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

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

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

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

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

regarding a Change Proposal; or seeking resolution of a contractual issue that Engineer has declined to address. A demand for money or services by a third party is not a Claim.

11. *Constituent of Concern*—Asbestos, petroleum, radioactive materials, polychlorinated biphenyls (PCBs), hazardous waste, and any substance, product, waste, or other material of any nature whatsoever that is or becomes listed, regulated, or addressed pursuant to (a) the Comprehensive Environmental Response, Compensation and Liability Act, 42 U.S.C. §§9601 et seq. ("CERCLA"); (b) the Hazardous Materials Transportation Act, 49 U.S.C. §§5501 et seq.; (c) the Resource Conservation and Recovery Act, 42 U.S.C. §§6901 et seq. ("RCRA"); (d) the Toxic Substances Control Act, 15 U.S.C. §§2601 et seq.; (e) the Clean Water Act, 33 U.S.C. §§1251 et seq.; (f) the Clean Air Act, 42 U.S.C. §§7401 et seq.; or (g) any other federal, state, or local statute, law, rule, regulation, ordinance, resolution, code, order, or decree regulating, relating to, or imposing liability or standards of conduct concerning, any hazardous, toxic, or dangerous waste, substance, or material.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

27. *Notice of Intent to Award*—The written notice by the Owner to a Bidder of, indicating the Owner's intention to accept the Bid, contingent upon final budget approval by the Division of Financial Assistance (DFA). The issuance of this notice does not constitute an award of the Contract, and no binding agreement exists until final budget approval by DFA and a formal Notice of Award is issued.

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

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

30. *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.

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

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

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

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

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

36. *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.

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

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

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

40. *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.

41. *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.

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

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

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

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

46. *Underground Facilities*—All underground pipelines, conduits, ducts, cables, wires, manholes, vaults, tanks, tunnels, or other such facilities or attachments, and any encasements containing such facilities, including but not limited to those that convey electricity, gases, steam, liquid petroleum products, telephone or other

communications, fiber optic transmissions, cable television, water, wastewater, storm water, other liquids or chemicals, or traffic or other control systems.

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

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

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

1.02 *Terminology*

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

B. *Intent of Certain Terms or Adjectives*:

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

C. *Day*:

1. The word “day” means a working day and is defined as any day except as follows:

a. Saturdays, Sundays and legal holidays;

b. Days on which the contractor is prevented by inclement weather or conditions resulting immediately therefrom adverse to the current controlling operation or operations, as determined by the engineer, from proceeding with at least 75 percent of the normal labor and equipment force engaged on that operation or operations for at least 60 percent of the total daily time being currently spent on the controlling operation or operations;

D. *Defective*:

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

a. does not conform to the Contract Documents; or

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

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

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

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

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

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

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

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

ARTICLE 2 – PRELIMINARY MATTERS

2.01 *Delivery of Bonds and Evidence of Insurance*

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

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

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

2.02 *Copies of Documents*

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

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

2.03 *Before Starting Construction*

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

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

2. a preliminary Schedule of Submittals; and

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

2.04 *Preconstruction Conference; Designation of Authorized Representatives*

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

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

2.05 *Initial Acceptance of Schedules*

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

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

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

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

2.06 *Electronic Transmittals*

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

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

C. When transmitting items in electronic media or digital format, the transmitting party makes no representations as to long term compatibility, usability, or readability of the items resulting from the recipient's use of software application packages, operating systems, or computer hardware differing from those used in the drafting or transmittal of the items, or from those established in applicable transmittal protocols.

ARTICLE 3 – DOCUMENTS: INTENT, REQUIREMENTS, REUSE

3.01 *Intent*

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

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

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

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

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

3.02 *Reference Standards*

A. Standards Specifications, Codes, Laws and Regulations

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

2. No provision of any such standard specification, manual, reference standard, or code, or any instruction of a Supplier, shall be effective to change the duties or responsibilities of Owner, Contractor, or Engineer, or any of their subcontractors,

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

3.03 *Reporting and Resolving Discrepancies*

A. *Reporting Discrepancies*:

1. *Contractor's Verification of Figures and Field Measurements*: Before undertaking each part of the Work, Contractor shall carefully study the Contract Documents, and check and verify pertinent figures and dimensions therein, particularly with respect to applicable field measurements. Contractor shall promptly report in writing to Engineer any conflict, error, ambiguity, or discrepancy that Contractor discovers, or has actual knowledge of, and shall not proceed with any Work affected thereby until the conflict, error, ambiguity, or discrepancy is resolved, by a clarification or interpretation by Engineer, or by an amendment or supplement to the Contract Documents issued pursuant to Paragraph 11.01.

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

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

B. *Resolving Discrepancies*:

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

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

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

3.04 *Requirements of the Contract Documents*

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

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

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

3.05 *Reuse of Documents*

A. Contractor and its Subcontractors and Suppliers shall not:

1. have or acquire any title to or ownership rights in any of the Drawings, Specifications, or other documents (or copies of any thereof) prepared by or bearing the seal of Engineer or its consultants, including electronic media editions, or reuse any such Drawings, Specifications, other documents, or copies thereof on extensions of the Project or any other project without written consent of Owner and Engineer and specific written verification or adaptation by Engineer; or

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

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

ARTICLE 4 – COMMENCEMENT AND PROGRESS OF THE WORK

4.01 *Commencement of Contract Times; Notice to Proceed*

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

4.02 *Starting the Work*

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

4.03 *Reference Points*

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

4.04 *Progress Schedule*

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

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

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

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

4.05 *Delays in Contractor's Progress*

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

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

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

1. severe and unavoidable natural catastrophes such as fires, floods, epidemics, and earthquakes;
2. abnormal weather conditions;
3. acts or failures to act of utility owners (other than those performing other work at or adjacent to the Site by arrangement with the Owner, as contemplated in Article 8); and
4. acts of war or terrorism.

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

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

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

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

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

5.01 *Availability of Lands*

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

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

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

5.02 *Use of Site and Other Areas*

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

1. Contractor shall confine construction equipment, temporary construction facilities, the storage of materials and equipment, and the operations of workers to the Site, adjacent areas that Contractor has arranged to use through construction easements or otherwise, and other adjacent areas permitted by Laws and Regulations, and shall not unreasonably encumber the Site and such other adjacent areas with construction equipment or other materials or equipment. Contractor shall assume full responsibility

for (a) damage to the Site; (b) damage to any such other adjacent areas used for Contractor's operations; (c) damage to any other adjacent land or areas; and (d) for injuries and losses sustained by the owners or occupants of any such land or areas; provided that such damage or injuries result from the performance of the Work or from other actions or conduct of the Contractor or those for which Contractor is responsible.

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

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

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

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

5.03 *Subsurface and Physical Conditions*

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

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

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

3. Technical Data contained in such reports and drawings.

B. *Reliance by Contractor on Technical Data Authorized*: Contractor may rely upon the accuracy of the Technical Data expressly identified in the Supplementary Conditions with

respect to such reports and drawings, but such reports and drawings are not Contract Documents. If no such express identification has been made, then Contractor may rely upon the accuracy of the Technical Data (as defined in General Conditions Article 1, paragraph 1.01, definition 45) contained in any geotechnical or environmental report prepared for the Project and made available to Contractor. Except for such reliance on Technical Data, Contractor may not rely upon or make any claim against Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, with respect to:

1. the completeness of such reports and drawings for Contractor's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences, and procedures of construction to be employed by Contractor, and safety precautions and programs incident thereto; or
2. other data, interpretations, opinions, and information contained in such reports or shown or indicated in such drawings; or
3. any Contractor interpretation of or conclusion drawn from any Technical Data or any such other data, interpretations, opinions, or information.

5.04 *Differing Subsurface or Physical Conditions*

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

1. is of such a nature as to establish that any Technical Data on which Contractor is entitled to rely as provided in Paragraph 5.03 is materially inaccurate; or
2. is of such a nature as to require a change in the Drawings or Specifications; or
3. differs materially from that shown or indicated in the Contract Documents; or
4. is of an unusual nature, and differs materially from conditions ordinarily encountered and generally recognized as inherent in work of the character provided for in the Contract Documents;

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

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

C. *Owner's Statement to Contractor Regarding Site Condition*: After receipt of Engineer's written findings, conclusions, and recommendations, Owner shall issue a written statement to Contractor (with a copy to Engineer) regarding the subsurface or physical condition in

question, addressing the resumption of Work in connection with such condition, indicating whether any change in the Drawings or Specifications will be made, and adopting or rejecting Engineer's written findings, conclusions, and recommendations, in whole or in part.

D. *Possible Price and Times Adjustments*:

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

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

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

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

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

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

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

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

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

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

5.05 *Underground Facilities*

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

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

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

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

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

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

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

B. *Notice by Contractor*: If Contractor believes that an Underground Facility that is uncovered or revealed at the Site was not shown or indicated in the Contract Documents, or was not shown or indicated with reasonable accuracy, then Contractor shall, promptly after becoming aware thereof and before further disturbing conditions affected thereby or performing any Work in connection therewith (except in an emergency as required by Paragraph 7.15), identify the owner of such Underground Facility and give written notice to that owner and to Owner and Engineer.

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

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

E. *Possible Price and Times Adjustments*:

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

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

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

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

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

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

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

5.06 *Hazardous Environmental Conditions at Site*

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

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

2. Technical Data contained in such reports and drawings.

B. *Reliance by Contractor on Technical Data Authorized*: Contractor may rely upon the accuracy of the Technical Data expressly identified in the Supplementary Conditions with respect to such reports and drawings, but such reports and drawings are not Contract Documents. If no such express identification has been made, then Contractor may rely on the accuracy of the Technical Data (as defined in General Conditions Article 1, paragraph 1.01, definition 45) contained in any geotechnical or environmental report prepared for the Project and made available to Contractor. Except for such reliance on Technical Data, Contractor may not rely upon or make any claim against Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors with respect to:

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

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

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

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

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

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

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

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

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

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

this Paragraph 5.06.H shall obligate Owner to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.

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

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

ARTICLE 6 – BONDS AND INSURANCE

6.01 *Performance, Payment, and Other Bonds*

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

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

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

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

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

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

6.02 *Insurance—General Provisions*

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

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

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

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

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

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

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

H. Without prejudice to any other right or remedy, if a party has failed to obtain required insurance, the other party may elect to obtain equivalent insurance to protect such other

party's interests at the expense of the party who was required to provide such coverage, and the Contract Price shall be adjusted accordingly.

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

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

6.03 *Contractor's Insurance*

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

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

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

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

4. Foreign voluntary worker compensation (if applicable).

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

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

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

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

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

1. Products and completed operations coverage:

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

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

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

3. Broad form property damage coverage.

4. Severability of interest.

5. Underground, explosion, and collapse coverage.

6. Personal injury coverage.

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

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

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

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

F. *Contractor's pollution liability insurance*: Contractor shall purchase and maintain a policy covering third-party injury and property damage claims, including clean-up costs, as a result of pollution conditions arising from Contractor's operations and completed operations. This insurance shall be maintained for no less than three years after final completion.

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

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

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

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

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

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

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

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

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

6.04 *Owner's Liability Insurance*

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

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

6.05 *Property Insurance*

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

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

2. be written on a builder's risk "all risk" policy form that shall at least include insurance for physical loss or damage to the Work, temporary buildings, falsework, and materials and equipment in transit, and shall insure against at least the following perils or causes of loss: fire; lightning; windstorm; riot; civil commotion; terrorism; vehicle impact; aircraft; smoke; theft; vandalism and malicious mischief; mechanical breakdown, boiler explosion, and artificially generated electric current; earthquake; volcanic activity, and other earth movement; flood; collapse; explosion; debris removal; demolition occasioned by enforcement of Laws and Regulations; water damage (other

than that caused by flood); and such other perils or causes of loss as may be specifically required by the Supplementary Conditions. If insurance against mechanical breakdown, boiler explosion, and artificially generated electric current; earthquake; volcanic activity, and other earth movement; or flood, are not commercially available under builder's risk policies, by endorsement or otherwise, such insurance may be provided through other insurance policies acceptable to Owner and Contractor.

3. cover, as insured property, at least the following: (a) the Work and all materials, supplies, machinery, apparatus, equipment, fixtures, and other property of a similar nature that are to be incorporated into or used in the preparation, fabrication, construction, erection, or completion of the Work, including Owner-furnished or assigned property; (b) spare parts inventory required within the scope of the Contract; and (c) temporary works which are not intended to form part of the permanent constructed Work but which are intended to provide working access to the Site, or to the Work under construction, or which are intended to provide temporary support for the Work under construction, including scaffolding, form work, fences, shoring, falsework, and temporary structures.
4. cover expenses incurred in the repair or replacement of any insured property (including but not limited to fees and charges of engineers and architects).
5. extend to cover damage or loss to insured property while in temporary storage at the Site or in a storage location outside the Site (but not including property stored at the premises of a manufacturer or Supplier).
6. extend to cover damage or loss to insured property while in transit.
7. allow for partial occupation or use of the Work by Owner, such that those portions of the Work that are not yet occupied or used by Owner shall remain covered by the builder's risk insurance.
8. allow for the waiver of the insurer's subrogation rights, as set forth below.
9. provide primary coverage for all losses and damages caused by the perils or causes of loss covered.
10. not include a co-insurance clause.
11. include an exception for ensuing losses from physical damage or loss with respect to any defective workmanship, design, or materials exclusions.
12. include performance/hot testing and start-up.
13. be maintained in effect, subject to the provisions herein regarding Substantial Completion and partial occupancy or use of the Work by Owner, until the Work is complete.

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

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

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

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

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

6.06 *Waiver of Rights*

A. All policies purchased in accordance with Paragraph 6.05, expressly including the builder's risk policy, shall contain provisions to the effect that in the event of payment of any loss or damage the insurers will have no rights of recovery against any insureds thereunder, or against Engineer or its consultants, or their officers, directors, members, partners, employees, agents, consultants, or subcontractors. Owner and Contractor waive all rights against each other and the respective officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, for all losses and damages caused by, arising out of, or resulting from any of the perils or causes of loss covered by such policies and any other property insurance applicable to the Work; and, in addition, waive all such rights against Engineer, its consultants, all Subcontractors, all individuals or entities identified in the Supplementary Conditions as insureds, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, under such policies for losses and damages so caused. None of the above waivers shall extend to the rights that any party making such waiver may have to the proceeds of insurance held by Owner or Contractor as trustee or fiduciary, or otherwise payable under any policy so issued.

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

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

2. loss or damage to the completed Project or part thereof caused by, arising out of, or resulting from fire or other insured peril or cause of loss covered by any property insurance maintained on the completed Project or part thereof by Owner during

partial occupancy or use pursuant to Paragraph 15.04, after Substantial Completion pursuant to Paragraph 15.03, or after final payment pursuant to Paragraph 15.06.

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

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

6.07 *Receipt and Application of Property Insurance Proceeds*

A. Any insured loss under the builder's risk and other policies of insurance required by Paragraph 6.05 will be adjusted and settled with the named insured that purchased the policy. Such named insured shall act as fiduciary for the other insureds, and give notice to such other insureds that adjustment and settlement of a claim is in progress. Any other insured may state its position regarding a claim for insured loss in writing within 15 days after notice of such claim.

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

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

ARTICLE 7 – CONTRACTOR'S RESPONSIBILITIES

7.01 *Supervision and Superintendence*

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

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

7.02 *Labor; Working Hours*

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

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

7.03 *Services, Materials, and Equipment*

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

B. All materials and equipment incorporated into the Work shall be of good quality and new, except as otherwise provided in the Contract Documents. All special warranties and guarantees required by the Specifications shall expressly run to the benefit of Owner. If required by Engineer, Contractor shall furnish satisfactory evidence (including reports of required tests) as to the source, kind, and quality of materials and equipment.

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

7.04 *"Or Equals"*

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

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

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

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

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

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

4) it is not objectionable to Owner.

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

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

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

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

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

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

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

7.05 *Substitutes*

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

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

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

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

    a. shall certify that the proposed substitute item will:

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

        2) be similar in substance to that specified, and

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

    b. will state:

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

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

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

    c. will identify:

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

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

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

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

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

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

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

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

7.06 *Concerning Subcontractors, Suppliers, and Others*

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

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

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

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

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

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

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

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

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

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

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

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

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

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

O. Nothing in the Contract Documents:

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

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

7.07 *Patent Fees and Royalties*

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

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

identified as being subject to payment of any license fee or royalty to others required by patent rights or copyrights.

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

7.08 *Permits*

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

7.09 *Taxes*

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

7.10 *Laws and Regulations*

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

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

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

resulting from such changes, then within 30 days of such notice Contractor may submit a Change Proposal, or Owner may initiate a Claim.

7.11 *Record Documents*

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

7.12 *Safety and Protection*

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

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

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

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

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

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

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

E. All damage, injury, or loss to any property referred to in Paragraph 7.12.A.2 or 7.12.A.3 caused, directly or indirectly, in whole or in part, by Contractor, any Subcontractor, Supplier, or any other individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, shall be remedied by Contractor at its expense (except damage or loss attributable to the fault of Drawings or Specifications or to the acts or omissions of Owner or Engineer or anyone

employed by any of them, or anyone for whose acts any of them may be liable, and not attributable, directly or indirectly, in whole or in part, to the fault or negligence of Contractor or any Subcontractor, Supplier, or other individual or entity directly or indirectly employed by any of them).

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

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

7.13 *Safety Representative*

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

7.14 *Hazard Communication Programs*

A. Contractor shall be responsible for coordinating any exchange of material safety data sheets or other hazard communication information required to be made available to or exchanged between or among employers at the Site in accordance with Laws or Regulations.

7.15 *Emergencies*

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

7.16 *Shop Drawings, Samples, and Other Submittals*

A. Shop Drawing and Sample Submittal Requirements:

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

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

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

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

d. determined and verified all information relative to Contractor's responsibilities for means, methods, techniques, sequences, and procedures of construction, and safety precautions and programs incident thereto.

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

3. With each submittal, Contractor shall give Engineer specific written notice of any variations that the Shop Drawing or Sample may have from the requirements of the Contract Documents. This notice shall be set forth in a written communication separate from the Shop Drawings or Sample submittal; and, in addition, in the case of Shop Drawings by a specific notation made on each Shop Drawing submitted to Engineer for review and approval of each such variation.

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

1. *Shop Drawings*:

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

b. Data shown on the Shop Drawings will be complete with respect to quantities, dimensions, specified performance and design criteria, materials, and similar data to show Engineer the services, materials, and equipment Contractor proposes to provide and to enable Engineer to review the information for the limited purposes required by Paragraph 7.16.D.

2. *Samples*:

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

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

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

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

D. *Engineer's Review*:

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

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

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

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

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

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

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

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

E. *Resubmittal Procedures*:

1. Contractor shall make corrections required by Engineer and shall return the required number of corrected copies of Shop Drawings and submit, as required, new Samples for review and approval. Contractor shall direct specific attention in writing to revisions other than the corrections called for by Engineer on previous submittals.

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

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

7.17 *Contractor's General Warranty and Guarantee*

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

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

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

2. normal wear and tear under normal usage.

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

1. observations by Engineer;

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

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

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

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

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

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

8. any correction of defective Work by Owner.

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

7.18 *Indemnification*

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

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

limitation on the amount or type of damages, compensation, or benefits payable by or for Contractor or any such Subcontractor, Supplier, or other individual or entity under workers' compensation acts, disability benefit acts, or other employee benefit acts.

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

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

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

7.19 *Delegation of Professional Design Services*

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

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

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

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

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

ARTICLE 8 – OTHER WORK AT THE SITE

8.01 *Other Work*

A. In addition to and apart from the Work under the Contract Documents, the Owner may perform other work at or adjacent to the Site. Such other work may be performed by Owner's employees, or through contracts between the Owner and third parties. Owner

may also arrange to have third-party utility owners perform work on their Utility and facilities at or adjacent to the Site.

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

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

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

8.02 *Coordination*

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

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

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

3. the extent of such authority and responsibilities.

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

8.03 *Legal Relationships*

A. If, in the course of performing other work at or adjacent to the Site for Owner, the Owner's employees, any other contractor working for Owner, or any utility owner causes damage to the Work or to the property of Contractor or its Subcontractors, or delays, disrupts, interferes with, or increases the scope or cost of the performance of the Work, through actions or inaction, then Contractor shall be entitled to an equitable adjustment in the Contract Price or the Contract Times, or both. Contractor must submit any Change Proposal

seeking an equitable adjustment in the Contract Price or the Contract Times under this paragraph within 30 days of the damaging, delaying, disrupting, or interfering event. The entitlement to, and extent of, any such equitable adjustment shall take into account information (if any) regarding such other work that was provided to Contractor in the Contract Documents prior to the submittal of the Bid or the final negotiation of the terms of the Contract. When applicable, any such equitable adjustment in Contract Price shall be conditioned on Contractor assigning to Owner all Contractor's rights against such other contractor or utility owner with respect to the damage, delay, disruption, or interference that is the subject of the adjustment. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times.

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

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

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

ARTICLE 9 – OWNER'S RESPONSIBILITIES

9.01 *Communications to Contractor*

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

9.02 *Replacement of Engineer*

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

9.03 *Furnish Data*

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

9.04 *Pay When Due*

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

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

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

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

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

9.06 *Insurance*

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

9.07 *Change Orders*

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

9.08 *Inspections, Tests, and Approvals*

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

9.09 *Limitations on Owner's Responsibilities*

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

9.10 *Undisclosed Hazardous Environmental Condition*

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

9.11 *Evidence of Financial Arrangements*

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

9.12 *Safety Programs*

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

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

ARTICLE 10 – ENGINEER'S STATUS DURING CONSTRUCTION

10.01 *Owner's Representative*

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

10.02 *Visits to Site*

A. Engineer will make visits to the Site at intervals appropriate to the various stages of construction as Engineer deems necessary in order to observe as an experienced and qualified design professional the progress that has been made and the quality of the various aspects of Contractor's executed Work. Based on information obtained during such visits and observations, Engineer, for the benefit of Owner, will determine, in general, if the Work is proceeding in accordance with the Contract Documents. Engineer will not be required to make exhaustive or continuous inspections on the Site to check the quality or quantity of the Work. Engineer's efforts will be directed toward providing for Owner a greater degree of confidence that the completed Work will conform generally to the Contract Documents. On the basis of such visits and observations, Engineer will keep Owner informed of the progress of the Work and will endeavor to guard Owner against defective Work.

B. Engineer's visits and observations are subject to all the limitations on Engineer's authority and responsibility set forth in Paragraph 10.08. Particularly, but without limitation, during or as a result of Engineer's visits or observations of Contractor's Work, Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work.

10.03 *Project Representative*

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

10.04 *Rejecting Defective Work*

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

10.05 *Shop Drawings, Change Orders and Payments*

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

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

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

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

10.06 *Determinations for Unit Price Work*

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

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

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

10.08 *Limitations on Engineer's Authority and Responsibilities*

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

B. Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work. Engineer will not be responsible for Contractor's failure to perform the Work in accordance with the Contract Documents.

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

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

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

10.09 *Compliance with Safety Program*

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

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

11.01 *Amending and Supplementing Contract Documents*

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

1. *Change Orders*:

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

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

2. *Work Change Directives*: A Work Change Directive will not change the Contract Price or the Contract Times but is evidence that the parties expect that the modification ordered or documented by a Work Change Directive will be incorporated in a subsequently issued Change Order, following negotiations by the parties as to the Work Change Directive's effect, if any, on the Contract Price and Contract Times; or, if negotiations are unsuccessful, by a determination under the terms of the Contract Documents governing adjustments, expressly including Paragraph 11.04 regarding change of Contract Price. Contractor must submit any Change Proposal seeking an adjustment of the Contract Price or the Contract Times, or both, no later than 30 days after the completion of the Work set out in the Work Change Directive. Owner must submit any Claim seeking an adjustment of the Contract Price or the Contract Times, or both, no later than 60 days after issuance of the Work Change Directive.

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

11.02 *Owner-Authorized Changes in the Work*

A. Without invalidating the Contract and without notice to any surety, Owner may, at any time or from time to time, order additions, deletions, or revisions in the Work. Such changes shall be supported by Engineer's recommendation, to the extent the change

involves the design (as set forth in the Drawings, Specifications, or otherwise), or other engineering or technical matters. Such changes may be accomplished by a Change Order, if Owner and Contractor have agreed as to the effect, if any, of the changes on Contract Times or Contract Price; or by a Work Change Directive. Upon receipt of any such document, Contractor shall promptly proceed with the Work involved; or, in the case of a deletion in the Work, promptly cease construction activities with respect to such deleted Work. Added or revised Work shall be performed under the applicable conditions of the Contract Documents. Nothing in this paragraph shall obligate Contractor to undertake work that Contractor reasonably concludes cannot be performed in a manner consistent with Contractor's safety obligations under the Contract Documents or Laws and Regulations.

11.03 *Unauthorized Changes in the Work*

A. Contractor shall not be entitled to an increase in the Contract Price or an extension of the Contract Times with respect to any work performed that is not required by the Contract Documents, as amended, modified, or supplemented, except in the case of an emergency as provided in Paragraph 7.15 or in the case of uncovering Work as provided in Paragraph 14.05.

11.04 *Change of Contract Price*

A. The Contract Price may only be changed by a Change Order. Any Change Proposal for an adjustment in the Contract Price shall comply with the provisions of Paragraph 11.06. Any Claim for an adjustment of Contract Price shall comply with the provisions of Article 12.

B. An adjustment in the Contract Price will be determined as follows:

1. where the Work involved is covered by unit prices contained in the Contract Documents, then by application of such unit prices to the quantities of the items involved (subject to the provisions of Paragraph 13.03); or

2. where the Work involved is not covered by unit prices contained in the Contract Documents, then by a mutually agreed lump sum (which may include an allowance for overhead and profit not necessarily in accordance with Paragraph 11.04.C.2); or

3. where the Work involved is not covered by unit prices contained in the Contract Documents and the parties do not reach mutual agreement to a lump sum, then on the basis of the Cost of the Work (determined as provided in Paragraph 13.01) plus a Contractor's fee for overhead and profit (determined as provided in Paragraph 11.04.C).

C. *Contractor's Fee*: When applicable, the Contractor's fee for overhead and profit shall be determined as follows:

1. a mutually acceptable fixed fee; or

2. if a fixed fee is not agreed upon, then a fee based on the following percentages of the various portions of the Cost of the Work:

a. for costs incurred under Paragraphs 13.01.B.1 and 13.01.B.2, the Contractor's fee shall be 15 percent;

b. for costs incurred under Paragraph 13.01.B.3, the Contractor's fee shall be five percent;

c. where one or more tiers of subcontracts are on the basis of Cost of the Work plus a fee and no fixed fee is agreed upon, the intent of Paragraphs 11.01.C.2.a and

11.01.C.2.b is that the Contractor's fee shall be based on: (1) a fee of 15 percent of the costs incurred under Paragraphs 13.01.A.1 and 13.01.A.2 by the Subcontractor that actually performs the Work, at whatever tier, and (2) with respect to Contractor itself and to any Subcontractors of a tier higher than that of the Subcontractor that actually performs the Work, a fee of five percent of the amount (fee plus underlying costs incurred) attributable to the next lower tier Subcontractor; provided, however, that for any such subcontracted work the maximum total fee to be paid by Owner shall be no greater than 27 percent of the costs incurred by the Subcontractor that actually performs the work;

d. no fee shall be payable on the basis of costs itemized under Paragraphs 13.01.B.4, 13.01.B.5, and 13.01.C;

e. the amount of credit to be allowed by Contractor to Owner for any change which results in a net decrease in cost will be the amount of the actual net decrease in cost plus a deduction in Contractor's fee by an amount equal to five percent of such net decrease; and

f. when both additions and credits are involved in any one change, the adjustment in Contractor's fee shall be computed on the basis of the net change in accordance with Paragraphs 11.04.C.2.a through 11.04.C.2.e, inclusive.

11.05 *Change of Contract Times*

A. The Contract Times may only be changed by a Change Order. Any Change Proposal for an adjustment in the Contract Times shall comply with the provisions of Paragraph 11.06. Any Claim for an adjustment in the Contract Times shall comply with the provisions of Article 12.

B. An adjustment of the Contract Times shall be subject to the limitations set forth in Paragraph 4.05, concerning delays in Contractor's progress.

11.06 *Change Proposals*

A. Contractor shall submit a Change Proposal to Engineer to request an adjustment in the Contract Times or Contract Price; appeal an initial decision by Engineer concerning the requirements of the Contract Documents or relating to the acceptability of the Work under the Contract Documents; contest a set-off against payment due; or seek other relief under the Contract. The Change Proposal shall specify any proposed change in Contract Times or Contract Price, or both, or other proposed relief, and explain the reason for the proposed change, with citations to any governing or applicable provisions of the Contract Documents.

1. *Procedures*: Contractor shall submit each Change Proposal to Engineer promptly (but in no event later than 30 days) after the start of the event giving rise thereto, or after such initial decision. The Contractor shall submit supporting data, including the proposed change in Contract Price or Contract Time (if any), to the Engineer and Owner within 15 days after the submittal of the Change Proposal. The supporting data shall be accompanied by a written statement that the supporting data are accurate and complete, and that any requested time or price adjustment is the entire adjustment to which Contractor believes it is entitled as a result of said event. Engineer will advise Owner regarding the Change Proposal, and consider any comments or response from Owner regarding the Change Proposal.

2. *Engineer's Action*: Engineer will review each Change Proposal and, within 30 days after receipt of the Contractor's supporting data, either deny the Change Proposal in whole,

approve it in whole, or deny it in part and approve it in part. Such actions shall be in writing, with a copy provided to Owner and Contractor. If Engineer does not take action on the Change Proposal within 30 days, then either Owner or Contractor may at any time thereafter submit a letter to the other party indicating that as a result of Engineer's inaction the Change Proposal is deemed denied, thereby commencing the time for appeal of the denial under Article 12.

3. *Binding Decision*: Engineer's decision will be final and binding upon Owner and Contractor, unless Owner or Contractor appeals the decision by filing a Claim under Article 12.

B. *Resolution of Certain Change Proposals*: If the Change Proposal does not involve the design (as set forth in the Drawings, Specifications, or otherwise), the acceptability of the Work, or other engineering or technical matters, then Engineer will notify the parties that the Engineer is unable to resolve the Change Proposal. For purposes of further resolution of such a Change Proposal, such notice shall be deemed a denial, and Contractor may choose to seek resolution under the terms of Article 12.

11.07 *Execution of Change Orders*

A. Owner and Contractor shall execute appropriate Change Orders covering:

1. changes in the Contract Price or Contract Times which are agreed to by the parties, including any undisputed sum or amount of time for Work actually performed in accordance with a Work Change Directive;

2. changes in Contract Price resulting from an Owner set-off, unless Contractor has duly contested such set-off;

3. changes in the Work which are: (a) ordered by Owner pursuant to Paragraph 11.02, (b) required because of Owner's acceptance of defective Work under Paragraph 14.04 or Owner's correction of defective Work under Paragraph 14.07, or (c) agreed to by the parties, subject to the need for Engineer's recommendation if the change in the Work involves the design (as set forth in the Drawings, Specifications, or otherwise), or other engineering or technical matters; and

4. changes in the Contract Price or Contract Times, or other changes, which embody the substance of any final and binding results under Paragraph 11.06, or Article 12.

B. If Owner or Contractor refuses to execute a Change Order that is required to be executed under the terms of this Paragraph 11.07, it shall be deemed to be of full force and effect, as if fully executed.

11.08 *Notification to Surety*

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

ARTICLE 12 – CLAIMS

12.01 *Claims*

A. *Claims Process*: The following disputes between Owner and Contractor shall be submitted to the Claims process set forth in this Article:

1. Appeals by Owner or Contractor of Engineer's decisions regarding Change Proposals;

2. Owner demands for adjustments in the Contract Price or Contract Times, or other relief under the Contract Documents; and

3. Disputes that Engineer has been unable to address because they do not involve the design (as set forth in the Drawings, Specifications, or otherwise), the acceptability of the Work, or other engineering or technical matters.

B. *Submittal of Claim*: The party submitting a Claim shall deliver it directly to the other party to the Contract promptly (but in no event later than 30 days) after the start of the event giving rise thereto; in the case of appeals regarding Change Proposals within 30 days of the decision under appeal. The party submitting the Claim shall also furnish a copy to the Engineer, for its information only. The responsibility to substantiate a Claim shall rest with the party making the Claim. In the case of a Claim by Contractor seeking an increase in the Contract Times or Contract Price, or both, Contractor shall certify that the Claim is made in good faith, that the supporting data are accurate and complete, and that to the best of Contractor's knowledge and belief the amount of time or money requested accurately reflects the full amount to which Contractor is entitled.

C. *Review and Resolution*: The party receiving a Claim shall review it thoroughly, giving full consideration to its merits. The two parties shall seek to resolve the Claim through the exchange of information and direct negotiations. The parties may extend the time for resolving the Claim by mutual agreement. All actions taken on a Claim shall be stated in writing and submitted to the other party, with a copy to Engineer.

D. *Mediation*:

1. At any time after initiation of a Claim, Owner and Contractor may mutually agree to mediation of the underlying dispute. The agreement to mediate shall stay the Claim submittal and response process.

2. If Owner and Contractor agree to mediation, then after 60 days from such agreement, either Owner or Contractor may unilaterally terminate the mediation process, and the Claim submittal and decision process shall resume as of the date of the termination. If the mediation proceeds but is unsuccessful in resolving the dispute, the Claim submittal and decision process shall resume as of the date of the conclusion of the mediation, as determined by the mediator.

3. Owner and Contractor shall each pay one-half of the mediator's fees and costs.

E. *Partial Approval*: If the party receiving a Claim approves the Claim in part and denies it in part, such action shall be final and binding unless within 30 days of such action the other party invokes the procedure set forth in Article 17 for final resolution of disputes.

F. *Denial of Claim*: If efforts to resolve a Claim are not successful, the party receiving the Claim may deny it by giving written notice of denial to the other party. If the receiving party does not take action on the Claim within 90 days, then either Owner or Contractor may at any time thereafter submit a letter to the other party indicating that as a result of the inaction,

the Claim is deemed denied, thereby commencing the time for appeal of the denial. A denial of the Claim shall be final and binding unless within 30 days of the denial the other party invokes the procedure set forth in Article 17 for the final resolution of disputes.

G. *Final and Binding Results*: If the parties reach a mutual agreement regarding a Claim, whether through approval of the Claim, direct negotiations, mediation, or otherwise; or if a Claim is approved in part and denied in part, or denied in full, and such actions become final and binding; then the results of the agreement or action on the Claim shall be incorporated in a Change Order to the extent they affect the Contract, including the Work, the Contract Times, or the Contract Price.

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

13.01 *Cost of the Work*

A. *Purposes for Determination of Cost of the Work*: The term Cost of the Work means the sum of all costs necessary for the proper performance of the Work at issue, as further defined below. The provisions of this Paragraph 13.01 are used for two distinct purposes:

1. To determine Cost of the Work when Cost of the Work is a component of the Contract Price, under cost-plus-fee, time-and-materials, or other cost-based terms; or

2. To determine the value of a Change Order, Change Proposal, Claim, set-off, or other adjustment in Contract Price. When the value of any such adjustment is determined on the basis of Cost of the Work, Contractor is entitled only to those additional or incremental costs required because of the change in the Work or because of the event giving rise to the adjustment.

B. *Costs Included*: Except as otherwise may be agreed to in writing by Owner, costs included in the Cost of the Work shall be in amounts no higher than those prevailing in the locality of the Project, shall not include any of the costs itemized in Paragraph 13.01.C, and shall include only the following items:

1. Payroll costs for employees in the direct employ of Contractor in the performance of the Work under schedules of job classifications agreed upon by Owner and Contractor. Such employees shall include, without limitation, superintendents, foremen, and other personnel employed full time on the Work. Payroll costs for employees not employed full time on the Work shall be apportioned on the basis of their time spent on the Work. Payroll costs shall include, but not be limited to, salaries and wages plus the cost of fringe benefits, which shall include social security contributions, unemployment, excise, and payroll taxes, workers' compensation, health and retirement benefits, bonuses, sick leave, and vacation and holiday pay applicable thereto. The expenses of performing Work outside of regular working hours, on Saturday, Sunday, or legal holidays, shall be included in the above to the extent authorized by Owner.

2. Cost of all materials and equipment furnished and incorporated in the Work, including costs of transportation and storage thereof, and Suppliers' field services required in connection therewith. All cash discounts shall accrue to Contractor unless Owner deposits funds with Contractor with which to make payments, in which case the cash discounts shall accrue to Owner. All trade discounts, rebates, and refunds and returns from sale of surplus materials and equipment shall accrue to Owner, and Contractor shall make provisions so that they may be obtained.

3. Payments made by Contractor to Subcontractors for Work performed by Subcontractors. If required by Owner, Contractor shall obtain competitive bids from subcontractors acceptable to Owner and Contractor and shall deliver such bids to Owner, who will then determine, with the advice of Engineer, which bids, if any, will be acceptable. If any subcontract provides that the Subcontractor is to be paid on the basis of Cost of the Work plus a fee, the Subcontractor's Cost of the Work and fee shall be determined in the same manner as Contractor's Cost of the Work and fee as provided in this Paragraph 13.01.

4. Costs of special consultants (including but not limited to engineers, architects, testing laboratories, surveyors, attorneys, and accountants) employed for services specifically related to the Work.

5. Supplemental costs including the following:

    a. The proportion of necessary transportation, travel, and subsistence expenses of Contractor's employees incurred in discharge of duties connected with the Work.

    b. Cost, including transportation and maintenance, of all materials, supplies, equipment, machinery, appliances, office, and temporary facilities at the Site, and hand tools not owned by the workers, which are consumed in the performance of the Work, and cost, less market value, of such items used but not consumed which remain the property of Contractor.

    c. Rentals of all construction equipment and machinery, and the parts thereof, whether rented from Contractor or others in accordance with rental agreements approved by Owner with the advice of Engineer, and the costs of transportation, loading, unloading, assembly, dismantling, and removal thereof. All such costs shall be in accordance with the terms of said rental agreements. The rental of any such equipment, machinery, or parts shall cease when the use thereof is no longer necessary for the Work.

    d. Sales, consumer, use, and other similar taxes related to the Work, and for which Contractor is liable, as imposed by Laws and Regulations.

    e. Deposits lost for causes other than negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, and royalty payments and fees for permits and licenses.

    f. Losses and damages (and related expenses) caused by damage to the Work, not compensated by insurance or otherwise, sustained by Contractor in connection with the performance of the Work (except losses and damages within the deductible amounts of property insurance established in accordance with Paragraph 6.05), provided such losses and damages have resulted from causes other than the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable. Such losses shall include settlements made with the written consent and approval of Owner. No such losses, damages, and expenses shall be included in the Cost of the Work for the purpose of determining Contractor's fee.

    g. The cost of Utility, fuel, and sanitary facilities at the Site.

    h. Minor expenses such as communication service at the Site, express and courier services, and similar petty cash items in connection with the Work.

i. The costs of premiums for all bonds and insurance that Contractor is required by the Contract Documents to purchase and maintain.

C. *Costs Excluded*: The term Cost of the Work shall not include any of the following items:

1. Payroll costs and other compensation of Contractor's officers, executives, principals (of partnerships and sole proprietorships), general managers, safety managers, engineers, architects, estimators, attorneys, auditors, accountants, purchasing and contracting agents, expediters, timekeepers, clerks, and other personnel employed by Contractor, whether at the Site or in Contractor's principal or branch office for general administration of the Work and not specifically included in the agreed upon schedule of job classifications referred to in Paragraph 13.01.B.1 or specifically covered by Paragraph 13.01.B.4. The payroll costs and other compensation excluded here are to be considered administrative costs covered by the Contractor's fee.

2. Expenses of Contractor's principal and branch offices other than Contractor's office at the Site.

3. Any part of Contractor's capital expenses, including interest on Contractor's capital employed for the Work and charges against Contractor for delinquent payments.

4. Costs due to the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, including but not limited to, the correction of defective Work, disposal of materials or equipment wrongly supplied, and making good any damage to property.

5. Other overhead or general expense costs of any kind and the costs of any item not specifically and expressly included in Paragraph 13.01.B.

D. *Contractor's Fee*: When the Work as a whole is performed on the basis of cost-plus, Contractor's fee shall be determined as set forth in the Agreement. When the value of any Work covered by a Change Order, Change Proposal, Claim, set-off, or other adjustment in Contract Price is determined on the basis of Cost of the Work, Contractor's fee shall be determined as set forth in Paragraph 11.04.C.

E. *Documentation*: Whenever the Cost of the Work for any purpose is to be determined pursuant to this Article 13, Contractor will establish and maintain records thereof in accordance with generally accepted accounting practices and submit in a form acceptable to Engineer an itemized cost breakdown together with supporting data.

13.02 *Allowances*

A. It is understood that Contractor has included in the Contract Price all allowances so named in the Contract Documents and shall cause the Work so covered to be performed for such sums and by such persons or entities as may be acceptable to Owner and Engineer.

B. *Cash Allowances*: Contractor agrees that:

1. the cash allowances include the cost to Contractor (less any applicable trade discounts) of materials and equipment required by the allowances to be delivered at the Site, and all applicable taxes; and

2. Contractor's costs for unloading and handling on the Site, labor, installation, overhead, profit, and other expenses contemplated for the cash allowances have been included in the Contract Price and not in the allowances, and no demand for additional payment on account of any of the foregoing will be valid.

C. *Contingency Allowance*: Contractor agrees that a contingency allowance, if any, is for the sole use of Owner to cover unanticipated costs.

D. Prior to final payment, an appropriate Change Order will be issued as recommended by Engineer to reflect actual amounts due Contractor on account of Work covered by allowances, and the Contract Price shall be correspondingly adjusted.

13.03 *Unit Price Work*

A. Where the Contract Documents provide that all or part of the Work is to be Unit Price Work, initially the Contract Price will be deemed to include for all Unit Price Work an amount equal to the sum of the unit price for each separately identified item of Unit Price Work times the estimated quantity of each item as indicated in the Agreement.

B. The estimated quantities of items of Unit Price Work are not guaranteed and are solely for the purpose of comparison of Bids and determining an initial Contract Price. Payments to Contractor for Unit Price Work will be based on actual quantities.

C. Each unit price will be deemed to include an amount considered by Contractor to be adequate to cover Contractor's overhead and profit for each separately identified item.

D. Engineer will determine the actual quantities and classifications of Unit Price Work performed by Contractor. Engineer will review with Contractor the Engineer's preliminary determinations on such matters before rendering a written decision thereon (by recommendation of an Application for Payment or otherwise). Engineer's written decision thereon will be final and binding (except as modified by Engineer to reflect changed factual conditions or more accurate data) upon Owner and Contractor, subject to the provisions of the following paragraph.

E. Within 30 days of Engineer's written decision under the preceding paragraph, Contractor may submit a Change Proposal, or Owner may file a Claim, seeking an adjustment in the Contract Price if:

1. the quantity of any item of Unit Price Work performed by Contractor differs materially and significantly from the estimated quantity of such item indicated in the Agreement;

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

3. Contractor believes that it is entitled to an increase in Contract Price as a result of having incurred additional expense or Owner believes that Owner is entitled to a decrease in Contract Price, and the parties are unable to agree as to the amount of any such increase or decrease.

ARTICLE 14 – TESTS AND INSPECTIONS; CORRECTION, REMOVAL OR ACCEPTANCE OF DEFECTIVE WORK

14.01 *Access to Work*

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

14.02 *Tests, Inspections, and Approvals*

A. Contractor shall give Engineer timely notice of readiness of the Work (or specific parts thereof) for all required inspections and tests, and shall cooperate with inspection and testing personnel to facilitate required inspections and tests.

B. Owner shall retain and pay for the services of an independent inspector, testing laboratory, or other qualified individual or entity to perform all inspections and tests expressly required by the Contract Documents to be furnished and paid for by Owner, except that costs incurred in connection with tests or inspections of covered Work shall be governed by the provisions of Paragraph 14.05.

C. If Laws or Regulations of any public body having jurisdiction require any Work (or part thereof) specifically to be inspected, tested, or approved by an employee or other representative of such public body, Contractor shall assume full responsibility for arranging and obtaining such inspections, tests, or approvals, pay all costs in connection therewith, and furnish Engineer the required certificates of inspection or approval.

D. Contractor shall be responsible for arranging, obtaining, and paying for all inspections and tests required:

1. by the Contract Documents, unless the Contract Documents expressly allocate responsibility for a specific inspection or test to Owner;

2. to attain Owner's and Engineer's acceptance of materials or equipment to be incorporated in the Work;

3. by manufacturers of equipment furnished under the Contract Documents;

4. for testing, adjusting, and balancing of mechanical, electrical, and other equipment to be incorporated into the Work; and

5. for acceptance of materials, mix designs, or equipment submitted for approval prior to Contractor's purchase thereof for incorporation in the Work.

Such inspections and tests shall be performed by independent inspectors, testing laboratories, or other qualified individuals or entities acceptable to Owner and Engineer.

E. If the Contract Documents require the Work (or part thereof) to be approved by Owner, Engineer, or another designated individual or entity, then Contractor shall assume full responsibility for arranging and obtaining such approvals.

F. If any Work (or the work of others) that is to be inspected, tested, or approved is covered by Contractor without written concurrence of Engineer, Contractor shall, if requested by Engineer, uncover such Work for observation. Such uncovering shall be at Contractor's expense unless Contractor had given Engineer timely notice of Contractor's intention to cover the same and Engineer had not acted with reasonable promptness in response to such notice.

14.03 *Defective Work*

A. *Contractor's Obligation*: It is Contractor's obligation to assure that the Work is not defective.

B. *Engineer's Authority*: Engineer has the authority to determine whether Work is defective, and to reject defective Work.

C. *Notice of Defects*: Prompt notice of all defective Work of which Owner or Engineer has actual knowledge will be given to Contractor.

D. *Correction, or Removal and Replacement*: Promptly after receipt of written notice of defective Work, Contractor shall correct all such defective Work, whether or not fabricated, installed, or completed, or, if Engineer has rejected the defective Work, remove it from the Project and replace it with Work that is not defective.

E. *Preservation of Warranties*: When correcting defective Work, Contractor shall take no action that would void or otherwise impair Owner's special warranty and guarantee, if any, on said Work.

F. *Costs and Damages*: In addition to its correction, removal, and replacement obligations with respect to defective Work, Contractor shall pay all claims, costs, losses, and damages arising out of or relating to defective Work, including but not limited to the cost of the inspection, testing, correction, removal, replacement, or reconstruction of such defective Work, fines levied against Owner by governmental authorities because the Work is defective, and the costs of repair or replacement of work of others resulting from defective Work. Prior to final payment, if Owner and Contractor are unable to agree as to the measure of such claims, costs, losses, and damages resulting from defective Work, then Owner may impose a reasonable set-off against payments due under Article 15.

14.04 *Acceptance of Defective Work*

A. If, instead of requiring correction or removal and replacement of defective Work, Owner prefers to accept it, Owner may do so (subject, if such acceptance occurs prior to final payment, to Engineer's confirmation that such acceptance is in general accord with the design intent and applicable engineering principles, and will not endanger public safety). Contractor shall pay all claims, costs, losses, and damages attributable to Owner's evaluation of and determination to accept such defective Work (such costs to be approved by Engineer as to reasonableness), and for the diminished value of the Work to the extent not otherwise paid by Contractor. If any such acceptance occurs prior to final payment, the necessary revisions in the Contract Documents with respect to the Work shall be incorporated in a Change Order. If the parties are unable to agree as to the decrease in the Contract Price, reflecting the diminished value of Work so accepted, then Owner may impose a reasonable set-off against payments due under Article 15. If the acceptance of defective Work occurs after final payment, Contractor shall pay an appropriate amount to Owner.

14.05 *Uncovering Work*

A. Engineer has the authority to require special inspection or testing of the Work, whether or not the Work is fabricated, installed, or completed.

B. If any Work is covered contrary to the written request of Engineer, then Contractor shall, if requested by Engineer, uncover such Work for Engineer's observation, and then replace the covering, all at Contractor's expense.

C. If Engineer considers it necessary or advisable that covered Work be observed by Engineer or inspected or tested by others, then Contractor, at Engineer's request, shall uncover, expose, or otherwise make available for observation, inspection, or testing as Engineer may require, that portion of the Work in question, and provide all necessary labor, material, and equipment.

1. If it is found that the uncovered Work is defective, Contractor shall be responsible for all claims, costs, losses, and damages arising out of or relating to such uncovering, exposure, observation, inspection, and testing, and of satisfactory replacement or reconstruction (including but not limited to all costs of repair or replacement of work of others); and pending Contractor's full discharge of this responsibility the Owner shall be entitled to impose a reasonable set-off against payments due under Article 15.

2. If the uncovered Work is not found to be defective, Contractor shall be allowed an increase in the Contract Price or an extension of the Contract Times, or both, directly attributable to such uncovering, exposure, observation, inspection, testing, replacement, and reconstruction. If the parties are unable to agree as to the amount or extent thereof, then Contractor may submit a Change Proposal within 30 days of the determination that the Work is not defective.

14.06 *Owner May Stop the Work*

A. If the Work is defective, or Contractor fails to supply sufficient skilled workers or suitable materials or equipment, or fails to perform the Work in such a way that the completed Work will conform to the Contract Documents, then Owner may order Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, this right of Owner to stop the Work shall not give rise to any duty on the part of Owner to exercise this right for the benefit of Contractor, any Subcontractor, any Supplier, any other individual or entity, or any surety for, or employee or agent of any of them.

14.07 *Owner May Correct Defective Work*

A. If Contractor fails within a reasonable time after written notice from Engineer to correct defective Work, or to remove and replace rejected Work as required by Engineer, or if Contractor fails to perform the Work in accordance with the Contract Documents, or if Contractor fails to comply with any other provision of the Contract Documents, then Owner may, after seven days written notice to Contractor, correct or remedy any such deficiency.

B. In exercising the rights and remedies under this Paragraph 14.07, Owner shall proceed expeditiously. In connection with such corrective or remedial action, Owner may exclude Contractor from all or part of the Site, take possession of all or part of the Work and suspend Contractor's services related thereto, and incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere. Contractor shall allow Owner, Owner's representatives, agents and employees, Owner's other contractors, and Engineer and Engineer's consultants access to the Site to enable Owner to exercise the rights and remedies under this paragraph.

C. All claims, costs, losses, and damages incurred or sustained by Owner in exercising the rights and remedies under this Paragraph 14.07 will be charged against Contractor as set-offs against payments due under Article 15. Such claims, costs, losses and damages will include but not be limited to all costs of repair, or replacement of work of others destroyed or damaged by correction, removal, or replacement of Contractor's defective Work.

D. Contractor shall not be allowed an extension of the Contract Times because of any delay in the performance of the Work attributable to the exercise by Owner of Owner's rights and remedies under this Paragraph 14.07.

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

15.01 *Progress Payments*

A. *Basis for Progress Payments*: The Schedule of Values established as provided in Article 2 will serve as the basis for progress payments and will be incorporated into a form of Application for Payment acceptable to Engineer. Progress payments on account of Unit Price Work will be based on the number of units completed during the pay period, as determined under the provisions of Paragraph 13.03. Progress payments for cost-based Work will be based on Cost of the Work completed by Contractor during the pay period.

B. *Applications for Payments*:

1. At least 20 days before the date established in the Agreement for each progress payment (but not more often than once a month), Contractor shall submit to Engineer for review an Application for Payment filled out and signed by Contractor covering the Work completed as of the date of the Application and accompanied by such supporting documentation as is required by the Contract Documents. If payment is requested on the basis of materials and equipment not incorporated in the Work but delivered and suitably stored at the Site or at another location agreed to in writing, the Application for Payment shall also be accompanied by a bill of sale, invoice, or other documentation warranting that Owner has received the materials and equipment free and clear of all Liens, and evidence that the materials and equipment are covered by appropriate property insurance, a warehouse bond, or other arrangements to protect Owner's interest therein, all of which must be satisfactory to Owner.

2. Beginning with the second Application for Payment, each Application shall include an affidavit of Contractor stating that all previous progress payments received on account of the Work have been applied on account to discharge Contractor's legitimate obligations associated with prior Applications for Payment.

3. The amount of retainage with respect to progress payments will be as stipulated in the Agreement.

C. *Review of Applications*:

1. Engineer will, within 10 days after receipt of each Application for Payment, including each resubmittal, either indicate in writing a recommendation of payment and present the Application to Owner, or return the Application to Contractor indicating in writing Engineer's reasons for refusing to recommend payment. In the latter case, Contractor may make the necessary corrections and resubmit the Application.

2. Engineer's recommendation of any payment requested in an Application for Payment will constitute a representation by Engineer to Owner, based on Engineer's observations of the executed Work as an experienced and qualified design professional, and on Engineer's review of the Application for Payment and the accompanying data and schedules, that to the best of Engineer's knowledge, information and belief:

a. the Work has progressed to the point indicated;

b. the quality of the Work is generally in accordance with the Contract Documents (subject to an evaluation of the Work as a functioning whole prior to or upon Substantial Completion, the results of any subsequent tests called for in the Contract Documents, a final determination of quantities and classifications for

Unit Price Work under Paragraph 13.03, and any other qualifications stated in the recommendation); and

c. the conditions precedent to Contractor's being entitled to such payment appear to have been fulfilled in so far as it is Engineer's responsibility to observe the Work.

3. By recommending any such payment Engineer will not thereby be deemed to have represented that:

   a. inspections made to check the quality or the quantity of the Work as it has been performed have been exhaustive, extended to every aspect of the Work in progress, or involved detailed inspections of the Work beyond the responsibilities specifically assigned to Engineer in the Contract; or

   b. there may not be other matters or issues between the parties that might entitle Contractor to be paid additionally by Owner or entitle Owner to withhold payment to Contractor.

4. Neither Engineer's review of Contractor's Work for the purposes of recommending payments nor Engineer's recommendation of any payment, including final payment, will impose responsibility on Engineer:

   a. to supervise, direct, or control the Work, or

   b. for the means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or

   c. for Contractor's failure to comply with Laws and Regulations applicable to Contractor's performance of the Work, or

   d. to make any examination to ascertain how or for what purposes Contractor has used the money paid on account of the Contract Price, or

   e. to determine that title to any of the Work, materials, or equipment has passed to Owner free and clear of any Liens.

5. Engineer may refuse to recommend the whole or any part of any payment if, in Engineer's opinion, it would be incorrect to make the representations to Owner stated in Paragraph 15.01.C.2.

6. Engineer will recommend reductions in payment (set-offs) necessary in Engineer's opinion to protect Owner from loss because:

   a. the Work is defective, requiring correction or replacement;

   b. the Contract Price has been reduced by Change Orders;

   c. Owner has been required to correct defective Work in accordance with Paragraph 14.07, or has accepted defective Work pursuant to Paragraph 14.04;

   d. Owner has been required to remove or remediate a Hazardous Environmental Condition for which Contractor is responsible; or

   e. Engineer has actual knowledge of the occurrence of any of the events that would constitute a default by Contractor and therefore justify termination for cause under the Contract Documents.

D. *Payment Becomes Due*:

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

E. *Reductions in Payment by Owner*:

1. In addition to any reductions in payment (set-offs) recommended by Engineer, Owner is entitled to impose a set-off against payment based on any of the following:

a. claims have been made against Owner on account of Contractor's conduct in the performance or furnishing of the Work, or Owner has incurred costs, losses, or damages on account of Contractor's conduct in the performance or furnishing of the Work, including but not limited to claims, costs, losses, or damages from workplace injuries, adjacent property damage, non-compliance with Laws and Regulations, and patent infringement;

b. Contractor has failed to take reasonable and customary measures to avoid damage, delay, disruption, and interference with other work at or adjacent to the Site;

c. Contractor has failed to provide and maintain required bonds or insurance;

d. Owner has been required to remove or remediate a Hazardous Environmental Condition for which Contractor is responsible;

e. Owner has incurred extra charges or engineering costs related to submittal reviews, evaluations of proposed substitutes, tests and inspections, or return visits to manufacturing or assembly facilities;

f. the Work is defective, requiring correction or replacement;

g. Owner has been required to correct defective Work in accordance with Paragraph 14.07, or has accepted defective Work pursuant to Paragraph 14.04;

h. the Contract Price has been reduced by Change Orders;

i. an event that would constitute a default by Contractor and therefore justify a termination for cause has occurred;

j. liquidated damages have accrued as a result of Contractor's failure to achieve Milestones, Substantial Completion, or final completion of the Work;

k. Liens have been filed in connection with the Work, except where Contractor has delivered a specific bond satisfactory to Owner to secure the satisfaction and discharge of such Liens;

l. there are other items entitling Owner to a set off against the amount recommended.

2. If Owner imposes any set-off against payment, whether based on its own knowledge or on the written recommendations of Engineer, Owner will give Contractor immediate written notice (with a copy to Engineer) stating the reasons for such action and the specific amount of the reduction, and promptly pay Contractor any amount remaining after deduction of the amount so withheld. Owner shall promptly pay Contractor the amount so withheld, or any adjustment thereto agreed to by Owner and Contractor, if Contractor remedies the reasons for such action. The reduction

imposed shall be binding on Contractor unless it duly submits a Change Proposal contesting the reduction.

3. Upon a subsequent determination that Owner's refusal of payment was not justified, the amount wrongfully withheld shall be treated as an amount due as determined by Paragraph 15.01.C.1 and subject to interest as provided in the Agreement.

15.02 *Contractor's Warranty of Title*

A. Contractor warrants and guarantees that title to all Work, materials, and equipment furnished under the Contract will pass to Owner free and clear of (1) all Liens and other title defects, and (2) all patent, licensing, copyright, or royalty obligations, no later than seven days after the time of payment by Owner.

15.03 *Substantial Completion*

A. When Contractor considers the entire Work ready for its intended use Contractor shall notify Owner and Engineer in writing that the entire Work is substantially complete and request that Engineer issue a certificate of Substantial Completion. Contractor shall at the same time submit to Owner and Engineer an initial draft of punch list items to be completed or corrected before final payment.

B. Promptly after Contractor's notification, Owner, Contractor, and Engineer shall make an inspection of the Work to determine the status of completion. If Engineer does not consider the Work substantially complete, Engineer will notify Contractor in writing giving the reasons therefor.

C. If Engineer considers the Work substantially complete, Engineer will deliver to Owner a preliminary certificate of Substantial Completion which shall fix the date of Substantial Completion. Engineer shall attach to the certificate a punch list of items to be completed or corrected before final payment. Owner shall have seven days after receipt of the preliminary certificate during which to make written objection to Engineer as to any provisions of the certificate or attached punch list. If, after considering the objections to the provisions of the preliminary certificate, Engineer concludes that the Work is not substantially complete, Engineer will, within 14 days after submission of the preliminary certificate to Owner, notify Contractor in writing that the Work is not substantially complete, stating the reasons therefor. If Owner does not object to the provisions of the certificate, or if despite consideration of Owner's objections Engineer concludes that the Work is substantially complete, then Engineer will, within said 14 days, execute and deliver to Owner and Contractor a final certificate of Substantial Completion (with a revised punch list of items to be completed or corrected) reflecting such changes from the preliminary certificate as Engineer believes justified after consideration of any objections from Owner.

D. At the time of receipt of the preliminary certificate of Substantial Completion, Owner and Contractor will confer regarding Owner's use or occupancy of the Work following Substantial Completion, review the builder's risk insurance policy with respect to the end of the builder's risk coverage, and confirm the transition to coverage of the Work under a permanent property insurance policy held by Owner. Unless Owner and Contractor agree otherwise in writing, Owner shall bear responsibility for security, operation, protection of the Work, property insurance, maintenance, heat, and Utility upon Owner's use or occupancy of the Work.

E. After Substantial Completion the Contractor shall promptly begin work on the punch list of items to be completed or corrected prior to final payment. In appropriate cases Contractor

may submit monthly Applications for Payment for completed punch list items, following the progress payment procedures set forth above.

F. Owner shall have the right to exclude Contractor from the Site after the date of Substantial Completion subject to allowing Contractor reasonable access to remove its property and complete or correct items on the punch list.

15.04 *Partial Use or Occupancy*

A. Prior to Substantial Completion of all the Work, Owner may use or occupy any substantially completed part of the Work which has specifically been identified in the Contract Documents, or which Owner, Engineer, and Contractor agree constitutes a separately functioning and usable part of the Work that can be used by Owner for its intended purpose without significant interference with Contractor's performance of the remainder of the Work, subject to the following conditions:

1. At any time Owner may request in writing that Contractor permit Owner to use or occupy any such part of the Work that Owner believes to be substantially complete. If and when Contractor agrees that such part of the Work is substantially complete, Contractor, Owner, and Engineer will follow the procedures of Paragraph 15.03.A through E for that part of the Work.

2. At any time Contractor may notify Owner and Engineer in writing that Contractor considers any such part of the Work substantially complete and request Engineer to issue a certificate of Substantial Completion for that part of the Work.

3. Within a reasonable time after either such request, Owner, Contractor, and Engineer shall make an inspection of that part of the Work to determine its status of completion. If Engineer does not consider that part of the Work to be substantially complete, Engineer will notify Owner and Contractor in writing giving the reasons therefor. If Engineer considers that part of the Work to be substantially complete, the provisions of Paragraph 15.03 will apply with respect to certification of Substantial Completion of that part of the Work and the division of responsibility in respect thereof and access thereto.

4. No use or occupancy or separate operation of part of the Work may occur prior to compliance with the requirements of Paragraph 6.05 regarding builder's risk or other property insurance.

15.05 *Final Inspection*

A. Upon written notice from Contractor that the entire Work or an agreed portion thereof is complete, Engineer will promptly make a final inspection with Owner and Contractor and will notify Contractor in writing of all particulars in which this inspection reveals that the Work, or agreed portion thereof, is incomplete or defective. Contractor shall immediately take such measures as are necessary to complete such Work or remedy such deficiencies.

15.06 *Final Payment*

A. *Application for Payment*:

1. After Contractor has, in the opinion of Engineer, satisfactorily completed all corrections identified during the final inspection and has delivered, in accordance with the Contract Documents, all maintenance and operating instructions, schedules, guarantees, bonds, certificates or other evidence of insurance, certificates of

inspection, annotated record documents (as provided in Paragraph 7.11), and other documents, Contractor may make application for final payment.

2. The final Application for Payment shall be accompanied (except as previously delivered) by:

   a. all documentation called for in the Contract Documents;

   b. consent of the surety, if any, to final payment;

   c. satisfactory evidence that all title issues have been resolved such that title to all Work, materials, and equipment has passed to Owner free and clear of any Liens or other title defects, or will so pass upon final payment.

   d. a list of all disputes that Contractor believes are unsettled; and

   e. complete and legally effective releases or waivers (satisfactory to Owner) of all Lien rights arising out of the Work, and of Liens filed in connection with the Work.

3. In lieu of the releases or waivers of Liens specified in Paragraph 15.06.A.2 and as approved by Owner, Contractor may furnish receipts or releases in full and an affidavit of Contractor that: (a) the releases and receipts include all labor, services, material, and equipment for which a Lien could be filed; and (b) all payrolls, material and equipment bills, and other indebtedness connected with the Work for which Owner might in any way be responsible, or which might in any way result in liens or other burdens on Owner's property, have been paid or otherwise satisfied. If any Subcontractor or Supplier fails to furnish such a release or receipt in full, Contractor may furnish a bond or other collateral satisfactory to Owner to indemnify Owner against any Lien, or Owner at its option may issue joint checks payable to Contractor and specified Subcontractors and Suppliers.

B. *Engineer's Review of Application and Acceptance*:

1. If, on the basis of Engineer's observation of the Work during construction and final inspection, and Engineer's review of the final Application for Payment and accompanying documentation as required by the Contract Documents, Engineer is satisfied that the Work has been completed and Contractor's other obligations under the Contract have been fulfilled, Engineer will, within ten days after receipt of the final Application for Payment, indicate in writing Engineer's recommendation of final payment and present the Application for Payment to Owner for payment. Such recommendation shall account for any set-offs against payment that are necessary in Engineer's opinion to protect Owner from loss for the reasons stated above with respect to progress payments. At the same time Engineer will also give written notice to Owner and Contractor that the Work is acceptable, subject to the provisions of Paragraph 15.07. Otherwise, Engineer will return the Application for Payment to Contractor, indicating in writing the reasons for refusing to recommend final payment, in which case Contractor shall make the necessary corrections and resubmit the Application for Payment.

C. *Completion of Work*: The Work is complete (subject to surviving obligations) when it is ready for final payment as established by the Engineer's written recommendation of final payment.

D. *Payment Becomes Due*: Thirty days after the presentation to Owner of the final Application for Payment and accompanying documentation, the amount recommended by Engineer

(less any further sum Owner is entitled to set off against Engineer's recommendation, including but not limited to set-offs for liquidated damages and set-offs allowed under the provisions above with respect to progress payments) will become due and shall be paid by Owner to Contractor.

15.07 *Waiver of Claims*

A. The making of final payment will not constitute a waiver by Owner of claims or rights against Contractor. Owner expressly reserves claims and rights arising from unsettled Liens, from defective Work appearing after final inspection pursuant to Paragraph 15.05, from Contractor's failure to comply with the Contract Documents or the terms of any special guarantees specified therein, from outstanding Claims by Owner, or from Contractor's continuing obligations under the Contract Documents.

B. The acceptance of final payment by Contractor will constitute a waiver by Contractor of all claims and rights against Owner other than those pending matters that have been duly submitted or appealed under the provisions of Article 17.

15.08 *Correction Period*

A. If within one year after the date of Substantial Completion (or such longer period of time as may be prescribed by the terms of any applicable special guarantee required by the Contract Documents, or by any specific provision of the Contract Documents), any Work is found to be defective, or if the repair of any damages to the Site, adjacent areas that Contractor has arranged to use through construction easements or otherwise, and other adjacent areas used by Contractor as permitted by Laws and Regulations, is found to be defective, then Contractor shall promptly, without cost to Owner and in accordance with Owner's written instructions:

1. correct the defective repairs to the Site or such other adjacent areas;

2. correct such defective Work;

3. if the defective Work has been rejected by Owner, remove it from the Project and replace it with Work that is not defective, and

4. satisfactorily correct or repair or remove and replace any damage to other Work, to the work of others, or to other land or areas resulting therefrom.

B. If Contractor does not promptly comply with the terms of Owner's written instructions, or in an emergency where delay would cause serious risk of loss or damage, Owner may have the defective Work corrected or repaired or may have the rejected Work removed and replaced. Contractor shall pay all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such correction or repair or such removal and replacement (including but not limited to all costs of repair or replacement of work of others).

C. In special circumstances where a particular item of equipment is placed in continuous service before Substantial Completion of all the Work, the correction period for that item may start to run from an earlier date if so provided in the Specifications.

D. Where defective Work (and damage to other Work resulting therefrom) has been corrected or removed and replaced under this paragraph, the correction period hereunder with

respect to such Work will be extended for an additional period of one year after such correction or removal and replacement has been satisfactorily completed.

E. Contractor's obligations under this paragraph are in addition to all other obligations and warranties. The provisions of this paragraph shall not be construed as a substitute for, or a waiver of, the provisions of any applicable statute of limitation or repose.

ARTICLE 16 – SUSPENSION OF WORK AND TERMINATION

16.01 *Owner May Suspend Work*

A. At any time and without cause, Owner may suspend the Work or any portion thereof for a period of not more than 90 consecutive days by written notice to Contractor and Engineer. Such notice will fix the date on which Work will be resumed. Contractor shall resume the Work on the date so fixed. Contractor shall be entitled to an adjustment in the Contract Price or an extension of the Contract Times, or both, directly attributable to any such suspension. Any Change Proposal seeking such adjustments shall be submitted no later than 30 days after the date fixed for resumption of Work.

16.02 *Owner May Terminate for Cause*

A. The occurrence of any one or more of the following events will constitute a default by Contractor and justify termination for cause:

1. Contractor's persistent failure to perform the Work in accordance with the Contract Documents (including, but not limited to, failure to supply sufficient skilled workers or suitable materials or equipment or failure to adhere to the Progress Schedule);

2. Failure of Contractor to perform or otherwise to comply with a material term of the Contract Documents;

3. Contractor's disregard of Laws or Regulations of any public body having jurisdiction; or

4. Contractor's repeated disregard of the authority of Owner or Engineer.

B. If one or more of the events identified in Paragraph 16.02.A occurs, then after giving Contractor (and any surety) ten days written notice that Owner is considering a declaration that Contractor is in default and termination of the contract, Owner may proceed to:

1. declare Contractor to be in default, and give Contractor (and any surety) notice that the Contract is terminated; and

2. enforce the rights available to Owner under any applicable performance bond.

C. Subject to the terms and operation of any applicable performance bond, if Owner has terminated the Contract for cause, Owner may exclude Contractor from the Site, take possession of the Work, incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere, and complete the Work as Owner may deem expedient.

D. Owner may not proceed with termination of the Contract under Paragraph 16.02.B if Contractor within seven days of receipt of notice of intent to terminate begins to correct its failure to perform and proceeds diligently to cure such failure.

E. If Owner proceeds as provided in Paragraph 16.02.B, Contractor shall not be entitled to receive any further payment until the Work is completed. If the unpaid balance of the Contract Price exceeds the cost to complete the Work, including all related claims, costs,

losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals) sustained by Owner, such excess will be paid to Contractor. If the cost to complete the Work including such related claims, costs, losses, and damages exceeds such unpaid balance, Contractor shall pay the difference to Owner. Such claims, costs, losses, and damages incurred by Owner will be reviewed by Engineer as to their reasonableness and, when so approved by Engineer, incorporated in a Change Order. When exercising any rights or remedies under this paragraph, Owner shall not be required to obtain the lowest price for the Work performed.

F. Where Contractor's services have been so terminated by Owner, the termination will not affect any rights or remedies of Owner against Contractor then existing or which may thereafter accrue, or any rights or remedies of Owner against Contractor or any surety under any payment bond or performance bond. Any retention or payment of money due Contractor by Owner will not release Contractor from liability.

G. If and to the extent that Contractor has provided a performance bond under the provisions of Paragraph 6.01.A, the provisions of that bond shall govern over any inconsistent provisions of Paragraphs 16.02.B and 16.02.D.

16.03 *Owner May Terminate For Convenience*

A. Upon seven days written notice to Contractor and Engineer, Owner may, without cause and without prejudice to any other right or remedy of Owner, terminate the Contract. In such case, Contractor shall be paid for (without duplication of any items):

1. completed and acceptable Work executed in accordance with the Contract Documents prior to the effective date of termination, including fair and reasonable sums for overhead and profit on such Work;

2. expenses sustained prior to the effective date of termination in performing services and furnishing labor, materials, or equipment as required by the Contract Documents in connection with uncompleted Work, plus fair and reasonable sums for overhead and profit on such expenses; and

3. other reasonable expenses directly attributable to termination, including costs incurred to prepare a termination for convenience cost proposal.

B. Contractor shall not be paid on account of loss of anticipated overhead, profits, or revenue, or other economic loss arising out of or resulting from such termination.

16.04 *Contractor May Stop Work or Terminate*

A. If, through no act or fault of Contractor, (1) the Work is suspended for more than 90 consecutive days by Owner or under an order of court or other public authority, or (2) Engineer fails to act on any Application for Payment within 30 days after it is submitted, or (3) Owner fails for 30 days to pay Contractor any sum finally determined to be due, then Contractor may, upon seven days written notice to Owner and Engineer, and provided Owner or Engineer do not remedy such suspension or failure within that time, terminate the contract and recover from Owner payment on the same terms as provided in Paragraph 16.03.

B. In lieu of terminating the Contract and without prejudice to any other right or remedy, if Engineer has failed to act on an Application for Payment within 30 days after it is submitted, or Owner has failed for 30 days to pay Contractor any sum finally determined to be due, Contractor may, seven days after written notice to Owner and Engineer, stop the

Work until payment is made of all such amounts due Contractor, including interest thereon. The provisions of this paragraph are not intended to preclude Contractor from submitting a Change Proposal for an adjustment in Contract Price or Contract Times or otherwise for expenses or damage directly attributable to Contractor's stopping the Work as permitted by this paragraph.

ARTICLE 17 – FINAL RESOLUTION OF DISPUTES

17.01 *Methods and Procedures*

A. *Disputes Subject to Final Resolution*: The following disputed matters are subject to final resolution under the provisions of this Article:

1. A timely appeal of an approval in part and denial in part of a Claim, or of a denial in full; and

2. Disputes between Owner and Contractor concerning the Work or obligations under the Contract Documents, and arising after final payment has been made.

B. *Final Resolution of Disputes*: For any dispute subject to resolution under this Article, Owner or Contractor may:

1. elect in writing to invoke the dispute resolution process provided for in the Supplementary Conditions; or

2. agree with the other party to submit the dispute to another dispute resolution process; or

3. if no dispute resolution process is provided for in the Supplementary Conditions or mutually agreed to, give written notice to the other party of the intent to submit the dispute to a court of competent jurisdiction.

ARTICLE 18 – MISCELLANEOUS

18.01 *Giving Notice*

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

1. delivered in person, by a commercial courier service or otherwise, to the individual or to a member of the firm or to an officer of the corporation for which it is intended; or

2. delivered at or sent by registered or certified mail, postage prepaid, to the last business address known to the sender of the notice.

18.02 *Computation of Times*

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

18.03 *Cumulative Remedies*

A. The duties and obligations imposed by these General Conditions and the rights and remedies available hereunder to the parties hereto are in addition to, and are not to be construed in any way as a limitation of, any rights and remedies available to any or all of

them which are otherwise imposed or available by Laws or Regulations, by special warranty or guarantee, or by other provisions of the Contract. The provisions of this paragraph will be as effective as if repeated specifically in the Contract Documents in connection with each particular duty, obligation, right, and remedy to which they apply.

18.04 *Limitation of Damages*

A. With respect to any and all Change Proposals, Claims, disputes subject to final resolution, and other matters at issue, neither Owner nor Engineer, nor any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, shall be liable to Contractor for any claims, costs, losses, or damages sustained by Contractor on or in connection with any other project or anticipated project.

18.05 *No Waiver*

A. A party's non-enforcement of any provision shall not constitute a waiver of that provision, nor shall it affect the enforceability of that provision or of the remainder of this Contract.

18.06 *Survival of Obligations*

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

18.07 *Controlling Law*

A. This Contract is to be governed by the law of the state in which the Project is located.

18.08 *Headings*

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

SUPPLEMENTARY CONDITIONS
TO THE GENERAL CONDITIONS

These Supplementary Conditions amend or supplement the Standard General Conditions of the Construction Contract, EJCDC No. C-700 (2013 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.8 Add the following language to the end of Paragraph 1.01.A.8:
The Change Order form to be used on this Project is EJCDC No. C-941. Owner approval is required before Change Orders are effective.

SC-1.01.A.10. Delete subdivision (a) in its entirety.

SC-1.01.A.28 Add to the end of the first sentence the following:
The Owner is further defined as the Board of Directors of the Markleeville Public Utility District.

SC -1.01.A.40 Delete this section in its entirety and replace with the following:
See SC-15.03.C. for definition of Substantial Completion.

SC-1.01.A.48. Add the following language at the end of the last sentence of Paragraph 1.01.A.48:
A Work Change Directive cannot change Contract Price or Contract Times without a subsequent Change Order except as provided in Article(s) (4 and) 5 of the Agreement.

SC-1.01.A.49 Add as section 1.01.A.48 the following:
Abnormal Weather Conditions - Conditions of extreme or unusual weather for a given region, elevation, or season as determined by Engineer. Extreme or unusual weather that is typical for a given region, elevation, or season should not be considered Abnormal Weather Conditions.

ARTICLE 2 – PRELIMINARY MATTERS

SC-2.02.A Amend the first sentence of Paragraph 2.02.A to read as follows:
Owner shall furnish to Contractor one copy of the Contract Documents in electronic portable document format (PDF). It is the responsibility of the Contractor to print copies of the bid documents and have print copies available on site as needed.

ARTICLE 3 – DOCUMENTS: INTENT, REQUIREMENTS, REUSE

SC-3.02.A.1 Amend to the end of the section the following:

The work embraced herein shall be done in accordance with the Markleeville Public Utility District (MPUD, the District) approved construction drawings, specifications, County Standards, and the State Standard Specifications.

SC-3.02.A.3 Add as section SC-3.02.A.3 the following:
In case of conflict between the project drawings, these specifications and these special provisions, the precedence hierarchy shall follow in the order of: Project Plans, Project Specifications, County Standards, and State Standards.
SC-3.02.A.4 Add as section SC-3.02.A.4 the following:
The construction materials, payments, etc., for items of work shown in the proposal and on the plans, but not specifically mentioned in these Special Provisions are referred to the Standard Construction Specifications and State Standard Specifications for conformance

SC-3.04.A. Delete "and Owner" from the first sentence of section 3.04.A.

SC-3.04.B. Delete "and on Owner, unless it appeals by filing a Claim." Insert the following in its place:
Engineer's written clarification, interpretation, or decision is not final and binding on Owner. If Owner elects to reject Engineer's determination, it shall promptly provide written notice to Contractor. Contractor may submit a claim in accordance with Article 12 – Claims.

ARTICLE 4 – COMMENCEMENT AND PROGRESS OF THE WORK
SC-4.01.A Amend 4.01.A to read as follows:
The Contract Times will commence on the day indicated in the Notice to Proceed.

SC-4.05.C.2 Amend Paragraph 4.05.C.2 by striking out the following text: "abnormal weather conditions;" and inserting the following text:
Abnormal Weather Conditions;

ARTICLE 5 - AVAILABILITY OF LANDS; SUBSURFACE AND PHYSICAL CONDITIONS; HAZARDOUS ENVIRONMENTAL CONDITIONS
SC-5.02.A.3 Add as section SC-5.02.A.3 the following:
The Contractor shall maintain a neat project site appearance to the satisfaction of the Public Works Department and Engineer.
SC-5.02.A.4 Add as section 5.02.A.4 the following:
In any area visible to the public, the following shall apply:

1. When practicable, broken concrete and debris developed during construction shall be disposed of concurrently with its removal. If stockpiling is necessary, the material shall be removed or disposed of weekly.
2. The Contractor shall furnish trash bins for all debris from structure construction. All debris shall be placed in trash bins daily. Forms or falsework that are to be re-used shall be stacked neatly concurrently with their removal. Forms and falsework that are not to be re-used shall be disposed of concurrently with their removal.

SC-5.02.A.5 Add as section SC-5.02.A.5 the following:
Full compensation for conforming to the provisions in this section, not otherwise provided for, shall be considered as included in prices paid for the various contract items of work involved and no additional compensation will be allowed

SC-5.02.C Amend to the end of section SC-5.02.C the following:

After completion of construction activities, any temporary fill and construction debris shall be removed, and disturbed areas restored to pre-project conditions, where feasible. Restoration work may include such activities as replanting species removed from banks or replanting emergent vegetation in the active channel.

SC-5.03. Delete Paragraphs 5.03.A and 5.03.B in their entirety and insert the following:

A. No geotechnical evaluation has been prepared for this project. Past subsurface investigations in the project area have been compiled and a technical memorandum prepared with general soils information. All previous subsurface investigations and the soils technical memorandum are included as an attachment to these Specifications.

SC-5.04. Delete section 5.04 in its entirety and insert the following in its place:

Hazardous Waste and Unforeseen Subsurface Conditions. In accordance with Section 7104 of the California Public Contract Code, the Contractor shall, when work involves digging trenches or other excavations deeper than 4 feet below the surface, promptly, and before the following conditions are disturbed, notify Owner, in writing, of any:

(1) Material that the Contractor believes may be material that is hazardous waste, as defined in Section 25117 of the Health and Safety Code, that is required to be removed to a Class I, Class II, or Class III disposal site in accordance with provisions of existing law.

(2) Subsurface or latent physical conditions at the site differing from those indicated by information about the site made available to bidders prior to the deadline for submitting bids.

(3) Unknown physical conditions at the site of any unusual nature, different materially from those ordinarily encountered and generally recognized as inherent in work of the character provided for in the Contract.

Owner shall promptly investigate the conditions, and if it finds that the conditions do materially so differ, or do involve hazardous waste, and cause a decrease or increase in the Contractor’s cost of, or the time required for, performance of any part of the work shall issue a Change Order under the procedures described in the Contract.

In the event that a dispute arises between Owner and Contractor whether the conditions materially differ, or involve hazardous waste, or cause a decrease or increase in Contractor's cost of, or time required for, performance of any part of the work, Contractor shall not be excused from any scheduled completion date provided for by the Contract but shall proceed with all Work to be performed under the Contract. Section 12 pertaining to claims shall in that case apply.

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

Owner assumes the responsibility, between the parties to the Contract, for the timely removal, relocation, or protection of existing main or trunkline utility facilities located on the site of the Project that is a subject of the Contract, if such Utility are not identified by Owner in the Contract Documents. Contractor shall be compensated for the costs of locating, repairing damage not due to the failure of Contractor to exercise reasonable care, and removing or relocating such utility facilities not indicated in the Contract Documents with reasonable accuracy, and for equipment on the Project necessarily idled during such Work. Contractor shall not be assessed liquidated damages for delay in completion of the Project,

when such delay was caused by the failure of Owner or the owner of the utility to provide for removal or relocation of such utility facilities.

Nothing herein shall be deemed to require the Owner to indicate the presence of existing service laterals or appurtenances whenever the presence of such Utility on the site of the Project can be inferred from the presence of other visible facilities, such as buildings, meter and junction boxes, on or adjacent to the site of the construction; provided, however, nothing herein shall relieve Owner from identifying main or trunklines in the Contract Documents.

If Contractor while performing the Contract discovers utility facilities not identified by Owner in the Contract Documents, it shall immediately notify Owner and the utility in writing.

This section does not relieve Contractor of its obligations under the Regional Notification Center System, Section 4216, et seq., of the California Government Code.

SC-5.06. Delete Paragraphs 5.06.A and 5.06.B in their entirety and insert the following:

A. No reports or explorations or tests of Hazardous Environmental Conditions at or contiguous to the Site are known to the Owner or Engineer.

ARTICLE 6 – BONDS AND INSURANCE

SC 6.01.A. Add the following immediately after section 6.01.A:
The performance bond and the payment bond shall each be in a sum not less than 100% of the amount of the Contract Price.

SC 6.01.B. Delete section 6.01.B in its entirety and insert the following in its place:
Each surety for the payment and performance bonds shall be an “admitted surety insurer,” as defined in Code of Civil Procedure section 995.120 and shall be named in the current US Department of Treasury Listing of Approved Sureties (Department Circular 570). The bonds shall be executed in the name of the surety insurer under penalty of perjury or the fact of execution of the bond shall be duly acknowledged before an officer authorized to take and certify acknowledgments, and either one of the following conditions, at the option of the surety insurer, is satisfied:

1. A copy of the transcript or record of the unrevoked appointment, power of attorney, bylaws, or other instrument, duly certified by the proper authority and attested by the seal of the insurer entitling or authorizing the person who executed the bond to do so for and in behalf of the insurer, is filed in the office of the clerk of the county of Alpine.
2. A copy of a power of attorney is attached to the bond.

The Contractor shall, in accordance with Code of Civil Procedure section 995.640, obtain from the clerk of the County of Alpine and provide to Owner a certificate stating that the surety is authorized by the Insurance Commissioner to transact surety business.

SC-6.03.A. Add the following paragraph immediately after subdivision 4 of section 6.03.A: Contractor shall obtain from its carrier a waiver of subrogation endorsement in favor of Owner and Engineer.

SC-6.03.K. Add as section 6.03.K the following:

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

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

a. State:	Statutory
b. Employer's Liability	$1,000,000

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

a. General Aggregate	$2,000,000
b. Products - Completed Operations Aggregate	$1,000,000
c. Personal and Advertising Injury	$1,000,000
d. Each Occurrence (Bodily Injury and Property Damage)	$1,000,000
e. Excess or Umbrella Liability	

2. Automobile Liability under paragraph 6.03.D of the General Conditions:

a. Combined Single Limit	$1,000,000

3. Umbrella or excess liability under paragraph 6.03.E of the General Conditions:

a. General Aggregate	$2,000,000
b. Each Occurrence	$2,000,000

4. Contractual Liability coverage required by paragraph 6.03.C.2 of the General Conditions shall be provided as part of the Commercial General Liability coverage.

5. The Owner and Engineer are to be included as additional insurers.

6. Contractor is not required to provide Contractor's Pollution Liability insurance under this Contract.

SC-6.03.L. Add as section 6.03.L the following:
Any deductible or self-insured retention amount for the policies of insurance required by section 6.03 shall be subject to Owner approval.

6.05.C. Add the following sentence immediately after section 6.05.C:
Any deductible amount shall be subject to Owner approval.

6.06.A. Delete the second and third sentences in section 6.06.A, in its entirety.

6.06.B. Delete section 6.06.B, in its entirety.

6.06.C. Delete section 6.06.C, in its entirety.

ARTICLE 7 – CONTRACTOR'S RESPONSIBILITIES

SC-7.02.B. Delete Paragraph 7.02 B. in its entirety, and insert the following:

Regular working hours will be 8:00 a.m. to 7:00 p.m. In the absence of any Laws or Regulations to the contrary, Contractor may perform the Work on holidays, and on any or all days of the week, at Contractor's sole discretion. Contractor shall notify the Owner in writing of any planned work on a weekend or holiday a minimum of 48 hours in advance of that working day.

SC-7.02.C Add as section SC-7.02.C the following:

Should the Contractor prepare to begin work at the regular starting time of any day on which inclement weather, or the conditions resulting from the weather, or the condition of the work, prevents the work from beginning at the usual starting time and the crew is dismissed as a result thereof and the Contractor does not proceed with at least 75 percent of the normal labor and equipment force engaged in the current controlling operation or operations for at least 60 percent of the total daily time being currently spent on the controlling operation or operations, the Contractor will not be charged for a working day whether or not conditions should change thereafter during that day and the major portion of the day could be considered to be suitable for those construction operations.

SC-7.02.D Add as section SC-7.02.D the following:

The current controlling operation or operations is to be construed to include any feature of the work (e.g., an operation or activity, or a settlement or curing period) considered at the time by the Engineer and the Contractor, which, if delayed or prolonged, will delay the time of completion of the contract.

SC-7.02.E Add as section SC-7.02.E the following:

Determination that a day is a non-working day by reason of inclement weather or conditions resulting immediately therefrom, shall be made by the Engineer. The Contractor will be allowed 15 days from the issuance of the weekly statement of working days in which to file a written protest setting forth in what respects the Contractor differs from the Engineer; otherwise, the decision of the Engineer shall be deemed to have been accepted by the Contractor as correct. The Engineer will furnish the Contractor a weekly statement showing the number of working days charged to the contract for the preceding week, the number of working days of time extensions being considered or approved, the number of working days originally specified for the completion of the contract and the number of working days remaining to complete the contract and the extended date for completion thereof, except when working days are not being charged in conformance with the provisions of "Temporary Suspension of Work."

SC-7.02.C. Add as section 7.02.C the following:

1. This is a public work. Contractor and its subcontractors are subject to the requirements of Chapter 1, Part 7 of the Labor Code, commencing with section 1720, pertaining to public works, and are responsible for ascertaining and applying those requirements. Any person who willfully violates Article 2 of Chapter 1 (Wages) is guilty of a misdemeanor. See Labor Code section 1777. Violations may also result in debarment. See Labor Code section 1777.1.

2. Not less than the general prevailing rate of per diem wages for work of a similar character in the locality in which the Work is performed, and not less than the general prevailing rate of per diem wages for holiday and overtime work fixed as provided in Chapter 1, Part 7 of the Labor Code, shall be paid for each craft, classification, or type of worker needed to execute this Contract. Contractor, and any subcontractor under it, shall be subject to penalties under Labor Code section 1775 for paying less than the prevailing wage rates.

3. Copies of the prevailing rates of per diem wages are accessible on the internet under the

heading "General Prevailing Wage Determination made by the Director of Industrial Relations pursuant to California Labor Code Part 7, Chapter 1, Article 2, Sections 1770, 1773 and 1773.1." The Internet address is https://www.dir.ca.gov/OPRL/DPreWageDetermination.htm.

4. Contractor shall post a copy of the prevailing rate of per diem wages at the Work site.

5. Contractor and any subcontractor under it shall keep accurate payroll records showing the name, address, social security number, work classification, straight time and overtime hours worked each day and week, and the actual per diem wages paid to each journeyman, apprentice, worker, or other employee employed by it in connection with the Work, and shall certify and make those records available for inspection and otherwise comply with the provisions of Labor Code sections 1776 and 1812. Contractor and its subcontractors are subject to a penalty assessment for a failure to comply with these requirements. Any person who neglects to comply with the provisions of section 1776, pertaining to payroll records, is guilty of a misdemeanor. See also Labor Code section 1814.

6. Contractor and any subcontractor under it shall be subject to the provisions of Labor Code section 1777.5 and California Code of Regulations Title 8, Division 1, Chapter 2, Subchapter 1, Article 10, pertaining to the employment of apprentices. Contractor and its subcontractors shall pay every apprentice employed in the execution of this Contract the prevailing rate of per diem wages for apprentices in the trade to which he or she is registered and shall otherwise comply with the provisions of that section. Contractor and its subcontractors are subject to penalty assessments under Labor Code sections 17777.6 and 1777.7 for a failure to comply with these requirements. Contractor and any subcontractors working under it shall not refuse to accept qualified employees as registered apprentices on any basis listed in subdivision (a) of section 12940 of the Government Code.

7. Contractor warrants that neither it nor any of its subcontractors is ineligible to work on public works projects pursuant to section 1777.1 or 1777.7 of the Labor Code. Contractor is prohibited from performing work on this Contract with an ineligible subcontractor.

8. Contractor and its subcontractors shall not discriminate in the employment of persons upon this Work on any basis listed in subdivision (a) of section 12940 of the Government Code. Contractor and its subcontractors shall be subject to penalties for violations of this prohibition, as provided in Labor Code section 1735.

9. The time of service of any worker employed in the execution of this Contract is limited and restricted to 8 hours during any one calendar day, and 40 hours during any one calendar week, except that work performed by Contractor's employees in excess of 8 hours per day, and 40 hours during any one week, shall be permitted upon compensation for all hours worked in excess of 8 hours per day at not less than 1 1/2 times the basic rate of pay, or at any higher rate of overtime pay that may be required pursuant to a Department of Industrial Relations prevailing wage determination. Contractor, or any subcontractor working under it, shall be subject to penalties under Labor Code section 1813 for violations of these limitations.

10. Contractor shall secure the payment of worker's compensation to its employees performing the Work, in accordance with the provisions of Sections 1860 and 3700 of the Labor Code and, in case any such Work is sublet, the Contractor shall require the subcontractor similarly to comply with those provisions.

SC-7.04.A Amend the third sentence of the paragraph by striking out the following words:
Unless the specification or description contains or is followed by words reading that no like, equivalent, or “or-equal” item is permitted.

SC-7.04.A.1 Amend the last sentence of Paragraph a.3 by striking out “and:” and adding a period at the end of Paragraph a.3.

SC-7.04.A.1 Delete paragraph 7.04.A.1.a.4 in its entirety.

SC-7.05.B. Add the following sentence immediately after section 7.05.B:
Any increase in Contract Price or Contract Times shall not be effective unless approved by Owner except as provided in Article(s) 4 and 5 of the Agreement.

SC-7.05.F. Add the following sentence immediately after section 7.05.F:
Any increase in Contract Price or Contract Times shall not be effective unless approved by Owner except as provided in Article(s) 4 and 5 of the Agreement.

SC-7.06.A Amend Paragraph 7.06.A by adding the following text to the end of the Paragraph:
The Contractor shall not award work valued at more than fifty percent of the Contract Price to Subcontractor(s), without prior written approval of the Owner.

SC-7.06.B. Delete section 7.06.B in its entirety and add the following in its place:
Contractor is subject to the Subletting and Subcontracting Fair Practices Act, Public Contract Code section 4100 et seq. Contractor shall, in its bid, set forth:

1. The name, the location of the place of business, and the California contractor license number of each subcontractor who will perform work or labor or render service to the Contractor in or about the construction of the work or improvement, or a subcontractor licensed by the State of California who, under subcontract to the Contractor, specially fabricates and installs a portion of the work or improvement according to detailed drawings contained in the plans and specifications, in an amount in excess of one-half of 1 percent of the Contractor’s total bid.

2. The portion of the work that will be done by each subcontractor under this act. Contractor shall list only one subcontractor for each portion as is defined by the Contractor in its bid.

Contractor may not substitute a person as subcontractor in place of the subcontractor listed in the original bid, except as provided in the Act.

If Contractor fails to specify a subcontractor or if Contractor specifies more than one subcontractor for the same portion of work to be performed under the contract in excess of one-half of 1 percent of the Contractor’s total bid, Contractor agrees that it is fully qualified to perform that portion itself, and that Contractor shall perform that portion itself.

Violation of the Act constitutes grounds for disciplinary action by the Contractors State License Board and penalties.

SC-7.06.C-F. Delete sections 7.06.C through F in their entirety.

SC-7.11.B. Add as section 7.11.B the following:
This Contract and the contracting parties shall, for the period of three years after final payment, be subject to examination and audit by the California state auditor, as provided in Government Code section 8546.7.

SC-7.12.H. Add as section 7.12.H the following:
Trenching Plan; Bid Item

Pursuant to Labor Code Section 6705, the Contractor shall submit, in advance of excavation of any trench or trenches five feet or more in depth, a detailed plan showing the design of shoring, bracing, or sloping, or other provisions to be made for worker protection from the hazard of caving ground during the excavation of such trench or trenches, acceptable to the Owner. If such plan varies from the shoring system standards, the plan shall be prepared by a registered civil or structural engineer.

Pursuant to Labor Code section 6707, for trenches or other excavations which are five feet or deeper, Owner's bid shall contain as a bid item adequate sheeting, shoring, and bracing or equivalent method for the protection of life or limb, which shall conform to applicable safety orders.

SC-7.15.A. Add the following sentence immediately after section 7.15.A:
An increase in Contract Price or Contract Times shall not be effective unless approved by Owner.

SC-7.17.E. Add as section 7.17.E. the following:
Special warranties provided for in the Technical Specifications do not limit, but are in addition to, Contractor's general warranty and guarantee provided in General Condition 7.17.A, and said special warranties do not in any manner limit any applicable statute of repose.

ARTICLE 8 – OTHER WORK AT THE SITE

No modifications

ARTICLE 9 – OWNER'S RESPONSIBILITIES

SC-9.02.A. Delete "provided Contractor makes no reasonable objection to the replacement engineer" from the first sentence of section 9.02.A.

SC-9.13.A. Add as section 9.13.A. the following:
Notice of Claims. Owner shall provide to Contractor timely notification of the receipt of any third-party claim relating to the Contract.

SC-9.13.B. Add as section 9.13.B. the following:
Owner will furnish an "Owner's Site Representative" to represent Owner at the Site and assist Owner in observing the progress and quality of the Work. The Owner's Site Representative is not Engineer's consultant, agent, or employee. Owner's Site Representative will be Lloyd Van Doren, Resident Project Representative (RPR). The authority and responsibilities of Owner's Site Representative follow: *Resident Project Representative.*

ARTICLE 10 – ENGINEER'S STATUS DURING CONSTRUCTION

SC-10.03.A. Add the following language at the end of paragraph 10.03.A:
The Duties, Responsibilities, and Limitations of Authority of the Resident Project Representative will be stated in the Agreement for Engineering Services executed for this specific Project.

SC-10.03.B. Add as section 10.03.B. the following:
On this Project, by agreement with the Owner, Engineer will not furnish RPR. The RPR shall be Owner's Site Representative and shall act as a liaison between and among the Owner, Engineer, and Contractor. The RPR is an employee of the Owner, is the Owner's Water System Manager and Treatment Operator, and shall be Owner's representative at the Site, will act as directed by and under the supervision of Owner, and will confer with Engineer regarding RPR's actions.

SC-10.07.B. Add as section 10.07.B the following:
Engineer's decisions are not binding on Owner. If Owner elects to reject Engineer's determination, Owners hall promptly provide written notice to Contractor. Contractor may submit a claim in accordance with Article 12 – Claims.

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

SC-11.01.A. Add subdivision 11.01.A.1.c:
Change orders shall become effective upon written approval by the Owner.

SC-11.01.A. Delete the last two sentences of subdivision 2 of section 11.01.A and add the following:
Work Change Directives shall become effective upon written approval by the Owner.

SC-11.02.A. Add after the fourth sentence of section 11.02.A:
Change Orders and Work Change Directives shall become effective upon written approval by the Owner.

SC-11.07.A. Delete section 11.07.A in its entirety and insert the following in its place:
Owner and Contractor shall execute Change Orders as required by this Contract.

ARTICLE 12 - CLAIMS

SC-12.01.A. Delete section 12.01.A in its entirety and insert the following in its place: Dispute Resolution

Contract claims shall be resolved in accordance with the provisions of Article 1.5, Chapter 1, Part 3, Division 2 of the Public Contract Code, commencing with section 20104.

Claims by Contractor for (A) a time extension, (B) payment of money or damages arising from Work done by, or on behalf of, Contractor pursuant to this Contract and payment of which is not otherwise expressly provided for or Contractor is not otherwise entitled to, or (C) an amount the payment of which is disputed by Owner shall be subject to the following requirements:

A. The claim shall be in writing and include the documents necessary to substantiate the claim. Claims must be filed within 20 days of the dispute giving rise to the claim or before

the date of final payment, whichever first occurs.

B.

1. For claims of less than fifty thousand dollars ($50,000), Owner shall respond in writing to any written claim within 45 days of receipt of the claim, or may request, in writing, within 30 days of receipt of the claim, any additional documentation supporting the claim or relating to defenses to the claim Owner may have against Contractor.

2. If additional information is thereafter required, it shall be requested and provided pursuant to this subdivision, upon mutual agreement of Owner and Contractor.

3. Owner's written response to the claim, as further documented, shall be submitted to Contractor within 15 days after receipt of the further documentation or within a period of time no greater than that taken by Contractor in producing the additional information, whichever is greater.

C.

1. For claims of over fifty thousand dollars ($50,000) and less than or equal to three hundred seventy-five thousand dollars ($375,000), Owner shall respond in writing to any written claim within 60 days of receipt of the claim, or may request, in writing, within 30 days of receipt of the claim, any additional documentation supporting the claim or relating to defenses to the claim Owner may have against Contractor.

2. If additional information is thereafter required, it shall be requested and provided pursuant to this subdivision, upon mutual agreement of Owner and Contractor.
3. Owner’s written response to the claim, as further documented, shall be submitted to Contractor within 30 days after receipt of the further documentation, or within a period of time no greater than that taken by Contractor in producing the additional information or requested documentation, whichever is greater.

D. Claims of more than three hundred seventy-five thousand dollars ($375,000) shall be handled in the same manner as claims of more than fifty thousand dollars ($50,000) but less than or equal to three hundred seventy-five thousand dollars ($375,000).

E. If Contractor disputes Owner’s written response, or Owner fails to respond within the time prescribed, Contractor may so notify Owner, in writing, either within 15 days of receipt of Owner’s response or within 15 days of Owner’s failure to respond within the time prescribed, respectively, and demand an informal conference to meet and confer for settlement of the issues in dispute. Upon a demand, Owner shall schedule a meet and confer conference within 30 days for settlement of the dispute.

F. Following the meet and confer conference, if the claim or any portion remains in dispute, Contractor may file a claim as provided in Chapter 1 (commencing with Section 900) and Chapter 2 (commencing with Section 910) of Part 3 of Division 3.6 of Title 1 of the Government Code. A failure to file a Government Code claim may preclude Contractor from pursuing the matter further. For purposes of those provisions, the running of the period of time within which a claim must be filed shall be tolled from the time Contractor submits its written claim pursuant to subdivision (a) until the time that claim is denied as a result of the meet and confer process, including any period of time utilized by the meet and confer process.

G. These requirements do not apply to tort claims and nothing in them is intended nor shall be construed to change the time periods for filing tort claims or actions specified by Chapter 1

(commencing with Section 900) and Chapter 2 (commencing with Section 910) of Part 3 of Division 3.6 of Title 1 of the Government Code.

The following procedures are established for all civil actions filed to resolve claims subject to Article 1.5, Chapter 1, Part 3, Division 2 of the Public Contract Code:

1. Within 60 days, but no earlier than 30 days, following the filing or responsive pleadings, the court shall submit the matter to nonbinding mediation unless waived by mutual stipulation of both parties. The mediation process shall provide for the selection within 15 days by both parties of a disinterested third person as mediator, shall be commenced within 30 days of the submittal, and shall be concluded within 15 days from the commencement of the mediation unless a time requirement is extended upon a good cause showing to the court or by stipulation of both parties. If the parties fail to select a mediator within the 15-day period, any party may petition the court to appoint the mediator.

   (a) If the matter remains in dispute, the case shall be submitted to judicial arbitration pursuant to Chapter 2.5 (commencing with Section 1141.10) of Title 3 of Part 3 of the Code of Civil Procedure, notwithstanding Section 1141.11 of that code. The Civil Discovery Act (Title 4 (commencing with Section 2016.010) of Part 4 of the Code of Civil Procedure) shall apply to any proceeding brought under this subdivision consistent with the rules pertaining to judicial arbitration.

   (b) Notwithstanding any other provision of law, upon stipulation of the parties, arbitrators shall be experienced in construction law, and, upon stipulation of the parties, mediators and arbitrators shall be paid necessary and reasonable hourly rates of pay not to exceed their customary rate, and such fees and expenses shall be paid equally by the parties, except in the case of arbitration where the arbitrator, for good cause, determines a different division. In no event shall these fees or expenses be paid by state or county funds.

   (c) In addition to Chapter 2.5 (commencing with Section 1141.10) of Title 3 of Part 3 of the Code of Civil Procedure, any party who after receiving an arbitration award requests a trial de novo but does not obtain a more favorable judgment shall, in addition to payment of costs and fees under that chapter, pay the attorney's fees of the other party arising out of the trial de novo.

2. The court may, upon request by any party, order any witnesses to participate in the mediation or arbitration process.

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

SC-13.02.C Delete Paragraph 13.02.C in its entirety.

SC-13.03.E. Delete “or Owner may file a Claim” from the first sentence of section 13.03.E. Add this paragraph immediately after subdivision 3 of section 13.03.E:
Engineer’s decision is not binding on Owner. If Owner elects to reject Engineer’s determination, it shall promptly provide written notice to Contractor. Contractor may submit a claim in accordance with Article 12 – Claims.

ARTICLE 14 - TESTS AND INSPECTIONS; CORRECTIONS; REMOVAL OR ACCEPTANCE OF DEFECTIVE WORK

No modifications.

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

SC-15.01.B Amend the second sentence of Paragraph 15.01.B.1 by striking out the following text:
"a bill of sale, invoice, or other."

SC-15.01.B. Delete "Engineer" from the first sentence of subdivision 1 of section 15.01.B and insert "Owner" in its place.

SC-15.01.B.3 Add the following language at the end of paragraph 15.01.B.3:
No payments will be made that would deplete the retainage, place in escrow any funds that are required for retainage, or invest the retainage for the benefit of the Contractor.

SC-15.01.B.4. Add as Paragraph 15.01.B.4 the following:
The Application for Payment Form to be used on this Project is EJCDC No. C-620. The Owner must approve all Applications for Payment before payment is made.

SC-15.01.C. Delete sections 15.01.C in its entirety and insert the following in its place: Pursuant to Section 20104.50 of the Public Contract Code, any payment request determined by the Owner not to be a proper request suitable for payment shall be returned to Contractor as soon as practical, but not later than seven (7) days after receipt, for correction and resubmission by Contractor. The returned request shall be accompanied by a document setting forth the reasons why the payment request is not proper. Payment will be made within thirty (30) days after receipt of an undisputed and properly submitted payment request from Contractor. The thirty-(30) day period will be reduced by the number of days by which the District exceeds the seven-(7) day return requirement. Progress payments made after the required time period will include interest equivalent to the legal rate set forth in subdivision (a) of Section 685.010 of the Code of Civil Procedure.

Payment of progress estimates shall not be construed as acceptance of defective or improper work or materials.

SC-15.01.D.1 Delete Paragraph 15.01.D.1 in its entirety and insert the following in its place:
The Application for Payment with Engineer's recommendation will be presented to the Owner for consideration. If both the Owner find the Application for Payment acceptable, the recommended amount less any reduction under the provisions of Paragraph 15.01.E will become due thirty (30) days after the Application for Payment is presented to the Owner, and the Owner will make payment to the Contractor.

SC-15.01.E. Delete "In addition to any reductions in payment (set-offs) recommended by Engineer," from the first sentence of section 15.01.E. Delete subdivision 15.01.E.3 in its entirety.

SC-15.02.A Amend Paragraph 15.02.A by striking out the following text:
"no later than seven days after the time of payment by Owner" and insert "no later than the time of payment by Owner."

SC-15.03 Substantial Completion - Delete section 15.03 in its entirety and add the following in its place:

A. Upon written notice from Contractor that the Work is Substantially Complete, Engineer will inspect all project Work with Owner and Contractor and will notify Contractor in writing of all particulars in which this inspection reveals that the Work is not Substantially Complete.

B. Promptly after Contractor's notification, Owner, Contractor, and Engineer shall inspect project 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. Within 60 days after the date of substantial completion of the Work, the retention withheld by Owner shall be released. In the event of a dispute between Owner and Contractor, Owner may withhold from the final payment an amount not to exceed 150 percent of the disputed amount. For purposes of this requirement, "substantial completion" means any of the following:

1. The occupation, beneficial use, and enjoyment of a work of improvement, excluding any operation only for testing, startup, or commissioning, by Owner, or its agent, accompanied by cessation of labor on the work of improvement.

2. The acceptance by Owner, or its agent, of the work of improvement.

3. After the commencement of a work of improvement, a cessation of labor on the work of improvement for a continuous period of 100 days or more, due to factors beyond the control of Contractor.

4. After the commencement of a work of improvement, a cessation of labor on the work of improvement for a continuous period of 30 days or more, if Owner files for record a notice of cessation or a notice of completion.

D. Except as provided below, within seven days from the time that all or any portion of the retention proceeds are received by Contractor, Contractor shall pay each of its subcontractors from whom retention has been withheld, each subcontractor's share of the retention received. However, if a retention payment received by Contractor is specifically designated for a particular subcontractor, payment of the retention shall be made to the designated subcontractor, if the payment is consistent with the terms of the subcontract.

E. Contractor may withhold from a subcontractor its portion of the retention proceeds if a bona fide dispute exists between the subcontractor and the Contractor. The amount withheld from the retention payment shall not exceed 150 percent of the estimated value of the disputed amount.

F. In the event that retention payments are not made within the time periods required by this Section, Owner or Contractor withholding the unpaid amounts shall be subject to a charge of 2 percent per month on the improperly withheld amount, in lieu of any interest otherwise due. Additionally, in any action for the collection of funds wrongfully withheld, the prevailing party shall be entitled to attorney's fees and costs.

G. Release of retentions under this section shall not be construed as acceptance of defective or improper work or materials.

SC-15.04. Delete section 15.04 in its entirety.

SC-15.06.C. Delete section 15.06.C in its entirety and add the following in its place:
The Work is complete upon acceptance by Owner.

SC-15.06.D Delete Paragraph 15.06.D in its entirety and insert the following in its place:
Thirty-five (35) days after the filing of a Notice of Completion with the County Recorder and after 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. Payment under this section shall not be construed as acceptance of defective or improper work or materials.

SC-15.07B. Delete "or appealed under the provisions of Article 17" from section 15.07.B.

SC-15.08E. Add the following sentence to the end of section 15.08.E:
"The provisions of this paragraph shall not in any manner relieve Contractor of its warranty that the Work will be in accordance with the Contract Documents and will not be defective."

ARTICLE 16 – SUSPENSION OF WORK AND TERMINATION

SC-16.04. Delete section 16.04 in its entirety.

ARTICLE 17 – FINAL RESOLUTION OF DISPUTES

SC-17.01. Delete section 17.01 in its entirety.

ARTICLE 18 – MISCELLANEOUS

SC-18.03. Delete section 18.03 in its entirety.

SC-18.09. Add as section 18.09 the following:

A. Implement reasonable precautions as provided in Great Basin Unified Air Pollution Control District (GBUAPCD) Rule 401 and prepare a Fugitive Dust Control Plan as set forth by US Environmental Protection Agency (US EPA): https://www.epa.gov/system/files/documents/2022-02/fugitive-dust-control-best-practices.pdf):
   1. Implement the Fugitive Dust Control Plan.
   2. Construction equipment exhaust emissions shall not exceed the National Ambient Air Quality Standards (40 CFR 50). Operators of vehicles and equipment found to exceed limits shall take action to repair the equipment within 72 hours or remove the equipment from service. Non-compliance may result in a Notice of Violation.
   3. The primary contractor shall be responsible to ensure that all construction equipment is properly tuned and maintained prior to and for the duration of onsite operation.
   4. Minimize idling time to 5 minutes – saves fuel and reduces emissions. (State idling rule: commercial diesel vehicles- 13 CCR Chapter 10 Section 2485 effective 02/01/2005; off road diesel vehicles- 13 CCR Chapter 9 Article 4.8 Section 2449 effective 05/01/2008)

5. Utilize existing power sources (e.g., power poles) or clean fuel generators rather than temporary power generators.
6. Develop a traffic plan to minimize traffic flow interference from construction activities. The plan may include advance public notice of routing, use of public transportation, and satellite parking areas with a shuttle service. Schedule operations affecting traffic for off-peak hours. Minimize obstruction of through-traffic lanes. Provide a flag person to guide traffic properly and ensure safety at construction sites.
7. Portable engines and portable engine-driven equipment units used at the project work site, with the exception of on-road and off-road motor vehicles, may require California Air Resources Board (ARB) Portable Equipment Registration with the State or a local district permit. The owner/operator shall be responsible for arranging appropriate consultations with the ARB or the District to determine registration and permitting requirements prior to equipment operation at the site.
8. It is the Contractor's responsibility to comply with all applicable California ARB regulations, including but not limited to, Heavy-Duty Diesel Vehicles and Off-Road Diesel Regulation regulations.

SC-18.10. Add as section 18.10 the following:

A. Access to Water for Construction:

1. The Contractor shall coordinate with the District for access to water for construction. No formal application for a construction water permit is required. The District shall provide water for construction to the Contractor at the Contractor's expense. The District shall measure water usage based on the size and quantity of truck loads used. The Contractor shall pay for water used at the District's current rates. No interruption of service is permitted. Temporary shutdowns as required for tie-in connection for water shall be coordinated with the District. Operation of valves shall be performed by District personnel. The Contractor shall not leave any hose attached to a fire hydrant except when actively drawing water therefrom and shall keep hydrants clear for possible use by the Fire Department.

SC-18.11. Add as section 18.11 the following:

A. Environmental Control

1. The Contractor shall comply with all environmental control rules, regulations, ordinances, mitigation measures, and statutes that apply to the project and any work performed pursuant to the contract.
2. All dewatering activities shall comply with State Discharge Requirements.

SC-18.12. Add as section 18.12 the following:

A. CWSRF Requirements

1. American Iron and Steel Requirement

a. The Contractor acknowledges to and for the benefit of the Markleeville Public Utility District (Purchaser) and the State of California (State) that it understands the goods and services under this Agreement are being funded with monies made available by the Clean Water State Revolving Fund that have statutory requirements commonly known as "American Iron and Steel" (AIS), that requires all of the iron and steel products used in the project to be produced in the United States ("American Iron and Steel Requirement")

including iron and steel products provided by the Contactor pursuant to this Agreement. The Contractor hereby represents and warrants to and for the benefit of the Purchaser and the State that (a) the Contractor has reviewed and understands the American Iron and Steel Requirement, (b) all of the iron and steel products used in the project will be and/or have been produced in the United States in a manner that complies with the American Iron and Steel (AIS) Requirement, unless a waiver of the requirement is approved, and (c) the Contractor will provide any further verified information, certification or assurance of compliance with this paragraph, or information necessary to support a waiver of the American Iron and Steel Requirement, as may be requested by the Purchaser or the State. Notwithstanding any other provision of this Agreement, any failure to comply with this paragraph by the Contractor shall permit the Purchaser or State to recover as damages against the Contractor any loss, expense, or cost (including without limitation attorney's fees) incurred by the Purchaser or State resulting from any such failure (including without limitation any impairment or loss of funding, whether in whole or in part, from the State or any damages owed to the State by the Purchaser). While the Contractor has no direct contractual privity with the State, as a lender to the Purchaser for the funding of its project, the Purchaser and the Contractor agree that the State is a third-party beneficiary and neither this paragraph (nor any other provision of this Agreement necessary to give this paragraph force or effect) shall be amended or waived without the prior written consent of the State.

Definitions

For the purposes of this section, the following definition apply:

- “Iron and Steel Products” means the following products primarily made with iron or steel: lined or unlined pipes and fittings, manhole covers and other municipal castings, hydrants, tanks, flanges, pipe clamps and restraints, valves, structural steel, reinforced precast concrete, and construction materials.
- “Steel” means an alloy that includes at least 50 percent iron or steel, measured by material costs only.
- “Structural steel” is defined as rolled flanged shapes, having at least one dimension of their cross-section three inches or greater, which are used in construction of buildings.
- “Construction materials” are defined as articles, materials, or supplies (such as, but not limited to, rebar, fasteners, framing joists, railings, doors, etc.), not including mechanical and/or electrical components, equipment, and systems.
- “Produced in the U.S.” means that all manufacturing processes must occur in the U.S. Manufacturing processes includes processes such as melting, refining, forming, rolling, drawing, finishing, and fabricating. Further, if a domestic iron and steel product is taken out of the U.S. for any part of the manufacturing process, it becomes foreign source material. It is important to understand that the AIS requirement is different than other domestic preference requirements. The AIS requirement is not the same as Buy American, Made in USA, Buy America Act, or any state domestic preference requirements. A product may be compliant with these other requirements, but it must also comply specifically with the AIS requirement. The United States Department of Agriculture (USDA) Rural Utilities Service Water and Environmental Programs also have an AIS requirement as of May 5, 2017, so a reference to the USDA AIS requirement in certification letters is acceptable as well for SRF projects, since the

USDA AIS requirement is the same as the SRF AIS requirement.

Methods of Compliance with the AIS Requirement

The two methods of compliance for SRF projects are certification letters and waivers.

Certification Letters

The Contractor is required to submit a certification that a product is American Iron and Steel with each submittal containing products primarily made with iron or steel. A certification letter asserts that all manufacturing processes for the purchased product (s) occurred in the U.S. Additionally, each certification letter includes the 5 elements listed below:

1. Delivery Jurisdiction: Letter should include the name of the project and/or jurisdiction where the product was delivered.
2. Product: Letter should list the specific product(s) delivered to the project site.
3. Manufacturer Location: Letter should include the location(s) of the foundry/mill/factory where the product was manufactured (City and State).
4. Signature of Company Representatives: On company letterhead.
5. Reference to AIS Requirement: Especially if the letter references other domestic preference laws.

Waivers

The AIS statute language permits the EPA to issue waivers for a case or category of cases where the EPA finds:

1. Applying this AIS requirement would be inconsistent with the public interest;
2. Iron and steel products are not produced in the U.S. in sufficient and reasonably available quantities as well as of a satisfactory quality; or
3. Inclusion of iron and steel products produced in the U.S. will increase the cost of the overall project by more than 25 percent.

The National De Minimis Waiver allows an SRF project to use a small percentage of incidental products of unknown or non-domestic origin (up to 5% of total project material costs, up to 1% of total project material cost of any single item).

2. Build America, Buy America

a. The Contractor acknowledges to and for the benefit of the Markleeville Public Utility District (“Owner”) and the State of California (the “Funding Authority”) that it understands the goods and services under this Agreement are being funded with monies made available by the Clean Water State Revolving Fund that have statutory requirements commonly known as "Build America, Buy America;” that requires all of the iron and steel, manufactured products, and construction materials used in the project to be produced in the United States (“Build America, Buy America Requirements”) iron and steel, manufactured products, and construction materials provided by the Contractor pursuant to this Agreement. The Contractor herby represents and warrants to and for the benefit of the Owner and Funding Authority (a) the Contractor has reviewed and understands the Build America, Buy America Requirements, (b) all of the iron and steel, manufactured products, and construction materials used in the project will be and/or have been produced in the United States in a manner that complies with the Build America, Buy America Requirements, unless a waiver of the requirements is approved, and (c) the Contractor will provide any further verified information, certification or assurance of compliance with this paragraph, or information necessary to support a waiver of the Build America, Buy America Requirements, as may be requested by the Owner or the Funding Authority.

Notwithstanding any other provision of this Agreement, any failure to comply with this paragraph by the Contractor shall permit the Owner or Funding Authority to recover as damages against the Contractor any loss, expense, or cost (including without limitation attorney's fees) incurred by the Owner or Funding Authority resulting from any such failure (including without limitation any impairment or loss of funding, whether in whole or in part, from the Funding Authority or any damages owed to the Funding Authority by the Owner). If the Contractor has no direct contractual privity with the Funding Authority, as a lender or awardee to the Owner for the funding of its project, the Owner and the Contractor agree that the Funding Authority is a third-party beneficiary and neither this paragraph (nor any other provision of this Agreement necessary to give this paragraph force or effect) shall be amended or waived without the prior written consent of the Funding Authority.

3. Davis-Bacon Act Compliance

a. The Contractor is required to comply with all Davis-Bacon Act requirements. The applicable Davis-Bacon requirements for CWSRF projects are in Appendix C. The applicable Federal Wage Determinations are in Appendix D.

4. Disadvantaged Business Enterprise (DBE) Requirements

The Contractor is required to comply with all DBE requirements associated with State Revolving Fund projects. The guidelines for meeting DBE requirements are as follows.

GUIDELINES FOR MEETING THE CLEAN WATER STATE REVOLVING FUND (CWSRF) PROGRAM DISADVANTAGED BUSINESS ENTERPRISE (DBE) REQUIREMENTS

The DBE Program is an outreach, education, and objectives program designed to increase the participation of DBEs in the CWSRF Program.

HOW TO ACHIEVE THE PURPOSE OF THE PROGRAM

Recipients of CWSRF/DWSRF financing that are subject to the DBE requirements (recipients) are required to seek, and are encouraged to use, DBEs for their procurement needs. Recipients should award a "fair share" of sub-agreements to DBEs. This applies to all sub-agreements for equipment, supplies, construction, and services.

The key functional components of the DBE Program are as follows.

- Fair Share Objectives
- DBE Certification
- Six Good Faith Efforts
- Contract Administration Requirements
- DBE Reporting

DISADVANTAGED BUSINESS ENTERPRISES ARE:

- Entities owned and/or controlled by socially and economically disadvantaged individuals as described by Title X of the Clean Air Act Amendments of 1990 (42 U.S.C. 7601 note) (10% statute), and Public Law 102-389 (42 U.S.C. 4370d) (8% statute), respectively;
- A Minority Business Enterprise (MBE) are entities that are at least 51% owned and/or controlled by a socially and economically disadvantaged individual as described by Title

X of the Clean Air Act Amendments of 1990 (42 U.S.C. 7601 note), and Public Law 102-389 (42 U.S.C. 4370d), respectively.

- A Women Business Enterprise (WBE) are entities that are at least 51% owned and/or controlled by women.
- Small Business Enterprise (SBE);
- Small Business in a Rural Area (SBRA);
- Labor Surplus Area Firm (LSAF); or
- Historically Underutilized Business (HUB) Zone Small Business Concern or a concern under a successor program.

CERTIFYING DBE FIRMS:

Under the DBE Program, entities can no longer self-certify and contractors and sub-contractors must be certified at bid opening. Contractors and sub-contractors must provide to the CASRF recipient proof of DBE certification. Certifications will be accepted from the following:

- The US Environmental Protection Agency (USEPA)
- The Small Business Administration(SBA);
- The Department of Transportation's State implemented DBE Certification Program (with U.S. citizenship);
- Tribal, State and Local governments;
- Independent private organization certifications.

If an entity holds one of these certifications, it is considered acceptable for establishing status under the DBE Program.

SIX GOOD FAITH EFFORTS (GFE)

All CWSRF financing recipients are required to complete and ensure that the prime contractor complies with the GFE below to ensure that DBEs have the opportunity to compete for financial assistance dollars. **All components of the GFE are due at bid opening.**

1. Ensure DBEs are made aware of contracting opportunities to the fullest extent practical through outreach and recruitment activities. For Tribal, State and Local Government Recipients, this will include placing DBEs on solicitation lists and soliciting them whenever they are potential sources.
2. Make information on forthcoming opportunities available to DBEs. Posting solicitations for bids or proposals for a minimum of 30 calendar days in a local newspaper, before the bid opening date.
3. Consider in the contracting process whether firms competing for large contracts could subcontract with DBEs.
4. Encourage contracting with a group of DBEs when a contract is too large for one firm to handle individually.
5. Use the services of the SBA and/or Minority Business Development Agency (MBDA) of the US Department of Commerce.
6. If the prime contractor awards subcontracts, require the prime contractor to take the

above steps.

The forms listed in the table below must be completed and submitted with the GFE. **The forms can be found in the General Specifications as part of the Bidding Requirements.**

FORM NUMBER	FORM NAME	REQUIREMENT	PROVIDED BY	COMPLETED BY	SUBMITTED TO
SWRCB Form 4500-2	DBE Sub-Contractor Participation Form	As Needed to Report Issues	Recipient	Sub- contractor	EPA DBE Coordinator
SWRCB Form 4500-3	DBE Sub-Contractor Performance Form	Include with Bid or Proposal Package	Prime Contractor	Sub- Contractor	SWRCB by Recipient
SWRCB Form 4500-4 or EPA	DBE Sub-Contractor Utilization Form	Include with Bid or Proposal Package	Recipient	Prime Contractor	SWRCB by Recipient

The completed forms should be submitted with each Bid or Proposal. The recipient shall review the bidder's documents closely to determine that the GFE was performed **prior** to bid or proposal opening date. Failure to complete the GFE and to substantiate completion of the GFE before the bid opening date could jeopardize CWSRF financing for the project. The following situations and circumstances require action as indicated:

1. If the apparent successful low bidder was rejected, a complete explanation must be provided;
2. Failure of the apparent low bidder to **perform** the GFE **prior** to bid opening constitutes a non-responsive bid. The construction contract may then be awarded to the next low, responsive, and responsible bidder that meets the requirements or the recipient may re-advertise the project.
3. If there is a bid dispute, all disputes shall be settled **prior** to submission of the Final Budget Approval Form.

ADMINISTRATION REQUIREMENTS

- A recipient of CWSRF financing must require entities receiving funds to create and maintain a Bidders List if the recipient of the financing agreement is subject to, or chooses to follow, competitive bidding requirements
- The Bidders list must include all firms that bid or quote on prime contracts, or bid or quote on subcontracts, including both DBEs and non-DBEs;
- Information retained on the Bidder's List must include the following:
  1. Entity's name with point of contact;
  2. Entity's mailing address and telephone number;
  3. The project description on which the entity bid or quoted and when;
  4. Amount of bid/quote; and
  5. Entity's status as a DBE or non-DBE.
- The Bidders List must be kept until the recipient is no longer receiving funding under the

agreement.

- The recipient shall include Bidders List as part of the Final Budget Approval Form.
- A recipient must require its prime contractor to pay its subcontractor for satisfactory performance no more than 30 days from the prime contractor's receipt of payment from the recipient.
- A recipient must be notified in writing by its prime contractor prior to any termination of a DBE subcontractor by the prime contractor.
- If a DBE subcontractor fails to complete work under the subcontract for any reason, the recipient must require the prime contractor to employ the six GFEs if soliciting a replacement subcontractor.
- A recipient must require its prime contractor to employ the six GFEs even if the prime contractor has achieved its fair share objectives.

REPORTING REQUIREMENTS

For the duration of the construction contract(s), the recipient is required to submit to the State Water Resources Control Board DBE reports annually by October 10 of each fiscal year on the attached Utilization Report form (UR-334). Failure to provide this information as stipulated in the financial agreement language may be cause for withholding disbursements.

CONTACT FOR MORE INFORMATION

SWRCB, CASRF – Compliance and Surveillance Unit	(916) 327-7323	DavisBacon@waterboards.ca.gov DFA-ComplianceUnit@Waterboards.ca.gov
SWRCB – CWSRF Barbara August	(916) 341-6952	barbara.august@waterboards.ca.gov
US-EPA Region 9 – Joe Ochab	(415) 972-3761	ochab.joe@epa.gov

SC-18.13. Add as section 18.13 the following:

A. Liquidated Damages

1. It is further agreed that in case the work called for under the contract is not finished and completed in all parts and requirements within the number of working days specified, the Engineer or Administrator shall have the right to increase the number of working days or not, as the Engineer or Administrator may deem best to serve the interest of the District, and if the Engineer or Administrator decides to increase the number of working days, the Engineer or Administrator shall further have the right to charge to the Contractor, or the Contractor's heirs, assigns or sureties and to deduct from the final payment for the work all or any part, as the Engineer or Administrator may deem proper, of the actual cost of engineering, inspection, superintendence, and other overhead expenses which are directly chargeable to the contract, and which accrue during the period of the extension, except that cost of final surveys and preparation of final pay estimate shall not be included in the charges.
2. The Contractor will be granted an extension of time and will not be assessed with liquidated damages or the cost of engineering and inspection for any portion of the

delay in completion of the work beyond the time named in the special provisions for the completion of the work caused by acts of God or of the public enemy, fire, floods, tsunamis, earthquakes, epidemics, quarantine restrictions, strikes, labor disputes, shortage of materials and freight embargoes, provided that the Contractor shall notify the Engineer in writing of the causes of delay within 15 days from the beginning of that delay. The Engineer shall ascertain the facts and the extent of the delay, and the Engineer's findings thereon shall be final and conclusive.

3. No extension of time will be granted for a delay caused by a shortage of materials unless the Contractor furnishes to the Engineer documentary proof that the Contractor has made every effort to obtain the materials from all known sources within reasonable reach of the work in a diligent and timely manner, and further proof in the form of supplementary progress schedules, as required in, "Progress Schedule," that the inability to obtain the materials when originally planned, did in fact cause a delay in final completion of the entire work which could not be compensated for by revising the sequence of the Contractor's operations. The term "shortage of materials," as used in this Section, shall apply only to materials, articles, parts, or equipment which are standard items and are to be incorporated in the work. The term "shortage of materials," shall not apply to materials, parts, articles, or equipment which are processed, made, constructed, fabricated or manufactured to meet the specific requirements of the contract. Only the physical shortage of material will be considered under these provisions as a cause for extension of time. Delays in obtaining materials due to priority in filling orders will not constitute a shortage of materials.
4. If the Contractor is delayed in completion of the work by reason of changes or by failure of the District to acquire or clear right of way, or by moving the Contractor's plant or by any act of the Engineer or of the District, not contemplated by the contract, an extension of time commensurate with the delay in completion of the work thus caused will be granted, and the Contractor shall be relieved from any claim for liquidated damages, or engineering and inspection charges or other penalties for the period covered by that extension of time; provided that the Contractor shall notify the Engineer in writing of the causes of delay within 15 days from the beginning of the delay. The Engineer shall ascertain the facts and the extent of the delay, and the Engineer's findings thereon shall be final and conclusive.
5. It is the intention of the above provisions that the Contractor shall not be relieved of liability for liquidated damages or engineering and inspection charges for any period of delay in completion of the work more than that expressly provided for in this Section.
6. The Contractor shall comply with all applicable mitigation measures as outlined in the general notes within the plans. Any additional costs for non-compliance with mitigation measures shall be borne by the Contractor.

SC-18.14. Add as section 18.14 the following:

Prior to commencement of groundbreaking work, Contractor shall provide and install the required CWSRF signage as specified in Appendix E. The specified sign should be printed 72 in (W) x 48 in (H). Installation location to be determined by the Engineer during construction. The sign must be installed and remain in place for the duration of the project.

SC-18.15. Add as section 18.15 the following:
A. Bid Item Descriptions (Base Bid):

Bid Item 1 - Mobilization/Demobilization

The lump sum bid for Mobilization shall not exceed four percent (4%) of the total bid price. Mobilization shall include: the obtaining of insurance and bonds; moving onto the site of all equipment; submittal and approval of initial project schedule; obtaining and paying for all permits by other agencies as applicable and not delineated in other bid items; furnishing temporary construction utilities (temporary power, toilets, water, fences, etc.); installing construction signs; temporary buildings and field office trailer(s); establishment of temporary site access and staging area; installation of temporary construction fencing; obtaining and installing required CWSRF signage; and all other construction as required for the proper performance and completion of work.

The lump sum bid for Demobilization shall not exceed four percent (4%) of the total bid price. Demobilization shall include site cleaning and restoration of surfaces within the job site; post-construction meeting; removal of all temporary facilities and equipment from the work area; disconnection of the temporary construction utilities; and turnover of a project to the Owner.

Contractor may apply for payment of mobilization on a percent complete basis as the items covered in Mobilization are being completed. Contractor may apply for payment of Demobilization after the overall project substantial completion is achieved and the project begins to demobilize.

The lump sum price shall be full compensation for the preparation and installation or submittal of these materials, and for all labor, equipment, tools and incidentals to complete this item.

Bid Item 2 - Traffic Control

The lump sum amount shall include all work and materials necessary to create, obtain approval, and implement a traffic control plan as required by the County/State for this project. Measurement and payment shall be made on a percent complete basis. The price shall be full compensation for updates or changes required by the County/State.

The lump sum price shall be full compensation for the preparation, submittal, approvals, fees, and implementation of these materials, and for all labor, equipment, tools, and incidentals to complete this item.

Bid Item 3 - Water Pollution Control Plan

The lump sum amount shall include all work and materials necessary for preparation and implementation of a water pollution control plan, site BMPs, and all other essentials required to complete this item as detailed in the Specifications and Plans.

The lump sum price shall be full compensation for all labor, equipment, tools, and incidentals to complete this item.

Bid Item 4 - Sewer Bypass Pumping

The lump sum amount for shall include all work and materials necessary for sewer bypass pumping or trucking (if required), including furnishing and installation of pumps, piping,

valves, and all other essentials required to complete this item as detailed in the Specifications and Plans.

The lump sum price shall be full compensation for all labor, equipment, tools, and incidentals to complete this item.

Bid Item 5 - Dewatering

The lump sum price for dewatering shall include all work and materials necessary for dewatering, including piping, pumps, fuel, earthwork, and all other essentials to complete this item as detailed in the Specifications and Plans.

The lump sum price shall be full compensation for all labor, equipment, tools, and incidentals to complete this item.

Bid Item 6 - Remove Existing Sanitary Sewer Facilities at Grade

The lump sum price for remove existing sanitary sewer facilities at grade shall include all work and materials necessary to remove, offhaul, and dispose of existing sewer facilities, including the existing shed, electronic controls and panels, existing site lights, concrete post supports, backfill and compaction, and all other essentials required to complete this item as detailed in the Specifications and Plans.

The lump sum price shall be full compensation for all labor, equipment, tools, and incidentals to complete this item.

Bid Item 7 - Abandon Existing Pump Station

The lump sum price for abandon existing pump station shall include all work and materials necessary to abandon the pump station, including concrete, caps, grout plugs, ¾" Class II aggregate base, ¾" crushed rock, sand, removal and disposal of pump station frame, cover, and cone, steel cylinder, cutting and disposal of pipe near the structures, removal and disposal of pump station equipment, and all other essentials required to complete this item as detailed in the Specifications and Plans.

The lump sum price shall be full compensation for all labor, equipment, tools, and incidentals to complete this item.

Bid Item 8 - Sanitary Sewer Pump Station

The lump sum price for sanitary sewer pump station shall include all work and materials necessary to install the pump station, including the precast concrete wet well, precast concrete vault, 2 submersible pumps, valves, piping, float switches, vault lids, pipe boots and grout for connecting sewer pipes, vault and wet well bedding, excavation, backfill, compaction, and all other essentials required to complete this item as detailed in the Specifications and Plans.

The lump sum price shall be full compensation for all labor, equipment, tools, and incidentals to complete this item.

Bid Item 9 - Electrical

The lump sum amount shall include all work and materials necessary to furnish and install all electrical equipment as specified in the Specifications and Plans. The price shall be full compensation for the control panel, propane generator, conduits, pull boxes, lift station and

pump controls, metering panel, automatic transfer switch (ATS), grounding system, site lighting, and startup and testing.

The lump sum price shall be full compensation for all labor, equipment, tools, and incidentals to complete this item.

Bid Item 10 - 8'x10' Shed

The lump sum amount shall include all work and materials necessary to furnish and install an 8'x10' shed and 6' roll-up door as specified in the Specifications and Plans. The lump sum price shall be full compensation for all labor, equipment, tools, and incidentals to complete this item.

Bid Item 11 - Propane Piping

The lump sum amount shall include all work and materials necessary to furnish and install pipe and fittings between the propane tank and generator as specified in the Specifications and Plans. The price shall be full compensation for the pipe, fittings, valves, trenching, backfill, compaction, and connection to generator.

The lump sum price shall be full compensation for all labor, equipment, tools, and incidentals to complete this item.

Bid Item 12 - Abandon Sanitary Sewer Pipe

The price per linear foot for abandon sanitary sewer pipe shall include all work and materials necessary to abandon pipe, including concrete, caps, grout plugs, repair of holes on existing structures, cutting and disposal of pipe near existing structures, trenching, backfill, compaction, and all other essentials required to complete this item as detailed in the Specifications and Plans.

The price per linear foot shall be full compensation for all labor, equipment, tools, and incidentals to complete this item.

Bid Item 13 - 8-inch Sanitary Sewer Gravity Pipe (PVC)

The price per linear foot for 8-inch sanitary sewer gravity pipe (PVC) shall include all work and materials necessary to install new 8-inch DR-35 PVC sanitary sewer, including potholing, trenching, installation of bedding, temporary plating, utility crossing protection, backfill and compaction, removal and disposal of existing pipe, furnishing of pipe, and all other essentials required to complete this item as detailed in the Specifications and Plans.

The price per linear foot shall be full compensation for all labor, equipment, tools, and incidentals to complete this item.

Bid Item 14 - 3-inch Sanitary Sewer Force Main (HDPE)

The price per linear foot for 3-inch sanitary sewer force main (HDPE) shall include all work and materials necessary to install new 3-inch DR-11 fusible HDPE sanitary sewer, including potholing, trenching, installation of bedding, temporary plating, utility crossing protection, backfill and compaction, removal and disposal of existing pipe, furnishing of pipe, and all other essentials required to complete this item as detailed in the Specifications and Plans.

The price per linear foot shall be full compensation for all labor, equipment, tools, and incidentals to complete this item.

Bid Item 15 - 4-inch Sanitary Sewer Force Main (HDPE)

The price per linear foot for 4-inch sanitary sewer force main (HDPE) shall include all work and materials necessary to install new 4-inch DR-11 fusible HDPE sanitary sewer, including potholing, trenching, installation of bedding, temporary plating, utility crossing protection, backfill and compaction, removal and disposal of existing pipe, furnishing of pipe, and all other essentials required to complete this item as detailed in the Specifications and Plans.

The price per linear foot shall be full compensation for all labor, equipment, tools, and incidentals to complete this item.

Bid Item 16 - Cured-In-Place-Pipe

The price per linear foot for curried-in-place-pipe shall include all work and materials necessary to install new CIPP pipe within existing host pipe, including backfill and compaction, removal and disposal of existing pipe, furnishing of pipe, and all other essentials required to complete this item as detailed in the Specifications and Plans.

The price per linear foot shall be full compensation for all labor, equipment, tools, and incidentals to complete this item.

Bid Item 17 - Abandon 48-inch Sanitary Sewer Manhole

The price per each for Abandon 48-inch Sanitary Sewer Manhole shall include all work and materials necessary to abandon manholes, including removal and disposal of frames, covers, and castings, cone, concrete, grout plugs, backfill and compaction, and all other essentials required to complete this item as detailed in the Specifications and Plans.

The price per each shall be full compensation for all labor, equipment, tools, and incidentals to complete this item.

Bid Item 18 - Remove Sanitary Sewer Manhole

The price per each for Remove Existing Sanitary Sewer Manhole shall include all work and materials necessary for removal and disposal of top, grade rings, and manhole base, excavation of manhole base, backfill and recompaction, and all other essentials required to complete this item as detailed in the Specifications and Plans.

The price per each shall be full compensation for all labor, equipment, tools, and incidentals to complete this item.

Bid Item 19 - 48-inch Sanitary Sewer Manhole

The price per each for Install 48-inch Sanitary Sewer Manhole shall include all work and materials necessary to install new sanitary sewer manholes, including saw cutting (if needed), trenching, removal and disposal of existing manhole, furnishing and installation of manhole bases, sections, frames, and covers, backfill and compaction, testing, and all other essentials required to complete this item as detailed in the Specifications and Plans.

The price per each shall be full compensation for all labor, equipment, tools, and incidentals to complete this item.

Bid Item 20 - Solids Screen

The price per each for solids screen shall include all work and materials necessary to furnish and install a solids screen, nuts, bolts, and all other essentials required to complete this item as detailed in the Specifications and Plans.

The price per each shall be full compensation for all labor, equipment, tools, and incidentals to complete this item.

Bid Item 21 - 1-inch Air Release Valve

The per each price shall include all work and materials necessary to install 1-inch air release valve, including testing, disinfection, air release valve, fittings, testing, disinfection, and all other essentials required to complete this item as detailed in the Specifications and Plans.

The per each price shall be full compensation for all labor, equipment, tools, and incidentals to complete this item.

Bid Item 22 - 4-inch Electromagnetic Flow Meter

The per each price shall include all work and materials necessary to install a 4-inch electromagnetic flow meter, including testing, calibration with certificate, fittings, pipe supports, wiring, conduit, and all other essentials required to complete this item as detailed in the Specifications and Plans.

The per each price shall be full compensation for all labor, equipment, tools, and incidentals to complete this item.

Bid Item 23 - Bollards

The price per each shall include all work and materials necessary to furnish and install bollards, including concrete footings, trenching, backfill, compaction, and all other essentials required to complete this item as detailed in the Specifications and Plans.

The per each price shall be full compensation for all labor, equipment, tools, and incidentals to complete this item.

Bid Item 24 - Minor Concrete

The price per cubic yard shall include all work and materials necessary to furnish and install concrete pads for the pump station and generator, including concrete, reinforcement, Class II aggregate base bedding, excavation, backfill, compaction, and all incidentals as required in the Specifications and Plans.

The per cubic yard price shall be full compensation for all labor, equipment, tools, and incidentals to complete this item.

Bid Item 25 - Imported Fill

The price per cubic yard shall include all work and materials necessary for imported fill as required to satisfy earthwork requirements in the construction documents. Measurement and payment shall be made per cubic yard. The price shall be full compensation for import material as required based on site conditions, testing of material, transportation, and all incidentals required by these Specifications and Plans.

The per cubic yard price shall be full compensation for the preparation and installation of these materials, and for all labor, equipment, tools, and incidentals to complete this item.

Bid Item 26 - Excavation & Grading

The price per cubic yard shall include all work and materials necessary for excavation and grading as shown in the construction documents. Measurement and payment shall be

made per cubic yard. The price shall be full compensation for excavation and grading of the access roads, wet well, manholes, vaults, and concrete pads, overexcavation, compaction, compaction testing, disposal of material, and all incidentals required by these Specifications and Plans.

The per cubic yard price shall be full compensation for the preparation and installation of these materials, and for all labor, equipment, tools, and incidentals to complete this item.

Bid Item 27 - Hard Rock Excavation

The price per cubic yard shall include all work and materials necessary to excavate hard rock where encountered. Measurement and payment shall be made per cubic yard. The price shall be full compensation for hard rock excavation, as defined as excavation requiring a hydraulic hoe-ram or jack-hammer to reach adequate trench size and depth for placement of the wet well, manholes, pipes, disposal of material, and all incidentals required by these Specifications and Plans.

The per cubic yard price shall be full compensation for the preparation and installation of these materials, and for all labor, equipment, tools, and incidentals to complete this item.

Bid Item 28 - 3-inch Minus Crushed Rock

The price per cubic yard shall include all work and materials necessary to furnish and install 3-inch minus crushed rock for the access roads, and all incidentals as required in the Specifications and Plans.

The per cubic yard price shall be full compensation for all labor, equipment, tools, and incidentals to complete this item.

Bid Item 29 – Electrical Service

The price per foot shall include all work and materials necessary to provide electrical service to the site form Liberty Utilities Transformer, including potholing, trenching, installation of bedding, temporary plating, utility crossing protection, backfill and compaction, furnishing of conduit and conductors, and all other essentials required to complete this item as detailed in the Specifications and Plans, and Liberty Utilities Standards. This quantity is an estimate and not shown in the plans. Exact location and length of pipe shall be determined during coordination with Lyberty Utility during construction. Quantity adjustments will be addressed with a change order.

The price per linear foot shall be full compensation for all labor, equipment, tools, and incidentals to complete this item

SC-19 Add the following new Article:

ARTICLE 19 – CALIFORNIA STATE REQUIREMENTS

A. At the time of the award of the Contract, and at all times while performing the Work, Contractor and its subcontractors listed in accordance with the provisions of Public Contract Code section 4104 shall be, and shall remain, registered and qualified to perform public work, pursuant to Labor Code sections 1725.5 and 1771.1. This Contract is subject to cancellation by Owner upon determination that Contractor or any of its subcontractors is not in compliance with the provisions of those sections.

B. This Project is subject to compliance monitoring and enforcement by the Department of Industrial Relations, as required by Labor Code section 1771.4. Contractor shall post

job site notices, as prescribed by regulation. Contractor shall furnish the records specified in Labor Code section 1776 directly to the Labor Commissioner.

C. In entering into a public works contract or a subcontract to supply goods, services, or materials pursuant to a public works contract, the Contractor or Subcontractor offers and agrees to assign to the awarding body all rights, title, and interest in and to all causes of action it may have under Section 4 of the Clayton Act (15 U.S.C. Section 15) or under the Cartwright Act (Chapter 2 (commencing with Section 16700) of Part 2 of Division 7 of the Business and Professions Code), arising from purchases of goods, services, or materials pursuant to the public works contract or the subcontract. This assignment shall be made and become effective at the time the awarding body tenders final payment to the Contractor, without further acknowledgment by the parties.

D. Contractor shall be responsible for marking all excavations and notifying Underground Service Alert (USA) at least 48 hours before digging and follow all other provisions of California Government Code Sections 4216 through 4216.9. Contractor shall maintain an active USA ticket number for the entire duration of the excavation.

E. Unless otherwise indicated in the Contract Documents, all utility lines, conduits, wires, or structures shall be maintained by the Contractor and shall not be disturbed, disconnected, or damaged by him during the progress of the Work, provided, that should the Contractor in the performance of the Work disturb, disconnect, or damage any of the above, all expenses arising from such disturbance or in the replacement or repair thereof shall be borne by the Contractor. However, in accordance with Section 4215 of the California Government Code, the Contractor shall be compensated for all costs of locating and repairing damage to main or trunkline utility facilities located on the work site and for costs of operating equipment on the work site necessarily idled during such work where the Contractor has exercised reasonable care in removing or relocating utility facilities which are inaccurately indicated in the Contract Documents.

TECHNICAL SPECIFICATIONS

TECHNICAL SPECIFICATIONS

TABLE OF CONTENTS

SECTION 01 20 00

MEASUREMENT AND PAYMENT

PART 1: GENERAL

1.01 DESCRIPTION

Payment shall be made at the bid prices and shall be considered as full compensation for furnishing all labor, materials, tools, supplies, and services as required for proper completion of the work described in the following bid items, complete in place, and to the satisfaction of the Engineer.

Items of work or other services which the Contractor is required to supply, such as final clean-up or other incidental items, and which are not listed as separate bid items shall be included in the related bid items and shall be considered as paid in those items, whether or not specifically identified in the following descriptions. Also considered to be included in such costs are any costs associated with the repair of damage which may occur to existing improvements as a result of the Contractor's operations.

1.02 LUMP SUM BREAKDOWN SUBMITTALS

After award of the Contract and prior to approval of initial progress payment requests, the Contractor shall submit a cost breakdown list to the Engineer for all Lump Sum bid items. The list shall consist of the major elements of work that make up each of the lump sum bid items and shall be used for determining progress pay estimates. The Contractor shall provide amounts for each element, pro-rating general costs such as mobilization, setup, temporary facilities and controls, and overhead and profit for each element. The distribution breakdown that the contractor indicates for any lump sum bid item may be revised as deemed necessary by the Engineer if it appears such items are unbalanced unless the Contractor can substantiate these costs. Only elements of work of value to the District shall be included in the list.

PART 2: MATERIALS - NOT USED

PART 3: EXECUTION - NOT USED

END OF SECTION

SECTION 01 33 00

SUBMITTALS

PART 1: GENERAL

1.01 SECTION INCLUDES

A. Submittal procedures.

B. Proposed Products list.

C. Product Data.

D. Shop Drawings.

E. Samples.

F. Design data.

G. Test reports.

H. Certificates.

I. Manufacturer's field reports.

J. CPM Qualifications

1.02 SUBMITTAL PROCEDURES

A. Transmit each submittal with transmittal form provided by Contractor.

B. Sequentially number the transmittal form. Resubmittals shall be identified with original number and a sequential resubmittal suffix number. The original submittal shall be numbered X-1. The first resubmittal shall be numbered X-2 and so on.

C. Identify Project, date of submittal, Contractor, Subcontractor or supplier, pertinent drawing and detail number, and specification section number, as appropriate.

D. Apply Contractor's signature certifying that review, approval, verification of Products required, field dimensions, adjacent construction Work, and coordination of information is in accordance with the requirements of the Work and Contract Documents.

E. Schedule submittals to expedite the Project and deliver to Engineer at the Engineer’s office. Coordinate submission of related items.

F. For each submittal for review, allow 30 days excluding delivery time to and from the Contractor.

G. Identify variations from Contract Documents and Product or system limitations which may be detrimental to successful performance of the completed Work.

H. Provide space for Design Engineer’s review stamps.

I. When revised for resubmission, identify all changes made since previous submission.

J. Distribute copies of reviewed submittals as appropriate. Instruct parties to promptly report any inability to comply with requirements.

K. Submittals not requested either in the Contract Documents or in writing from the Engineer will not be recognized or processed.

L. Within 15 days after Notice to Proceed submit a complete list of all submittals to be submitted and the dates when they will be submitted.

M. Wherever called for in the Contract Documents, or where required by the Engineer, the Contractor shall furnish to the Engineer for review one electronic copy of each shop drawing submittal. The term “Shop Drawings” as used herein shall be understood to include detail design calculations, shop drawings, fabrication and installation drawings, erection drawings, lists, graphs, catalog sheets, data sheets, and similar items. Whenever the Contractor is required to submit design calculations as part of a submittal, such calculations shall bear the signature and seal of an engineer registered in California, unless otherwise directed.

N. All Shop Drawing submittals shall be accompanied by the Contractor’s standard submittal transmittal form. Any submittal not accompanied by such a form, or where applicable items on the form are not complete, will be returned for resubmittal.

O. Normally, a separate transmittal form shall be used for each specific item or class of material or equipment for which a submittal is required. Transmittal of a submittal of various items using a single transmittal form will be permitted only when the items taken together constitute a manufacturer’s “package” or are so functionally related that expediency indicates review of the group or package as a whole. A multi-page submittal shall be collated into sets, and each set shall be stapled or bound, as appropriate, prior to transmittal to the Engineer.

P. Except as may otherwise be indicated herein, the Engineer will return prints of each submittal to the Contractor with its comments noted hereon, within 30 calendar days following their receipt by the Engineer. It is considered reasonable that the Contractor shall make complete and acceptable submittal to the Engineer by the second submission of a submittal item. The District reserves the right to withhold monies due to the Contractor to cover additional costs of the Engineer’s review beyond the second submittal. The Engineer’s maximum review period for each submittal, including all resubmittals, will be 30 days per submittal. In other words, for a submittal that requires two resubmittals before it is complete, the maximum review period for that submittal could be 90 days.

Q. If a submittal is returned to the Contractor marked “NO EXCEPTIONS NOTED”, formal revision and resubmission of said submittal will not be required.

R. If a submittal is returned to the Contractor marked “MAKE CORRECTIONS NOTED”, formal revision and resubmission of said submittal will not be required.

S. If a submittal is returned to the Contractor marked “AMEND-RESUBMIT”, the Contractor shall revise said submittal and shall resubmit the required number of copies of said revised submittal to the Engineer.

T. If a submittal is returned to the Contractor marked “REJECTED-RESUBMIT”, the Contractor shall revise said submittal and shall resubmit the required number of copies of said revised submittal to the Engineer.

U. Fabrication of an item shall be commenced only after the Engineer has reviewed the pertinent submittals and returned copies to the Contractor marked “NO EXCEPTIONS TAKEN” or “MAKE CORRECTIONS NOTED”. Corrections indicated on submittals shall be considered as changes necessary to meet the requirements of the Contract Documents and shall not be taken as the basis for changes to the contract requirements.

V. The Engineer’s review of Contractor Shop Drawing submittals shall not relieve the Contractor of the entire responsibility for the correctness of details and dimensions. The Contractor shall assume all responsibility and risk for any misfits due to errors in Contractor submittals. The Contractor shall be responsible for the dimensions and the design of adequate connections and details for all connections and details.

1.03 PROPOSED PRODUCTS LIST

A. Within 15 days after date of Notice to Proceed submit list of major products proposed for use, with name of manufacturer, trade name, and model number of each product.

B. For products specified only by reference standards, give manufacturer, trade name, model or catalog designation, and reference standards.

1.04 PRODUCT DATA AND SHOP DRAWINGS

A. Product Data for Review:

1. Submitted to Engineer for review for the limited purpose of checking for conformance with information given and the design concept expressed in the contract documents.
2. After review, provide copies and distribute in accordance with SUBMITTAL PROCEDURES article above.

B. Product Data for Information:

1. Submitted for the Engineer's knowledge as contract administrator or for the District.

C. Product Data for Project Close-out:

1. Submitted for the District's benefit during and after project completion.

D. Submit one electronic copy of each drawing included in the submittal.

E. Mark each copy to identify applicable products, models, options, and other data. Supplement manufacturers' standard data to provide information specific to this Project.

F. After review distribute in accordance with the Submittal Procedures article above.

1.05 SAMPLES

A. Samples for Review:

1. Submitted to Engineer for review for the limited purpose of checking for conformance with information given and the design concept expressed in the contract documents.
2. After review, produce duplicates and distribute in accordance with SUBMITTAL PROCEDURES article above.

B. Samples for Information:

1. Submitted for the Engineer's knowledge as contract administrator or for the District.

C. Include identification on each sample, with full Project information.

D. Submit the number of samples specified in individual specification sections; one of which will be retained by Engineer.

E. Reviewed samples which may be used in the Work are indicated in individual specification sections.

F. Samples will not be used for testing purposes unless specifically stated in the specification section.

1.06 DESIGN DATA

A. Submit for the Engineer's knowledge as contract administrator or for the District's knowledge.

B. Submit for information for the limited purpose of assessing conformance with information given and the design concept expressed in the contract documents.

1.07 TEST REPORTS

A. Submit for the Engineer's knowledge as contract administrator or for the District's knowledge.

B. Submit test reports for information for the limited purpose of assessing conformance with information given and the design concept expressed in the contract documents.

1.08 CERTIFICATES

A. When specified in individual specification sections, submit certification by the manufacturer, installation/application Subcontractor, or the Contractor to Engineer, in quantities specified for Product Data.

B. Indicate material or Product conforms to or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.

C. Certificates may be recent or previous test results on material or Product but must be acceptable to Engineer.

1.09 MANUFACTURER'S FIELD REPORTS

A. Submit reports for the Engineer's benefit as contract administrator and for the District.

B. Submit one electronic copy of each report within 30 days of observation to Engineer

for information.

C. Submit for information for the limited purpose of assessing conformance with information given and the design concept expressed in the contract documents.

1.10 CPM QUALIFICATIONS

A. Submit a statement for individual who will perform CPM scheduling that identifies who they are and highlights their qualifications.

PART 2: MATERIALS - NOT USED

PART 3: EXECUTION - NOT USED

END OF SECTION

SECTION 01 54 00

TEMPORARY SEWER BYPASS PUMPING

PART 1: GENERAL

1.01 DESCRIPTION

A. The Contractor shall provide a complete sewer bypassing system including, but not limited to, the following:

1. Developing a sewer bypassing plan
2. Developing a spill prevention and emergency response plan
3. Submitting and obtaining approval from the District for the sewer bypassing plan and the spill prevention and emergency response plan
4. Implementing the bypassing and spill prevention and emergency response plan
5. Providing bypassing in accordance with the approved plans throughout the duration of the work

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Section 01 33 00: Submittals

B. Section 33 05 11: Plastic Pipe and Fittings

1.03 SUBMITTALS

A. In accordance with Section 01 33 00.

B. Within 10 days of Notice to Proceed, submit drawings and complete design data for bypass pumping plan. Show all proposed methods, equipment, and discharge locations for bypassing. No construction activities related to bypassing shall begin prior to the approval of the required submittals by the District. Approval of the Contractor's Bypassing and Spill Prevention and Emergency Response Plan in no way relieves the Contractor of his responsibility to maintain sewage service or provide sewer bypassing at all times during construction and to prevent any spills.

C. Bypassing Plan

1. The Contractor shall design the bypass system to handle the flows of the system. Contractor shall have plugs on hand for and bypass pump capacity available for 75% of the maximum flow in the system.

2. The Contractor shall develop and submit to the District, for review and approval, a written Bypassing Plan including sequence of work outlining how sewage flows will be maintained and bypassed during construction. The bypassing plan shall include, but not be limited to:

a. A primary and 100% redundant backup pumping system, each capable of handling the peak flow of the system. Which shall be on site and available 24 hours a day.

b. A flow monitoring plan describing the method of monitoring and showing the location of upstream and downstream monitoring units for all of the construction locations.

3. The bypassing plan shall be developed in conjunction with the traffic control plans in order to minimize the impact to the community. See the County Standard Specifications.

C. Spill Prevention and Emergency Response Plan

1. The Contractor shall develop and submit to the District, for review and approval, a written Spill Prevention and Emergency Response Plan. The Spill Prevention and Emergency Response Plan shall be developed to prevent and respond to any construction related sewage spills. The plan shall include, but not be limited to:

a. Identification of all nearby waterways, channels, catch basins and entrances to underground storm drains.

b. Furnishing of all the necessary materials, supplies, tools equipment, labor and other services to prevent sewage from coming into contact with these areas.

c. Arrangements for an emergency response unit comprised of emergency response equipment and trained personnel to be immediately dispatched to the site in the event of sewage spill(s).

d. An emergency notification procedure, which includes an emergency response roster with telephone numbers and arrangements for backup personnel and equipment and an emergency notification roster of designated District representatives.

e. Direct phone numbers (no voicemail) for 3 Contractor representatives who shall be accessible and available at all times to respond immediately to any construction related emergency.

1.04 RESPONSIBILITIES OF CONTRACTOR

A. The Contractor shall observe and comply with all Federal, State, and local laws, ordinances, codes, orders, and regulations which in any manner affect the conduct of the work, specifically as it relates to sewage and prevention of sewage spills. The Contractor shall be fully responsible for preventing sewage spills, containing any sewage spills, recovery and legal disposal of any spilled sewage, paying any and all fines, incurring and handling any penalties, claims, or liability arising from negligently causing or allowing a sewage spill, failure to prevent a sewage spill, or any violation of any law, ordinance, code, order, or regulation as a result of the spillage.

PART 2: MATERIALS

2.01 GENERAL

A. All equipment and tools used for sewer bypassing shall be designed to prevent any and all sewage leaks or spills.

B. All equipment used as part of the bypassing system shall not cause a significant noise impact to the community in accordance with local noise ordinances. If noise complaints from residents occur due to the Contractor's activities, the Contractor shall immediately replace the noise-generating equipment or reduce the noise generated with mitigating devices to the satisfaction of the District.

C. Sewage shall be conveyed/pumped in closed conduits and disposed of in a sanitary sewer system. Sewage shall not be permitted to flow in trenches or be covered by backfill.

D. Suction and discharge manholes shall be sealed to prevent odors.

E. Access to driveways may not be blocked by the bypass pipe. Flat pipe, a raised platform above bypass pipe, or a shallow trench shall be used to provide access to residents.

F. If bypass pumping must cross any major arterial streets/roads, piping must be installed in a shallow trench. Flat piping or raised traffic platforms across these streets will not be allowed. Trench shall be backfilled or covered with recessed, secured trench plating.

G. All shallow trenching shall be backfilled and paved in accordance with the standard specifications following demobilization of sewer bypass. All costs to install, maintain, backfill, and pave temporary shallow trenching shall be included in Contractor's bid item for sewer bypassing and no additional compensation shall be made therefor.

H. If deemed necessary due to lack of preparedness on the Contractor's part, the District has the option to clean up a sewage spill caused by the Contractor. Clean up costs incurred by the District shall be recoverable in addition to the penalties from the Contractor's progress payments.

2.02 PUMPING EQUIPMENT

A. All pumps used for sewer bypassing shall be the submersible type and shall only be operated below ground in the sewer manhole or other sewer facility. The use of above ground pumps or pumps not specifically designed for submersible service are not allowed.

B. The pumps shall be sized to fit in manholes or other confined areas necessary to successfully complete the sewer bypassing. The Contractor shall ensure all equipment used for bypassing will operate under the conditions required and the Contractor will be responsible for all costs associated with changes to the bypassing system due to inappropriate equipment or non-conformance with the Contract Documents.

C. Electric or fuel/generator driven pumps shall be used. The Contractor shall provide an emergency standby power generator, sized to operate the bypass system at a minimum, to be used to operate the submersible pumps if electrical power is lost during the progress of the work and a sewage spill will occur.

D. The pumps shall be specifically intended for use with raw sewage and shall be capable of passing a 3-inch diameter solid.

E. Regardless of power used, the total noise of any equipment used by the Contractor as part of the bypassing system shall be under 68 dba as measured standing thirty (30) feet from the equipment.

PART 3: EXECUTION

3.01 GENERAL

A. The Contractor shall exercise care not to damage existing public and private improvements, interrupt existing services and/or facility operations which may cause a sewage spill. Any reasonably anticipated utility and/or improvement which is damaged by the Contractor shall be immediately repaired at the Contractor's expense. In the event that the Contractor damages an existing utility or interrupts an existing service which causes a sewage spill, the Contractor shall immediately notify the District representatives. The Contractor shall request and obtain from the District an emergency roster of the designated District representatives with their respective telephone numbers. The Contractor shall take all measures necessary to prevent further damage or service interruption, and to control, contain, and clean up the resultant impacts of the damage, service interruption, and any resulting sewage spill(s).

B. The Contractor shall continuously monitor the flow levels downstream and upstream of the construction location to detect any possible failure that may cause a sewage backup and spill. The Contractor shall include the means and methods of monitoring the flow in their Sewer Bypassing Plan.

3.02 SEWAGE SPILLS

A. In case of sewage spill, the Contractor shall act immediately, within fifteen minutes – without instructions from the District – to control the spill and take all appropriate steps to contain it in accordance with their Spill Response Plan.

B. The Contractor shall immediately notify the District representatives of the sewage spill(s) and all remedial actions taken.

C. The Contractor shall, within 24 hours from the occurrence of the spill, submit to the District a draft written report describing the following information related to the spill: the location; the nature and volume; the date and time; the duration; the cause; the type of remedial and/or preventive actions taken; and the water body impacted and results of any necessary monitoring. The District will review the draft report, and if revisions are required, the Contractor shall make those revisions and submit the final report to the District within 24 hours of the receipt of comments. Requests for additional compensation for the handling of the spill shall be submitted to the Engineer as a construction claim. The Contractor shall assure the validity, accuracy, and correctness of the claim under penalty of perjury. The Engineer may institute further corrective actions, as deemed

necessary, to fully comply with existing law, ordinance, code, order, or regulation. The Contractor shall be responsible for all costs incurred for the corrective actions.

D. It shall be the Contractor's responsibility to assure that all field forces, including Subcontractors, know and obey all safety and emergency procedures, including the Spill Response Plan, to be maintained and followed at the site.

3.03 SEWER BYPASSING

A. The Contractor shall provide temporary means to maintain and handle the sewage flow in the existing system as required to complete the necessary construction.

B. The Contractor shall size the bypass system to handle the peak flow of the system. The Contractor shall provide a redundant, identically sized, one-hundred percent (100%) backup bypass system. The Contractor shall utilize the backup system to mitigate any additional wet weather flows, perform the necessary maintenance and repairs on the primary bypass system, and exercise and ensure the operability of the backup system. Each pump, including the backup pumps, shall be a complete unit with its own suction and discharge piping. The Contractor shall operate the backup bypass system for a minimum of twenty-five percent (25%) of the time on a weekly basis. The backup bypass system shall be fully installed and operationally ready at all times.

C. Prior to the full operation of the bypass system, the Contractor shall demonstrate, to the satisfaction of the District, that both the primary and backup bypass systems are fully functional and adequate and shall certify the same, in writing, in a manner acceptable to the District.

D. The Contractor shall provide all equipment necessary to minimize the noise generated by the bypassing operations. Noise levels from the complete bypassing system shall not exceed the levels allowable under the local jurisdictional codes and requirements.

E. The Contractor shall continuously (while in use) monitor the operation of the bypass system and all impacted facilities. The Contractor shall submit, as part of their bypass plan, their system monitoring procedure and frequency. The Contractor shall maintain a log of the monitoring in a manner acceptable to the Engineer.

F. The Contractor shall continuously monitor the flow levels downstream and upstream of the bypass to detect any possible failure that may cause a sewage backup and/or spill. The Contractor shall include the means and methods of monitoring the flow in their Bypassing Plan. The Contractor shall provide flow monitoring data to the District on a weekly basis in a format acceptable to the District.

G. The Contractor shall routinely inspect and maintain the bypass system, including the backup system. The Contractor shall submit as part of their Bypassing Plan their maintenance procedures and frequency. The Contractor shall maintain a log of all pertinent inspection, maintenance and repair records in a manner acceptable to the Engineer.

H. At the end of each day's work, the Contractor shall re-establish sewer flows in the gravity sewer system. Work undertaken each day shall only include work that can be completed during that working day.

END OF SECTION

SECTION 01 57 00

CONSTRUCTION ACTIVITIES
STORMWATER BEST MANAGEMENT PRACTICES

PART 1: GENERAL

1.01 DESCRIPTION

This section describes the types of Construction Activity Best Management Practices (BMP) to be employed by the Contractor at the project site to reduce or eliminate sediment and other pollutants in stormwater and non-stormwater discharges during all phases of construction.

1.02 RELATED WORK DESCRIBED ELSEWHERE

A. Section 31 23 19: Dewatering

B. Section 01 57 23: Stormwater Runoff Control Program

C. Section 32 92 19: Vegetative Erosion Control

D. California Stormwater Quality Association (CASQA), “Stormwater Best Management Practice Handbook for Construction”.

E. Best Management Practice (BMP) Field Manual and Trouble Shooting Guide.

1.03 SUBMITTALS

Prior to any equipment staging and/or earthwork activities, the Contractor shall provide the following:

A. A list of BMP equipment venders and suppliers to be used by the Contractor for this project, including the type(s) of BMP equipment to be provided by each vender/supplier and equipment availability and delivery schedules;

B. A list of qualified personnel/contractors who will be responsible for the following, as described further in this section:

1. Coordinating BMP selection and implementation
2. BMP Installation
3. BMP Inspection and Reporting and Follow-Up
4. BMP Maintenance and Repair
5. BMP removal, if necessary

1.04 PERMITS

A. The Contractor shall be responsible for the development of the site-specific erosion prevention plan and sediment control plan as it pertains to the Contractor’s project schedule and the location of his equipment and materials. These plans shall be included in the Stormwater Pollution Prevention Plan (SWPPP) or Erosion Control Plan (ECP). The Contractor is required to provide the SWPPP or ECP (for 1 acre or less disturbance).

B. The Contractor shall be responsible for obtaining any necessary permits from regulating bodies. Obtaining dewatering permits shall be the responsibility of the Contractor.

1.05 MEASUREMENT AND PAYMENT

The Contractor shall be responsible for all costs associated with the procurement, installation, his inspection, maintenance and repair, and removal of any construction related stormwater BMP employed at the site.

PART 2: MATERIALS

2.01 FACILITIES AND EQUIPMENT

The Contractor shall provide all necessary facilities and equipment for the selection, installation, inspection, maintenance and repair, and removal of any construction related stormwater BMP employed at the site.

PART 3: EXECUTION

3.01 GENERAL REQUIREMENTS

A. The Contractor, in consultation with the Engineer will select BMPs based on existing and anticipated site conditions.

B. The Contractor will be responsible for providing the necessary equipment and materials to install, inspect and maintain selected BMPs, as described in this section and related Specifications.

C. The Contractor will be responsible for ensuring the selected BMP equipment and materials are available and onsite with sufficient time to be installed prior to their required installation dates per the Contractor-developed BMP Selection and Implementation Schedule.

D. The Contractor shall be responsible for ensuring the installation, inspection, maintenance and repair, and removal of any selected construction related BMP is done by qualified personnel. All temporary BMPs must be removed and immediate surrounds repaired and/or cleaned up at projects completion unless instructed by an Owner's Representative to not do so.

E. The selection, installation, maintenance and repair of any construction related BMP shall, at the minimum, be in accordance with the following control documents:

1. California Stormwater Quality Association (CASQA), "Stormwater Best Management Practice Handbook for Construction"
2. Caltrans Best Management Practice (BMP) Field Manual and Trouble Shooting Guide
3. Sediment Source Control Handbook Published by the Sierra Business Council and Produced in collaboration with the Lahontan Regional Water Quality Control Board and the California Alpine Resort Environmental Cooperative
4. Caltrans Stormwater Quality Handbook: Construction Site BMPs Manual, November 2000

5. Caltrans Stormwater Quality Handbook: Construction Contractor's Guide and Specifications, April 1997

F. The Contractor shall ensure that water conservation measures are implemented in accordance with Caltrans BMP# NS-1: Water Conservation Practices and Caltrans BMP# NS-7: Potable Water/Irrigation. At no time shall the use of water during construction create or contribute to an unapproved non-stormwater discharge from the site. All non-stormwater discharges must be preapproved by the Engineer and must be documented in the site's Construction Stormwater Pollution Prevention Plan (SWPPP) prior to discharge or (ECP).

G. The Contractor shall ensure, to the extent practical, that clear water and run-on from offsite sources is directed around the construction site. Where it is not practical to divert run-on and/or concentrated flows around the construction site, the Contractor shall direct run-on and concentrated flows though the construction site in a non-erodible fashion. The diversion of run-on/concentrated flows shall be in accordance with Caltrans BMP# NS-5: Diversion of Clear Water Diversion, and the following concentrated flow conveyance controls:

1. Caltrans BMP#SS-9: Earth Dikes/Drainage Swales and Lined Ditches
2. Caltrans BMP#SS-10: Outlet Protection/Velocity Dissipation Devices
3. Caltrans BMP#SS-11: Slope Drains

H. The Contractor shall be responsible for obtaining a Dewatering General Permit for any dewatering activity, including removal and discharge of groundwater, accumulated rainwater and removing water from cofferdams or diversions, if necessary. Dewatering activities shall comply with the conditions of the Lahontan Regional Water Control Board's General Permit for Dewatering Activities and shall be in accordance with Caltrans BMP# NS-2 Dewatering Operations.

I. Contractor is responsible to install and maintain BMPs until Notice of Completion by the Engineer. At least seventy percent (70%) of all disturbed areas must be stabilized prior to project acceptance by Engineer.

3.02 EROSION AND SOIL STABILIZATION CONTROLS

A. The Contractor shall prepare a Construction Activity Schedule that addresses the conditions described in Caltrans BMP # SS-01: Scheduling. The Schedule shall be provided to the Engineer upon award of Contract and prior to any construction related activity occurring at the site. The Schedule shall, at the minimum, accomplish the following conditions to the extent practical:

1. Minimize the length of time that soils are left exposed.

    a. The Contractor shall ensure that protective erosion control measures, as described in this section, or equivalent BMPs, be implemented for any disturbed area that will remain exposed for more than 14 days.

    b. All disturbed areas must be stabilized at least 48 hours prior to storm events utilizing the appropriate BMPs described in this section, or an equivalent BMP.

2. Reduce the total area of exposed soils during the raining season (October 1 through May 30). Soil stabilization improvements shall be performed within 14

days after final grade is achieved or all other construction activity on that feature/region is inactive.

3. At all times protect critical areas, including but not limited to drainage channels, creeks, natural water courses and sensitive natural resources (i.e., wetlands).

B. The Contractor shall ensure that existing vegetation is preserved, and preservation measures are inspected and maintained, in accordance with Caltrans BMP # SS-2: Preservation of Existing Vegetation. ALL temporary construction fencing on the WWTF property shall be removed at contract's end unless otherwise specified by Owner.

C. Soil stabilization BMPs shall be limited to the following, unless the Contractor can recommend alternative BMPs that are deemed as effective by the Engineer:

1. Hydraulic Mulch in accordance with Caltrans BMP# SS-3: Hydraulic Mulch.
2. Hydroseeding in accordance with Caltrans BMP# SS-4: Hydroseeding, however, Section 32 92 19 – Vegetative Erosion Control – holds precedence.
3. Tackifiers/Soil Binders in accordance with Section 32 92 19 – Vegetative Erosion Control. Caltrans BMP# SS-5: Soil Binders, provides supporting information.
4. Straw Mulch in accordance with Section 32 92 19 – Vegetative Erosion Control Control. Caltrans BMP# SS-6: Straw Mulch provides supporting information.
5. Erosion control blankets and mats in accordance with Section 32 92 19 – Vegetative Erosion Control. Caltrans BMP# SS-7: Geotextiles, Plastic Covers and Erosion Control Blankets and Mats provides supporting information.

3.03 SEDIMENT CONTROL BMPS

A. Sediment control BMPs shall only be used in conjunction with erosion control BMPs. The use of sediment control BMPs in the absence of erosion control BMPs is not considered Best Conventional Pollutant Control Technologies (BCT) / Best Available Technologies Economically Achievable (BAT) and will not satisfy the compliance requirements of the Clean Water Act (i.e., the General Permit).

B. Sediment control BMPs shall be limited to the following, unless the Contractor can recommend alternative BMPs that are deemed as effective by Engineer:

1. Silt Fence in accordance with Caltrans BMP# SC-1: Silt Fence.
2. Desilting/Sediment Settling Basin in accordance with Caltrans BMP# SC-2: Desilting Basin.
3. Sediment Trap in accordance with Caltrans BMP# SC-3: Sediment Trap.
4. Check Dams in accordance with Caltrans BMP# SC-4: Check Dams.
5. Fiber Rolls in accordance with Caltrans BMP# SC-5: Fiber Rolls.

C. The use of sandbags and gravel bags are not approved due to the potential to add pollutants to stormwater discharges. Straw bales are discouraged due to the extensive effort to properly install and maintain straw bales as an effective sediment control BMP.

D. The Contractor shall provide for control of offsite discharge of sediments from wind and wind erosion. The use of soil binders or water as wind erosion BMP shall be in accordance with this specification Section 3.01 (F) and/or Section 3.02 (C) (3).

E. The Contractor shall stabilize construction entrances and exits in accordance with Caltrans BMP# TC-1: Stabilized Construction Entrance/Exit.

F. The Contractor shall stabilize construction roadways in accordance with Caltrans BMP# TC-2: Stabilized Construction Roadway.

3.04 EQUIPMENT RELATED POLLUTANT BMPS

A. Should the Contractor elect to conduct the following activities onsite at any time, the Contractor shall comply with the following BMPs:

1. Equipment and vehicle cleaning shall be done in accordance with Caltrans BMP# NS-8: Vehicle and Equipment Cleaning.

2. Fueling activities shall be done in accordance with Caltrans BMP# NS-9: Vehicle and Equipment Fueling. It is recommended that fuel trucks and equipment be equipped with “Cam-Loc” air tight vapor and liquid recovery systems to minimize fuel spills and releases.

3. At no time shall open containers of equipment fluids be left uncovered and unsecured. Secondary containment shall be provided for all chemical and waste containers. Stacking of open or closed equipment fluid containers on top of other fluid containers on secondary containment pallets is prohibited.

B. Equipment maintenance should be conducted as described below:

1. To prevent or reduce the discharge of pollutants to stormwater from vehicle and equipment maintenance by running a “dry site”. This involves using off-site facilities, performing work in designated areas only, providing cover for materials stored outside, checking for leaks and spills, containing and cleaning up spills immediately, and training employees and subcontractors.

a. Keep vehicles and equipment clean; don’t allow excessive build-up of oil and grease.

b. Use off-site repair shops as much as possible. Maintaining vehicles and equipment outdoors or in areas where vehicle or equipment fluids may spill or leak onto the ground can pollute stormwater. If you maintain a large number of vehicles or pieces of equipment, consider using an off-site repair shop. These businesses are better equipped to handle vehicle fluids and spills properly.

c. If maintenance must occur on-site, use designated service areas located a minimum of 300 feet away from drainage courses. Surface drainage shall be diverted away/around service and staging areas to prevent the run-on of stormwater and the runoff of spills.

d. Always use secondary containment, such as a drain pan or drop cloth, to catch spills or leaks when removing or changing fluids.

e. Place a stockpile of spill cleanup materials where it will be readily accessible.

f. Use adsorbent materials on small spills rather than hosing down or burying the spill. Remove the adsorbent materials promptly and dispose of properly.

g. Regularly inspect on-site vehicles and equipment for leaks, and repair immediately.

h. Do not allow leaking vehicles or equipment on-site. If fluid spills or leaking vehicles are detected, take immediate measures to stop the leak and/or properly clean the spill.

i. Repair and maintenance activity shall not take place during wet weather conditions or within 24 hours of a predicted rain event.

j. Segregate and recycle wastes, such as greases, used oil or oil filters, antifreeze, cleaning solutions, automotive batteries, hydraulic, and transmission fluids.

k. Train employees and subcontractors in proper maintenance and spill cleanup procedures.

END OF SECTION

SECTION 01 57 23

STORMWATER RUNOFF CONTROL PROGRAM

PART 1: GENERAL

1.01 DESCRIPTION

A. This section describes work necessary by the Contractor to allow the Owner to comply with the current California State Water Resources Control Board (SWRCB) General Construction Activity Storm Water Permit No. CAS000002 (General Permit) for discharges of stormwater associated with construction activities. Specifically, this includes the implementation of a Stormwater Pollution Prevention Plan (SWPPP) should disturbance exceed 1 acre, an erosion control plan (ECP) for projects less than 1 acre and Monitoring and Reporting Plan. The Contractor will be responsible for compliance with the General Permit and any other applicable stormwater regulations. The Contractor will be required to produce a SWPPP or ECP and M&RP, pursuant to the requirements of the General Permit.

B. This specification, in addition to specification Sections 32 92 19 and 01 57 00, detail the minimum essential elements of the SWPPP, ECP and Monitoring Reporting Program. Should the disturbed land area exceed 1 acre, the Contractor will be responsible for composing a complete SWPPP that includes all elements set forth in Section A, “Storm Water Pollution Prevention Plan”, of the General Permit. An Erosion Control Plan (ECP) shall be submitted to the District based on the Alpine County Erosion Control Plan Submittal requirements. The Contractor will also be responsible for composing an M&RP that satisfies the requirements set forth in Section B, “Monitoring Program and Reporting Requirements”, of the General Permit.

C. The Contractor will be responsible for obtaining coverage under the General Permit and finalizing the SWPPP or approval of an ECP and M&RP prior to commencing construction. The SWPPP or ECP and M&RP must be approved by the Engineer before they are considered finalized.

D. Disposal of construction water from operations such as groundwater dewatering and water used for testing, disinfecting, and flushing pipelines is not part of the work under this section. Refer to Sections 31 23 19 and 31 23 33 for permit requirements for those discharges.

1.02 RELATED WORK DESCRIBED ELSEWHERE

A. Section 01 33 00: Submittals

B. Section 31 23 19: Dewatering

C. Section 31 23 33: Trenching, Backfilling, and Compacting

D. Section 32 92 19: Vegetative Erosion Control

E. Section 01 57 00: Construction Activities Stormwater Best Management Practices

1.03 STATE CONSTRUCTION PERMIT COVERAGE

A. It is the responsibility of the landowner to obtain State CGP coverage for planned construction activities prior to the commencement of work. To apply for coverage, the landowner, or his/her Legal Responsible Person (LRP) must electronically submit through the State's Storm Water Multiple Application and Report Tracking System (SMARTS), a Notice of Intent (NOI), a SWPPP, and other documents required by the CGP, and mail the appropriate fee to the SWRCB. This request to the State will provide, if approved, coverage under the State's General NPDES permit for construction activities. Coverage under the permit is not complete until a SWPPP and Permit Registration Documents (PRD's) are electronically submitted, the appropriate fee is paid, and a Waste Water Identification Number (WDID) is assigned by the RWQCB.

B. The General Permit for Construction Activity requires the SWPPP address water pollution control during construction. The SWPPP must outline the Best Management Practices (BMP's) planned for use on the site to prevent pollutants from leaving the project site. The BMP's should include, but are not limited to:

1. Erosion controls
2. Wind erosion controls
3. Sediment controls
4. Non-stormwater runoff controls
5. Tracking controls
6. Waste management controls
7. Materials pollution controls
8. Advanced treatment methods

1.04 PROJECTS ONE ACRE OR MORE – NOT USED

1.05 PROJECTS LESS THAN ONE ACRE

SWPPP's and State NPDES permits are not required for projects under one acre within the District, unless they are part of a larger development encompassing over one acre, in which case, the procedures listed above are required. For projects less than one-acre, an erosion and sediment control plan shall be submitted with the improvement plans to the District for approval. This is generally part of the Grading Plan for the development. The Public Works Department, Development Section, will approve the erosion and sediment control plan upon review of the project. All erosion and sediment control devices shall be identified and implemented in the same fashion as projects with SWPPP's over one acre. Enforcement will be conducted similarly, with exception to SWPPP administrative requirements.

1.06 ENFORCEMENT PROCEDURES

The District prohibits polluted stormwater discharges from entering the District‘s storm drainage system, watercourse, natural outlet or channel. The District has the authority to make inspections to enforce water quality, and to issue stop work orders for polluted discharges.

1.07 ABANDONED/INACTIVE CONSTRUCTION SITES ONE ACRE OR MORE

A. Should a new development project with a valid State Stormwater Permit and WDID number become abandoned or inactive during the course of construction and at the discretion of the District's staff will initiate the following procedure.

1. Determine the stability of the construction site as it relates to storm water runoff and conformance with the approved SWPPP.
2. If the site is unstable and has the potential to adversely impact receiving water quality, the District will contact with the owner/developer by telephone, written letter, and/or electronic mail within 14 days of determining the project has been abandoned or inactive. Inform the owner of the current status and encourage them to stabilize the site according to the project's SWPPP.
3. Conduct Stormwater site inspection after 21 days of determining the project has been abandoned or inactive, or as applicable to determine if adequate BMP's were installed to establish stability, and monitor through the wet season by communicating with the owner/developer representative via periodic Stormwater inspections.
4. Should the owner/developer be unresponsive, uncooperative, or fails to install adequate BMP's as defined above, a District citation and/or RNOV will be issued. If the site is not properly addressed, then the Stormwater project file will be forwarded to the RWQCB staff for further processing and handling.

1.08 LESS THAN ONE ACRE

A. Should a new development project with a current encroachment permit or subdivision agreement from the District become abandoned or inactive at the discretion of the District, the District will initiate the following procedure.

1. Determine if the construction site is unstable and without proper stabilization and has a potential to impact water quality.
2. Attempt to make contact with the owner/developer by telephone, written letter, and/or electronic mail prior to the wet season, or as necessary.
3. Inform the owner/developer of the current status and encourage him/her to stabilize the site according to the approved plans and the County Standards before the first rain event.
4. Conduct Stormwater site inspection to determine if adequate BMP's were installed to establish stability and monitor through the wet season by communicating with the owner/developer representative.
5. Should the owner/developer be unresponsive, uncooperative, or fails to install adequate BMP's as defined above, a District citation and/or RNOV will be issued. If the site is not properly addressed, then the Stormwater project file will be forwarded to the District Attorney's Office for further processing and handling including bond recovery proceedings.

1.09 DISTRICT REPORTING

A. By September 15th of each year, the District is required to submit an annual report to the RWQCB describing the District's stormwater management program's effectiveness in accordance with the State's General Permit for MS4's. In part, the report encompasses goal expectations for the construction element of the permit. As such, the Public Works Department, Engineering Division, Construction Management Section, will maintain permanent records of all active SWPPP's including inspection reports, and maintain for three years following each project NOT.

B. For detailed BMP information including a SWPPP template, see the California Stormwater Quality Association (CASQA) web site at: www.cabmphandbooks.com. For online training courses based on the CASQA handbooks, go to the California State University web site at: www.owp.csus.edu/research/bmpcourses.

1.10 SUBMITTALS

A. Within ten (10) calendar days after issuance of the Notice of Award, the Contractor shall submit (as per Section 01300, Submittals), at a minimum, the following information for review and, upon approval by the Engineer, incorporation into the SWPPP:

1. SWPPP Compliance Certification-Contractor;
2. Contractor's Summary of Responsibilities;
3. Erosion Prevention Plan, narrative and detailed graphic (figures shall not be at scales greater than 100 feet per inch);
4. Sediment Control Plan, narrative and detailed graphic (figures shall not be at scales greater than 100 feet per inch);
5. Stormwater pollution prevention training descriptions for both the Project Engineer and Project BMP Installation Trainer(s);
6. Project Construction Schedule (refer to Caltrans BMP #SS-1 in Appendix B);
7. BMP Selection and Implementation Schedule (Appendix B);
8. Contractor's weather forecast source (i.e., website or Company and report name) for storm event preparation;
9. Hazardous Materials Inventory List with reference to Contractor's Hazardous Materials Business Plan (Federal and County requirement);
10. Safety Plan: Cal OSHA. Title 8, Chapter 4, Subchapter 4 - Construction Safety Orders Sections 1500 through 1938 and Subchapter 7 – General Industrial Safety Orders, with emphasis on chemical handling and storage (refer to www.dir.ca.gov/samples/search/query.htm).

B. The submittal shall detail the Contractor's selected BMPs with brief justification on why that BMP is selected, the intended installation date and location on the site. BMP materials and specifications shall be provided, including, where applicable, reference to BMPs described in Specification Section 01 57 00. If the Contractor believes additional or alternative BMPs are necessary, details shall be provided. The Contractor will be required to revise or supplement submitted information that is inadequate or incomplete in the opinion of the Engineer.

C. Once the information is compiled, the Contractor will finalize and submit the proposed SWPPP or ECP to the Owner and Engineer for final acceptance. The SWPPP or ECP will be posted on-site for reference in compliance monitoring.

D. In the event the Contractor desires to implement environmental protection BMPs differently than detailed in the Plans and Specifications, SWPPP or the ECP, the Contractor may provide a submittal with his alterations/amendments to the Engineer. All alterations or amendments must get prior authorization from the Engineer as outlined in the SWPPP or ECP. However, if the Contractor desires to implement alternative BMPs to those detailed exclusively in the SWPPP or ECP for an emergency repair to prevent an offsite discharge, he may do so without prior

consent. No schedule delays will be allowed due to BMP revisions proposed by the Contractor, unless authorized by the Owner.

1.11 MEASUREMENT AND PAYMENT

The Contractor shall be responsible for all costs associated with the development of the SWPPP or ECP and M&RP. The Contractor shall be responsible for the implementation of the SWPPP or ECP and M&RP. This includes the installation, maintenance, and removal of erosion and sediment control practices specified in the SWPPP or ECP upon completion of the project or as requested by the Engineer. These costs shall be included in the lump sum bid amount.

PART 2: MATERIALS

2.01 STORMWATER POLLUTION PREVENTION PLAN

A. The Contractor shall utilize all materials as approved and as necessary to implement a successful SWPPP in accordance with the requirements specified in the General Permit. Refer to Section 32 92 19 for materials used in vegetative erosion control and specification Section 01 57 00 for material used in additional BMPs.

B. The Contractor is responsible for implementing the Best Management Practices to maintain positive pollution prevention, as described in the SWPPP, in response to the monitoring program reports, or as circumstances require. Materials, and the costs thereof, for stormwater pollution prevention are the responsibility of the Contractor.

2.02 EROSION CONTROL PLAN

A. The Contractor shall utilize all materials as approved and as necessary to implement a successful ECP in accordance with the requirements specified in the General Permit and the Alpine County Erosion Control Plan Requirements. Refer to Section 32 92 19 for materials used in vegetative erosion control and specification Section 01 57 00 for material used in additional BMPs.

B. The Contractor is responsible for implementing the Best Management Practices to maintain positive pollution prevention, as described in the ECP, in response to the monitoring program reports, or as circumstances require. Materials, and the costs thereof, for stormwater pollution prevention are the responsibility of the Contractor.

PART 3: EXECUTION

3.01 GENERAL

A. The SWPPP, ECP and M&RP shall be developed by the Contractor and submitted to the Owner. The SWPPP, ECP and M&RP must be accepted by the Owner and approved by the Engineer prior to commencement of construction activities in the field.

B. The Contractor will provide, at a minimum, site specific information as listed in this section, Submittals.

C. The Contractor shall comply with all conditions identified in the General Permit, which could apply to the work under this contract.

D. The Contractor shall be responsible for the compliance of his personnel and subcontractors with the SWPPP or ECP and the implementation of the M&RP.

E. The SWPPP (document) and ECP shall be kept on site during construction activity and made available upon request of a representative of the SWRCB and/or other regulatory agency.

F. The Contractor shall employ BMPs as detailed in the SWPPP and ECP during construction operations to adequately prevent the discharge of pollutants to surface waters, including the municipal storm sewer system.

3.02 STORMWATER POLLUTION PREVENTION PLAN

The SWPPP shall include all the requirements set forth in Section A, “Storm Water Pollution Prevention Plan”, of the General Permit. The SWPPP shall provide a description of potential sources which are likely to add significant quantities of pollutants to stormwater discharges or which may result in non-stormwater discharges from the construction site. The SWPPP, similar to this specification Section and specification Section 32 92 19 and 01 57 00, also provides guidelines on how to prevent potential pollutants and commingled waters from leaving the site, as well as wind-induced sediment transport.

3.03 EROSION CONTROL PLAN

The ECP shall include all the requirements set forth Alpine County Erosion Control Plan Requirements. The ESP shall provide a description of potential sources which are likely to add significant quantities of pollutants to stormwater discharges or which may result in non-stormwater discharges from the construction site. The ECP, similar to this specification Section and specification Section 32 92 19 and 01 57 00, also provides guidelines on how to prevent potential pollutants and commingled waters from leaving the site, as well as wind-induced sediment transport.

3.04 MONITORING AND REPORTING PROGRAM

A. The Contractor shall implement the M&RP. The Contractor shall also be responsible for monitoring and inspecting his actions and the activities of those responsible to the Contractor.

B. Monitoring and Inspection:

1. The Contractor will be responsible for completing a Weekly Activity Log, which includes documentation of the following information:
2. Location (using grid map) of weekly construction activities;
3. Confirmation that the appropriate BMPs have been installed per the respective BMP specifications;
4. Confirmation that each BMP is being properly maintained per the respective BMP specifications;
5. Any corrective action taken by the Contractor to ensure proper BMP installation and maintenance;
6. Confirmation that proper housekeeping is being maintained at the site;
7. Confirmation that trash/debris is being controlled and properly stored in covered containers;

8. Confirmation that identified oil spills/leaks are being cleaned up and the contaminated waste and soils are being properly stored and disposed of; and,
9. Evidence that any leaking equipment or vehicles are being taken out of service and repaired prior to continued use.

C. The Contractor's Weekly Activity Log input will be reviewed for accuracy and completeness by the Engineer or an assigned representative of the Owner. The weekly logs become a part of the Stormwater SWPPP or ECP/M&RP as partial evidence of compliance with stormwater management regulations. Any deficiencies identified by the Engineer will be brought to the Contractor's attention and shall be corrected at no additional cost to the Owner.

D. In addition to the weekly Activity Log, it is the Contractor's responsibility to report to the Owner any discharges immediately after discovery. At the Owner's discretion, the Contractor may be required to notify the appropriate regulatory agency (i.e. Regional Board, DHS). These discharges may include, but are not limited to:

1. Fuels
2. Oils
3. Chemicals
4. Sanitary wastes
5. Process and wash waters
6. Sediment laden waters

E. The Contractor shall allow representatives of the Owner, the Agency, the SWRCB, and/or other regulatory agencies to enter the construction site, inspect the construction site for compliance, and sample and monitor the construction site discharges.

F. The M&RP may extend past the completion date for this contract. The Contractor's responsibilities for the M&RP will cease upon closure of three conditions: 1) acceptance by the Owner of all work under the contract; 2) the Contractor submits information to the Engineer verifying the site meets the criteria for the Notice of Termination (a notice of termination is not required for an ECP, but the District reserves the right to hold the contractor accountable to the requirements of the NOT), which the Contractor will submit to the SWRCB for approval (pursuant to SWPPP); and, 3) final acceptance not given by Owner until the SWRCB issues approval of the NOT (pursuant to SWPPP).

3.05 DUTY TO COMPLY

A. The Contractor shall comply with all conditions identified in the General Permit, SWPPP, ECP and M&RP. Nonadherence with the conditions specified in the General Permit may constitute a violation of the Clean Water Act and the Porter-Cologne Water Quality Control Act and may be grounds for enforcement action by the State, which can carry civil or criminal penalties (some cases under Porter-Cologne exceed CWA penalties of $25,000 per day).

B. The Contractor shall take all reasonable steps to minimize or prevent any discharge in violation of the General Permit and degradation of water quality due to construction activities.

3.06 SWPPP COMPLIANCE CERTIFICATION

A. An officer or other authorized representative of the Contractor shall certify the Contractor's stormwater handling roles and responsibilities by signing the "SWPPP Compliance Certification" for the SWPPP, as well as annual reports required under the General Permit. The purpose of these forms is to certify that the construction activity is and has been in compliance or has been modified to comply with the requirements of the General Permit and the SWPPP.

B. During construction, if the Contractor determines that he cannot maintain the site with all of the General Permit and SWPPP requirements, he shall notify the Engineer and Owner immediately. It shall be the responsibility of the Contractor to provide a written Notice of Noncompliance to the RWQCB within 30 days of knowledge of the following noncompliant conditions; which the Contractor may need to provide information for:

   1. Failure to certify, by July 1 of each year, that the project's construction activities are in compliance with the provisions of the SWPPP and the Construction General Permit;
   2. Failure to implement the BMPs listed within the SWPPP, in accordance with the schedule outlined within the SWPPP;
   3. Failure to conduct inspection, monitoring and/or reporting as described within the SWPPP; and/or
   4. Failure to initiate corrective actions to BMP breaches, failures and emergency situations.

END OF SECTION

SECTION 02 41 13

PIPE REMOVAL

PART 1: GENERAL

1.01 SUMMARY

A. Includes general specifications for removing raw water, sanitary sewer, or storm drain pipe.

1.02 SUBMITTALS

A. Submittals shall be provided in accordance with Section 01 33 00 and shall include the following:

1. A removal plan for review by the Engineer prior to the start of removal after field verification of pipe location, material, and size.
2. Names and descriptions of materials to be used.

PART 2: PRODUCTS

2.01 EQUIPMENT AND MATERIALS

A. Equipment and materials shall be selected by Contractor as necessary to achieve desired results for removal. Selected equipment and materials are subject to review of Engineer through submittals.

B. All equipment shall be in good repair and operating order.

C. Sufficient standby equipment and materials shall be kept available to ensure continuous operation, where required.

PART 3: EXECUTION

3.01 PIPE REMOVAL

A. Existing sewer pipes shall not be removed until the corresponding new sewer pipes are fully in service or bypass pumping has been established.

B. Service outages shall not be allowed. Service must be maintained at all times through temporary sewer bypass pumping in accordance with Section 01 54 00.

C. Pipe shall be removed and salvaged if requested by the Owner; otherwise, pipe shall be removed and disposed of in accordance with all applicable laws.

D. Backfill pipe removal area with Class II aggregate base.

END OF SECTION

SECTION 03 39 00

MANHOLES AND CLEANOUTS

PART 1: GENERAL

1.01 DESCRIPTION

The work of this section consists of the furnishing of materials and constructing therewith new manholes and cleanouts as shown on the drawings.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Section 01 33 00: Submittals

B. Section 33 05 05: Testing of Gravity Sewer Lines and Manholes

C. Section 31 23 33: Trenching, Backfilling, and Compacting

D. Section 31 23 00: Structure Excavation and Backfill

1.03 QUALITY ASSURANCE

Standards, American Association of State Highway and Transportation Officials (AASHTO) and American Society for Testing and Materials (ASTM).

1.04 SUBMITTALS

Shop Drawings and catalog cut sheets shall be submitted for manhole, frames and covers, precast manhole bases and sections, and joint sealer accordance with Section 01 33 00.

PART 2: MATERIALS

2.01 FRAMES AND COVERS

A. Manhole frames and covers shall be per County Standard Details, cast iron manhole frame and cover set, or approved equal.

B. Horizontal surfaces of manhole cover seats and under surface of the seat cover which rests upon the frame shall be machined. After machining, it shall not be possible to rock any cover after it has been seated in any position in its frame. Manhole frames and covers shall be designed for heavy duty, H-20 traffic loading. All manholes shall be provided with a nominal 24-inch diameter cover unless otherwise noted on the drawings. Manhole frames shall be capable of receiving standard non-shifting manhole extension (riser) rings.

2.02 PRECAST CONCRETE MANHOLE SECTIONS

Manholes shall be constructed of precast reinforced manhole sections conforming to ASTM C478 and as shown. Precast concrete rings, cones, and flat slabs shall be manufactured by a process that will produce a dense, homogeneous concrete section of first quality. The sections shall be steel reinforced and have a minimum wall thickness of four (4) inches. Cement used in manufacturing the sections shall be Type II/V, Portland

cement, as specified in ASTM C150. Precast concrete sections, cones, and grade rings shall be joined using preformed joint sealant only. Use of mortar will not be allowed. All manholes shall have cast-in-place concrete bases and formed channels with inverts to match the adjoining pipes. Precast manhole base-blocks will not be allowed.

2.03 PRECAST MANHOLE BASES

Precast manhole bases as manufactured by Central Pre-Cast, Jensen Precast, Hanson Precast, or approved equal.

2.04 DESIGN LOADS

A. Vertical Loads: Design all precast manhole rings and accessories to support an AASHTO H-20 truck loading, in addition to soil weight above sloping ring sections and the dead load of all material supported above.

B. Lateral Loads: Lateral loads shall be as dictated by the following formula or the geotechnical report requirements, whichever are more stringent.

Operating: 95 x H (psf) triangular equivalent fluid pressure for dead load plus a live load surcharge from an H-20 truck, including impact.

Seismic: 23 x H^2 (psf) uniform pressure distribution.

Where H = depth below finished grade.

2.05 CONES

All manhole cones shall be as shown on the plans and conform to ASTM designation C478.

2.06 JOINT SEALER

The joint sealer shall be Ram-Nek by K.T. Snyder Company, Inc.; Kent Seal No. 2, or approved equal.

2.07 CLEANOUTS - NOT USED

2.08 MORTAR

Mortar will not be allowed.

2.09 INTERIOR AND EXTERIOR COATINGS - NOT USED

2.10 MECHANICAL RUBBER SEAL

A. Modular, mechanical type, consisting of interlocking synthetic rubber links shaped to continuously fill the annular space between the pipe and the wall opening.

B. EPDM seal element suitable for service to 250 degrees F, except seal element shall be silicone or viton suitable for 300 degrees F for aeration piping.

C. Composite pressure plates.

D. 316 stainless steel nuts and bolts.

E. Thunderline Link-Seal, or equal.

PART 3: EXECUTION

3.01 SETTING BASES

A. Construct to grades, lines and elevations shown on the drawings or staked in the field. Shape tops of the bases by means of accurate bell-ring forms to receive the barrel section. Wet setting is not permitted. Joint sealer shall be placed on the first joint after the Engineer has approved the manhole base for stacking. The concrete shall cure a minimum of 24 hours before stacking the barrel sections.

Pour foundations on 12-inches of compacted crushed rock wrapped in filter fabric. See plans for manhole details.

B. Precast bases shall be installed in strict conformance with the manufacturer's written instructions, on a foundation of clean, undisturbed soil or native soil compaction to at least 95% maximum dry density and 6" of ¾" crushed rock.

3.02 SETTING PRECAST SECTIONS

A. Precast-reinforced concrete sections shall be set so as to be vertical and with sections in true alignment. Joints shall be primed and made with sealer applied in strict accordance with the manufacturer's printed instructions.

3.03 FIELD CONNECTIONS

A. Openings for field connections shall be made with a motor-driven cutting tool which will provide a smooth round opening no more than 3 inches larger than the outside diameter of the pipe being connected. The new pipe shall be inserted with a waterstop conforming to County Standard Details. Jack hammers and chipping hammers will not be allowed. Seal field connections with non-shrink grout.

3.04 INTERIOR DROPS

A. Install interior drops as detailed on the plans.

3.05 INVERT CHANNELS

A. Smooth and semi-circular in shape conforming to the inside of the adjacent sections. Make changes in flow direction by a smooth curve of radius as large as permitted by manhole size. Make changes in size and grade gradually and evenly. See plans for details.

3.06 SETTING FRAMES AND COVERS

A. Frames and covers shall be set as detailed on the plans for various locations.

3.07 CLEANOUTS - NOT USED

3.08 EPOXY MANHOLES - NOT USED

END OF SECTION

SECTION 22 13 43

WASTEWATER UTILITY PUMPING STATION

PART 1: GENERAL

1.01 PRECAST PUMPING STATION DESIGN CRITERIA

A. See Plans.

1.02 DESCRIPTION

A. Site assembled precast wastewater utility pumping.

1.03 SECTION INCLUDES

A. Site assembled and tested precast wastewater utility pumping stations, including:
   1. Precast concrete wet well and valve vault.
   2. Pumps and mountings.
   3. Control panels.
   4. Piping and Valves integral to pumping station.
   5. Odor control system.

1.04 ACTION SUBMITTALS

A. Product Data: Provide manufacturer's technical data including station capacities and operating characteristics.

B. Pump Performance Curves.

C. Shop Drawings: Show precast fabrication and installation details.

1.05 CLOSEOUT SUBMITTALS

A. Field Reports: Provide quality-control test reports documenting station operation performance.

B. Warranty: Copy of manufacturer's warranty.

C. Operation and Maintenance Manual: Include component manufacturer's O&M manuals, approved station design, completed start-up report, and component manufacturer's schedule for maintenance requirements.

1.06 QUALITY ASSURANCE

A. Manufacturer Qualifications: NPCA-certified plant with experience and demonstrated capability to produce work specified in this Section

B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in

NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

1.07 WARRANTY

A. Manufacturer's Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of pumping stations that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:

   a. Structural failures including precast concrete structures, hatches, and other accessories.

   b. Faulty operation of pumps, controls, or pumping and piping system accessories.

   c. Deterioration of metals, metal finishes, and other materials beyond normal use.

2. Warranty Period for Complete Packaged Pump Station provided by a Single Source Supplier (Including Concrete, Pumps, and Control Panel): One year from date of delivery.

PART 2: PRODUCTS

2.01 MANUFACTURER

A. Basis of Design: Provide site assembled precast wastewater utility pumping station, including specified controls, pumps, valves, internal piping, and precast concrete well and valve vault manufactured and furnished by **Jensen Precast**, (855) 468-5600, PumpStations@jensenprecast.com, www.JensenPrecast.com/Water-Resources.

2.02 PRECAST PUMPING STATIONS DESIGN CRITERIA

A. Description: Site assembled precast wastewater utility pumping station including controls, pumps, valves, internal piping, precast concrete well, and valve vault.

1. Pump Station Peak Design Flow: 125 gpm.
2. Force Main: New, as shown on drawings.

   a. Length: 831 feet.

   b. Inlet Pipe Size: 8 inches.

   c. Discharge Pipe Size: 3 inches.

   d. Pipe Type: PVC

   e. Discharge Elevation: 5499 feet

3. Design Elevations:

    a. Inlet Piping: 8 feet

    b. Wet Well Finish Grade: 5507 feet

    c. Wet Well Rim: 5507 feet

    d. Wet Well Discharge Piping: 5504 feet

4. Wet Well: Precast concrete.

    a. Capacities and Characteristics: Provide base, barrel, flat top, and riser precast sections as follows to correspond to height of precast structures indicated and as shown on Drawings:

        1) Diameter or Dimensions: 60 inches.

        2) Inlet Pipe Size: 8 inches.

        3) Discharge Spool Pipe Size: 3 inches.

5. Valve Vault: Precast concrete.

    a. Capacities and Characteristics: Provide precast sections as follows and as shown on the Drawings:

        1) Diameter or Dimensions: 72 inches.

        2) Height: 58 inches.

        3) Inlet Pipe Size: 3 inches.

        4) Discharge Spool Pipe Size: 4 inches.

6. Flow Meter Vault: Precast concrete.

    a. Capacities and Characteristics: Provide precast sections as shown on the Drawings.

2.03 PRECAST CONCRETE STRUCTURES

A. General: Size indicated, with provision for sealant at joints, meeting ASTM C 913, designed according to ASTM C 890 for A-16 (AASHTO HS20-44), heavy traffic, structural loading.

B. Round Precast Concrete Wells: ASTM C 478, precast, reinforced concrete.

1. Joint Sealant: ASTM C 990, bitumen or butyl rubber.

2. Flexible Resilient Pipe Connectors: ASTM C 923:

C. Precast Concrete Vaults: ASTM C 890, precast, reinforced concrete.

1. Resilient Pipe Connectors: ASTM C 923, cast or fitted into manhole walls, for each pipe connection.

D. Joint Sealant: ASTM C 990, bitumen or butyl rubber.

E. Well and Vault Bituminous Waterproofing: Carboline 300M, Xypex, or comparable product acceptable to Engineer.

2.04 PRECAST CONCRETE MATERIALS AND MIX DESIGN

A. General: Precast concrete according to ACI 318/318R.

B. Concrete Design Mix: 4,000 psi minimum, with 0.45 maximum water/cementitious materials ratio.

2.05 ACCESS DOORS AND FRAMES

A. Access Door: Single-leaf opening, 36”x60”, Steel angle frame access hatch manufactured by Jensen MetalTech. Includes: TraxPlate™, lift assist, bituminous paint, flush lifting handle, 316 stainless steel nuts & bolts, hinges, and hold-open arm.

1. Fabricated access hatches, doors, grates or covers required for equipment or maintenance access into Utility Structure shall be designed and fabricated in accordance with ASTM C1802 for the applicable Load Level. Fabricated access covers shall be manufactured using aluminum, or steel with slip-resistant material and torsion-assisted assemblies.

2.06 WET-WELL ACCESSORIES

A. Pipe Supports: Manufacturer’s standard.

B. Guide Rail Assembly: Guide rails, stainless steel, Type 304, with pump guide brackets configured to match requirements of selected pumps.

C. Flexible Resilient Pipe Connectors: Flexible connector, ASTM C 923.

D. Well Protective Liner: Liner shall be Dura Plate 100 as manufactured by A-LOK® Products, Incorporated, Tullytown, Pennsylvania, or approved equal.

1. Liner Composition - The liner, channel joints, H-joints and corner joints shall be manufactured from an Acrylic PVC Alloy.

E. Ventilation: PVC piping, with internal insect screening.

F. Lifting Crane: Crane shall be a portable davit crane as manufactured by Thern Incorporated, Winona, Minnesota.

1. Crane shall be sized according to manufacturer’s recommendation as required for project.

2.07 PUMPS

A. Basis of Design: Furnish and install two (2) grinder type centrifugal pump with a self-engaging Autocoupling Assembly, or a comparable product approved by Engineer prior to bid. Manufacturer shall be HOMA or approved equal.

B. General Conditions:

1. As this pump will be utilized for solids handling, it must be capable of either repeatedly passing spherical solids up to 3 inch in diameter OR have the ability to macerate all solids prior to the solid entering the volute by using a rotating cutter mounted on the shaft immediately adjacent to the impeller.
2. Pumps shall be designed to handle raw, unscreened sewage, stormwater, sludge, or similar contaminated liquid, with induction type electric motor assembled in a single body, watertight NEMA Type B chamber.
3. The pumps shall be capable of maintaining their watertight integrity submerged under 80 feet of water.
4. For all sewage pump stations, the pumps must comply with NEC Class 1, Division 1, Group C & D hazardous locations.

C. Materials of Construction:

1. Primary materials of construction are listed below.
    a. Major castings: ASTM A48 Class 40B Cast Iron.
    b. Wear Ring: ASTM Bl44 Bronze.
    c. Shaft: AISI 430F Stainless Steel.
    d. Fasteners: AISI 304 Stainless Steel.
    e. O-Rings: Nitrile Rubber.
    f. Shaft Seals: Silicon Carbide/Silicon Carbide (impeller and motor side).
    g. Cable Jacket: Neoprene.
    h. Cable Entry: elastomer grommet, stainless steel washers.
    i. Protective Coating: High Solids Epoxy
2. Specific applications may warrant alternative materials. Alternate selections must be reviewed and approved by the Engineer of Record (EOR) prior to bid.

D. Pump System Characteristics: As required to meet performance requirements.

1. Number of Pumps: Two.
2. Capacity: 125 gpm.
3. Motor Size: 8.9 hp.
4. Total Dynamic Head: 83.7 feet.
5. Static Head: 39.2 feet.
6. Motor Speed: 3450 rpm.
7. Hydraulic Operating Efficiency: 39.2 percent, minimum.
8. Shut-off Head: _ feet.

E. Pumping Station Electrical Characteristics:

1. Electrical Service:

   a. Volts: 480V.

   b. Phases: Three.

   c. Frequency: 60Hz.

2. Full-Load Amperes: 5.8

2.08 PUMPING STATION CONTROLS

A. Control Sequence of Operation: Cycle each pump on and off automatically to maintain well wastewater level. Automatic control operates both pumps in parallel if well level rises to starting point of lag pump, until shutoff level is reached. Automatic alternator, with manual disconnect switch, changes sequence of lead-lag sewage pumps at completion of each pumping cycle.

B. Motor Controllers: Magnetic, full voltage, non-reversing. Include under-voltage release, thermal- overload heaters in each phase, manual reset buttons, and hand-automatic selector switches. Include circuit breakers to provide branch-circuit protection for each controller.

C. Install labels to identify switches and controls.

D. Control Panel: Complying with UL 508A, with weatherproof enclosure, covered compartments sized to accommodate controllers, circuit breakers, transformers, alternators, and programmable logic controller.

1. Basis of Design Product: Provide California Motor Control Systems, Inc., PV2 Series Control Panels, or a comparable product approved by Engineer prior to bid.

2. Enclosure: NEMA 250, Type 3R, fiberglass, powder-coated sheet steel, or stainless steel.

3. Control panel must be supplied with a dead front panel door.

4. Secondary Main Disconnect: A secondary main disconnect panel must be installed in the immediate vicinity of the primary control panel. This main disconnect must have the ability to be locked out/tagged out during control panel maintenance.

E. Level Control System: Senses variations of wastewater level in well. The system shall utilize a two wire, 4-20 mA, submersible pressure transducer as the primary level detection device. Redundant back up will be provided by two intrinsically safe, non-mercury, lead free floats.

1. Basis of Design (Pressure Transducer): Dwyer PBLTX or pre-approved equal.

2. Basis of Design (Float Switch): OPTI-FLOAT or approved equal, internally weighted, mercury and lead free Float Switch.

2.09 PIPING, VALVES, AND FITTINGS

A. PVC SCH80 Pipe and Fittings:

1. All PVC Schedule 80 pipe and fittings shall be produced from PVC Type I, cell classification 12454, conforming to ASTM Standard D 1784. All PVC injection molded Schedule 80 fittings and extruded pipe shall be certified for potable water service by NSF International. All Schedule 80 fittings shall be manufactured in strict compliance to ASTM D 2467 and Schedule 80 pipe shall be manufactured in strict compliance to ASTM D 1785. All PVC flanges shall be designed and manufactured to meet CL150 bolt pattern per ANSI Standard B16.5 and rated for a maximum internal pressure of 150 psi, non-shock at 73°F.
2. Basis of Design: Spears Manufacturing Company

B. PVC SCH80 Valves

1. Ball Valves: All ball valves, sizes up to 4”, shall be of true union design with two-way blocking capability. All O-rings shall be EPDM or FKM with PTFE seats. PTFE seats shall have elastomeric backing cushion of the same material as the valve seals. Stem shall have double O-rings and be of blowout-proof design. The valve handle shall double as carrier removal and/or tightening tool. ISO mounting pad shall be integrally molded to valve body for actuation. PVC conforming to ASTM D1784 Cell Classification 12454A, CPVC conforming to ASTM D1784 Cell Classification 23567-A, PP conforming to ASTM D4101 Cell Classification PP0210B67272 and PVDF conforming to ASTM D3222 Cell Classification Type II. The ball valves, except PP, shall have a pressure rating of 230psi for sizes 1/2” to 3” and 150psi for 4” (150psi for PP, all sizes) at 70º F.
2. Ball Check Valves: All ball check valves and foot valves shall be of solid thermoplastic construction, and shall be designed with an elastomeric uniseat/seal for tight shut-off under pressure. Sizes 1/2" through 2" shall be of true union design, while 3" & 4" shall be single union design. The same seal shall function as both the ball seat and the union seal. PVC shall conform to ASTM D1784 Cell Classification 12454A, CPVC shall conform to ASTM D1784 Cell Classification 23567A, PP shall conform to ASTM D4101 Cell Classification PP0210B67272 and PVDF shall conform to ASTM D3222 Cell Classification Type II. Ball check valves and foot valves sizes 1/2"- 2" shall be rated 150psi at 70º F, 3" and 4" rated 100psi at 70º F.

C. Stainless-Steel Pipe and Fittings:

1. Pipe and Fittings: ASME A112.3.1, socket and spigot ends.
2. Application: Within submersed portion of well where indicated on approved Shop Drawings.

D. Flow Meter: Flanged magnetic type: Badger Meter or approved comparable product.

E. Isolation Valves: Asahi or approved equal.

F. Air Vacuum/Air Release Combination Valves: Manufacturer's standard.

2.10 FABRICATION

A. Precast Concrete Structures:

1. ASTM C 478 for precast wells.
2. ASTM C 890 for precast vaults.
3. Fabricate structures with continuous joints to provide watertight construction.
4. Prepare valve and meter vaults with factory installed piping, valves, sleeves and other devices required.

PART 3: EXECUTION

3.01 PRECAST CONCRETE STRUCTURES

A. Install precast concrete structure sections with sealants per ASTM C 891 and ASTM C 1821.

3.02 FIELD QUALITY CONTROL

A. Perform tests and inspections and prepare test reports.

1. Manufacturer's Field Service: Engage a pump station manufacturer's authorized service representative to assist in testing and startup.

B. Tests and Inspections:

1. Test completed piping systems according to requirements of authorities having jurisdiction. Submit reports.
2. After installing wastewater pumping stations and after electrical circuitry has been energized, test pumps and controls for compliance with requirements.
3. After electrical circuitry has been energized, start units to confirm the station can run at pre-specified design parameters.
4. Test piping for leaks and defects.
5. Test and adjust controls and safeties.
6. Force Main: Test at pressure not less than 1-1/2 times the maximum system operating pressure, but not less than 150 psig.

C. Remove and replace components of the wastewater pumping stations that do not pass tests and inspections and retest as specified above.

SECTION 26 05 00

ELECTRICAL WORK, GENERAL

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Provide electrical work, for a complete and operable sewage pump station, in accordance with the Contract Documents.

B. The provisions of this Section apply to all sections in Division 26, except as indicated otherwise. The work of this Section is required for operation of electrically-driven equipment provided under specifications in other Divisions. Attention is directed to the requirement for proper coordination of the work of this Section with the work of equipment specifications, and the work of Division 40.

C. Major work shall include but is not limited to: electrical service including Metering Panel with main disconnect, automatic transfer switch (ATS), propane fueled Standby Generator, Control Panel with autodialer, shed lights and receptacles, instrumentation (wet well 2 floats and flowmeter), handhole, and site light.

D. Work also includes installation of wet well pumps, wet well instruments, and Pump Panel, all being supplied as part of the Work. Contractor is responsible for a complete and operable sewage lift station. Not all conduits and cables and terminations are shown for the wet well pumps and instruments and Pump Panel on the Contract Drawings. Contractor is responsible to coordinate with pumping system supplier and provide all work required for a complete and operable system, including required cable lengths from wet well to Pump Panel, without splicing.

E. Contractor to provide all required Factory and Field Testing as part of these Contract Documents. This includes pumping system supply.

F. Contractor is responsible to configure all programmable equipment, including but not limited to: Automatic Transfer Switch controller, Standby Generator controller, Autodialer, magmeter transmitter, digital display, and red beacon/horn.

G. All concrete, excavation, and backfill work required for encasement, installation, or construction of the work of the various sections of Division 26 is included as a part of the work under the respective sections, including ductbanks and handhole.

H. Provide panel stanchions with concrete bases. Provide painted plywood back boards to mount panels on shed walls, for reinforcement.

1.2 APPLICABLE CODES AND REQUIREMENTS

A. The work of this Section and all sections in Division 26 shall comply with the latest editions of the following:

1. Title 8, Subchapter 5, California Administrative Code – Electrical Safety Orders.
2. Local Laws and Ordinances.
3. State and Federal Laws.
4. Local and State Fire Marshal.
5. Underwriters' Laboratories (UL).
6. National Electrical Safety Code (NESC).
7. American National Standards Institute (ANSI).
8. National Electrical Manufacturer's Association (NEMA).
9. National Electrical Contractors' Association (NECA) Standard of Installation.
10. Institute of Electrical and Electronics Engineers (IEEE).
11. Insulated Cable Engineers Association (ICEA).
12. Occupational Safety and Health Act (OSHA).
13. National Electrical Testing Association (NETA).
14. American Society for Testing and Materials (ASTM).
15. National Fire Protection Association (NFPA).
16. National Electrical Code (NEC).
17. California Electrical Code (CEC).
18. Markleeville Public Utility District (MPUD, Owner).
19. Liberty Utilities (Liberty).

B. All electrical equipment shall be listed by and shall bear the label of Underwriters' Laboratories, Inc. (UL), or by an independent testing laboratory acceptable to the local code enforcement agency having jurisdiction.

C. Installation of electrical equipment and materials shall comply with Occupational Safety and Health Administration (OSHA) Safety and Health Standards, state building standards, and applicable local, state, and federal codes and regulations.

D. Where the requirements of the specifications conflict with UL, National Electrical Manufacturers Association (NEMA), National Fire Protection Association (NFPA), or other applicable standards, the more stringent requirements shall govern as approved by the local authority having jurisdiction.

1.3 SIGNAGE

A. Provide danger, caution, and warning signs and equipment identification markings in accordance with applicable federal, state, OSHA, and NEC requirements.

Provide the following signage at a minimum, unless otherwise stated in individual equipment specifications sections.

1. Arc Flash Labels – Provide Arc Flash warning labels as required per NEC Articles 110.16 to Metering Panel, Control Panel, ATS, Standby Generator and Pump Panel. Provide Arc Flash label with calculations as required per NEC Articles 110.24 to Metering Panel with main disconnect.
2. Equipment Nameplates – Provide engraved phenolic equipment nameplates on all electrical and instrumentation equipment. Nameplate to be inscribed with equipment name and electrical capacity, at a minimum.
3. Warning Signs: Provide signs near equipment that can start automatically, including Standby Generator to read: “Caution Equipment to Start Automatically”.
4. Warning Sign: Provide sign on front of Control Panel that inscribed “Caution - Standby Power Source is a Standby Generator connected via ATS to this Control Panel”. Sign shall be 10” x 14”, engineer grade aluminum, and attached with stainless steel screws.

1.4 INSPECTION OF THE SITE AND EXISTING CONDITIONS

A. Before submitting a bid, visit the site and determine conditions at the site and at all existing structures in order to become familiar with all existing conditions and electrical systems which will, in any way or manner, affect the work required under this Contract. No subsequent increase in Contract cost will be allowed for additional work required due to failure to fulfill this requirement.

B. Protect all existing aboveground and underground utilities during construction. Pay for all repairs without increase in Contract cost should damage to underground utilities occur during construction. Restore existing site surfaces to original condition.

1.5 RESPONSIBILITY

A. Complete systems functionally operational in accordance with the intent of these Contract Documents.

B. Coordinating the details of facility and process equipment layouts and construction for all Specification Divisions which affect the work covered under Division 26.

C. Furnishing and installing all incidental items not actually shown or specified, but which are required by good practice to provide complete functional systems.

D. Coordination with other Division for equipment electrical, wiring and cable requirements.

E. Installation of pumping system supply. Refer to Section 22 13 43 – Wastewater Utility Pumping Station.

F. New electrical service meeting the requirements of Liberty.

G. Submit a complete copy of red line as-builts every month after the Notice to Proceed. At end of project, prior to final acceptance and final payment, field confirm red lined as-builts with Owner's Operation and Maintenance staff. Confirmation shall review in field the installed work versus the red lined as-builts. Owner Operation and Maintenance staff must approve the red lined as-builts for project acceptance and payment.

1.6 INTENT OF DRAWINGS

A. The Contract Drawings indicate the extent, general location, and arrangement of equipment. Ductbanks and conduit runs are diagrammatic and may not show the exact locations for installation. Verify the locations of conduit stub-ups based upon conduit entry space of equipment furnished from the manufacturer's certified shop drawings and by inspection of the actual equipment to be installed.

B. In general, where the background on Contract Drawings has been screened, the area screened is work other than electrical, unless otherwise noted. Work under this Division 26 is shown heavier for contrast.

1.7 DUCTBANKS AND TRENCHES

A. "Ductbanks" or electrical "trenches" for non-utility conduits, shall have sand backfill; refer to Contract Drawing details. The terms ductbank and trench are synonymous. Details applies even to under slab electrical trench installations.

B. As-built the ductbanks. Provide physical locations with width and depth call outs, and measurement take offs from permanent structures.

C. Electrical service ductbank to be per Liberty standards.

1.8 CONTRACTOR SUBMITTALS

A. General

1. Refer to Section 01 33 00 – Submittals.

2. Provide manufacturers' descriptive information and shop drawings for all equipment, material, and devices furnished under Division 26. Submit Schematic (control) Diagrams, Interconnect Diagrams, equipment dimensional drawings with scaled panel elevations and layouts, instrument installation details, catalog cut sheet information, nameplate schedules, and calculations. Device designations and symbols for Schematic (Control) Diagrams shall conform to the latest edition of NEMA ICS 1.

3. Submit complete electrical drawings for all equipment furnished in accordance. These drawings shall contain scaled panel elevation, bill of materials, control schematic diagrams (complete with terminal numbers, device names, field equipment tag numbers, wire labels, wire size, and wire insulation colors) to provide complete identification of the circuits and

provide coordination between the equipment. Both AutoCAD (version per Owner) and PDF-type files are required.

4. Submit Interconnect Diagrams for all cables installed. Interconnect Diagrams shall represent: Metering Panel, ATS, Standby Generator, Control Panel, Pump Panel, field instrumentation, lighting, receptacles, beacon, and wet well equipment. Refer to Section 40 70 00 – Process Control and Instrumentation Systems for information requirements of Interconnect Diagrams.

5. Submit listing of equipment nameplates complete with inscriptions for review.

6. Check submittals for proper number of copies, adequate identification, correctness and compliance with Drawings and Specifications.

7. Operation and Maintenance (O&M) Manuals.

B. Submit certified shop drawings and diagrams as follows:

1. Layouts indicating conformity with space requirements, including access requirements.

2. Detailed anchoring requirements providing anchor type, size, and min embedment.

3. Assembly drawings in sufficient detail to identify every part of the specified equipment, including bills of material.

4. General dimension, outline, and panel, section, and structure layout drawings showing the principal dimensions of the equipment, the location of all devices therein, and the size of electrical conduit windows and cable connections. Include front, rear, side elevations and top view. Include access requirements. Provide finish and materials, temperature limitations, and grounding requirements. Provide nameplate inscription schedule. Provide manufacturer anchoring requirements to confirm seismic results and equipment weights.

1.9 AREA DESIGNATIONS

A. General

1. Raceway system and pull boxes shall comply with Sections 26 05 33 and 26 05 43.

2. Table 1 lists the type of electrical equipment and materials to be used based on applied area in Table 2.

3. The following (Table 2) identifies Area Classifications.

4. Installations in hazardous locations shall conform strictly to the requirements of the National Electrical Code and NFPA 820.

Table 1 Enclosure Ratings and Electrical Materials by Area Classification					
Area Classification	Enclosure, Pullbox or JBox NEMA Rating	Enclosures / Device Boxes	Strut and Mounting Hardware	Exposed Conduit, Fittings, and Condulets	Underground Conduit System
Exterior Wet	NEMA 3R, 4X (Painted Metal)	Painted Metal	316 Stainless Steel	Galvanized Rigid Steel	PVC Sch 40 Non-Metallic
Class 1, Div. 1, Group D Area	N/A	Not Allowed	304 Stainless Steel	PVC Coated Galvanized Rigid Steel, or Stainless Steel	PVC Coated Galvanized Rigid Steel, or Stainless Steel
Exterior Corrosive and Class 1, Div 2	NEMA3R, 4X (Stainless Steel only)	Stainless Steel	316 Stainless Steel	PVC Coated Galvanized Rigid Steel, or Stainless Steel	PVC Sch 40 Non-Metallic
Interior General	NEMA 1, or 12	Painted Metal	316 Stainless Steel	Galvanized Rigid Steel	N/A

Table 2 Areas Classifications		
Areas	Locations	Classifications
Sewage Wet Well	Interior of Wet Well and up to interior of hatch edge	Class 1, Div. 1, Group D Area
	Exterior of Wet Well extending 36” horizontally and vertically 18” from hatch edges	Class 1, Div. 2, Group D Area
	Beyond 36” deep x 18” high envelope from hatch edge, outside of Wet Well	Exterior Wet
Valve Vault	Interior of Vault, up to hatch edge	Exterior Corrosive and Class 1, Div 2, Group D
	Outside of Vault, beyond hatch edge	Exterior Wet
Shed	Interior of Shed	Interior General
	Exterior of Shed	Exterior Wet
General Site	All exterior areas not otherwise designated	Exterior Wet

B. Material Requirements

1. NEMA 3R, NEMA 4, and NEMA 4X rated enclosures shall be 316 stainless steel or painted metal.

2. Materials and equipment shall be rated for marine environments, unless noted otherwise.

1.10 TESTS

A. Furnish all necessary testing equipment and pay all costs of tests, including all replacement parts and labor, due to damage resulting from damaged equipment or from testing and correction of faulty installation.

B. All test forms shall be submitted and approved prior to scheduling testing.

C. Provide a minimum of two weeks notification of Field Tests to the Engineer. Field Tests shall be witnessed and signed off by the Owner and Engineer in order to be considered valid.

1.11 TEMPORARY LIGHTING

A. Provide temporary power and lighting in accordance with NEC Article 590. The average lighting level (foot-candle) shall meet OSHA 1926.56 and CAL-OSHA requirements.

1.12 DEFINITIONS (APPLICABLE TO SPECIFICATIONS AND DRAWINGS)

A. Above Grade – Not buried in ground and not embedded in concrete slab on ground.

B. Below Grade – Buried in ground and below slabs as applicable, and not embedded within concrete slab on ground.

C. Certified – Confirmed to be accurate, or as represented, or as meeting standards.

D. Concealed – In general, any item not visible or directly accessible.

E. Connect – Complete hookup of item with required services, including conduits, wires, and other accessories.

F. Exposed – Either visible or subject to mechanical or weather damage, indoor or outdoor, include areas such as mechanical and storage rooms. In general, any item that is directly accessible without removing walls, panels, ceilings or other parts of structure.

G. Underground – Buried in ground, including under building slabs.

H. Wiring – Electrical conduit, raceway, conductors and connections.

1.13 WARRANTY

A. The warranty for all provided equipment shall be not less than one year after approved and witnessed startup and receipt of approved as-built drawings and O&M Manuals, or Owner beneficial use, whichever is later.

PART 2 - PRODUCTS

2.1 GENERAL

A. All equipment and materials shall be new, shall be listed by UL, and shall bear the UL label where UL requirements apply. All equipment and materials shall be the products of experienced and reputable manufacturers in the industry. Similar items in the work shall be products of the same manufacturer. All equipment and materials shall be of industrial grade standard of construction.

B. Where a NEMA enclosure type is indicated in a non-hazardous location, utilize that type of enclosure, despite the fact that certain modifications such as cutouts for control devices may negate the NEMA rating.

2.2 MOUNTING HARDWARE

A. Miscellaneous Hardware

1. All nuts, bolts, and washers shall be 316 stainless steel, unless called out otherwise.
2. Strut materials shall be per Table 1 – Area Designations.
3. Where contact with concrete or dissimilar metals may cause galvanic corrosion, suitable non-metallic insulators shall be utilized to prevent such corrosion.
4. Anchors for attaching equipment to concrete floors and slab on grade, shall be 316 stainless steel chemical anchors.

2.3 ELECTRICAL IDENTIFICATION

A. All conduits, and individual wires shall be labeled. All terminal blocks shall be labeled. All handhole covers shall be inscribed.

B. All equipment, control devices, and panels shall include nameplate with description, ratings, name, and tag number if provided.

2.4 TEMPERATURE AND ELEVATION RATINGS

A. Provide equipment and devices to be installed outdoors capable of continuous operation within an ambient temperature range of 0° C to 40° C. Equipment must be capable of proper operation at rated output continuously in this ambient temperature range in direct sun.

B. All equipment shall be rated for 5,500 feet elevation.

PART 3 - EXECUTION

3.1 GENERAL

A. Incidentals: Provide all materials and incidentals required for a complete and operable system, even if not required explicitly by the Specifications or the Drawings.

B. Field Control of Location and Arrangement: The Contract Drawings diagrammatically indicate the location and arrangement of conduit runs, equipment, and other items. Exact locations shall be determined based on the physical size and arrangement of equipment, finished elevations, and other obstructions.

1. Where "home runs" are shown, route the conduits in accordance with the indicated installation requirements. Routings shall be exposed or encased as indicated.

2. All conduit and equipment shall be installed in such a manner as to avoid all obstructions and to preserve working clearances and keep openings and passageways clear.

C. Workmanship: All materials and equipment shall be installed in strict accordance with the printed recommendations of the manufacturer. Installation shall be accomplished by workers skilled in the work. Installation shall be coordinated in the field with other trades to avoid interferences.

D. Protection of Equipment and Materials: Protect all materials and equipment against damage from any cause. All materials and equipment, both in storage and during construction, shall be covered in such a manner that no finished surfaces will be damaged, marred, or splattered with water, foam, dust, dirt, plaster, or paint. All moving parts shall be kept clean and dry. Replace or refinish all damaged materials or equipment, including face plates of panels, at no additional expense to the contract.

E. Label and cap all spare conduits. Include pull tape in all spare conduits.

F. Wet well instruments and pumps, supplied as part of pumping system supply, shall be installed per suppliers installation guidelines. Coordinate with supplier for guidelines. Supplier to confirm wet well instruments and pumps are installed correctly, and installation shall not void pumping system warranty.

G. Pump Panel, supplied as part of pumping system supply, shall be installed per suppliers installation guidelines. Coordinate with supplier for guidelines. Supplier to confirm Pump Panel is installed correctly, and installation shall not void pumping system warranty.

3.2 EQUIPMENT ANCHORING

A. Floor-supported equipment and conduits shall be anchored in place by methods that will meet project seismic requirements.

B. Anchoring methods and leveling criteria specified in the printed recommendations of the equipment manufacturers are a part of the work of this Contract. Such recommendations shall be submitted as shop drawings.

3.3 EQUIPMENT IDENTIFICATION

A. General: Equipment and Devices shall be Identified as Follows:

1. Nameplates shall be provided for all equipment and instruments. Equipment description and equipment tag number noted on Drawings, and electrical power source shall be utilized on all nameplates. If no tag number is given, assign and submit a number for approval.

2. All conduits and cables shall be labeled. Provide conduit tag, and wire tag label inscriptions. If no tag number is given, assign and submit a label inscription for approval.

3.4 CUTTING AND PATCHING

A. Lay out work carefully in advance. Do not cut, drill, or notch any structural member or building surface without the specific approval of the Engineer. Carefully carry out any cutting, channeling, chasing, or drilling of floors, walls, paving, or other surfaces required for the installation, support, or anchorage of conduit, raceways, or other electrical materials and equipment. Following such work, restore surfaces neatly to original condition.

3.5 LOAD BALANCE

A. The Contract Drawings and Specifications indicate circuiting to electrical loads and distribution equipment. Balance electrical load between phases as nearly as possible on panelboards.

3.6 CLEANING AND TOUCHUP PAINTING

A. Keep the premises free from an accumulation of waste material or rubbish. Upon completion of the work, remove all materials, scraps, and debris from the premises and from the interior and exterior of all devices and equipment. Touch up scratches, scrapes, or chips in interior and exterior surfaces of devices and equipment with finishes matching as nearly as possible the type, color, consistency, and surface of the original finish. If extensive damage is done to equipment paint surfaces, refinish the entire equipment in a manner that provides a finish equal to or better than the factory finish, that meets the requirements of the Specifications, and that is acceptable to the Engineer.

B. The interior of all electrical equipment, panels, and enclosures, shall be vacuumed and wiped free of dust just before final acceptance.

3.7 INSPECTION

A. Allow materials, equipment, and workmanship to be inspected at any time by the Engineer and Owner or their representatives.

B. Correct the work, materials, or equipment not in accordance with these Contract Documents or found to be deficient or defective in a manner satisfactory to the Engineer.

3.8 OPERATION AND MAINTENANCE MANUALS

A. Provide Operation and Maintenance Manuals in hard cover, 3-ring binders, separately bound volumes, number as required to accommodate material 8½-inch x 11-inch for text and 11-inch x 17-inch half-sized drawings. Provide the number of copies specified. Electrical and Instrumentation O&Ms shall include the following as a minimum:

1. Operation, maintenance, recommended spare parts, and renewal parts information for all equipment furnished under this Section.
2. Set of complete, final, as-reviewed and accepted manufacturer's or vendor's descriptive information.
3. As-built electric schematics, equipment, elevations, layouts, and installation drawings showing equipment as it was actually installed and connected. Provide PDF and AutoCAD formats on disk within O&Ms.
4. Index of all equipment suppliers with a list of current names, addresses, and telephone numbers of those who should be contacted for service, information, and assistance.
5. All Field Test results.
6. Confirmation and programming settings in hard copy version and electronic as applicable.
7. Information listed under individual specification submittal requirements.
8. Complete facility Interconnect Diagrams for all equipment except lighting and receptacles. Show field wiring from equipment origin numbered terminal to destination numbered terminal in block diagram format. Include wire labels, cable labels, conduit numbers, handholes, junction boxes, etc.

3.9 RECORD DRAWINGS

A. Provide two sets of full-sized marked-up as-built Contract Drawings in accordance with specifications. Show all departures from original Drawings, underground cable, conduit, or duct runs dimensioned from established structures, and all electrical work revisions. As-built drawings shall be initialed by the Engineer prior to submission for drafting. Obtain two new, clean sets of Contract Drawings for as-built production after each as-built submittal.

3.10 SERVICE CONTINUITY, START-UP AND SHUTDOWNS

A. Make no outages without the prior written authorization of the Engineer. Include all costs for temporary wiring and overtime work required in the Contract price. Remove all temporary wiring at the completion of the work. Shutdowns and startups shall be scheduled two weeks in advance, upon approval from the Owner and Engineer. Schedule of shutdowns and startups shall be limited between Tuesday and Thursday from 9:00 a.m. to 3:00 p.m., unless prior approval has been given from the Owner and Engineer.

3.11 TESTING

A. All testing shall be witnessed by the Owner or Engineer. All testing sheets shall be signed off by the Owner or Engineer to be considered valid.

B. Perform miscellaneous electrical testing and provide results to third party testing organization for evaluation and inclusion in testing submittal.

1. Miscellaneous Testing:

    a. Demonstrate that loads are powered by named breaker per schedule and drawings.

    b. Test operation of two floats used to inhibit operation of Standby Generator. Generator will not be called unless level in wet well is triggered by the LSH float and will stay operational until LSL float falls.

    c. Test operation of flowmeter and digital display and totalizer.

    d. Test autodialer. Contractor is responsible to configure and program. Coordinate with Owner for cell phone numbers.

C. Pre Demonstration period for electrical work shall include Manufacturer certification, Instrumentation Supplier certification, Field Testing, equipment start-up, instrumentation simulation, autodialer verification (with Owner), approval of electrical and instrumentation O&M Manuals, and electrical and instrumentation training.

D. Demonstration period for electrical work shall include 7-day functional testing of sewage lift station pumping system.

END OF SECTION

SECTION 26 05 19

WIRES AND CABLES

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Provide wires and cables, complete and operable, in accordance with the Contract Documents.

1.2 REFERENCE SPECIFICATION, CODES, AND STANDARDS

A. Reference Codes: All work specified herein shall conform to or exceed the applicable requirements of the National Electrical Code (NEC); provided that, where a local code or ordinance is in conflict with the NEC, the provisions of said local code or ordinance shall take precedence. For additional requirements, see Section 26 05 00 – Electrical Work, General.

B. Commercials Standards

1. ANSI/IEEE C2 National Electrical Safety Code.
2. ANSI/NFPA 70 National Electrical Code
3. ICEA S-95-658 Insulated Cable Engineers Association
4. NEMA WC70 National Electrical Manufacturers Association

1.3 CONTRACTOR SUBMITTALS

A. General: Submit Shop Drawings in accordance with Section 26 05 00 – Electrical Work, General.

B. Shop Drawings

1. Product Data: Provide complete catalog cuts of all cables, wires, terminations, splices, fittings, identification systems, and tape. This applies to vendor-supplied cables including float switches, flow meter, and pumping system supply.
2. Test Reports: Indicate results of the cable megger tests for all 600 VAC rated cables unless noted otherwise.

C. Tags and Inscriptions: Contractor to submit individual wire tags. Submit tag materials and inscription schedules for approval.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, protect, and handle products to site under provisions of Section 26 05 00 – Electrical Work, General.

B. Accept cable and accessories on site in manufacturer’s packaging. Inspect for damage.

C. Store and protect in accordance with manufacturer's instructions.

D. Protect from weather. Provide adequate ventilation to prevent condensation.

PART 2 - PRODUCTS

2.1 GENERAL

A. All conductors, including grounding electrode conductors, shall be stranded copper. Aluminum conductor wire and cable will not be permitted. Insulation shall bear the UL label and the manufacturer's trademark, and shall identify the type, voltage, and conductor size. All conductors (except flexible cords and cables, fixture wires, and conductors that form an integral part of equipment such as motors and controllers) shall conform to the requirements of Article 310 of the National Electric Code, latest edition, for current carrying capacity. Flexible cords and cables shall conform to Article 400, and fixture wires shall conform to Article 402. The use of the manufacturer's name and model or catalog number is for the purpose of establishing the standard of quality and general configuration desired.

B. Coordinate with pumping system supplier for wire and cable requirements.

2.2 LOW VOLTAGE WIRE AND CABLE

A. Power and Lighting and Equipment Grounding Wires:

1. All power and lighting circuits wire shall be rated 600 volts, Class B stranded copper, UL-listed, with XHHW-2 insulation rated for 90°C in wet or dry locations, and insulation colored per Insulation Color Table.

2. All equipment grounding conductors shall be rated 600 volts, Class B stranded copper, UL-listed, with XHHW-2 insulation rated for 90°C in wet or dry locations, and insulation colored green. Solid copper conductors are not allowed.

3. Acceptable products include: Okonite X-Olene XHHW-2, or equal.

B. Control Wires:

1. All control wires shall be rated 600 volts, Class B stranded copper, UL-listed, with XHHW-2 insulation rated for 90°C in wet or dry locations.

2. Acceptable products include: Okonite X-Olene XHHW-2, or equal.

C. Instrumentation Wire:

1. Individual conductors shall be No. 16 AWG stranded, tinned copper. Insulation shall be color coded polyethylene: black-clear. Instrumentation cables shall be composed of the individual conductors, an aluminum polyester foil shield, a No. 18 or larger AWG stranded, tinned copper drain wire, and a PVC outer jacket with a minimum thickness of 0.032-inches.

2. Acceptable products include: Belden #8719, or equal.

2.3 GROUNDING ELECTRODE CONDUCTORS

A. Provide bare, concentric stranded, copper conductors conforming to ASTM B-8, size as indicated on the drawings, or minimum size as specified in Section 26 05 26 – Grounding, for the grounding electrode conductors. Solid copper conductors are not allowed.

B. Grounding electrode conductors shall be size as indicated on the drawings, or minimum size as specified in Section 26 05 26 – Grounding, whichever is larger.

C. Acceptable Products: Southwire Bare Copper Wire, or equal.

2.4 600V CABLE TERMINATIONS

A. Compression connectors shall be Burndy "Hi Lug", Thomas & Betts "Sta-Kon,", or equal. Threaded connectors shall be split bolt type of high strength copper alloy.

B. Spices only allowed where shown on Drawings.

C. Pressure type, twist-on connectors are only acceptable for light and receptacle circuits.

D. General purpose insulating tape shall be Scotch No. 33, Plymouth "Slip-knot", or equal. High temperature tape shall be polyvinyl as manufactured by Plymouth, 3M, or equal.

2.5 CONDUCTOR AND CABLE TAGS

A. Tags relying on adhesives or taped-on markers are not acceptable.

B. Conductor labels for individual wires, installed at each termination point shall be white heat-shrink with thermal transfer printing, 3-to-1 shrink ratio, two inches long, and meet UL 224. Inscription shall be per approved Interconnect Diagrams, based on origin/destination format. Acceptable products include: Raychem Tyco Shrink Mark Heat Shrinkable Sleeves, or equal.

2.6 ELECTRICAL TAPE FOR COLOR CODING

A. Only color coding electrical tape for conductors larger than #4 AWG, otherwise conductors shall have insulation colors as required. Electrical color coding tape shall be premium grade, not less than seven mils thick, rated for 90°C minimum, flame-retardant, weather resistant, and available in suitable colors for color coding. The tape shall be resistant to abrasion, ultraviolet rays, moisture, alkalies, solvents, acids, and suitable for indoor and weather-protected outdoor use. The tape shall be suitable for use with PVC and polyethylene jacketed cables, and meet or exceed the requirements of UL 510.

B. Acceptable products include: 3M 35 Scotch Vinyl Electrical Tape for Color Coding, Plymouth Rubber Company Premium 37 Color Coding Tape, or equal.

PART 3 - EXECUTION

3.1 GENERAL

A. Provide and terminate all power, control, and instrumentation conductors, except where indicated.

B. No cables shall be routed exposed within Standby Generator. Contractor shall provide conduits complete within generator housing, from below grade interface to breaker panel and controller panel.

3.2 INSTALLATION

A. No conductors shall be installed until conduits have been cleaned and labeled, and Interconnect Diagrams have been submitted and approved.

B. If mechanical means are used to pull cable, the pulling tension shall be monitored, recorded and submitted to the Engineer.

C. Tighten terminal bolts using torque type wrenches and/or drivers to tighten to the inch-pound requirements of the NEC and UL.

D. Instrumentation wire shall not be run in the same raceway with power and control wiring except where specifically indicated.

E. Wire in panels, cabinets, and wireways shall be neatly grouped using nylon tie straps, and shall be fanned out to terminals.

F. Install bare grounding electrode conductor 36 inches below finished grade as shown on the Drawings. Reference Specification Section 26 05 26 – Grounding for further requirements.

3.3 SPLICES AND TERMINATIONS

A. General:

1. There shall be no cable splices without the approval of the Engineer, or as noted on Drawings.

2. Stranded conductors shall be terminated directly on equipment box lugs making sure that all conductor strands are confined within the lug. Use forked-tongue lugs where equipment box lugs have not been provided.

3. Excess control and instrumentation wire shall be properly taped and terminated as spares.

B. Control Wire and Cable:

1. Control conductors shall be terminated only at the locations indicated and only on terminal strips or terminal lugs of vendor furnished equipment.

2. All control wire and spare wire shall be terminated to terminal strips in junction boxes, enclosures and panels.

C. Shielded instrumentation cables shall be grounded at one end only, preferably the Control Panel.

D. Contractor to torque all wire terminations.

3.4 CABLE IDENTIFICATION

A. All cables and conductors shall be identified. All conductors shall have wire labels at each termination point. Labels shall be permanent, waterproof, legible, and heat shrink applied.

B. Cable labels and conductor labels shall match Interconnect Diagrams.

C. Cables and conductors shall be labeled prior to beginning Pre Demonstration period.

D. Cables and conductors shall have the following colored insulation:

AC Power System	Description	Insulation Color (Field and Panel)
All Systems	Grounding Electrode Conductor	Bare wire, no insulation
277/480 VAC, Three Phase, Four Wire	Phase A Phase B Phase C Neutral Equipment Grounding Conductor	Brown Orange Yellow White Green
120/240 VAC, Single Phase, Three Wire	Hot Leg Hot Leg Neutral Equipment Grounding Conductor	Black Red White Green

Control Conductors	Panel Wiring – Insulation Color	Field Wiring – Insulation Color
AC – Control Wiring (120 VAC)	Red	Violet
AC – Control Wiring (Neutral)	White	White
DC – Control Wiring (24 VDC)	Blue	Blue
DC – Control Wiring (Common)	Gray	N/A
Shielded Pair: + / -	Black/Clear	Black/Clear

3.5 GROUPING OF WIRES AND CABLES

A. All wires and cables shall be neatly grouped in pull boxes, Control Panel, Pump Panel, ATS, wet well, and handholes. Wires and cables shall be grouped so that the wires of the individual circuits are together and tagged with the cable number.

B. Cables passing through handholes shall be looped at least once along every wall, minimum 4’ loop. Loops shall be organized, trained, and neatly installed.

C. Single conductors and cables in handholes and other indicated locations shall be bundled with nylon cable ties placed at intervals not exceeding 18 inches on centers.

3.6 FIELD TESTING

A. All installed cables, #12 AWG and larger, shall be megger tested by Contractor:

1. Provide megger testing at 1000 VDC for conductor to conductor, and conductor to ground.

2. Provide cable testing per the latest NETA standards.

B. Cable field testing shall be performed after cables are installed in the raceways, and prior to energizing. Disconnect equipment that might be damaged by this test.

C. Cable field testing shall be witnessed and signed off by the Owner and/or Engineer. Cable field testing results shall be submitted to the Engineer for review and acceptance.

D. Acceptable cable field testing shall be 100 mega-ohms or greater. If results are less than acceptable level, replace cable.

E. Provide copies of reports of all field tests for inclusion in Operation and Maintenance Manuals and for review by the Engineer.

END OF SECTION

SECTION 26 05 26

GROUNDING

PART 1 - GENERAL

1.1 THE REQUIREMENT

A. Provide the electrical grounding system, complete and operable, in accordance with the Contract Documents.

B. The requirements of Section 26 05 00 – Electrical Work, General apply to this Section.

C. Single Manufacturer: Like products shall be the end product of one manufacturer in order to achieve standardization of appearance, operation, maintenance, spare parts and manufacturer's services.

D. The grounding electrode conductor system is intended to provide a low resistance path to earth ground. Acceptable ground system resistance is 5 ohms or less.

E. Coordinate, provide, and install bonding and grounding system, as required by NEC and Contract Drawings, at the Metering Panel (per Drawings and Liberty), ATS, Standby Generator (UFER ground system in generator slab), Control Panel, Pump Panel, magmeter flow tube, and site light (UFER ground system in pole base).

1.2 CONTRACTOR SUBMITTALS

A. General: Submittals shall be in accordance with the requirements of Section 26 05 00 – Electrical Work, General.

B. Shop Drawings: Manufacturer's product information for connections, clamps, and grounding system components, showing compliance with the requirements of this Section.

PART 2 - PRODUCTS

2.1 GENERAL

A. All components of the grounding electrode conductor system shall be manufactured in accordance with American National Standards Institute (ANSI)/UL 467 – Standard for Safety Grounding and Bonding Equipment, and shall conform to the applicable requirements of National Electrical Code (NEC) Article 250 and local codes. The minimum size shall be as outlined in National Electrical Code.

B. There shall be an equipment grounding conductor in each raceway.

2.2 GROUNDING ELECTRODE SYSTEM

A. Grounding electrode conductors shall be bare, stranded, copper conductors suitable for direct burial. Conductors shall be #2 AWG minimum, unless indicated otherwise, or larger as required by NEC.

B. Ground rods shall be copper-clad steel, 3/4-inch diameter and 10 feet long conforming to UL 467. Electrolyte copper 10 mils thick shall be mechanically bonded to the rigid steel core.

C. Cable-to-cable connections and all concealed connections shall be made using irreversible compression connectors.

2.3 GROUND ROD BOXES

A. Boxes shall be precast, high density, reinforced concrete, traffic rated, measuring a 10-inch interior diameter at the top and 12 inches deep. Covers shall be cast iron, and shall include special markings: “GROUND”.

B. Boxes and covers shall be manufactured by Christy Concrete G03, or equal.

PART 3 - EXECUTION

3.1 GROUNDING

A. General: When sizes are not specifically indicated on the drawings, grounding cable shall be sized in accordance with all applicable code requirements. The location of ground rods shall be as indicated. The grounding system shall be in strict accordance with Article 250 of the NEC.

B. Equipment Grounding System: Ground continuity throughout the facility shall be maintained by means of an equipment grounding conductor run in all conduits. Equipment grounding conductors which are run in conduit shall be insulated copper conductors, sized in accordance with the NEC and the drawings, whichever is larger. Conductors shall meet the requirements of Section 26 05 19 – Wires and Cables.

1. Insulated throat grounding fittings shall be employed for all equipment grounding connections. Route equipment grounding conductor through insulated throat grounding fitting and terminate to equipment ground bus, or bond fitting to equipment ground bus with same size grounding jumper as equipment ground conductor contained within conduit and terminate to equipment ground bus.

2. Completely remove all paint, dirt, or other surface coverings at grounding conductor connection points so that good metal-to-metal contact is made.

C. Grounding Electrode System: Install the grounding electrode conductor system, with all required components, in strict accordance with National Electrical Code Article 250, and the Contract Drawings.

1. Connection to grounding electrodes conductors shall be compression connectors or exothermic where concealed or below grade, and shall be bolted pressure type

where exposed and above grade or within ground well. Bolted connectors shall be assembled wrench tight to manufacturer's requirements.

2. Grounding electrode conductors that make up the ground grid shall have a minimum buried depth of 36 inches below finished grade.
3. Bond all exposed structural members and metallic enclosures of electrical equipment to ground grid. This includes Metering Panel, ATS, Standby Generator, Control Panel, Pump Panel, and site light pole.
4. Grounding electrode conductor connections to equipment shall be compression lug mechanical connection type.
5. Standby Generator main bonding jumper and system bonding jumpers shall be sized per the requirements of National Electrical Code Article 250, or as shown, whichever is larger. Bond neutral at Standby Generator to grounding electrode system.
6. Provide UFER grounding system, in addition to ground rods, as part of slab on grade for Standby Generator, and within concrete base for site light. UFER grounding system shall be minimum 20’ of bare copper stranded conductor, #2 AWG, encased in concrete, unless shown otherwise. Connect UFER ground to generator ground bus and neutral, and to site light pole ground lug, as applicable.
7. In ground rod boxes, install ground rod with one end exposed six inches above pea gravel, with compression or exothermic connection of grounding electrode conductors fully visible and accessible. Refer to Contract Drawings for detail.

D. Shield Grounding

1. Shielded instrumentation cable shall be grounded at one end only; this shall typically be at the Pump Panel and Control Panel.
2. Termination of each shield drain wire shall be on its own terminal screw. All of these terminal screws in one rack shall be connected with jumper wire. The connection to the ground shall be accomplished with a No. 14 green insulated conductor to the main ground bus.

3.2 FIELD TESTING

A. All grounding shall be installed prior to start of field testing.

B. All field testing to be witnessed and signed off by the Engineer.

C. In the Engineer’s presence, test the ground resistance of the grounding system using the Institute of Electrical and Electronics Engineers (IEEE) “Fall of Potential Method.” Test ground system at Pump Control Panel and at Standby Generator.

D. Test all ground fault circuit interrupter (GFCI) receptacles and/or GFCI circuit breakers for proper connection and operation with methods and instruments prescribed by the manufacturer.

E. Provide copies of reports of all field tests for inclusion in Operation and Maintenance Manuals and for review by the Engineer.

F. Grounding tests shall be completed and approved prior to energizing electrical equipment

END OF SECTION

SECTION 26 05 33

ELECTRICAL RACEWAY SYSTEMS

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Provide electrical raceway systems, complete and in place, in accordance with the Contract Documents.

B. The Contractor shall provide electrical raceway systems sized for submitted and approved cables, including pumping system supplied cables, or ultimate equipment size, based on the National Electrical Code or as shown on Contract Drawings, whichever is larger.

C. Provide seal off fittings as required by National Electrical Code for hazardous area crossings.

1.2 CONTRACTOR SUBMITTALS

A. General: Submittals shall be furnished in accordance with Section 26 05 00 – Electrical Work, General.

B. Shop Drawings: Complete catalog cuts of all raceways, fittings, boxes, supports, and mounting hardware, marked where applicable to show proposed materials and finishes.

C. Conduit Tags: Submit tag materials for approval.

1.3 QUALITY ASSURANCE

A. Seismic Design Requirements: All raceway systems to be furnished under this Section shall be designed and constructed to meet the seismic requirements of Section 26 05 00 – Electrical Work, General.

B. Demonstrate to the Engineer that the approved manufacturer's recommended installation tools and methods are being utilized on the job site by all persons engaged in the installation of PVC-coated rigid steel conduit, elbows, nipples, and fittings. These tools and methods shall include, but not be limited to, clamp inserts for use on power-driven units of chain vises, new die heads and enlarged pipe guides in conduit threading machines, and strap wrenches and extra wide wrench jaws for use in conduit assembly.

PART 2 - PRODUCTS

2.1 GENERAL

A. Pull and junction boxes, fittings, and other indicated enclosures which are dedicated to the raceway system, shall comply with the requirements of this Section.

B. Set screw type couplings, bushings, elbows, nipples and other fittings are not allowed.

C. No exposed conduit shall be smaller than ¾-inch, unless noted otherwise. All underground conduits shall be a minimum of 1-inch, unless noted otherwise.

D. Conduits containing manufacturer cables shall be sized based on approved manufacturer cable at minimum 40-percent fill, unless approved by the Engineer.

E. Coordinate with pumping system supplier for conduit requirements. Sizes shown on Contract Drawings are minimum required, but Contractor to size and install conduits as required by supplied equipment cables.

2.2 CONDUIT

A. Rigid Non-Metallic (PVC) Conduits

1. Rigid non-metallic conduit shall be Schedule 40 PVC, 90 degrees Celsius rated, heavy duty type, UL listed. Conduit shall be manufactured in accordance with NEMA TC-2 - Electrical Plastic Tubing and Conduit, and UL-651 - Standard for Rigid Non-metallic Conduit.
2. Manufacturer shall be PW Eagle, Carlon, or approved equal.

B. Rigid PVC Coated Galvanized Steel (PVC-RGS) Conduit

1. A PVC coating shall be bonded to the outer surface of the galvanized conduit. The bond between the coating and the conduit surface shall be greater than the tensile strength of the coating.
2. PVC coating thickness shall be not less than 40 mils. Interior coating shall be minimum 2 mil urethane. All male threads on conduit, elbows and nipples shall be protected by urethane coating.
3. PVC-RGS shall be manufactured in accordance with the following standards: UL-6, ANSI C80.1, NEMA RN1 – PVC Externally Coated Galvanized Rigid Steel Conduit and Intermediate Metal Conduit, and Federal Specification WW-C-581E.
4. Conduits shall be suitable for conductors with 75° C insulation.
5. Manufacturers, or equal:
    a. Robroy Plasti-Bond Red
    b. Occidental Coating Company OCAL-Blue Double-Coat
    c. Perma-Cote Industries Supreme Conduit

C. Rigid Galvanized Steel (RGS) Conduit

1. Rigid steel conduit shall be mild steel, hot-dip galvanized inside and out. Rigid steel conduit shall be manufactured in accordance with ANSI C80.1 - Rigid Steel Conduit, Zinc Coated, and UL-6.
2. Conduits shall be suitable for conductors with 75° C insulation.
3. Manufacturers, or equal:
    a. Allied Tube and Conduit

b. Western Tube and Conduit

D. Stainless Steel (SSC) Conduit

1. Stainless steel conduits, couplings, and fittings shall be UL listed manufactured with 316 grade stainless steel.

2. Manufacturers, or equal:

a. Crouse-Hinds RCOND xxx 316SS, RCxxx316SS

E. Liquidtight Flexible Metal Conduit

1. Liquidtight flexible metal conduit shall be constructed of a flexible galvanized metal core with a sunlight resistant thermoplastic outer jacket.

2. Liquidtight flexible metal conduit shall be manufactured in accordance with UL-360 - Steel Conduits, Liquid-Tight Flexible.

3. Conduits shall have insulated throat and stainless-steel sealing O-ring.

4. Manufacturers, or equal:

a. Anaconda, "Sealtite" Type UA

b. Electriflex, "Liquatite" Type LA

F. Electrical Metallic Tubing and Intermediate Metallic Conduits will not be accepted.

2.3 FITTINGS AND CONDUIT BODIES

A. General

1. All cast and malleable iron fittings for use with metallic conduit shall be the threaded type with five full threads.

2. All fittings and conduit bodies shall have neoprene gaskets and non-magnetic stainless steel screws. All covers shall be attached by means of holes tapped into the body of the fitting. Covers for fittings attached by means of clips or clamps will not be allowed.

3. Conduit, fittings, and conduit bodies in hazardous locations shall be suitable for the Class and Division installed.

B. Fittings for Liquidtight Flexible Metal Conduit

1. Liquidtight flexible metal conduit fittings shall have PVC coated cadmium-plated malleable iron body and gland nut with cast-in lug, brass grounding ferrule threaded to engage conduit spiral and o-ring seals around the conduit and box connection and insulated throat. Straight, 45 degree and 90 degree fittings shall be used where applicable.

2. For areas designed as corrosive, use PVC coated galvanized steel-insulated throat connectors for liquid-tight flexible metal conduit, suitable for use in wet locations, with a minimum 40 mil PVC exterior coating and pressure sealing sleeves. Acceptable products include: Robroy Plasti-Bond Red Liquid-tight Connectors,

Occidental Coating Company OCAL-Blue Double-Coat Sealtight Connectors, Perma-Cote Industries Supreme Liquid-tight Connectors, or equal.

C. Fittings and Conduit Bodies for PVC Coated Rigid Steel Conduit:

1. Use PVC coated insulated throat grounding bushings at all conduit ends. Provide threaded zinc-plated malleable iron grounding bushings with bonding screw and insulated throat rated for 150° C. Acceptable products include: Thomas & Betts PVC Coated Grounding and Bonding Bushings, OZ Gedney, Appleton, or equal.

2. Watertight and corrosion resistant hubs for PVC Coated Rigid Steel conduit shall have a minimum 40 mil PVC exterior coating, a urethane interior coating, and pressure sealing sleeves. Acceptable products include: Robroy Plasti-Bond Red Type ST Hub, Perma-Cote Industries Supreme Type ST Hub, Occidental Coating Company OCAL-Blue Double-Coat Type ST Hub, or equal.

3. For conduit bodies for use with steel conduits, size as required by the NEC, use PVC coated cast iron conduit bodies and covers, with captive stainless-steel screws. Provide conduit body with a 40 mil minimum PVC exterior coating and nominal 2 mil internal urethane coating, and pressure sealing sleeves on all conduit openings. Acceptable products include: Robroy Plasti-Bond Red Form 8 Conduit Bodies, Occidental Coating Company OCAL-Blue Double-Coat Form 8 Conduit Bodies, Perma-Cote Industries Supreme Form 8 Conduit Bodies, or equal.

2.4 JUNCTION AND PULL BOXES

A. Junction and pull boxes shall be provided as required to make the installation in accordance with NEC. Size junction and pull boxes in accordance with the NEC for the number of conductors enclosed in the box.

B. Where outlet boxes are used as junction or pull boxes, use materials as specified in Section 26 27 26 – Wiring Devices

C. Where boxes larger than outlet or device boxes are required for junction of pull boxes, provide the following:

1. Utilize NEMA 4 or 4X watertight and raintight enclosures for outdoor locations or where the subscript WP (weatherproof) is indicated at the box location on the Drawings. Furnish 14-gauge or 16-gauge stainless-steel enclosures with continuously welded seams, continuous door hinge, external fast operating clamp cover, external mounting feet, oil-resistant gasket and adhesive, and a polyester powder coating inside and outside. Acceptable products include: Hoffman Bulletin A51S Boxes, or equal.

2.5 CONDUIT TAGS

A. Provide permanent, stainless steel 2-inch diameter conduit tags with conduit number pressure stamped onto the tag for above grade conduits. Conduit numbers shall be 1/2-inch minimum. Tags relying on adhesives or taped-on markers are not acceptable.

B. Conduit tags in underground installations like handholes, wetwell and vault, shall be 2” diameter engraved black phenolic tags, with 1/2-inch white lettering.

2.6 SUPPORTS AND FITTINGS

A. Strut and mounting hardware shall be per Table 1 in Section 26 05 00 – Electrical Work, General.

B. Strut and mounting hardware shall be sized to meet seismic requirements.

C. All supports and fittings shall be of same material as conduit, including pipe straps, clamp back spacers, beam clamps, and other supports and fittings. Bolts and hardware shall be stainless steel. For example, if conduits are PVC coated galvanized rigid steel, all conduit clamp back spacers shall be PVC coated galvanized rigid steel.

2.7 CONDUIT PENETRATION SEALS AND SLEEVES

A. Conduit penetration seals shall be a modular, mechanical type, consisting of interlocking synthetic rubber links shaped to continuously fill the annular space between the conduit and the opening. The elastomeric element shall be sized and selected per the manufacturer’s recommendations and shall be suitable for use in standard service applications.

B. Acceptable products include: Thunderline Corporation Link-Seal, or equal.

2.8 DUCT SEAL

A. Duct seal shall be a non-hardening compound designed as a waterstop and moisture barrier for sealing the annular space between conduit and electrical conductors and cables.

B. Acceptable products include: O-Z Gedney DUX, or equal.

2.9 PULL TAPE

A. Pull tape shall be ½-inch in width, suitable for 1,250 pounds of pull strength.

B. Acceptable products include: Neptco Muletape WP1250P, or equal.

PART 3 - EXECUTION

3.1 GENERAL

A. Raceway systems shall be electrically and mechanically complete before conductors are installed. Bends and offsets shall be smooth and symmetrical, and shall be accomplished with tools designed for this purpose. Factory elbows shall be utilized wherever possible.

B. Raceway sizes shown on Drawings are minimum dimensions based on designed equipment.

C. Conduits located underground shall be installed per Section 26 05 43 – Underground Raceway Systems.

D. Where raceways are indicated but routing is not shown, such as home runs or on conduit schedules; raceway routing shall be in accordance with the NEC.

E. Routings shall be adjusted to avoid obstructions. Coordinate with all other trades prior to installation of raceways. Lack of such coordination shall not be justification for extra compensation, and removal and re-installation to resolve conflicts shall be at no extra cost to the Owner.

F. Wherever contact with concrete or dissimilar metals can produce galvanic corrosion of equipment, suitable insulating means shall be provided to prevent such corrosion.

G. Support

1. Support raceways at intervals not exceeding NEC requirements unless otherwise indicated. Support all raceways from structural members only.

2. Support flexible metal conduit with conduit clamps.

H. Bends

1. Make changes in the direction of runs with symmetrical bends or PVC coated cast metal fittings. Make bends and offsets of the longest practical radius. Avoid field-made bends and offsets where possible; but, where necessary, make with an acceptable hickey or conduit bending machine.

2. Make bends in parallel or banked runs of raceways from the same center or centerline so that bends are parallel and of neat appearance. Factory elbows may be used in parallel or banked raceways if there is a change in the plane of the run and the raceways are of the same size. Otherwise, make field bends in parallel runs.

3. Make no bends in flexible conduit that exceed allowable bending radius of the cable to be installed or that significantly restricts the conduits flexibility.

I. Insulated Throat Grounding Bushings and Conduit to Enclosure Connections

1. Where conduit enters metal enclosure install insulated throat grounding hubs. Install the equipment grounding conductor to the bushing, and continue to equipment ground bus. Interconnection of bonding jumpers from each conduit grounding bushing to the equipment ground bus or ground pad is acceptable, as long as size is based on larger equipment grounding conductor of that set. If neither a ground bus or ground pad exists, connect the bonding jumper to the metallic enclosure with a bolted-lug connection.

2. All NEMA 3R, 4, and 4X enclosures without integral watertight hubs shall be connected with PVC coated insulated throat grounding hubs. The conduit connections shall maintain the integrity of the enclosure NEMA rating. Liquid-tight PVC jacketed flexible metal conduit connections shall be corrosive resistant, watertight hub.

J. PVC Coated Rigid Steel Conduit: Install in strict accordance with the manufacturer’s instructions. Touch up any damage to the coating with conduit manufacturer acceptable patching compound. PVC boot shall cover all threads.

Leave no metallic threads uncovered. Clean field threads with solvent and coat with urethane touch-up.

K. All conduits leaving the ATS, Control Panel, Pump Panel Standby Generator, handholes, Metering Panel, and below grade J-Boxes, shall be sealed with duct seal compound to prevent the entrance into or exit from the structure with gases, liquids, or rodents.

L. No cables shall be routed exposed within Standby Generator. Contractor shall provide conduits complete within generator housing, from below grade interface to breaker panel and controller panel.

3.2 CONDUIT

A. All exposed conduit shall be as noted in Area Designations per Specification 26 05 00.

B. PVC coated RGS factory elbows shall be utilized for transition from underground concrete ductbank to exposed conduit. Refer to Contract Drawings for details on transition from underground to exposed or concealed locations.

C. All threads shall be coated with a conductive lubricant before assembly. Acceptable products include: Appleton Type TLC, Thomas & Better KOPR-Shield, or equal.

D. Joints shall be tight, thoroughly grounded, secure, and free of obstructions in the pipe. All conduits shall be adequately reamed to prevent damage to the wires and cables inside. Strap wrenches and vises shall be used to install conduits to prevent wrench marks on the conduits. Conduits with wrench marks shall be replaced at no additional cost.

3.3 REQUIRED RACEWAY TYPE FOR SPECIAL LOCATIONS AND INSTALLATION METHOD

A. Provide PVC coated GRS conduits and fittings, or stainless steel conduits and fittings, at Class 1, Division 1 or 2 classified areas where conduit is exposed beyond wall of area. Refer to National Electrical Code Article 500 for further raceway requirements. Size conduits per NEC based on submitted and approved manufacturer cable, or as shown on Contract Drawing, whichever is larger.

B. Final Connection to Certain Equipment: Make final connection to motors, instrumentation, and other equipment where flexible connection is required to facilitate removal or adjustment of equipment with liquidtight flexible metal conduit. Liquidtight flexible metal conduit shall be of 12-inch minimum to 24-inch maximum lengths, unless otherwise approved by the Engineer.

C. Provide seal off fittings as required by NEC, even if not shown on Contract Drawings. Seal off fittings are required to be located outside of wet well. Provide seal off fittings on conduits from Pump Panel to wet well. Provide conduits within handhole for conduits from handhole to wet well and flowmeter vault.

3.4 PREPARATION FOR PULLING IN CONDUCTORS

A. Ream all raceways, remove burrs, and clean raceway interiors. Immediately after installation, plug or cap all raceway ends with watertight and dust-tight seals.

B. Pull a bristle brush and then mandrel through each raceway to remove any debris and clean raceway prior to pulling conductors. The diameter of the mandrel shall be approximately ¼ inch less than the raceway inside diameter, through each raceway. For conduits one inch and less, pull a rag through to clean and remove debris prior to pulling conductors.

C. For all raceways which contain less than 50 percent of the NEC allowed fill, install a pull tape along with the conductors.

3.5 EMPTY RACEWAYS

A. Certain raceways will have no conductors pulled in as part of this Contract. Identify with conduit tags at each end and at any intermediate pull point of each such empty raceway. Provide a removal cap over each end of empty raceways. Provide a pull tape in each empty raceway.

3.6 JUNCTION AND PULL BOXES

A. Where indicated on the Contract Drawings, or where necessary, redirect multiple conduit and cable runs and provide and install appropriately-sized junction boxes. Furnish and install pull boxes where necessary in the raceway system to facilitate conductor installation.

B. Make all boxes accessible. Do not install boxes in finished areas unless accepted in writing by the Engineer. Mount all boxes plumb and level.

C. Conduit bodies maybe used for junction or pull boxes as long as sized for installation.

3.7 ELECTRICAL CONTINUITY

A. The entire electrical raceway system shall form a continuous metallic electrical conductor from the service point to every load, and shall be grounded by connection to the main service ground.

B. Rigid steel conduits shall have threads coated with conductive sealant before screwing into fittings.

C. An equipment grounding conductor shall be installed in all conduits. Conduits shall not be substituted for the equipment grounding wire. Bond together the conduit system, enclosures, grounding system, and equipment bus bars.

3.8 CONDUIT IDENTIFICATION

A. All conduits shall be identified with minimum of two tags, one at each end. In addition, all conduits shall be tagged at intermediate pull points like cabinets, handholes or pull boxes. Use correct type of tag based on installed location. Tags

shall be inscribed as designated on the Contract Drawing Conduit and Cable Schedule and per approved Interconnect Diagrams.

B. Exposed and Above Grade Conduits: Attach conduit tags to conduits with 316 stainless steel tie wire at end of the conduit.

C. Conduits shall be tagged prior to Field Testing.

END OF SECTION

SECTION 26 05 43

UNDERGROUND RACEWAY SYSTEMS

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Provide underground raceway systems, complete and in place, in accordance with the Contract Documents.

B. The Contractor shall provide underground raceway systems sized for submitted and approved cables, including pumping system supplied cables, or ultimate equipment size, or as shown on Contract Drawings, whichever is larger. Conduit sizes shall be as required by National Electrical Code.

1.2 CONTRACTOR SUBMITTALS

A. General: Submittals shall be furnished in accordance with Section 26 05 00 – Electrical Work, General.

B. Shop Drawings: Complete catalog cuts of all underground raceway systems, including handholes, conduits, ductbanks, trenches, spacers, etc.

C. Conduit Tags: Submit tag materials for approval.

D. Underground Raceway System shall be documented to be submitted and approved as-builts for record drawings. Refer to Section 26 05 00 – Electric Work, General.

E. Provide surveyed as-built drawings of all installed ductbanks providing top-of-ductbank elevation, ductbank width, handholes, and routing. Include cross-section information for all ductbank sections.

PART 2 - PRODUCTS

2.1 GENERAL

A. Handholes, conduits and fittings which are dedicated to the underground raceway system shall comply with the requirements of this Section. Contractor shall provide handholes, even if not shown on Drawings, to facilitate cable pulling as required, at no extra cost to Owner. Provide separate handholes for “S” type conduits, from “P” and “C” conduits.

B. Coordinate with pumping system supplier for conduit requirements. Sizes shown on Contract Drawings are minimum required, but Contractor to size and install conduits as required by supplied equipment cables.

2.2 HANDHOLES

A. Handholes and special marking covers shall be designed for AASHTO M309 H-20 traffic loading. Boxes shall include extensions for interior dimension per these

Specifications. Handhole covers shall be checker plate, hot-dip galvanized after fabrication, inscribed, and provided with security “Penta” style bolts.

B. Handhole “HH-S1” shall be 13” x 24” x 36” deep.

C. Handhole covers shall have identification letters one-inch high and ¾-inch wide minimum, indicating “SIGNAL”, as applicable, and handhole number, “HH-S1” for example, as shown on Contract Drawings. For example, the signal handhole cover will be inscribed “SIGNAL HH-S1”.

D. Acceptable products include: Christy Concrete B1324 with extensions, checker plate, hot dipped galvanized cover, slab bottom, and 316 stainless steel Penta bolts, or equal. Provide with extensions for total 36” depth. Provide with identification lettering and inscribed handhole tag number on cover.

2.3 CONDUITS AND SPACERS

A. Underground conduits shall be Schedule 40 PVC, PVC coated galvanized rigid conduits, or stainless steel conduits. Refer to Section 16110 – Electrical Raceway Systems for conduit specifications.

B. Install conduit spacers in ductbanks, where four or more conduits are provided. Conduit spacers shall be Carlon Snap-Loc Spacers, or equal, with minimum 1½” duct separation, and spacers installed at five foot on center intervals.

2.4 CONDUIT TAGS

A. Provide permanent, stainless steel 2-inch diameter conduit tags with conduit number pressure stamped onto the tag for above grade conduits. Conduit numbers shall be 1/2-inch minimum. Tags relying on adhesives or taped-on markers are not acceptable.

B. Conduit tags in underground installations like handholes, wetwell, and vault, shall be 2” diameter engraved black phenolic tags, with 1/2-inch white lettering.

2.5 WARNING TAPE

A. Provide heavy-gauge, red, non-adhesive polyethylene tape of six-inch minimum width, four-mil nominal thickness, with black lettering, for use in trenches containing electric circuits. Use tape with the following printed warning: “CAUTION-ELECTRIC LINE BURIED BELOW”.

B. Acceptable products include: Harris Industries, Inc. Underground Tape Catalog No. UT-29, or equal.

2.6 GROUND ROD BOXES

A. Refer to Section 26 05 26 – Grounding, for ground rod boxes specification.

PART 3 - EXECUTION

3.1 GENERAL

A. Raceway systems shall be electrically and mechanically complete before conductors are installed. Bends and offsets shall be smooth and symmetrical, and shall be accomplished with tools designed for this purpose. Factory elbows shall be utilized wherever possible.

B. Do not backfill ductbanks until they have been inspected by the Engineer.

C. Warning Tapes: Bury warning tapes approximately 12 inches above top-of-conduits, in all underground conduit runs or duct banks. Align parallel to and within six inches of the centerline of runs that are 12 inches wide or less. Provide two tapes and align parallel to and within six inches of the centerline of each side of runs that are more than 12 inches wide.

3.2 TRENCHING

A. Verify the location of all existing cables, conduits, piping, and other equipment in or near the areas to be trenched, prior to starting trenching. Call an Underground Service firm before trenching.

B. Trenches shall not be left unattended unless the area is fenced or barricaded to restrict entry to the area. Repair any equipment damaged during trenching.

3.3 DUCTBANKS AND TRENCHING

A. Separation and Support

1. Separate runs of four or more raceways in a single trench with preformed, nonmetallic spacers designed for the purpose. Install conduit spacers at intervals of five feet.

2. Support raceways installed in fill areas to prevent accidental bending until backfilling is complete. Tie raceways to supports, and raceways and supports to the ground, so that raceways will not be displaced when sand backfill is placed.

3. Provide 3” separation between “S” conduits from “P” and or “C” conduits.

B. Arrangement and Routing

1. Make changes in the location or cross-section as necessary to avoid obstructions or conflicts. Where raceway runs cannot be installed substantially as shown on submitted and approved layout drawings because of conditions not discoverable prior to digging of trenches, refer the condition to the Engineer for instructions before further work is done. Determine exact alignment and depth as required to avoid other utilities.

2. Where other utility piping systems are encountered or being installed along a raceway route, maintain a 12-inch minimum vertical separation between raceways and other systems at crossings. Do not place raceways over valves or couplings in other piping systems. Refer conflicts with these requirements to the Engineer for instructions before further work is done.

3. Ductbank alignments shown on Drawings are diagrammatic. Actual alignments shall contain no sharp bends and shall be installed with minimum radius bends as required in the NEC or installed cable, whichever requires a larger radius bend.

3.4 HANDHOLES

A. Provide excavation, backfilling, compaction and grading, etc., in accordance with requirements specified in Contract Documents.

B. Do not install handholes until final conduit grading, including field changes necessitated by underground interferences, has been determined. Set frames just above final grade so that the site drains away from the handholes.

C. Make the installation so that raceways enter handholes at nearly right angles and as near as possible to one end of a wall, unless otherwise indicated.

D. Provide for over-excavation of the handhole foundation area and furnish minimum of one-foot depth of ¾-inch drain rock below the handhole and six inches beyond all handhole sides.

E. Provide minimum 6” concrete collar around handhole as required in Oldcastle Christy Concrete Installation Guide for H20 installations.

F. Bolt down covers with 316 stainless steel Penta bolts. Coat bolt threads with marine grade anti-seize, that are coated with Tripac 2000 Blue, or equivalent.

3.5 CONDUIT IDENTIFICATION

A. All conduits shall be identified with minimum of two tags, one at each end. In addition, all conduits shall be tagged at intermediate pull points like cabinets, handholes or pull boxes, as applicable to conduit run. Use correct type of tag based on installed location. Tags shall be inscribed as designated on the approved Interconnect Diagrams.

B. All underground and below grade conduits shall be tagged within handholes, wetwell, and vault, and where stub up into equipment.

C. Exposed and Above Grade Conduits: Attach stainless steel tags to conduits with 316 stainless steel tie wire at end of the conduit.

D. Below Grade Conduits: black engraved phenolic conduit tags shall be applied with epoxy to the wall of the handhole or wetwell or vault above the conduit entrance, or attached to conduit with black nylon cable tie if conduit is accessible.

E. Conduits shall be tagged prior to Field Testing.

3.6 PREPARATION FOR PULLING IN CONDUCTORS

A. Ream all raceways, remove burrs, and clean raceway interiors. Immediately after installation, plug or cap all raceway ends with watertight and dust-tight seals.

B. Pull a bristle brush and then a mandrel through each raceway to remove any debris and clean the raceway prior to pulling conductors. Mandrel diameter shall be approximately 1/4-inch less than the raceway inside diameter, through each

raceway. For conduits of one inch and less, pull a rag through to clean and remove debris prior to pulling the conductors.

C. For all raceways which contain less than 50 percent of the NEC allowed fill, install a pull tape along with the conductors.

3.7 EMPTY RACEWAYS

A. Certain raceways will have no conductors pulled in as part of this Contract. Identify them with conduit tags at each end and at any intermediate pull point of each such empty raceway. Provide a removal cap over each end of empty raceways.

B. Provide a pull tape in each empty raceway.

3.8 TRENCH SETTLING

A. If, at any time during a period of one year dating from the date of final acceptance of the project, there shall be any settlement of conduit trenches, the Engineer may notify the Contractor to immediately provide additional fill and to make such repairs or replacements in paving, planting, or structures, as may be deemed necessary at the Contractor's expense.

END OF SECTION

SECTION 26 27 26

WIRING DEVICES

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Provide wiring devices, complete and operable, in accordance with the Contract Documents.

B. Single Manufacturer: Like products shall be the end product of one manufacturer in order to achieve standardization of appearance, operation, maintenance, spare parts, and manufacturer's services.

C. Section includes Metering Panel, automatic transfer switch (ATS), Shed light switch and receptacle, red beacon, and Site Light pole toggle switch.

D. The Metering Panel shall meet Liberty and EUSERC service meter requirements for 100 amp, 480/277 VAC, three phase, four wire, 60 Hz service. Contractor to coordinate with Liberty for complete and operable electrical service.

E. For ATS configuration, refer to this Section and Section 26 32 13 Standby Generator.

1.2 CONTRACTOR SUBMITTALS

A. General: Contract submittals shall be in accordance with Section 26 05 00 – Electrical Work, General.

B. Shop Drawings

1. Complete catalog cuts of Metering Panel, ATS, switches, receptacles, enclosures, covers, and appurtenances, marked to clearly identify proposed materials.
2. Schematics Drawings and Elevation Drawings for Metering Panel and ATS.
3. Documentation that Liberty approves Metering Panel.
4. Documentation showing that proposed materials comply with the requirements of NEC and UL.
5. Hardcopy of configuration settings for ATS controller.

C. Operations and Maintenance Manuals for ATS. Refer to Section 26 05 00 – Electrical Work, General for O&M Manual requirements

PART 2 - PRODUCTS

2.1 GENERAL

A. All devices shall carry the UL label.

2.2 LIGHT SWITCHES

A. Light switches shall be heavy duty, industrial, toggle type, 20-amp, 125 VAC-rated, self-grounding, and back and side wired. Light switch handles shall be brown. Contact arm spring and terminal plate shall be copper alloy. Contact points shall be silver cadmium oxide. Ground terminal shall be nickel-plated steel with brass screw. Provide with weatherproof covers where installed outside.

B. Switches shall conform to UL 20.

C. Acceptable products: Hubbell 1221B, or equal.

2.3 RECEPTACLES

A. Duplex receptacles shall be 125 VAC, 20 amperes, polarized three-wire type, NEMA 5-20R confirming to UL 498. Receptacles shall be brown. Receptacles shall conform to UL 498. External wiring shall be provided by side mounted terminal screws. Acceptable products: Hubbell 5362B, or equal.

B. Ground-fault circuit interrupting receptacles (GFCIs) shall be installed at outdoor locations, including site light pole. GFCIs shall be rated 125 V, 20 amperes NEMA 5-20R, conforming to UL 498 and UL 943, and brown. Acceptable products: Hubbell GF-5362B, or equal.

2.4 OUTLET AND DEVICE BOXES

A. Outlet and Device boxes are specified in Section 26 05 33.

2.5 OUTDOOR DEVICE COVERS

A. Outdoor receptacle covers shall be metal while in use cover, weatherproof, and shall be die cast aluminum lift covers for GFCI receptacles stainless steel screws, and neoprene gasket. Covers shall be Eaton WIUMV-1, or equal.

2.6 METERING PANEL

A. Metering Panel shall be 480/277-volt class suitable for operation on a three-phase, four-wire, 60-Hz system. Metering Panel shall contain Liberty incoming section and metering compartment. Metering Panel shall be per Liberty and EUSERC requirements. Metering Panel to be painted steel, ANSI 61, and NEMA 3R, suitable for stanchion mounting.

B. Both utility service and load side conduits shall be from underground.

C. Metering Panel shall include provision for termination of incoming neutral conductor in conformance to NEC requirements for service entrance, and be bonded and grounded.

D. Main breaker shall be 100 amp frame with 100 amp trip. The interrupting capacity shall be a minimum of 65,000 RMS symmetrical amperes at operating voltage. Circuit breaker shall be molded case type with thermal magnetic trip units. Circuit

breaker shall be Eaton Series C F-Frame Type HFD, or equal. Provide means of padlocking main breaker.

E. Metering Panel with main disconnect shall be Eaton B-Line, or equal.

2.7 AUTOMATIC TRANSFER SWITCH

A. Automatic Transfer Switch (ATS) shall be automatic, delayed open transition. ATS shall be UL 1008 listed. ATS shall be rated for 480 VAC, 3 pole, 100 amps, minimum 65kAIC. ATS shall be front accessible only, contactor type, with control power transformer for unit heater with thermostat, but control voltage shall come from Control Panel UPS. ATS shall have means for manual operation.

B. Functionality: When there is a loss of utility power and the wet well needs to run a pump (level is at or above LSH float), the ATS will send a start signal to the engine generator to start after an adjustable time delay. Then, when the engine generator is ready to receive the load, the loads will be added to the engine generator after an adjustable time delay. Upon a return of utility power, the load will be transferred back to the utility after an adjustable time delay. The transfer back to the utility will be open transition. Provide an adjustable engine cool-off delay timer. Mount controller on front door.

C. Provide Eaton ATS with ATC-300+ controller, or approved equal.

2.8 RED BEACON

A. Red beacon, mounted to outside of Shed via rigid conduit, shall be NEMA 3R, 120VAC, LED with 50,000 hours rating, with red lens and internal buzzer. Beacon shall mount to 1/2" NPT conduit nipple, supported off wall bracket. Beacon shall be provided with three LEDs, steady or flashing pattern with polycarbonate housing. Horn shall be switchable on or off.

B. Red beacon shall be Federal Signal #AV1-LED-120-R with wall bracket #LWMB2, or approved equal.

PART 3 - EXECUTION

3.1 GENERAL

A. Perform work in accordance with the National Electrical Code.

B. Metering Panel shall be installed per Liberty requirements. Provide NETA testing on Metering Panel, main breaker, and grounding system prior to authority having jurisdiction inspection.

C. Contractor to configure red beacon based on Owner input for alarm type and horn.

3.2 CONNECTION

A. Rigidly attach wiring devices in accordance with manufacturer instructions.

B. Securely fasten nameplates using epoxy glue centered under or on the device, unless otherwise indicated.

3.3 INSTALLATION

A. Mount boxes at the following heights unless otherwise indicated (heights are to the centerline of the box):

1. Site Light Switch: 48” above pole base, mounted to pole provided additional handhole.
2. Shed light switch: 48” to center of box.
3. Shed receptacle: 24” to center of box
4. Contractor to provide additional bracing, including plywood backboard within Shed to mount ATS. Plywood shall be minimum 1-1/4” thick, painted white (exterior paint), and 2’ larger in all dimensions to ATS.

3.4 GROUNDING

A. Ground all devices, including switches and receptacles, in accordance with NEC and Section 26 05 26 – Grounding.

B. Ground switches and associated metal plates through switch mounting yoke, outlet box, and raceway system.

C. Ground receptacles and their metal plates through positive ground connections to the outlet box and grounding system. Maintain ground to each receptacle by spring-loaded grounding contact to mounting screw or by grounding jumper, each making positive connection to the outlet box and grounding system at all times.

3.5 FIELD TESTING

A. Provide checkout, field, and functional testing of wiring devices in accordance with Section 26 01 26 – Electrical Testing.

B. Test each receptacle for polarity and ground integrity with a standard receptacle tester.

C. Wiring Devices testing shall be completed during field testing period, prior to start of 7 day “live test”.

D. Test functionality of ATS with Standby Generator, including wet well float permissive. Contractor is responsible for configuration of ATS and Standby Generator controllers, including submitting hard copy of configuration data for review and including in O&M Manuals.

E. Test Red Beacon with Owner. Reconfigure beacon or horn based on Owner input.

END OF SECTION

SECTION 26 32 13

STANDBY GENERATOR

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes: Packaged propane engine generator system to provide emergency standby power, shall include the following components:
   1. Propane gas engine.
   2. 277/480 VAC, three phase, 60 Hz, alternator
   3. Liquid coolant system.
   4. Battery and battery charger.
   5. Fuel system and piping.
   6. Critical exhaust silencer.
   7. Controller system, NFPA 110 Level 1.
   8. Skid system.
   9. Circuit breaker, and bonded neutral connected to grounding electrode conductor.
   10. Residential critical sound attenuating (minimum level 2), weatherproof, aluminum enclosure. Enclosure to be painted desert tan, or approved color. Doors to be padlockable, or key lockable. Provide 6 sets of keys.
   11. Accessories as specified but not limited to: UL 2200 listing, IBC seismic certification, block heater, battery charger, 2 year warranty, general maintenance manual, stainless steel fasteners, and stainless steel rodent guards, and spare parts.
   12. Coordinate with ATS and Control Panel suppliers, and provide interconnection with ATS and Control Panel for proper Standby Generator operation, control, and monitoring.
   13. All other equipment as required to provide a complete and operable standby power system.

B. Related Sections:
   1. Section 26 05 00 – Electrical Work, General.
   2. Section 26 27 26 – Wiring Devices.
   3. Section 40 67 16 – Control Panel

1.02 REFERENCES

A. Referenced Standards: Construct equipment in accordance with the applicable requirements of the following codes and standards:
   1. National Electrical Code (NEC).
   2. American National Standards Institute (ANSI).
   3. National Electrical Manufacturers Association (NEMA).
   4. Institute of Electrical and Electronic Engineers (IEEE).
   5. Insulated Cable Engineers Association (ICEA).
   6. American Society for Testing and Materials (ASTM).
   7. Underwriters' Laboratories, Inc. (UL).
   8. Electrical Generation Systems Association (EGSA).

9. Local air quality management.
10. Codes and standards referenced shall be considered minimum acceptable work.

1.03 SYSTEM DESCRIPTION

A. The Contractor shall furnish all labor, materials, tools, equipment and services for supply, installation and wiring of the propane Standby Generator for installation. Although such work is not specifically indicated, furnish and install all supplementary or miscellaneous items, appurtenances and devices incidental to or necessary for a sound, secure and complete installation.

B. Contractor shall provide and install outdoor rated Standby Generator, with weather proof enclosure, critical sound attenuation (minimum Level 2), and propane fuel system, complete and operable, in accordance with the Contract Documents. Contractor to provide all programming configuration of Standby Generator controls. Contractor to provide all programming configuration of ATS. Standby Generator shall be UL 2200 labeled, NFPA 110 Level 1, and IBC seismic certified.

C. Contractor shall carefully coordinate the new standby generator enclosure location (per the proposed standby generator supplier's submittal information) with field conditions to ensure that adequate clearances may be obtained. This coordination shall be performed by the Contractor prior to submitting submittal information for Engineer's review. Provide required clearances around Standby Generator and orient for ease of maintenance.

D. Contractor shall provide and submit Interconnect Drawings between Standby Generator, and Control Panel, ATS, and branch circuit power supplies. Number of wires shall be as required, or per Contract Drawings, whichever is greater.

E. Standby Generator Requirements:
1. Power Output Rating: Kilowatts and voltage as scheduled below, delivered at 0.8 power factor minimum, 480 VAC, three phase, 3 wires, 60 hertz, without exceeding NEMA MG-1 temperature rise limits. Bond neutral at generator, directly to grounding electrode conductor. Generator shall be rated for standby service.
2. Generator housing shall reduce noise to 65 dB or less at 23 feet from Generator.
3. Generator will meet local air district air quality permitting requirements.

1.04 SUBMITTALS

A. Shop Drawings:
1. Complete Package: Submit complete shop drawings of each component making up the Standby Generator package.
2. Submit critical exhaust system silencer noise attenuation curves.
3. Submit Standby Generator sizing calculations.
4. Submit Bill of Materials summarizing all manufacturers, part numbers and applicable ratings or sizes of all equipment or components provided.
5. Engine, including:
   a. Make, model, displacement, cylinder arrangement, and aspiration.
   b. RPM and HP at rated kW output.

c. Manufacturer's certified engine emissions test data.
d. Provide fuel consumption at full, 3/4, 1/2 and 1/4 loads.
e. Cold cranking amperage required by starting system or manufacturer's recommended battery capacity in cold cranking amps at 32°F.

6. Engine Systems and Accessories:
   a. Cooling system, including radiator and low coolant alarm device.
   b. Airflow specifications for radiator and cooling system, including the required airflow and maximum allowed inlet and discharge airflow restriction across the radiator.
   c. Jacket water heater(s) and heater isolation valves.
   d. Isochronous governor.
   e. Starting system, including voltage, quantity and size of battery, battery box for installation and line voltage battery charger with cut sheets showing alarm contacts and fault indications.
   f. Engine driven automatic battery charging alternator with solid-state voltage regulation (in addition to line voltage battery charger).
   g. Fuel system specifications, including maximum fuel consumption, total fuel flow rate, piping requirements, pressure requirements.
7. Engine-generator control system, including control system, switches, panel, gauges or digital display features, dry contact accessory kit for communication of specified status and alarm conditions to Control Panel, engine alarms and protective devices.
8. Weatherproof enclosure, with critical residential sound attenuation rating (minimum Level 2). Submit exterior paint samples. Exterior color shall be desert tan or similar, as selected by Owner during submittal review stage.
9. Generator and Electrical System:
   a. Submit system schematic diagram showing all piping and wiring interconnections with sizes and quantities. Submit ladder-type schematic electrical diagrams with legend identifying all devices on diagrams
   b. Generator construction, windings and pitch, insulation class and treatment, temperature rise.
   c. Voltage dip curves for motor starting.
   d. Regulator.
   e. PMG excitation.
   f. Generator circuit breaker and breaker enclosure and bussing. Provide mounting location of breaker enclosure (to verify NEC required working clearances).
10. Structural steel side-rail skid base for engine-generator set with anchor bolt locations and dimensioned layout. Submit catalog data and installation instructions and calculations for size and number of anchor bolts. Structural Standby Generator anchoring calculations to be signed and stamped by a licensed Civil or Structural Professional Engineer.
11. Submit Interconnection Diagrams that show field terminal block numbers and wiring requirements to and from the automatic transfer switch (ATS) and Control Panel.
12. Emission Data: The engine generator supplier shall furnish to the engineer all emissions data, and any other data required by the air quality board for the application to permit construction and operation of the proposed equipment, as required. This includes all permits, as required.
13. Submit listing of spare parts including listing of all Generator Maintenance Service Kit parts.

14. Detailed description of factory testing program, testing equipment, reporting procedure, and criteria for test passing or failing.
15. Start-up Inspection Report: Submit a start-up inspection report signed by the engine manufacturers authorized field service representative.
16. Field testing procedures.
17. Training agenda with topics to be covered. Topics to include, at a minimum: Maintenance items and procedures, Alarms, Controller configuration settings, Review of O&M Manual, showing of Spare Parts. Resume of trainer.

B. Manufacturer's Installation Instructions: Submit a detailed recommended installation procedure for the engine/generator equipment.

C. Test Reports:
1. Submit certified copies of the results of the factory and field tests.

D. Certificates and Final Documentation:
1. For the Complete Package: Upon completion of installation, manufacturer shall issue a certification of compliance with the Contract Documents.
2. Submit “as built” system Interconnection Diagrams in both hardcopy and electronic format (i.e. ACAD files).
3. Submit configuration files of Standby Generator Controller.

E. Operation and Maintenance Data: Instruction manuals containing operation and maintenance procedures. The O&M Manuals must be for the specific or actual piece of equipment or system furnished under this Contract.
1. Provide a separately tabbed section in the O&M Manual marked “Replacement Parts”, with a bill of materials listing of all common field replaced spare parts and including the part numbers for replacement filters, belts, lamps hoses, thermostat, and fuses.
2. Provide troubleshooting and repair service manuals. These manuals cover work beyond the scope of ordinary O&M manuals and include troubleshooting and diagnosis procedures.
3. All information, procedures, or parts which are relevant and applicable to the equipment and system actually furnished under this Contract shall be highlighted or designated with an arrow pointed to the applicable portions.
4. Warranty: Provide 2 year warranty, signed by supplier

F. Quality Control Submittals:
1. Manufacturer's certificate of proper installation.
2. Factory test report.
3. Field test report and certification.

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications:
1. The engine, generator and all major items of auxiliary equipment shall be manufactured by manufacturers currently engaged in the production of such equipment.
2. Factory authorized parts and service facility located within 250 miles of the Project site.
3. Materials, equipment, and parts comprising the units specified shall be new and

unused, of current manufacture, and of the highest grade.

4. System to have engine and generator unit factory-assembled and tested by the engine manufacturer and shipped to the jobsite by an authorized dealer.

B. Supplier Qualifications:
   1. Standby Generator to be furnished by one factory authorized supplier who shall be responsible for furnishing, testing, installation supervision, and guaranteeing the system.
   2. The factory authorized supplier for the Standby Generator will be referred to as the Primary Supplier. The responsibility of the Primary Supplier shall extend to the selection and furnishing of the specified components and supervision of installation, testing and start-up.

C. Supplier Services: Provide Standby Generator manufacturers' services at the job site for the minimum man-days listed below, travel time excluded
   1. One man-day for support services, which include a pre-startup inspection report, adjustment of the equipment, and start-up and field-testing supervision. Field testing shall include field transfer sequence tests and field load bank tests. Supplier responsible to provide 100% rated load bank for field test.
   2. One man-day to instruct the Owner's personnel in the operation and maintenance of the equipment (on-site). Training shall not take place on same day as start up. Submit final copies of previously reviewed O&M manuals at least ten (10) working days prior to this instruction.

D. Regulatory Requirements: Comply with the following:
   1. Regulations of the Fire Prevention Bureau of the fire department having jurisdiction.
   2. State of California:
      a. Requirements of Cal-OSHA.
      b. Requirements of local Air Quality Management District or Air Pollution Control District, as applicable.
   3. International Building Code.
   4. Uniform Fire Code.
   5. NFPA 110.
   6. Other applicable state, city, and local codes.
   7. Contractor shall not be relieved from complying with the specifications that may be in excess of, and not contrary to, the regulations.

1.06 ENVIRONMENTAL REQUIREMENTS

A. Project Site Elevation: Less than 5,500 feet above sea level.
B. Project Site Ambient Temperature: 40 degrees Celsius.

1.07 WARRANTY

A. Generator Package: Covered by a manufacturer's standard warranty for a minimum of 2 year from date of acceptance or first beneficial use of the package.

1.08 MAINTENANCE

A. Spare Parts and Accessories: Furnish the following spare parts for the Standby

Generator to the Owner prior to acceptance of the Work. Provide rubber tub, and include within rubber tup all spare parts:

1. General Maintenance Service Kit.
2. In addition to the Generator Maintenance Service Kit above, provide the following: 2 air filters, 2 fuel filters (as applicable), 2 oil filters, 2 light bulbs, 1 radiator cap, 1 thermostat and gasket, 1 set of belts.

B. Special Tools: Furnish a set of specialty tools necessary for routine maintenance of the equipment.

C. Rubber tub: Rubbermaid Action Packer Storage Box, or equal. Size as required to fit spare parts.

PART 2 PRODUCTS

2.01 PROPANE ENGINE

A. Manufacturers:
   1. Engine: One of the following, no equal:
      a. Kohler
      b. Cummins.

B. Engine Requirements:
   1. Engine Type: 4-Stroke Cycle, turbocharged. Provide in-line propane engine with compression ignition, meeting all requirements of NFPA 37 and NFPA 110.
   2. Maximum Rotational Speed: 1,800 rpm.
   3. Minimum Piston Displacement: As scheduled.
   4. Main Bearings: Minimum of five, replaceable insert type.
   5. Cooling: Liquid cooled with engine driven coolant pump.
   6. Fuel Type: Propane
   7. Emissions: Meet the requirements of the Air Quality Management District or Air Pollution Control Board, as applicable to the Project site, and size of Standby Generator.
   8. Air filters: Replaceable dry element type with dirty condition differential pressure indicator.
   9. Lube oil filters: Cartridge type.

C. Governor: Electronic, isochronous digital type to regulate engine speed within +/- 0.33% at any constant load from no load to full load.

2.02 GENERATOR

A. Manufacturers:
   1. Generator: One of the following, no equal:
      a. Kohler
      b. Cummins.
   2. Voltage Regulator: Standard included with manufacturer’s engine/generator unit, solid-state volts/Hz.

B. Generator:
   1. Type: Synchronous, 4-pole, rotating field.
   2. Exciter Type: Brushless, permanent magnet.
   3. Leads: Quantity of twelve (12), re-connectable.

4. Insulation: Class H, 130 degrees Celsius temperature rise per NEMA MG1.
5. Bearing: Sealed type.
6. Coupling: Flexible disc.
7. Amortisseur Windings: Full.
8. Voltage Regulation: +/- 0.5% average, no-load to full-load.
9. One-Step Load Acceptance: 100% of rating per NFPA 110.
10. Unbalanced Load Capability: 100% of rated standby current.
11. NEMA MG1, IEEE and ANSI Standards compliance for temperature rise and motor starting.
12. Capable of sustained short circuit current up to 300% of rated current for 2 seconds.
13. Self-ventilated, drip-proof construction.
14. Vacuum impregnated windings with fungus-resistant epoxy varnish.

2.03 COOLING SYSTEM

A. Liquid-cooled, rated for continuous operation with an ambient temperature of 40 degrees Celsius.

B. Engine-driven fan.

C. Radiator: Mounted on the engine skid.

D. Coolant Solution: Provide solution of 50 percent ethylene glycol and softened water; add chemical water conditioner as recommended by the engine manufacturer.

E. Jacket Water Heater: Sized to maintain engine jacket water to 90 degrees Fahrenheit for an ambient temperature of 0 degrees Celsius. Voltage per Drawings.

F. Radiator Hoses: Provide premium, oil resistant hoses of Viton or silicone rubber carcass with reinforcing fabric; assembly to be suitable for a minimum service temperature of 250 degrees Fahrenheit.

2.04 WEATHERPROOF ACOUSTICAL HOUSING

A. Type: Provide aluminum enclosure to protect engine, generator, starting system, batteries, and other specified accessories from weather exposure. Enclosure to be painted desert tan, or equivalent color as selected by Owner during submittal review process.

B. Certified to withstand a minimum of 150 mph wind load.
   1. Lockable, flush-mounted door latches on removable doors with a viewing window in control panel door. The viewing window shall be positioned approximately to view the control panel inside.

C. Vertical air inlet and outlet hoods with 90 degree angles to redirect air and reduce noise.

D. Critical sound attenuated, residential rated, with minimum 2 inches of acoustical insulation. 14 gauge steel enclosure with powder-baked paint finish. Fasteners shall be stainless steel.

E. Noise Reduction: Maximum dBA as scheduled.

2.05 ENGINE - GENERATOR ELECTRICAL AND CONTROL SYSTEM

A. Kohler APM402 controller, or equivalent controller system by Cummins. Equivalent control system shall provide, at minimum, all status, alarm and control features as the specified Kohler controller. Controller shall be NFPA 110 Level 1 capable.

B. Integral Controls for the Standby Generator shall have terminal blocks for termination of incoming remote start/stop control wires and alarm wires. The panel shall be equipped with controls and alarms as follows: Three-way position switch AUTO-OFF-HAND; Dry contact output for: Run Status (two dry contact outputs), Generator Fail (two dry contact outputs), Low Fuel Pressure, Battery Charger Fail, Low Battery, Not in Auto. Provide indication for: High coolant temperature, Low oil pressure, Battery charger fault / low battery voltage, Low coolant level, Over voltage and Over speed. When in AUTO generator to start based on remote contact closure from ATS and Control Panel in Shed. Generator will continue to run until same contact opens, then the engine shall be idled and shutdown at the end of the cool off period. Generator controls shall operate from 120 volt, single phase, 60 Hz power, off battery charger circuit provided. Provide Generator Control Panel with LCD display, or LED lamps as applicable, that reads: voltages, current, frequency, kVA, engine speed, low fuel pressure, low oil pressure, battery voltage, run hours, sensor failure, fault history, oil pressure, coolant temperature, time and date, low oil pressure shutdown, high coolant temperature shutdown, over voltage, over speed, low coolant level, not in auto position alarm, and exercise speed. Provide with built in programmable exerciser.

C. Control system shall also be equipped with status and alarm dry contacts as indicated on the Drawings. Generator Fail alarm to autodialer shall be general or common alarm.

D. Control system shall accept a remote dry contact Start/Stop command from the remote ATS/Control Panel as indicated on the Drawings.

E. Standby Generator shall be provided with remote signal wiring terminal blocks for connection of all field signal wiring from the Shed Control Panel.

F. Standby Generator shall have field wiring terminal blocks for two 20 ampere power connections for supplying the skid-mounted jacket water heater (120 VAC) and battery charger (120 VAC).

G. Circuit Breaker: Provide a skid-mounted main line molded case circuit breaker with minimum 22 kilo-amperes interrupting rating. Ampere rating shall be 80 amps, three poles. If larger breaker is provided, Contractor shall upsize feeder from Standby Generator to ATS per NEC at no extra cost to Owner.

H. Generator shall be 480 VAC, three phase, three wire, with grounded electrode connection bonded to the neutral of the generator. Also bond neutral to ground bus at the generator. Generator to be equipped with grounding electrode lugs at the frame and at the circuit breaker box.

2.06 GENERATOR SYSTEM OPERATION

A. Provide control devices and logic to sequentially start, operate, control, test, and stop the generator system. Coordinate ATS control system design so that on loss of utility power and wet well level is high, power is automatically supplied by the generator and on return of stable utility power, power is automatically switched back to utility power and the engine shuts down.

B. Engine Start Sequence:
   1. Engine shall not start if any of the safety shutdown circuits have been tripped and not cleared and reset.
   2. Automatic Engine Start Sequence:
      a. Initiated by a dry contact closure from the automatic transfer switch and wet well level needs pump to operate. Refer to Contract Drawings.
      b. Starter: Automatically crank the engine for adjustable times.

C. Emergency Shutdown Sequence: Engine shall shutdown immediately if the emergency stop button is activated, or any of the specified shutdowns activate.

D. Normal Shutdown Sequence: Local or remote Stop signal shall cause the engine to run unloaded for an adjustable cool-down period and then stop.
   1. Remote stop signal shall be based on sensing the return of utility power for an adjustable 0 to 15 minute time period before the engine is stopped and return to utility power is limited. If utility power is lost during the time delay period the timer shall be reset to zero and the engine shutdown not initiated until the set delay time expires without an interruption of utility power.

2.07 BASE

A. Base Requirements: Mount the engine, generator, radiator, and specified accessories on a common heavy-duty fabricated steel skid base.

B. Base Construction: Fabricated steel skid base to consist of a rigid welded frame of wide flange members or rails on each side.

C. Anchors: The structural steel base shall be secured to the concrete pad with anchor bolts. Anchor bolts and nuts shall be 316 stainless steel. Provide and submit anchoring requirements (diameter, minimum embedment). Additional Requirements:
   1. Provide for bolting skid to the concrete slab according to manufacturer's anchor bolt layout.
   2. Installation shall have a crankcase drain pipe at least 8 inches from the floor, equipped with a readily accessible shutoff valve.
   3. Provide front and rear engine mounts from the base in addition to a generator support mount.
   4. Provide bracing from the engine skid diagonally to the top of the radiator housing in addition to lower radiator supports on the base.

2.08 ACCESSORIES

A. Starting System: Provide 12 volt direct current electric motor starting system.

B. Battery Charging Alternator: Negative ground, rated 130 amps, or as approved by Engineer.

C. Battery: Rated minimum 630 cold cranking amperes, or as approved by Engineer.

D. Battery Charger: Minimum 10 ampere UL approved, current limiting type which shall automatically recharge the battery. Battery charger shall be factory wired to the engine/generator control panel and shall receive power supply from the single 120 VAC external power supply.

E. Provide plastic laminate red signs, 6” by 6” nominal, suitable for outdoor use with white letters measuring a minimum of one inch high. The signs shall read: “WARNING – THIS MACHINE MAY START WITHOUT WARNING BY REMOTE SIGNAL. DO NOT WORK ON MACHINE UNLESS MASTER SELECTOR SWITCH IS OFF”. Mount signs on each side of the Standby Generator, minimum two signs.

2.09 FINISHES

A. Engine, Generator, Tanks, other Equipment and Accessories: Shop-finished with manufacturer's premium corrosion resistant coating system suitable for corrosive environments; field touch up with same or compatible coating.

B. Enclosure: Provide with aluminum weather protective enclosure and critical grade muffler. Enclosure shall be minimum Level 2 sound attenuating. Provide with polyurethane enamel paint. Enclosure shall include multiple doors for access to controls and breaker as well as servicing oil fill and batteries. Enclosure doors shall be common key lockable. Provide 6 copies of key. Color shall be desert tan, or as selected by Owner during submittal stage, submit color options.

2.10 SOURCE QUALITY CONTROL

A. Factory Testing: Prior to shipment of the new engine/generator equipment to the Project site, factory test the equipment as a complete unit as follows. The Contractor shall notify the Owner no less than fifteen (15) days prior to the planned factory testing date and time and invite the Owner to attend and witness the factory testing. The Owner shall have the option to either attend or waive attendance of the factory witness testing at no additional cost to the Owner. If the Owner elects to attend the factory witness testing, travel and subsistence costs associated with the visit shall be the responsibility of the Owner:
   1. Verification that all set-mounted components are correctly installed and interconnected. Perform tests with submitted cooling and exhaust system.
   2. Verification that each subsystem is complete and functions according to design criteria; include measurements of temperatures, pressures, and flows for all components.
   3. Individual testing of each protective device and verification of the accuracy of instrumentation set points.
   4. Operation of the generator unit from 0 to 100 percent load, starting at no load and increasing in increments of 25 percent of the temporary loadbank; check at each load point to verify stable operation, fuel consumption, engine performance, and generator performance. Perform load test at 0.8 power factor; provide resistive and reactive temporary load bank (sized for total generator kW capacity) to achieve this. Load test unit for minimum 2 hours at the factory.
   5. Performance of full load transient tests to verify that voltage and frequency transient characteristics are within accepted submittal values.

6. Verification that equipment is free of all vibrations throughout operating range.
7. Provide written report including raw test data, calculated values and a certification that all values are normal and within specifications prior to shipment of the package.
8. Measure radiator performance at full load including air flow, air inlet temperature and air outlet temperature.
9. If system fails shop testing and testing is delayed more than 1 day beyond original testing schedule or must be rescheduled after the Owner arrives for scheduled testing, the Contractor shall pay the Owner's reasonable travel expenses including transportation, lodging and meals for a follow-up testing visit.

PART 3 EXECUTION

3.01 INSTALLATION

A. Installation shall be by competent personnel experienced and regularly engaged in field installation of power generation systems.

B. All field cables into Standby Generator shall be within conduits. No exposed field cables allowed.

C. Coordinate and provide fuel piping, routing and connections.

3.02 FIELD QUALITY CONTROL

A. Generating System:
1. The Contractor shall install and anchor the Standby Generator in accordance with submitted and approved seismic anchoring calculations. Seismic anchoring shall be based on manufacturer recommendations but confirmed by registered professional engineer.
2. Conduit installation shall be coordinated with manufacturer's as-fabricated drawings so that conduit stub-ups are within the area allotted for conduit. Conduit shall be stubbed up in the section that contains the devices to which conductors are terminated. Conduits shall continue to panels or enclosures with water tight fittings. No field cables shall be exposed within Generator housing.
3. Contractor shall program and configure Standby Generator controls and Automatic Transfer Switch controls based on submitted and approved parameters.
4. Installed location and orientation of Standby Generator shall comply with the required working clearances in front of circuit breakers and other electrical equipment that will require service while energized per the NEC, and as approved by Owner in field.
5. Grounding and bonding shall be completed as required by applicable sections of the NEC. Bond neutral of Standby Generator, as separately derived system, to grounding electrode system. Ground Standby Generator to grounding electrode conductor connected to ground rod in two places; at structural base and at circuit breaker ground bus. Ufer ground within Generator slab shall connect to ground bus and neutral.
6. Check torque of bolted connections.

7. Primary Supplier shall fill Standby Generator cooling and lubrication systems. Refer to manufacturer literature.
8. Contractor shall fill the propane tank both initially and after testing and start up.
9. After installation of the engine/generator set is complete, perform full-load test the generating system at the Project site in the presence of the Owner for a minimum period of 2 hours with the generator connected to a 0.8 power factor reactive/resistive portable load bank (100% of Standby Generator capacity) supplied by the Primary Supplier. During running load test, determine that the installation has been made properly and that there is no undue noise, vibration, oil leaks, water leaks, overheating, or propane leaks.
10. The following Field Tests shall be performed by the Standby Generator supplier and witnessed by the Owner after the full-load reactive/resistive 2 hour test. Confirm proper configuration of controller. Confirm operation of digital displays and configured outputs. Confirm wiring of intrusion switches. Simulate all Standby Generator controls and alarms. Simulate contact closure from ATS/Control Panel (no utility power and wet well high) to call Standby Generator, run for 15 minutes at 100 percent full load, and remove contact to stop Generator.
11. After successful completion of the field load bank testing, connect the generator to the ATS and operate the engine/generator in conjunction with available pump station electrical and motor loads for a minimum period of 1 hour.
12. Correct defects which become evident during testing at no additional cost to the Owner.
13. Measure pressures and temperatures of fuel, coolant, exhaust gas, and radiator air at inlets and outlets to system components, as applicable.
14. Fuel System Field Test: The Contractor shall submit manufacturer's certifications of pressure test, leak-proof test, and structural integrity test of fuel system and anchoring. Testing shall be provided by Standby Generator supplier with propane tank supplier.
15. Provide final written test report after completion of all successful field testing.
16. Upon completion of testing, Contractor shall fill the propane tank to maximum capacity.

B. Consumables: Primary supplier to provide lubricating oil, grease, ethylene glycol, chemical water conditioner. Contractor shall provide sufficient fuel for testing.

C. Manufacturer's Field Service:

Provide services of a factory-trained engine/generator equipment Manufacturer representative to be present at the Project site to inspect installation of the equipment, oversee the field testing, oversee the pump station electrical load testing, standby power system functional testing and make necessary adjustments, place it in initial trouble-free operation, and instruct the Owner's personnel on its operation and maintenance. The Contractor shall schedule operation and maintenance training date with the Owner at least 2 weeks prior to proposed training date.

3.03 SCHEDULE AND LOAD STEPS

PROPANE GENERATOR SYSTEM SCHEDULE AND LOAD STEPS	
Item	**Description**
Power Output Rating, minimum kW (KVA)	40 kW, or larger, as required by generator supplier based on approved load calculations
Output Voltage	277/480 VAC, 60 Hz
Power Phases	3 phase
Rating Basis	Standby
Manufacturer:	Kohler KG40 with 4P5X alternator, or equivalent by Cummins. Kohler or Cummins, no equal.
Jacket Water Heater: Watts, voltage/phases	1000 Watts, 120 VAC, 1 phase
Emissions:	Stationary Emergency, EPA requirements
Standby Generator Controller	Kohler APM402, or equivalent by Cummins. Kohler or Cummins, no equal.
Automatic Loadbank	Not applicable
Weather Proof Acoustic Housing:	Required Residential (minimum Level 2) critical grade, painted desert tan or color per Owner
Maximum Sound Pressure (dBA) at 23 feet:	64 dBA or better
Generator Load Steps:	Load Descriptions:
Criteria, Limits:	Voltage Dip 35%, Frequency Dip 10%, Gen loading 100% max
Load Step 1:	Resistive 2 kW
Load Step 1:	8.9 hp SLS Pump, 3 phase, (Code G, NEMA), FVNR, loaded at start
Load Step 2:	8.9 hp SLS Pump, 3 phase, (Code G, NEMA), FVNR, loaded at start

END OF SECTION

SECTION 26 56 00

LIGHTING

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. The Contractor shall provide all lighting fixtures, lighting pole, conductors, conduits and accessories for a complete and operable lighting system, in accordance with the Contract Documents.

B. Contractor shall coordinate location of site light pole as not to interfere with other equipment, and to best illuminate wet well. Owner to field approve final site light pole location.

1.02 CONTRACTOR SUBMITTALS

A. General: Submittals shall be in accordance with the requirements of Section 26 05 00 – Electrical Work, General.

1. Catalog literature for each fixture.

a. Materials of construction, type of diffusers, hardware, gaskets, reflector and chassis, finish, and anchor bolts.

b. Luminaries: Submit technical photometric data for each luminaries, including IES lighting classification and isolux diagram. Submit fastening details of luminaries to structure and method of fastening.

B. Submit site light pole base reinforcement and concrete design. Include reinforcement bar type, spacing, and quantities. Include concrete strength. Submittal shall include details for construction. Show Ufer grounding system in detail.

C. Substitutions for specified fixtures: Contractor shall provide a sample of the specified luminaries and the proposed substituted luminaries for each proposed substitution. Substitutions will be accepted only if judged equal or better in performance characteristics, construction quality, ease of maintenance, and aesthetic appearance by Owner and Engineer.

1.03 QUALITY ASSURANCE

A. Lighting fixtures shall be stored in their original cartons from the manufacturers until the time of installation.

1.04 CLEANUP

Fixture lenses, diffusers, and reflectors shall be cleaned just prior to the system demonstration test.

PART 2 - PRODUCTS

2.01 GENERAL

A. Provide luminaires as shown in Fixture Schedule. Provide luminaires with all electrical components easily accessible and replaceable without removing the luminaries.

B. Refer to Section 26 27 26 – Wiring Devices for Site Light pole mounted switch and weatherproof cover.

C. Special Requirements

1. Contractor shall install appropriate fittings provided by the luminaries' manufacturer to make the assembly complete.

2. Provide outdoor luminaires with "Suitable For Wet Locations" label.

3. Provide Shed luminaires with "Suitable For Damp Locations" label.

PART 3 - EXECUTION

3.01 LUMINAIRES

A. General

1. Locate and orient site light fixture in field with Engineer and Owner prior to installation. Test site light in field with pole mounted toggle switch in weatherproof cover and photocell control.

2. Install each luminaire in a manner recommended by the luminaire manufacturer and accepted by the Engineer. Test Shed lights with Shed light switch.

3. Be responsible for handling the luminaires, installing plumb and level, and keeping luminaires clean.

4. Provide and install all fixtures complete, ready for service.

5. After construction of total project is completed, remove all labels and other markings, wash dirty luminaires inside and out with a nonabrasive mild soap or cleaner. Clean luminaries' plastic lenses with antistatic cleaners only. Touch up all painted surfaces of luminaires with high-grade exterior enamel, and poles with paint supplied by manufacturer.

END OF SECTION

SECTION 31 00 00

EARTHWORK

PART 1: GENERAL

1.01 DESCRIPTION

Contractor furnished labor, materials, equipment, and incidentals necessary to perform all excavation, backfill, grading, and compaction required to complete the work shown on the Plans and specified herein. The work shall include, but not necessarily be limited to, excavation for structures, footings, conduit, pipe, and paving; backfilling and fill; embankment and grading; disposal of surplus and unsuitable materials; hydroseeding; and all incidental related work.

1.02 REFERENCED SECTIONS

The following Sections are referenced in this Section:

1. Section 01 33 00: Submittals
2. Section 31 23 33: Trenching, Backfilling, and Compacting

1.03 GEOTECHNICAL REPORT

See Appendix A for the Geotechnical Report.

1.04 QUALITY ASSURANCE

A. Reference Specifications, Codes, and Standards

This section references the following documents. They are a part of this section insofar as specified and modified herein. The latest edition of referenced publications in effect at the time of bid opening shall govern. In case of conflict between the requirements of this section and the listed documents, the requirements of this section shall prevail.

Reference	Title
ASTM D1556	Density and Unit Weight of Soil in Place by the Sand-Cone Method
ASTM D1557	Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft^3 (27,000 kN-m/m^3))
ASTM D6938	In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth)

B. Tests

1. The District or their Representative shall take samples and perform moisture content, gradation, compaction, and density tests during compaction and placement of backfill materials to check compliance with these specifications.
2. The Contractor shall remove surface material at locations designated by the Engineer and provide such assistance as necessary for sampling and testing.
3. The Engineer may direct the Contractor to construct inspection trenches in compacted or consolidated backfill to determine that the Contractor has complied with these specifications.

4. Tests will be made in accordance with the following:

Test	Standard Procedure
Moisture content	ASTM D6938
Density in-place	ASTM D1556 or ASTM D6938
Moisture-density relationships	ASTM D1557

1.05 SUBMITTALS

Comply with the General Provisions and include test results, certifications, and source for all earthwork materials.

PART 2: PRODUCTS

2.01 MATERIALS

A. Imported fill

Imported fill shall be imported granular material with a maximum plasticity index 12 and a three-inch maximum particle size. Imported fill shall be approved by the Engineer prior to importation to the site.

B. Engineered Fill

1. Engineered fill material shall consist of soil excavated onsite, free of debris, wood, trash, peat, and other objectionable material which may be compressible, or which cannot be compacted properly.
2. Engineered fill shall be well graded and shall possess sufficient fines such that no nesting or voids result in the compacted mass.
3. Engineered fill shall contain less than 3% organic matter or other deleterious substances by weight and shall not contain rocks or rubble fragments over three inches in greatest dimension.
4. Soil removed during excavations will require drying prior to use as engineered fill material. Lime can be mixed with soil to dry it to compactable moisture content. The percentage of lime is dependent on the moisture content of the soils.
5. Engineering fill shall comply with all material requirements in the Geotechnical Report.

C. Crushed Rock (Drain Rock)

1. Crushed rock shall be clean and free draining and conform to the following gradation:

Sieve Size	Percent Passing by Weight
3/4”	100
No. 4	0-5

2. Crushed rock material shall be composed of hard, durable, sound pieces having a specific gravity of not less than 2.60.

D. Pipe Bedding and Pipe Zone Material

Pipe bedding and pipe zone material shall be import sand. Sand shall be free of clay or organic material, suitable for the purpose intended, and conform to the following gradation:

Sieve Size	% Passing
#4	90-100
#200	0-5

E. Trench Backfill Material

Native material meeting the requirement of Engineered Fill or 3/8-inch minus granular material conforming to the following gradation:

Sieve Size	% Passing
3/4"	100
3/8"	100
#4	35 - 55
#30	20-60
#200	0-10
Sand Equivalent	30min
Minimum Dry Density	80 lb/cu ft
Coefficient of Permeability	1.4 in/hr

F. Gravel Material

1-inch minus aggregate material obtained from a single source of uniformly graded angular rock, shall be clean and free draining with no more than 2% passing a No. 4 sieve, and shall be of such a nature that it can be spread and compacted to produce a stable driving surface.

G. Filter Fabric Material

Permeable, nonwoven, shall not act as a wicking agent, and shall conform to the requirements of the Filter Fabric found in Section 88 of the most current Standard Specifications, as issued by the California Department of Transportation.

H. Controlled Low Strength Material (CLSM)

1. Hand-excavatable, free-flowing and self-compacting material that consists of cement, pozzolan fly ash, fine and coarse aggregates, and water that has been mixed in accordance with ASTM C94.
2. The CLSM shall have a minimum 28-day compressive strength of not less than 50 psi and a maximum 28- day compressive strength of no more than 150 psi.
3. Placement of backfill or concrete on top of the CLSM is not allowed until the CLSM passes a ball drop test described in ASTM D6024.

PART 3: EXECUTION

3.01 GENERAL

A. Control of Water

Keep excavations free from water during construction. Groundwater shall be maintained either naturally or by dewatering at least three feet below the lowest anticipated excavation depth.

B. Surplus Material

1. Unless otherwise specified, surplus excavated material shall be disposed of at the Contractor's expense.
2. The Contractor shall satisfy himself that there is sufficient material available for the completion of the work before disposing of any material inside or outside the site. Shortage of material, caused by premature disposal of any material by the Contractor, shall be replaced by the Contractor at his expense.

C. Hauling

When hauling is done over highways or city streets, the loads shall be trimmed and the vehicle shelf areas shall be cleaned after each loading. The loads shall be watered after trimming to eliminate dust.

D. Maintenance of Roadways

All earthwork operations shall be performed in a manner which does not disrupt the continuous flow of traffic on existing roadways. All streets shall be swept clean daily where dirt and debris result from contractor's operations.

E. Finish Grading

1. Finish grades and existing or natural grades in the area of work are indicated on the plans. If no finished grade is shown on the Plans, Contractor shall grade to existing.
2. The Contractor shall do all grading, filling or excavating as required to completely grade the site to lines and grades shown, and to provide for the indicated drainage.
3. Where finished grade corresponds practically with existing grade, the ground shall be worked up and graded off evenly with existing grade.
4. Filled areas shall be compacted so as to prevent settlements and the Contractor shall be responsible for a period of one year after final acceptance of the project to provide additional fill as necessary to bring to grade any areas which settle below the indicated grades and to replace or repair any planting or work damaged by such settlement.

F. Tolerances

1. Finished grade shall be to the line and grade shown on the plans to within a tolerance of plus or minus 0.05 ft.

2. Allowance for topsoil and grass cover, and sub-base and pavement thickness shall be made so that the specified thickness can be applied to attain the finished grade.

G. Control of Erosion

1. The Contractor shall maintain earthwork surfaces true and smooth and protected from erosion.

2. Erosion control measures, such as silt fences, filter fabric, sedimentation ponds, placement of straw waddles along the peripheries of construction sites, temporary detention ponds, and terraced slopes, shall be employed as appropriate and shall be in place prior to any clearing or grading activity.

3.02 EXCAVATION AND COMPACTION

A. General

1. Excavation shall be in accordance with the Plans and as required for construction. Excavations shall be kept free from water while construction is in progress. The Engineer shall be notified immediately in writing if it becomes necessary to remove soft, weak, or wet material. Wet excavated materials may need to be dried by aeration prior to being used as engineered fill.

2. Soil disturbed or weakened by the Contractor's operations and soils permitted to soften from exposure to weather shall be excavated to firm foundation and refilled with engineered fill material compacted to 95 percent of ASTM D1557, maximum density. All work of this nature will be at the Contractor's expense.

B. Trench Excavation

1. Trench sides shall be constructed as nearly vertical as practicable. Sides of trenches shall not be sloped between the bottom of the trench and the elevation of the top of the pipe.

2. Bottom of trenches shall be graded accurately to provide uniform bearing and support for each section of pipe or conduits on undisturbed soil, or bedding material as indicated or specified at every point along its entire length except for portions where it is necessary to excavate for bell holes and for making proper joints.

3. Bell holes and depressions for joints shall be dug after trench has been graded. Dimension of bell holes shall be as required for properly making the joint to ensure that the bell does not bear on the bottom of the excavation. Trench dimensions shall be as indicated.

C. Structural Excavation

1. General

a. The bottom excavation elevation shall be enough to allow the proper placing of forms and concrete construction to undisturbed weathered material to the elevations indicated, or as specified herein.

b. Unless otherwise specified, excavations shall extend enough distance from walls and footings to allow for placing and removal of forms, installation of

services, and for inspection, except where concrete is specified to be placed directly against excavated surfaces.

2. Foundation Inspection

   a. Whenever any structure excavation is substantially completed to grade, the Contractor shall notify the Engineer who will inspect the foundation for uniformity and suitability as a structure foundation.

   b. No gravel, rock, sand, concrete or masonry shall be placed until the foundation has been inspected by the Engineer.

   c. The Contractor shall, if directed by the Engineer, dig test pits and make test borings and foundation bearing tests.

   d. If the material tested complies with the specifications, the cost thereof will be paid for as extra work.

   e. If the material tested does not comply with the specifications, the cost thereof (initial testing, remedial work, re-testing) will be borne by the Contractor.

3.03 SUBGRADE PREPARATION

A. Ground surfaces receiving fill shall be prepared by clearing and grubbing as specified in these specifications, and by removing soil which is high in organic content and other deleterious material.

B. Subgrade shall then be scarified to a depth of 8 inches, brought to a uniform moisture content of one (1%) to three percent (3%) above optimum and compacted to at least 90 percent (90%) maximum dry density as determined by ASTM D1557.

3.04 FILLING OPERATIONS

A. General

1. The Contractor shall be responsible for the maintenance and protection of all embankments and fills made during the contract period and shall bear the expense of replacing any portion which has been displaced due to carelessness, negligent work, erosion or failure to take proper precautions.
2. If the existing slope in an area to be filled is greater than 5:1, the Contractor shall bench the area prior to filling to allow each lift to be keyed 1 foot into the existing slope.

B. Construction of Engineered Fill and Imported Fill

1. Finish grade shall be established with onsite engineered fill and imported fill placed in lifts not to exceed eight inches in compacted thickness and uniformly compacted at or near the optimum moisture content.
2. Each layer shall be spread evenly and shall be thoroughly mixed during spreading to promote uniformity of the material in each layer.
3. When the moisture content of Engineered Fill with clay materials is less than two percent (2%) over optimum, water shall be added until a moisture content of at least two percent (2%) over optimum is achieved.

4. When the moisture content of Imported Fill is less than optimum, water shall be added until a moisture content of at least optimum is achieved.
5. When the moisture content of the Engineered Fill is too high to permit the specified compaction, the fill shall be aerated by blading or other methods until satisfactory moisture content is achieved.
6. No fill shall be placed during weather conditions, which will alter the moisture content of the fill materials sufficiently to make adequate compaction impossible.
7. After placing operations have been stopped because of adverse weather conditions, no additional fill material shall be placed until the last layer compacted has been checked and found to be compacted to the specified densities.

C. Pipe Bedding and Trench Backfill

1. Bedding

   a. Provide six-inch minimum bedding material under pipe. Bedding shall be placed in 6-inch maximum loose lifts.

   b. Provide uniform and continuous support for each section of utility except at bell holes or depressions necessary for making proper joints.

   c. Bring up evenly on each side and along the full length of the pipe.

   d. Ensure that no damage is done to piping or their protective coatings.

   e. Compact each loose lift as specified below before placing the next lift.

   f. Do not place bedding in freezing weather or where the material in the trench is already frozen or is muddy, except as authorized.

2. Backfilling

   a. Backfill shall be placed in 6-inch maximum loose lifts, mechanically consolidated and shovel sliced under the haunches of the pipe. See County Development Standards for backfill and compaction requirements.

   b. Where settlements greater than the tolerance allowed herein for grading occur in trenches and pits due to improper compaction, excavate to the depth necessary to rectify the problem, then backfill and compact the excavation as specified herein and restore the surface to the required elevation.

   c. Coordinate backfilling with testing of Utility.

3. Unsuitable Material Under Bedding

   a. If soft, spongy, unstable, or similar other material is encountered upon which the bedding material or pipe is to be placed, this unsuitable material shall be removed to a minimum depth of 12-inches below the pipe.

b. The 12-inch depth shall be backfilled with pervious material or accepted bedding material suitably compacted.

c. Sufficient pervious material shall be installed to provide a stable base accepted by the Engineer prior to installation of the utility, pipe, or structure.

3.05 COMPACTION

A. General

1. Each layer or lift of material specified shall be compacted so that the in- place density tested is not less than the percentage of maximum density identified herein. Compaction shall be accomplished by mechanical equipment such as tamping rollers, sheepsfoot rollers, pneumatic tire rollers, vibrating rollers, or other mechanized tampers suitable for the work.
2. Compaction of materials by ponding and jetting is prohibited.
3. Compaction equipment and procedures are subject to approval by the Engineer.
4. Compaction shall be in accordance with Section 31 23 33.

B. Consolidation of Crushed Rock

1. Crushed rock shall be consolidated by one of three methods, as follows:

   a. A minimum of three (3) passes with a vibrator plate compactor

   b. Tamping of the crushed rock as it is placed, using the bucket of the backhoe

   c. Thoroughly wheel rolling with equipment

2. Each lift of rock shall not exceed 12 inches of unconsolidated thickness.

3.06 CLEAN UP

After completing all earthwork, the Contractor shall leave the site in a neat and clean condition, doing all such grading as is required by the plans. Any existing features, structures, and other facilities damaged or affected by the work shall be replaced, repaired, or restored to their original condition or better.

END OF SECTION

SECTION 31 11 00

DEMOLITION, CLEARING, GRUBBING, AND STRIPPING

PART 1: GENERAL

1.01 DESCRIPTION

Work Included: Demolition, clearing, grubbing, and stripping required for this work includes, but is not necessarily limited to:

A. Felling and removal of trees, stumps, roots, and tree debris.

B. Removal of surface rock and all debris.

C. Removal of surface organic topsoil layer.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Section 31 00 00: Earthwork

B. Section 31 23 33: Trenching, Backfilling, and Compacting

C. Section 31 23 00: Structure Excavation and Backfill

1.03 LIMITS OF WORK

Perform demolition, clearing, grubbing, and stripping operations to the following limits:

A. Demolition: Perform demolition of existing facilities as designated on the contract drawings.

B. Clearing: Perform clearing operations throughout the project site, including, but not limited to, areas upon which facilities, ponds, roadways, structures, landscaping or structural fill will be placed, and all borrow sites.

C. Grubbing: Perform grubbing operations at all locations identified for clearing.

D. Stripping: Perform stripping operations at the following locations as:

1. The area of the plant site.
2. The new access roadways.
3. The effluent pipeline corridor.
4. The pond sites
5. Irrigation/borrow fields, as required to meet fill requirements

E. Any and all areas that have been demolished, cleared, grubbed or stripped that has not be covered by any other order of work and is left as bare or native ground ,excluding the irrigation fields, shall have a finishing treatment applied at the discretion of the engineer and may consist of one of the following: hydroseeded and continuously irrigated until established, covered with 2-inch Class 2 aggregate base and compacted to 95%, paved, or receive authorization by the engineer to remain it the native state.

1.04 CLEARING

Remove and dispose of trees, snags, stumps, shrubs, brush, limbs, and other vegetative growth to the limits defined in Section 1.03. Remove all evidence of branches greater than 1-inch in diameter of thickness. Remove and dispose of trash piles and rubbish. Protect structures and piping above and below ground, trees, shrubs, and vegetative growth and fencing which are not designated for removal or which exist outside project limits.

1.05 GRUBBING

After clearing, remove and dispose of wood or root matter, including stumps, trunks, roots, or root systems greater than 1-inch in diameter to the limits defined in Section 1.03.

1.06 STRIPPING

A. After grubbing, strip the organic material to the limits defined in Section 1.03 to a depth of not less than 6-inches or to a depth required to remove all deleterious matter, vegetation, or cementations larger than 1 inch in the maximum dimension. Upon completion of the stripping operation, the remaining material, if utilized for structural fill, shall not exceed a concentration of organics in excess of 3 percent by dry weight. Dilution shall be accomplished by means of disking.

B. Stripping material shall be stockpiled onsite. All stockpiled material, including existing stockpile in irrigation fields, shall be spread across the borrow site to drain towards the tailwater ditch.

1.07 QUALITY ASSURANCE

A. Qualifications of Workmen: Provide at least one person who shall be present at all times during tree clearing and grubbing operations and who shall be thoroughly familiar with the types of trees involved and who shall direct the trimming of roots and limbs where required.

B. Codes and Standards: In addition to complying with all pertinent codes and regulations, comply with the requirements of those insurance carriers providing coverage for this work.

1.08 JOB CONDITIONS

A. Dust Control: Use all means necessary to prevent the spread of dust during performance of the work; thoroughly moisten all surfaces as required to prevent dust being a nuisance to the public, neighbors, and concurrent performance of other work on the site. Winds of more than 10 MPH causing dust to leave site will require Contractor to limit dust causing activities.

B. Burning: On-site burning will not be permitted.

C. Protection: Use all means necessary to protect existing objects designated to remain and, in the event of damage, immediately notify the Engineer and make all repairs and replacements necessary for approval by the Engineer at no additional cost to the Owner.

PART 2: MATERIALS

2.01 TEMPORARY BARRICADES

Unless otherwise specifically approved by the Engineer, use only new and solid lumber of utility grade or better to construct temporary barricades around the objects designated to remain.

2.02 PRUNING PAINT

Use only a pruning paint specially formulated for horticultural application to cut or damaged plant tissue and approved by the Engineer for use on this work.

2.03 EXPLOSIVES

Do not use explosives on this project.

2.04 OTHER MATERIALS

All other material not specifically described but required for proper completion of the work of this Section, shall be as selected by the Contractor subject to approval of the Engineer.

PART 3: EXECUTION

3.01 PREPARATION

A. Notification: Notify the Engineer at least two full working days prior to commencing the work of this section.

B. Site Inspection:

1. Prior to all work of this section, carefully inspect the entire site and all objects designated to be removed and to be preserved.
2. Locate all existing inactive utility lines to be encountered by the new work and determine all requirements for disconnecting and capping. Abandonment of piping requires capping at each end or plugging with concrete to the satisfaction of the Engineer.
3. Locate all existing active utility lines traversing the site and determine the requirements for their protection.

C. Clarification:

1. The Drawings do not purport to show all objects existing on the site.
2. Before commencing the work of this section, verify with the Engineer all objects to be removed and all objects to be preserved.

D. Scheduling:

1. Schedule all work in a careful manner with all necessary consideration for neighbors, operation of existing facilities, and the public.
2. Avoid interference with the use of, and passage to and from, adjacent buildings and facilities.

E. Disconnection of Utility: Before starting site operations, disconnect or arrange for the disconnection of all utility services designated to be removed, performing all such work in accordance with the requirements of the utility company or Owner involved.

F. Protection of Utility: Preserve in operating condition all active Utility traversing the site and designated to remain.

3.02 STRUCTURE DEMOLITION

A. Facilities so designated on the plans shall be demolished, and all materials there from shall become the property of the Contractor and shall be removed and disposed of away from the site. Any equipment or pipework connected within a structure which is designated to be removed and saved or relocated shall be removed before demolition begins. All other equipment within the structure shall become the property of the Contractor.

B. All concrete and rock shall be removed to firm undisturbed soil and scarified to a depth of 12 inches, unless otherwise noted, and shall be disposed of off-site. Concrete not removed shall be broken to prevent entrapment of water, as directed by the Engineer. Concrete includes all reinforcement and embedded items. Pipework and conduit within 10 feet of a structure shall also be removed to firm undisturbed soil and scarified to a depth of 12 inches unless otherwise noted.

C. Safety Requirements: The Contractor's attention is directed to the provisions of Subpart T of the OSHA Safety and Health Standards for Construction and the provisions of Article 31 of the Construction Safety Orders of the California Division of Industrial Safety governing the work of demolition. The Contractor shall perform all the work hereunder in accordance with said provisions, and where in conflict, the more stringent shall apply.

D. Backfill and Grading: After facilities have been demolished and all material removed, any remaining depression or hole shall be backfilled, and the area finish graded as specified in Section 31 00 00. Rubble and broken concrete will not be allowed to be used as fill material.

3.03 ROADWAY DEMOLITION

A. Where shown on the contract drawings, the Contractor shall remove entire pavement section including base material. This will also be necessary where deemed by the Engineer that extensive pipe construction has caused a loss of pavement integrity. Base material may be stockpiled and reused where appropriate and only with the approval of the Engineer.

B. Asphalt concrete, concrete curb, and gutter materials to be demolished shall be removed from the site by the Contractor at no additional cost to the Owner.

3.04 PIPE DEMOLITION

A. Unless otherwise specified, or in conflict with a proposed pipeline or structure, all pipes shown to be demolished shall be abandoned in place and have each end capped with at least a 24-inch long plug of concrete or grout material within the pipe. Piping subject to internal pressure upon abandonment shall be capped with pressure retaining caps or plugs.

B. All pipe materials to be removed including pipe, fittings, valves, and thrust blocking shall be removed from the site by the Contractor at no additional cost to the Owner.

3.05 CLEARING AND GRUBBING

A. Area to be Cleared and Grubbed:

1. The Contractor shall restrict clearing and grubbing to the areas designated for new construction or adjustment of grades on the plans. Surrounding trees shall be protected from damage.
2. Where limbs or roots of trees designated to remain extend into work areas, the limbs or roots shall be trimmed in accordance with the provisions of this section.

B. Felling of Trees:

1. Use all necessary care to protect the roots and branches of trees designated to remain, and to prevent damage to persons and properties.
2. Immediately after felling a tree, remove the branches, cut trunk and limbs as necessary for removal, and clear the debris. Remove tree roots within a minimum of 3 feet below the existing grade.

C. Trimming of Trees:

1. In company with the Engineer, ascertain the limbs and roots which are to be trimmed and clearly mark them to designate the approved point of cutting.
2. Cut evenly, using proper tools and skilled workmen to achieve neat severance with the least possible damage to the tree.
3. Promptly coat the cut area with the approved pruning paint in strict accordance with the manufacturer's recommendations.
4. In the case of root cuts, apply wet burlap or other protection approved by the Engineer, as required, to prevent drying out.

D. Grubbing:

Remove all surface rocks and all stumps, roots, and vegetation within the limits of construction. Roots shall be removed to at least 2.5 feet below proposed finish grade.

3.06 PLACEMENT OF STRIPPINGS

Strippings shall be removed from the site. The contractor may coordinate with the Engineer to stockpile strippings and then spread on project site area should a specific site area be available.

3.07 CONSTRUCTION OF BARRICADES

A. Layout:

1. At all trees designated to be preserved, construct a temporary barricade around the tree at the tree's approximate drip line.
2. Construct barricades at least three feet high, consisting of two inch by four inch or larger posts set at least 18 inches into the ground at not more than six feet on centers, joined at the top by one inch by six inch or larger boards firmly nailed to

the posts. Metal post with orange safety fencing may also be used if allowed by the local Owner having jurisdiction.

B. Protection:

1. Take special care in setting posts to not damage tree roots.
2. Do not permit stockpiling of materials or debris within the barricaded area nor permit the earth surface to be changed in any way except as specifically approved by the Engineer.

C. Maintenance: All protective fencing shall be inspected and maintained by the contractor at weekly intervals. Any damaged fencing shall be restored within one week.

D. Removal of Barricades: All protective fencing including posts and fabric shall be removed from the site at the completion of the work at the Contractor's expense.

3.08 REMOVAL OF DEBRIS

A. Remove all debris from the site and leave the site in a neat and orderly condition to the approval of the Engineer. Dispose of debris off site at a location approved by the Engineer.

B. Removal of demolished materials shall be included in the applicable lump sum base bid item and shall not be paid on a unit cost basis.

END OF SECTION

SECTION 31 23 00

STRUCTURE EXCAVATION AND BACKFILL

PART 1: GENERAL

1.01 DESCRIPTION

The work of this section consists of all structure excavation and backfill required to complete the work, including rock excavation and furnishing select or imported backfill. It includes disposal of surplus or unsuitable material.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Section 01 33 00: Submittals

B. Section 31 00 00: Earthwork

C. Section 31 11 00: Demolition, Clearing, Grubbing, Stripping

D. Section 31 23 33: Trenching, Backfilling, and Compacting

1.03 QUALITY ASSURANCE

Evaluation of all fill materials and testing required to determine compliance for the work of this section will be the responsibility of the Contractor and at the Contractor's expense. Areas where test results indicate noncompliance shall be corrected before placing additional backfill.

1.04 PROJECT CONDITIONS

A. Excavations should be performed carefully to avoid damaging existing underground Utility and adjacent structures. Adjacent improvements should be monitored by the Contractor so that excavation methods and support systems can be modified in a timely manner, if surface deflections are observed.

B. Take necessary precautions to prevent the entrance of soils and other materials into streambeds, lakes, or water courses.

1.05 RELATIVE COMPACTION TEST

A. The Contractor will test for compaction every 100 square feet at locations determined by the Engineer.

B. Relative compaction is defined as the ratio, in percent, of the as-compacted dry density to the laboratory maximum dry density. The laboratory maximum dry density is defined in accordance with ASTM D1557, latest edition.

C. Where compaction tests indicate a failure to meet the specified compaction, the Contractor will take additional tests every 50 square feet in each direction until the extent of the failing area is identified. Rework the entire failed area until the specified compaction has been achieved.

PART 2: MATERIALS

2.01 ENGINEERED FILL

See Section 31 00 00 for Material Requirements.

2.02 CRUSHED ROCK

Material shall be crushed rock of one inch (1") maximum size, with no material passing a Number four (#4) sieve.

2.03 AGGREGATE BASE

Aggregate base shall be Class 2 aggregate base, ¾" maximum as specified in Section 26 of the most recent California Department of Transportation Standard specifications.

2.04 DRAIN ROCK

Drain rock shall be Class 1, Type B permeable material as specified in Section 68 of the most recent California Department of Transportation Standard specifications.

2.05 DRAIN ROCK FABRIC

Drain rock fabric shall be non-woven geotextile fabric.

PART 3: EXECUTION

3.01 CLEARING

Perform clearing operations in accordance with Section 31 11 00.

3.02 STRUCTURAL EXCAVATION

A. General: All excavation for structures shall be done to the dimensions and levels indicated on the drawings or specified herein.

1. Under all structures, the Contractor shall:

    a. Excavate to sub-grade, remove and dispose of organic material and unsuitable soils.

    b. Scarify the surface a minimum depth of 8 inches; bring the moisture content to at least 3 percent above optimum and compact to not less than 90 percent relative compaction.

    c. Place Engineered Fill in 8-inch maximum lifts to obtain sub-grade elevations. Compact to not less than 95 percent relative compaction and at a moisture content of at least 2 percent above optimum.

2. Under all pavements, the Contractor shall:

    a. Excavate to below sub-grade, remove and dispose of organic material and unsuitable soils.

b. Scarify the surface a minimum depth of 12 inches; bring the moisture content to at least 3 percent above optimum and compact to not less than 95 percent relative compaction.

c. Place Engineered Fill in 8-inch maximum lifts to obtain sub-grade elevations. Compact to not less than 95 percent relative compaction and at a moisture content of at least 2 percent above optimum.

3. Excavation shall be made to such width outside the lines of the structure to be constructed therein as may be required for proper working methods, the erection of forms and the protection of the work. Care shall be taken to preserve the foundation surfaces shown on the drawings in an undisturbed condition. If the Contractor excavates or disturbs the foundation surfaces shown on the drawings or specified herein without written authorization of the Engineer he shall replace at his expense such foundations with compacted gravel foundation fill or other material approved by the Engineer in a manner which will show by test an equal bearing strength with the undisturbed foundation material.

B. Bracing, Sheeting, and Shoring: Care shall be exercised in excavating for lower footings not to disturb bearing under higher adjacent footings or structures. Existing structures and pipework shall be adequately braced and cared for so that no damage will result. The Contractor shall submit structural calculations and drawings signed and sealed by a civil engineer registered in the State of California showing members, connections, and anchorage of the proposed bracing, sheeting, and shoring. The Contractor shall provide suitable sheeting and shoring, where necessary, for protection of the excavations. All such sheeting and shoring shall be removed unless otherwise specifically authorized.

C. Unsuitable Materials: To suit field conditions, excavation below the depths shown may be ordered, but changes may only be made as directed. Soft, spongy, or unsuitable bearing material of any kind shall be entirely removed down to solid bearing soil and replaced with an engineered fill as specified herein. In such event only the excess excavation and fill will be paid for as extra work.

D. Dewatering: In accordance with Section 02140.

E. Approval of Excavation: The Contractor shall notify the Engineer when excavation for a structure is complete and no forms, reinforcing steel or concrete, shall be placed until the excavation has been deemed acceptable by the Engineer. Once the excavation is deemed acceptable, the Contractor must protect the work from flooding or groundwater uplift.

F. Disposal of Waste Excavation: Excavated material determined by the Engineer to be unsuitable, or in excess of the amounts required for backfill shall be disposed off-site at no additional cost to the Owner.

3.03 ENGINEERED FILL

A. General: All soil under structures, pavements, and at other locations where indicated on the drawings shall be made using Engineered Fill subbase, carefully controlled and compacted on a prepared surface.

B. Surface Preparation: The surface on which fill is to be placed shall be free of all vegetation, debris, or other objectionable material, and all large roots shall be grubbed out to a depth of at least 2 feet below footing, slab, or pavement elevations and 5 feet

beyond the limits of the proposed improvements. The surface shall be scarified to a depth of 12 inches, brought to a moisture content of optimum plus approximately 2 percent. It may be necessary to adjust the moisture content of the sub-grade soil by watering or aeration to bring the moisture content of the soil near optimum in order that the specified densities can be obtained.

C. Placement of Fill:

1. Fill materials shall be spread in a maximum of 8-inch lifts and shall have uniform moisture content that will provide the specified dry density after compaction. If necessary to obtain uniform distribution of moisture, water shall be added to each layer by sprinkling and the soil disced, harrowed, or otherwise manipulated after the water is added. If the material is too wet, the moisture content shall be reduced as necessary by spreading and aerating.
2. Field density tests shall be used to check the compaction of the fill materials. Sufficient tests shall be made on each layer by the Engineer to assure adequate compaction throughout the entire area. If the dry densities are not satisfactory, the contractor will be required to increase the weight of the roller or the number of passes as required to produce the specified densities.
3. Where trenches must be excavated in Engineered Fill these trenches shall be backfilled with the fill materials excavated. The backfill shall be placed in 6 inch layers and each layer compacted with pneumatic tampers to provide densities as specified above. Backfill placed adjacent to walls shall be placed in a similar manner to that specified for backfill in excavated trenches.
4. No fill shall be placed during weather conditions which will alter the moisture content of the fill materials sufficiently to make adequate compaction impossible. After placing operations have been stopped because of adverse weather conditions, no additional fill material shall be placed until the last layer compacted has been checked and found to be compacted to the specified densities.

3.04 BACKFILL AGAINST STRUCTURES

Material for filling and backfilling around structures shall meet the requirements for Engineered Fill. Should the material available from excavation be insufficient or unsuitable for the required use, the Contractor shall furnish and place suitable material. Do not place backfill against newly constructed concrete structures for a period of 14 days unless authorized by the Engineer. Hand operated compactors shall be used for backfilling against concrete walls within a horizontal distance of H/2 of the structure, where H is defined as the vertical height of the backfill above the foundation. Backfill shall be placed in even, uniform lifts around the structure.

3.05 TEMPORARY EXCAVATION SLOPES

A. Based on the conditions encountered in exploratory borings, including shallow groundwater and zones of granular soil type the site may be considered OSHA “Type C”. The Contractor shall have an OSHA-approved competent person onsite during excavation and pipe placement to evaluate trench/excavation conditions and to make appropriate recommendations where necessary.

B. Sloughing and caving should be anticipated, particularly in area with seepage zones of poorly grade, cohesionless sands. Flatter slopes, shoring, or safety shields may be needed in areas where sloughing raveling or running is likely. The Contractor shall have equipment readily available to flatten slopes or install shoring if necessary. Loose

or easily erodible soils may be present locally and should be removed from excavation faces before personnel begin work below the slopes. In addition, stockpiled materials, equipment and other surcharge loads should be kept back a minimum distance from the top of the trench equal to the depth of the excavation.

3.06 EXCAVATION BOTTOM CONDITIONS

A. Based on conditions encountered in our exploratory borings, materials exposed at the base of excavations are expected to be variable ranging from lean clay with sand and gravel to silty sand with gravel.

B. Generally, some form of excavation bottom stabilization will be necessary where wet, unstable soils are exposed. Since we do not know the extent of potential locally soft or unstable areas, our field representative shall provide mitigation recommendations in the field at the time of construction. Typical mitigation alternatives include overexcavation and replacement with a gravel mat wrapping in geosynthetic fabric to prove a stable bottom.

C. The weight of pipe, contents and compacted backfill above the pipe will not result in significant increased load over present overburden. Assuming soft and/or unsuitable subgrade areas are mitigated, pipeline settlement should be negligible.

END OF SECTION

SECTION 31 23 19

DEWATERING

PART 1: GENERAL

1.01 SCOPE

The work of this section consists of providing all labor, materials, and equipment necessary to dewater trench and structure excavations.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Section 01 33 00: Submittals

B. Section 31 00 00: Earthwork

C. Section 31 23 33: Trenching, Backfilling, and Compacting

D. Section 31 23 00: Structure Excavation and Backfill

1.03 SUBMITTALS

A. In accordance with Section 01 33 00.

B. Two weeks prior to installation of dewatering facilities and commencement of excavation, submit:

1. A dewatering plan prepared and submitted to the Engineer for approval.
2. Drawings and descriptions indicating numbers, locations, arrangements, depths, capacities, and construction details, as applicable, of all dewatering system equipment and components, including standby equipment and components.
3. Methods of disposal of pumped water.
4. Methods of diverting precipitation and surface water away from excavations.
5. Method for collecting and removing precipitation within excavations as necessary.
6. Copies of executed permits necessary to perform work.

1.04 PERMITS

The Contractor shall obtain and comply with all required permits for the dewatering system and operation, disposal of water, and pay all associated fees.

PART 2: MATERIALS

2.01 FACILITIES AND EQUIPMENT

The Contractor shall provide all necessary facilities and equipment for the dewatering operations.

PART 3: EXECUTION

3.01 GENERAL REQUIREMENTS

A. The Contractor shall have on hand, at all times, sufficient pumping equipment and machinery in good working condition and shall have available, at all times, competent workmen for the operation of the pumping equipment. Adequate standby equipment shall be kept available at all times to insure efficient dewatering and maintenance of dewatering operation during power failure.

B. Dewatering shall commence at an appropriate time prior to commencing excavation and shall be continuous until facilities and structures are completed, backfilled, and, as appropriate, filled with water to prevent damage from hydrostatic uplift and/or floatation.

C. Excavations extending below site groundwater levels or encounter perched groundwater within permeable soil layers shall be dewatered. Dewatering of narrow trench excavations that penetrate less than a few feet below the groundwater level and do not encounter loose and/or cohesionless soils may be possible by directing inflow to a sump where water can be removed by a pump. Temporary dewatering of wider, deeper, and/or more extensive excavations may require well points, perimeter trench drains, and/or deep sumps. To help maintain bottom stability of wider, deeper, and/or more extensive excavations, groundwater levels shall be drawn-down a minimum of 3 feet below the lowest portion of the excavation.

D. Dewatering shall at all times be conducted in such a manner as to preserve the undisturbed bearing capacity of the subgrade soils at proposed bottom of excavation and protect temporary excavation slope stability during construction. If foundation soils are disturbed or loosened by the upward seepage of water or an uncontrolled flow of water, the affected areas shall be excavated and replaced with drain rock on geotextile fabric at no additional cost to the Owner.

3.02 DISPOSAL OF WATER

A. The Contractor shall be responsible to design and control the dewatering operations such that disposal of water does not cause erosion or other damage and such that water to be disposed of is free from silt and other objectionable materials and in compliance with any applicable permit requirements. Settling basins and/or other means shall be used as necessary.

B. Contractor shall utilize applicable construction activity Best Management Practices (BMP) for the project. Refer to “Caltrans Storm Quality Handbooks, Construction Site Best Management Procedures Manual”, Latest Edition.

3.03 TERMINATION OF DEWATERING

The termination of dewatering operations shall be performed in such a manner as to maintain the undisturbed state of the natural foundation soils, prevent disturbance of compacted backfill and prevent flotation or movement of structures, pipelines and sewers. Dewatering devices/features shall either be removed or abandoned in place in accordance with legal regulatory requirements and as approved by the Engineer.

END OF SECTION

SECTION 31 23 33

TRENCHING, BACKFILLING, AND COMPACTING

PART 1: GENERAL

1.01 DESCRIPTION

A. The work of this section consists of trenching and backfilling for the construction and installation of pipelines, conduits, and cables. All trenching will be open cut, unless otherwise approved in writing. It includes all trenching or tunneling, construction of cribbing and cofferdams, incidental work, and providing specified backfill.

B. Excavated soil at the site will generally be suitable for use as backfill above the pipe zone provided it does not contain deleterious matter, vegetation or cementations larger than 3 inches in maximum dimension. Pipe zone materials (bedding shading, etc.) shall conform to the requirements of the pipe manufacturer or utility authority, as appropriate and will likely consist of imported aggregate or sand.

C. Temporary excavation, sloping, and shoring shall be per Section 31 40 00.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Section 01 33 00: Submittals

B. Section 33 05 05: Testing of Gravity Sewer Lines and Manholes

C. Section 31 23 19: Dewatering

D. Section 31 00 00: Earthwork

E. Section 31 23 00: Structure Excavation and Backfill

F. Section 31 40 00: Sheeting, Waling, and Shoring

1.03 SUBMITTALS

A. Submit an electronic copy of a report from a testing laboratory verifying that backfill material conforms to the specified gradations of characteristics for granular material, imported sand, rock refill for foundation stabilization, and water.

B. Submit method of compaction in pipe zone, including removal sequence of shoring where used.

C. Provide written description of barricading, shoring, cribbing, bracing, and sloping precautions.

1.04 PROJECT CONDITIONS

A. Obtain all required permits and licenses before installing Utility under existing roads and follow the rules and requirements of the authority having jurisdiction.

B. Arrange construction sequences to provide the shortest practical time that the trenches will be opened to avoid hazard to District staff, subcontractors, and the public, and to minimize the possibility of trench collapse.

1.05 TESTING FOR COMPACTION

A. The Contractor shall test for compaction every 100 feet at locations determined by the Engineer.

B. Relative compaction is defined as the ratio, as a percentage, of the as-compacted dry density to the laboratory maximum dry density. The laboratory maximum dry density is defined in accordance with ASTM D1557, latest edition.

C. Where compaction tests indicate a failure to meet the specified compaction, the Contractor will take additional tests every 50 feet in each direction until the extent of the failing area is identified. Rework the entire failed area until the specified compaction has been achieved.

1.06 STREET ZONE

The street zone includes the asphalt concrete and aggregate base pavement section placed over the trench backfill.

1.07 TRENCH ZONE

The trench zone includes the portion of the trench from the top of the pipe zone to the bottom of the street zone in paved areas or to the existing surface in unpaved areas.

1.08 PIPE ZONE

The pipe zone shall include the full width of trench from the bottom of the pipe or conduit to a horizontal level above the top of the pipe, as shown on the contract drawings. Where multiple pipes or conduits are placed in the same trench, the pipe zone shall extend from the bottom of the lowest pipes to a horizontal level above the top of the highest or topmost pipe.

1.09 EXCAVATION BOTTOM CONDITIONS

A. Based on conditions encountered in our exploratory borings, materials exposed at the base of excavations are expected to be variable ranging from lean clay with sand and gravel to silty sand with gravel.

B. Generally, some form of excavation bottom stabilization will be necessary where wet, unstable soils are exposed. Since we do not know the extent of potential locally soft or unstable areas, our field representative shall provide mitigation recommendations in the field at the time of construction. Typical mitigation alternatives include overexcavation and replacement with a gravel mat wrapping in geosynthetic fabric to prove a stable bottom.

C. The weight of pipe, contents and compacted backfill above the pipe will not result in significant increased load over present overburden. Assuming soft and/or unsuitable subgrade areas are mitigated, pipeline settlement shall be negligible.

1.10 PIPE BEDDING

A. All earthwork operations shall be observed, and all fills tested for recommended compaction and moisture content by a geotechnical inspector.

B. Pipe zone materials (bedding, shading, etc.) shall conform to the requirements of the District and/or pipe manufacturer, as appropriate, and will likely consist of imported aggregate or sand.

C. The pipe base or bedding shall be defined as a minimum 6-inches thick layer of material immediately below the bottom of the pipe or conduit and extending over the full trench width in which the pipe is bedded.

D. Trench backfill shall be mechanically compacted. Flooding or jetting will not be allowed. Backfill shall be placed in lifts 12 inches or less in loose thickness, moisture-conditioned above optimum moisture content, and compacted to at least 90% relative compaction. Excavated soils may require drying prior to placement.

PART 2: MATERIALS

2.01 GRANULAR MATERIAL FOR BACKFILL

Granular material or granular soil for backfill used above the pipe zone shall be Class 2 Aggregate Base conforming to the most recent Caltrans Standard Specifications 26-1.02. Import material for fill shall be like site soils with an expansion index less than 20, plasticity index less than 15, be free of organic material, construction debris, and not contain rock or cementations larger than 6 inches in greatest dimension. Import soil shall contain sufficient fines (generally 15% or more) to reduce caving potential when excavated. Proposed import materials shall be sampled, tested, and approved by the Geotechnical Engineer prior to transportation to the site.

2.02 PIPE BASE AND PIPE ZONE

Pipe base and pipe zone material shall be important sand in accordance with Section 31 00 00. Pipe base and pipe zone material shall conform to the most recent Caltrans Standard Specifications 19-3 as applicable. Bedding material shall be placed a minimum of six inches below the pipeline.

2.03 PIPE ZONE MATERIAL ALTERNATIVE

Pipe zone material shall be 3/8-inch Class 2 Aggregate Base conforming to the most recent Caltrans Standard Specifications 26-1.02.

2.04 TRENCH ZONE MATERIAL

Trench zone material shall consist of native material conforming to engineered fill, in accordance with Section 31 00 00.

2.05 CEMENT SLURRY - PIPE BASE AND PIPE ZONE ALTERNATIVE

Cement slurry backfill shall consist of Type I or II Portland cement, imported sand, and sufficient water for workability, per the most recent Caltrans Standard Specification 19-3.062. The mix shall produce a minimum 28-day strength of 50 PSI and 1 x 10 -6 cm/sec permeability. Submit a mix design and confirming test results per Section 01 33 00.

2.06 CONCRETE FOR PIPE ENCASEMENT AND THRUST BLOCKS – NOT USED

2.07 WATER FOR COMPACTION

Water for compaction shall be clean and free of oil, acids, salts, and other deleterious substances. Contractor may truck in their own water or coordinate with Markleeville Water Company to obtain water. The closest fire hydrant is approximately 300 feet away from the proposed pump station and 500 feet from the manhole B2 access road. The Contractor shall coordinate with the Engineer for the use of the water, shall provide all necessary labor and equipment to extract the water, and shall be responsible for the repair of any damage to the existing facilities which can be attributed to this operation.

PART 3: EXECUTION

3.01 COMPACTION REQUIREMENTS

Unless otherwise shown in the drawings or otherwise described in the specifications for the particular type of pipe installed, relative compaction in pipe trenches shall be as follows:

A. Pipe Base: 95% relative compaction.

B. Pipe Zone: 95% relative compaction.

C. Backfill in Trench Zone not Beneath Paving or Aggregate Base Access Roadways: 90% relative compaction.

D. Backfill in Trench Zone to Street Zone in Paved Areas or Within Limits of Aggregate Base Roadways: 95% relative compaction.

E. Backfill in Street Zone in Paved Areas or within Limits of Aggregate Base Roadways: 95% of relative compaction.

F. Refill for Foundation Stabilization: 95% relative compaction.

G. Refill for Over-excavation: 95% relative compaction.

3.02 MATERIAL REPLACEMENT

Remove and replace any trenching and backfilling material which does not meet the specifications, at the Contractor's expense.

3.03 SLOPING, SHEETING, SHORING, AND BRACING OF TRENCHES

Trenches shall have sloping, sheeting, shoring, and bracing conforming with 29CFR1926, Subpart P – Excavations, CAL/OSHA requirements, and Section 31 40 00.

3.04 SIDEWALK, PAVEMENT, AND CURB REMOVAL

Cut bituminous and concrete pavements regardless of the thickness and curbs and sidewalks prior to excavation of the trenches with a pavement saw or pavement cutter. Width of the pavement cut shall be at least equal to the required width of the trench at ground surface. Haul pavement and concrete materials from the site. Do not use for trench backfill.

3.05 TRENCH WIDTHS

Trench widths in the pipe zone shall be as shown in the drawings. If no details are shown, maximum width shall be 24 inches greater than the pipe outside diameter. Comply with 29CFR Part 1926 Subpart P – Excavations. Trench width at the top of the trench will not be limited except where width of excavation would undercut adjacent structures and footings. In such case, width of trench shall be such that there is at least 2 feet between the top edge of the trench and the structure or footing.

3.06 TRENCH EXCAVATION

Excavate the trench to the lines and grades shown in the drawings with allowance for pipe thickness, sheeting and shoring if used, and for pipe base or special bedding. If the trench is excavated below the required grade, refill any part of the trench excavated below the grade at no additional cost to the Owner with foundation stabilization material. Place the refilling material over the full width of trench in compacted layers not exceeding 6-inches deep to the established grade with allowance for the pipe base or special bedding.

3.07 DEWATERING

In accordance with Section 31 23 19.

3.08 LOCATION OF EXCAVATED MATERIAL

During trench excavation, place the excavated material only within the working area. Do not obstruct any roadways or streets. Conform the federal, state, and local codes governing the safe loading of trenches with excavated material. All trenches shall be backfilled at the end of each day's operation. Trench patching with asphalt concrete shall be completed within 24 hours of trench backfill.

3.09 LENGTH OF OPEN TRENCH

Limit the length of open trench to 50 feet in advance of pipe laying or amount of pipe installed in one working day, whichever is less, and not more than 50 feet in the rear of pipe laying, except as modified by encroachment permit requirements. At the end of each working day, the trench shall be backfilled to match existing surface.

3.10 TRENCH EXCAVATION IN BACKFILL AND EMBANKMENT AREAS

A. Construct trench excavation for pipe, pipes, or conduit in backfill or embankment areas in accordance with the following procedures:

B. Construct and compact the embankment to an elevation of 1-foot minimum over the top of the layer of the largest pipe or conduit to be installed.

C. Excavate trench in the compacted backfill or embankment. Place cement slurry in the pipe base and pipe zone. Compact backfill above the pipe zone to the relative compaction required for trench zone backfill.

3.11 FOUNDATION STABILIZATION

A. After the required excavation has been completed, the Owner and/or Agency will inspect the exposed subgrade to determine the need for any additional excavation. It is the intent that additional excavation is conducted in all areas within the influence of

the pipeline where unacceptable materials exist at the exposed sub-grade. Over-excavation shall include the removal of all such unacceptable materials that exists directly beneath the pipeline to the required trench width and to the depth required. Backfill the trench to sub-grade of pipe base with fill material adequate for foundation stabilization. Place the foundation stabilization material over the full width of the trench and compact in layers not exceeding 6-inches deep to the required grade. Foundation stabilization work above and beyond the recommended stabilization of bedding and foundation preparation in this section and Section 31 23 00 may be executed in accordance with a change order. Any claims relating to this work without prior written authorization will be at the contractor's expense.

B. Refill used by the Contractor for his convenience will not receive any additional payment.

3.12 INSTALLING BURIED PIPING

A. Backfill per the detailed piping specification for the particular type of pipe and per the following.

B. Handle pipe in such a manner as to avoid damage to the pipe. Do not drop or dump pipe into trenches under any circumstances.

C. Inspect each pipe or fitting prior to placing into the trench. Inspect the interior and exterior protective coatings. Patch damaged areas in the field with material recommended by the protective coating manufacturer. Clean ends of pipe thoroughly. Remove foreign matter and dirt from inside of pipe and keep clean during and after installation.

D. Grade the bottom of the trench to the line and grade to which the pipe is to be laid, with allowance for pipe thickness and bedding depth. Remove hard spots that would prevent a uniform thickness of bedding. Place the specified thickness pipe base material over the full width of trench. Grade the top of the pipe base ahead of the pipe laying to provide firm, continuous, uniform support along the full length of pie, and compact to the relative compaction specified herein. After laying each section of the pipe, check the grade and alignment and correct any irregularities prior to laying next joint.

E. Excavate bell holes at each joint to permit proper assembly and inspection of entire joint. Fill the area excavated for the joints with the bedding material specified or detailed in the drawings.

F. When installing pipe, do not deviate more than 1-inch from line or 1/4 –inch from grade. Measure elevation at the pipe invert. The Contractor shall verify pipe grade at not more than 80 feet intervals, in the presence of the Owner's Representative.

G. After pipe has been bedded, place pipe zone material simultaneously on both sides of the pipe, in maximum 6-inch lifts, keeping the level of backfill the same on each side. Carefully place the material around the pipe so that the pipe barrel is completely supported and that no voids or compacted areas are left beneath the pipe. Use particular care in placing material on the underside of pipe to prevent lateral movement during subsequent backfilling.

H. For pipe sizes greater than 12-inches in diameter, no more backfill material than the lesser of 6-inches or 1/3rd of the pipe diameter shall be placed prior to shovel slicing.

Sufficient care shall be taken to prevent movement of the pipe during shovel slicing. Shovel slicing shall be witnessed by the Field Inspector and/or Geotechnical Engineer.

I. Compact each lift to the relative compaction specified herein.

J. Push the backfill material carefully onto the backfill previously placed in the pipe zone. Do not permit free fall of the material until at least 2 feet of cover is provided over the top of the pipe. Do not drop sharp, heavy pieces of material directly onto the pipe or the tamped material around the pipe. Do not operate heavy equipment over the pipe until at least 3 feet of backfill has been placed and compacted over the pipe.

K. When pipe laying is not in progress, including the noon hours, close the open ends of pipe. Do not allow trench water, animals, or foreign material to enter the pipe.

L. Remove and dispose of all water entering the trench during the process of pipe laying. Keep the trench dry until the pipe laying and jointing are completed.

3.13 BACKFILL COMPACTION

Compact per the detailed piping specification for the particular type of pipe and per the following:

A. Compact trench backfill to the specified relative compaction. Compact by using mechanical compaction or hand tamping. Do not use high impact hammer-type equipment except where the pipe manufacturer warrants in writing that such use will not damage the pipe. Ponding or jetting is not allowed.

B. Compact material placed within 12-inches of the outer surface of the pipe by hand tamping only.

C. Do not use any axle-driven or tractor-drawn compaction equipment within 5 feet of building walls, foundations, or other structures.

3.14 CEMENT SLURRY BACKFILL

When cement slurry backfill is utilized, pipe shall be supported by mounding imported backfill material or sandbags filled with imported backfill material. Pipe shall not be supported on wooden or concrete blocks.

END OF SECTION

SECTION 31 40 00

SHEETING, WALING, AND SHORING

PART 1: GENERAL

1.01 DESCRIPTION

The work of this section covers protective installations consisting of shores, wales, braces, posts, piling, sheeting, anchorages and fastenings required for the work of this project.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Section 01 33 00: Submittals

B. Section 31 23 33: Trenching, Backfilling, and Compaction

1.03 QUALITY ASSURANCE

Design Criteria. Contractor shall design and construct temporary and permanent sheeting, shoring, and cofferdams, which are to be used as an aid in construction and portions shall be left in permanently to prevent sediment scour. Design shall be prepared in conformance with applicable requirements of Article 6, “Excavations, Trenches, Earthwork” of Construction Safety Orders of California State Division of Occupational Health and Safety. In addition, sheet piling design shall be based on the material requirements specified herein. Sloping of excavations shall not be employed below the groundwater or maximum aqueduct water elevation. Designs shall be prepared and signed by a Civil Engineer registered in the State of California and shall be based on the stresses for various materials of construction contained in the Uniform Building Code 1994 Edition and latest supplement. The allowable stresses permitted by the Uniform Building Code may be increased 15 percent for temporary shoring used as an aid to construction.

1.04 SUBMITTALS

A. In accordance with Section 01 33 00.

B. Submit to the Engineer for record purposes copies of the drawings and calculations used to determine the strength, size, and stability of the protective installations. All designs submitted under this section shall be signed by a Structural or Civil Engineer duly registered in the State of California.

C. Prior to the start of any work involving sheeting and bracing, the Contractor shall obtain a valid excavation permit from the Cal OSHA District office as required. A copy of the permit and all accompanying drawings, data, and calculations shall be submitted to the Engineer for record purposes only and not for review or approval.

1.05 ALTERNATIVES

The use or application of alternative methods and materials, and the employment of propriety systems under lease or franchise in lieu of that specified herein, may be allowed. Demonstration of suitability and compliance with these specifications and approval of the Owner shall be required.

PART 2: PRODUCTS

2.01 MATERIALS

A. Sheet Piling

1. Sheeting shall be continuous interlock type. Steel sheeting shall be made in accordance with ASTM A857 from steel meeting the requirements of ASTM A1011, Grade 30. Sheeting shall be hot-dipped galvanized per ASTM A123 at a rate of two ounces per square foot total both sides. The sides of each piece of sheeting shall be furnished with an interlock that is continuous for the full length of the sheeting. The interlock shall have an opening of sufficient width to allow free slippage of the adjoining sheet. Sheeting shall be "Metric Sheeting" as manufactured by Contech Construction Products, Inc, or approved equal.

2. Dimensions and Section Properties. Steel sheet piling used for cofferdams or shall be standard rolled metric sections. The sheeting shall be galvanized after fabrication and have the minimum physical and sectional properties; Physical Properties: 5 gauge (0.209 inches), Sectional Properties: Modulus – 6.28 in^3, Moment of Inertia – 11.04 in^4.

PART 3: EXECUTION

3.01 INSTALLATION

A. General. Install sheeting and bracing for trench and structure excavation as the work requires. Butt planks to and/or interlock sheets to exclude groundwater and fines, preventing the erosion of voids outside sheeting. In soft, wet ground drive sheeting to a lower level as excavation progresses so that sheeting is embedded in undisturbed earth. Bracing of sheet piling may be permitted to penetrate the structural concrete only as approved by the Engineer. Install wales and struts at close intervals so as to prevent displacement of the surrounding earth and to maintain safe conditions in the work area. Any damage proven to result from improper installation shall be the responsibility of the Contractor.

B. Temporary sheeting for trench and structure excavation may be removed and re-used. Withdraw individual planks alternatively as the backfill is raised, maintaining sufficient sheeting and bracing to protect the work and workmen. Remove bracing completely. Where unstable conditions occur in the underlying strata from any cause, and withdrawal of sheeting will endanger the work, a portion of the sheeting, including bracing, may be left in place with approval of the Owner. Remove all wood within a zone extending to four (4) feet below finished grade. Leaving such material in place shall not be cause for an increase in Contract in price.

C. Sheet Piling. The Contractor has the option of using steel sheet piling for temporary protective installations. All piling installations shall be continuous.

1. Installation of Sheet Piling. Depth of piling shall be sufficient to prevent heave when the trench is dewatered. Piles shall be driven with a hammer with an adequate capacity to complete pile driving without changing hammers. The use of air or water jets to assist in driving the sheet piling will be permitted, providing that the last 5 feet of advance is by driving. Piles shall be driven accurately to the lines and grades shown or required, with each section interlocked with the sheet piles driven previously. To ensure proper alignment of the sheet piles, a driving template or jig shall be used. If any pile is damaged during driving, it shall

be removed and replaced. If piles are driven out of interlock or are not properly plumbed or aligned, the piles shall be pulled and re-driven.

2. Prevention of Damage. In installing, cutting off, or removing sheet piles, every precaution shall be taken to ensure that damage to the structure or pipeline does not occur. If damage does occur, the Contractor shall perform the necessary repairs at his own expense.

3.02 PROTECTION OF EXISTING FACILITIES

It is the Contractor's responsibility to protect existing facilities from the consequences of his work. Where any sloped excavation infringes on or potentially endangers any existing facilities or structures, provide shoring, sheeting, and bracing according to shop drawings and calculations signed and stamped by a structural or civil engineer registered in the State of California.

END OF SECTION

SECTION 32 92 19

VEGETATIVE EROSION CONTROL

PART 1: GENERAL

1.01 DESCRIPTION

The work of this section consists of furnishing and installing vegetative erosion control as specified herein. Vegetative erosion control shall be applied on all disturbed areas that are not paved, graveled, lined or landscaped including all graded or disturbed areas at the treatment plant site. This section describes both the vegetative erosion control efforts with and without anchored straw. The approach without straw shall be utilized between May 1st through October 15th and the process utilizing anchored straw thereafter.

1.02 QUALITY ASSURANCE

A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this section.

B. Planting materials shall meet or exceed the specifications of Federal, State, and Local laws requiring inspection for plant disease and insect control.

1.03 SUBMITTALS

A. Comply with pertinent provisions of Section 01 33 00.

B. Submit complete materials list of items proposed to be submitted under this section, complete data on source and quality, and sufficient data to demonstrate compliance with the specified requirements.

PART 2: MATERIALS

2.01 FERTILIZER

A. A. Commercial fertilizer shall be ammonium phosphate (16-20-0) and contain a minimum of 16 percent nitrogen, 20 percent available phosphoric acid, zero percent water soluble potash, uniform in composition, dry and free flowing, pelleted or granular.

B. B. All fertilizer shall be delivered in unbroken or unopened containers, labeled in accordance with applicable State regulations and bearing the warranty of the producer for the grade furnished.

2.02 SEED

A. A. All seed shall be delivered to the site tagged and labeled in accordance with the California Agricultural Code and shall be acceptable to the County Agricultural Commissioner. Seed mixture shall be guaranteed for a minimum of 80% germination.

B. B. Bag tag figures will be evidence of purity and germination. Time since date of

seed test shall not exceed 9 months.

C. C. Seed shall be of a quality that weed seed shall not exceed 0.5 percent of the aggregate of pure live seed (PLS) (percent germination x percent purity) and other material.

D. D. Seed shall be a mixture of the following in proportion to application rates:

Botanical Name	(Common Name)	Pure Live Seed Application Rate – Broadcast (lbs/acre)
Bromus mollis	Blanco brome	8
Hordeum brachyantherum ssp. Californicum	California barley	2
Bromus carinatus	California brome	2
Trifolium hirlum	Rose clover	6
Medicago hispida	California burclover	3

E. E. Seed shall be furnished separately or in mixture of the proportionate quantities in standard containers with the variety and net weight shown. Based on bag tags, seeding rates shall be adjusted to insure the required amounts of pure live seed.

2.03 2.03 INOCULANTS

A. A. The inoculant for treating legume seeds shall be a pure culture of Nitrogen fixing bacteria prepared specifically for the plant species and shall not be used later than the date indicated on the container. A mixing medium, as recommended by the manufacturer or approved substitute, shall be used to bond the inoculant to the seed. For nonpellet inoculated seed, two times the amount of the inoculant recommended by the manufacturer shall be used and seed shall be sown within 24 hours.

B. B. For pellet inoculated seed, at least 30 pounds of inoculant shall be used per 1,000 pounds of raw seed and the seed shall be labeled to show the Lot Number, Expiration Date, and Percent Coat of the finished product. Pellet inoculated seed shall be kept cool and sown within 180 days. Use only fresh, age-dated inoculant specifically labeled for the legume to be seeded.

2.04 2.04 WOOD FIBER MULCH

A. Wood fiber shall be a wood cellulose fiber that contains neither germination nor growth inhibiting factors. The wood fiber shall be produced from nonrecycled wood such as wood chips or similar wood materials. It shall be manufactured in such a manner that after addition and agitation in slurry tanks with fertilizer, seed, water, and other approved additives, the fibers in the material will become uniformly suspended to form a homogeneous slurry; and that when hydraulically sprayed on the ground, the material will form a blotter-like ground cover impregnated uniformly with seed; and which after application, will allow the absorption of moisture and allow the rainfall to percolate to the underlying soil. It shall be colored with a nontoxic water-soluble green dye to provide a proper gauge for metering of material over ground surfaces.

B. The wood fiber mulch may also be produced from the following materials:

1. Recycled wood fiber, such as wood chips or similar wood materials;

2. A combination of recycled newsprint and cardboard materials that contain at least 50 percent cardboard; or,
3. A combination of recycled newsprint and non-recycled wood fiber or recycled wood fiber materials that does not contain more than 50 percent newsprint.

C. Cellulose shall be certified to indicate that laboratory and field testing of the product has been accomplished and that it meets all the foregoing requirements based on testing. Weight specifications of this material from suppliers and for all application shall refer only to air dry weight of the fiber material.

D. Absolute air-dry weight is based on the normal standards of the Technical Association of the Pulp and Paper Industry for wood cellulose and is considered equivalent to 10% moisture. Each package of the cellulose fiber shall be marked by the manufacturer to show the air-dry weight content.

E. Alternate Mulching Methods: Contractor may either stockpile topsoil (or "duffing") and reapply it 6 inches thick to exposed areas as approved by the Engineer. Or, Contractor may use mechanically punched clean (free of noxious weed seeds and molds), rice barley, or wheat straw with fibers at less than six inches in length, as approved by the Engineer.

2.05 TACKIFIER

Tackifier/soil binder material shall be one of the following and shall have the property to be evenly dispersed and suspended in water when agitated: M-Binder, Sentinel, Ecotak-SAT, Fish-STIK, Soil Master WR, and Soil Sement.

2.06 WATER

Clean, Potable: Add to the slurry mixture in sufficient amount to spread uniformly the required quantity of hydromulch solids.

2.07 STRAW

Straw shall be new straw derived from rice, wheat, oats, or barley that meets the County Agricultural Commissioner's standards for weed pests. Clearance shall be obtained from the County Agricultural Commissioner, as required by law, before straw obtained outside the county in which it is to be used is delivered to the site.

2.08 ROLLED EROSION CONTROL PRODUCTS

Rolled erosion control products, including flexible nets, blankets, or mats, that are unrolled to cover exposed soil surfaces must be plastic-free.

2.09 FIBER ROLLS

Fiber rolls are composed of natural netting filled with rice or wheat straw, rice hull, wood excelsior, cotton or coconut fiber. Photodegradable polypropylene netting used for constructing fiber rolls is not allowed because of wildlife entrapment concerns.

PART 3: EXECUTION

3.01 APPLICATION PROCEDURE

A. General: Erosion control shall consist of surface preparation, seeding, fertilization, mulching, and maintenance, and potentially irrigation. Prior to October 15th, all vegetative erosion control efforts utilizing the hydroseed technique without straw will be the two-stepped process of applying seed, inoculant (if applicable), fertilizer, water, and wood fiber mulch, followed by second step of more mulch, water and tackifier/soil binder. Post October 15 application shall include a middle step of blown straw, which shall then be anchored. After the Engineer has accepted the graded surface, it shall be seeded and mulched. Seeding shall be done preferably between September 15 and October 15, however, hydroseeding can be used as a BMP during the construction season prior to September 15th, if appropriate measures are additionally provided for (i.e. eliminate vehicular traffic on area).

B. Site Preparation: Large rocks (2-1/2" or greater) should be removed from the slopes. Any uneven area should be graded so that water will not collect and cause concentrated flows; refer to Caltrans BMP# SS-4: Hydroseeding in Section 01 57 00, for grading prior to hydroseeding. If the soil surface is crusted from a previous rain, then it should be raked or dragged to break it up. Small clods or a rough appearance should not be of concern as they help to hold the seed and the rainfall. Remove all trash, weeds, and other debris.

C. Seedbed preparation shall be suspended when soil moisture conditions are not suitable for obtaining a satisfactory seedbed.

D. Fertilization: Fertilizer shall not be applied more than 15 days prior to seeding. Fertilizer shall be distributed uniformly over the seedbed at the rate of 500 pounds per acre.

E. Fertilizer shall be applied in any way that will result in uniform distribution. It is recommended that fertilizer be applied hydraulically by hydroseeder in the form of a slurry. The slurry shall also contain the required seed, inoculants (if applicable), mulch, and water. Fertilizer shall not remain in the slurry longer than two (2) hours.

F. Seedings:

1. The seed shall be drilled, broadcast, or distributed uniformly in a water slurry by hydroseeder. The seeds shall be covered by approximately ¼- to ½-inch mulch.
2. The hydroseeder shall be equipped with a built-in continuous agitation system of sufficient operating capacity to produce a homogeneous slurry and a discharge system that will apply the slurry to the slopes at a continuous and uniform rate.
3. Seed shall not remain in the slurry longer than thirty (30) minutes. The slurry in this first application shall also contain wood fiber mulch at the rate of 500 pounds per acre and the required fertilizer.
4. Application rates for wood fiber mulch products that have moisture contents greater than 15 percent shall be increased by the following factor, c:

$$C = \frac{85 \text{ percent}}{\text{Percent fiber (solids) in product}}$$

5. The wood fiber shall not remain in the slurry longer than two (2) hours. Water used shall be potable water or Class 1 or 2 agricultural irrigation water.

6. The slurry shall be continuously mixed and shall be mixed for at least five (5) minutes after the last addition before application starts. The slurry shall be applied uniformly over the site at a rate that is nonerosive and minimizes runoff.

G. Mulching:

1. Areas equal to or greater than 2:1 slope (netting installation regardless of application date), material shall be hand punched straw or wood fiber blankets or bio-composite reinforcing matting. Regions with concentrated flow shall have American Excelsior Curlex Enforcer II or equal while regions with high velocity flows shall have American Excelsoir Curles III or equal. Netting rolls shall be applied up and down the slope with a 4-inch minimum side-to-side overlap and a 3-foot minimum end-to-end overlap.
2. The upper end of the netting shall be buried at least 8 inches into the soil. Overlap of matting shall be provided. Anchor pin or staple spacing shall be 5 feet down sides and center of rolls driven perpendicularly into soil. Spacing at top end and at end overlaps shall be 1 foot. If manufacturer installation recommendations are more conservative, manufacturer recommendations take precedence.
3. Areas Less Than 2:1 Slope (Hydromulch Seeding Installation):

    a. General Equipment Requirements: Use hydraulic equipment for the application of the fertilizer, seed, and slurry of prepared wood pulp of the type approved by the Engineer. This equipment shall have a built-in agitation system and operating capacity sufficient to agitate, suspend and homogeneously mix a slurry containing up to 40 pounds of fiber plus combined total of 70 pounds fertilizer solids for each 100 gallons of water. The slurry distribution lines shall be large enough to prevent stoppage and equipped with a set of hydraulic spray nozzles which will provide a continuous non-fluctuating discharge and delivery of the slurry of the prescribed quantities uniformly, without misses, waste, or erosion. The slurry tank shall have a minimum capacity of 1,000 gallons and be mounted on a traveling unit which may be either self-propelled or drawn with a separate unit which will place the slurry tank and spray nozzles within sufficient proximity to the areas to be seeded so as to provide uniform distribution. The Engineer may allow equipment with smaller tank capacity provided that the equipment has the necessary agitation system and sufficient pump capacity to spray the slurry in a uniform coat.

    b. Mulching Prior to October 15th Application:

        1) Wood fiber with tackifier shall be distributed uniformly over the seeded area in a water slurry by hydroseeder. Application shall be made within 48 hours following seeding.

        2) The hydroseeder shall be equipped with a built-in continuous agitation system of sufficient operating capacity to produce a homogeneous slurry and a discharge system that will apply the slurry to the slopes at a continuous and uniform rate.

        3) The slurry in this second step of application shall contain wood fiber at the rate of 1500 pounds per acre and tackifier. The wood fiber shall not remain in the slurry longer than two (2) hours. Water used shall be potable water or Class 1 or 2 agricultural irrigation water.

c. Irrigation: Irrigation of hydroseeded regions shall only be mandated if application is prior to September 15th, and early rains caused germination. Irrigation shall continue until natural atmospheric moisture is enough to sustain growth.

d. Mulching Application after October 15TH:

1) A straw covering shall be distributed uniformly over the seeded area within 48 hours after seeding. Straw shall be applied at the rate of two (2) tons per acre. The straw shall be applied by hand, blower, or other suitable equipment. If straw is applied by blower, it shall not be chopped in lengths less than six (6) inches.

2) Anchoring the Mulch Mechanically: The straw mulch shall be anchored in place via with hand tools, mulching rollers, disks, or similar types of suitable equipment alone or in combination with a hydro-mulch material and shall be performed in a satisfactory manner.

3) Anchoring Straw Mulch with Hydro-Process: All post October 15th applications shall utilize a hydro-mulch anchoring process. The hydro-mulch material shall be applied uniformly over the straw in a water slurry by hydroseeder within 48 hours following mulching. The hydromulch shall be wood fiber mulch, a tackifier, and water in the following portions per acre:

Tackifier	Rate (pounds)	Wood Fiber Mulch (pounds)	Water (gallons)
M-Binder	100	150	700
Ecotak-SAT	100	150	700
Sentinel	100	500	2,000
Fish -STIK	60	500	3,000
Soil Master WR	100	250	1,000

4) The hydroseeder shall be equipped with a built-in continuous agitation system of sufficient operating capacity to produce a homogeneous slurry and a discharge system that will apply the slurry to the slopes at a continuous and uniform rate.

5) The materials shall not remain in the slurry longer than two (2) hours. Water used shall be potable water or Class I or 2 agricultural irrigation water.

6) The slurry shall be continuously mixed and shall be mixed for at least five (5) minutes after the last addition before application starts. The slurry shall be applied uniformly over the site at a rate that is nonerosive and minimizes runoff.

H. Preliminary Inspection: Notify the Engineer 48 hours in advance of all seeding. Inspection and favorable review of the completed work shall begin the plant establishment period.

I. Plant Establishment Maintenance:

1. General plant maintenance shall immediately follow seeding and continue until all seeded areas are 85% germinated and covered with acceptable stands of grass and clover.
2. Protect areas against all damage, including erosion and trespass, and provide proper safeguards. Maintain and keep in good repair all temporary barriers erected to prevent trespass. Check all barriers and temporary fencing daily and make immediate repairs or replacements.
3. Repair all damage to seeded areas.
4. Contractor shall irrigate as necessary (refer to 3.01E.c.) to maintain a minimum moisture of 30% percent to a depth in soil of 2-inches to ensure vigorous growth.
5. Continue maintenance for at least 45 days or until the grass is established as approved by Engineer.

J. Initial Inspection for Acceptance: Initial inspection for acceptance will be conducted upon completion of maintenance replacements, and corrective work. Three (3) days notice shall be given. If project improvements, corrective work, and maintenance have not been performed as specified and to the satisfaction of the Engineer, maintenance shall continue at Contractor's expense until such time as work has been successfully completed.

K. Guarantee, Replacement, and Final Acceptance:
1. Guarantee all planting to be in a healthy, thriving condition until the end of the maintenance period.
2. Replace all seeded areas not in vigorous condition as soon as directed by Engineer. Repair any erosion in areas where grass does not become established. Seed mixture used for replacement must be of the same kind and quantity as specified in this section.
3. Final acceptance requires a 4” high stand of plant material, 200 grass plants/ ft^2, and 100% coverage (i.e., no areas larger than 1 ft^2 with less than the specified coverage).

END OF SECTION

SECTION 33 01 30
CURED-IN-PLACE PIPE

PART 1: GENERAL

1.01 DESCRIPTION

The Contractor shall provide all materials, labor, equipment and services necessary for:

1. Traffic control
2. Pre-installation cleaning, clearing, and television inspection of sewers to be rehabilitated
3. Liner installation and reconnection of service connections
4. All quality controls, providing samples for performance of required material tests
5. Post-installation television inspection and testing of the rehabilitated pipe system

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Section 01 33 00: Submittals

B. Section 33 05 11: Plastic Pipe and Fittings

C. Section 33 05 00: Piping Accessories and Appurtenances

1.03 QUALITY ASSURANCE REFERENCES

This section contains references to some or all of the following documents, most recent edition. They are a part of this section as specified and modified. In case of conflict between the requirements of this section and those of the listed documents, the requirements of this section shall prevail.

Reference	Title
ASTM F1216	Standard Practice for Rehabilitation of Existing Pipelines and Conduits by the Inversion and Curing of a Resin-Impregnated Tube
ASTM F1743	Standard Practice for Rehabilitation of Existing Pipelines and Conduits by the Pulled-In-Place Installation of Cured-In-Place Thermosetting Resing Pipe (CIPP)
ASTM D543	Standard Practice for Evaluating the Resistance of Plastics to Chemical Reagents
ASTM D638	Standard Test Method for Tensile Properties of Plastics
ASTM D790	Standard Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials
ASTM D792	Standard Test Methods for Density and Specific Gravity of Plastics by Displacement
ASTM F2019	Standard Practice for Rehabilitation of Existing Pipelines and Conduits by the Pulled in Place Installation of Glass Reinforced Plastic Cured-in-place (GRP-CIPP) Using the UV-Light Curing
ASTM D2122	Standard Test Method for Determining Dimensions of Thermoplastic Pipe and Fittings
ASTM F2561	Standard Practice for Rehabilitation of a Sewer Service Lateral and Its Connection to the Main Using a One Piece Main and Lateral Cured-in-Place Liner
ASTM D2990	Standard Test Methods for Tensile, Compressive, and Flexural Creep and Creep-Rupture of Plastics

Reference	Title
ASTM D3567	Standard Practice for Determining Dimensions of “Fiberglass” (Glass-Fiber-Reinforced Thermosetting-Resin) Pipe and Fittings
ASTM D3681	Standard Test Method for Chemical Resistance of “Fiberglass” (Glass Fiber-Reinforced Thermosetting-Resin) Pipe in a Deflected Condition
ASTM D5813	Standard Specification for Cured-in-Place Thermosetting Resin Sewer Piping Systems

1.04 SUBMITTALS

A. In accordance with Section 01 33 00.

B. The Contractor shall prepare and submit a detailed installation plan describing all preparation work, cleaning operations, pre-installation CCTV inspections, grinding of intruding tap laterals, traffic control, installation procedure, method of curing, service connection, quality control, testing to be performed, final CCTV inspection, warrantees furnished and all else necessary for a complete liner installation.

C. The Contractor shall prepare and submit to the District one (1) copy of a detailed plan with a description of the proposed CIPP technology. The detailed plan shall identify all active service connections maintaining service during mainline installation.

D. The Contractor shall submit a description of all CIPP materials to be furnished for the project. Submittals shall be complete and conform to these specifications.

E. The Contractor shall submit engineering design calculations, in accordance with the Appendix of ASTM F1216 for each length of liner to be installed, including the thickness of each proposed CIPP. It will be acceptable for the Contractor to submit a design for the most severe line and apply that to all the sections. These calculations shall be performed and certified by a qualified Professional Engineer.

F. The Contractor shall submit an outline of a mitigation procedure to be implemented in the event of key equipment failure, and removal of any existing blockages in the pipeline that may be encountered during the cleaning process.

G. The Contractor shall submit certification from the manufacturer that the Contractor is licensed to perform the work, as well as certification that the CIPP material is manufactured, sampled, tested, and inspected in accordance with ASTM F1216, ASTM F1743, and ASTM F2019.

PART 2: MATERIALS

2.01 FABRIC TUBE

A. General: Fabric tube shall consist of one or more layers of absorbent non-woven felt fabric, felt/fiberglass, felt/carbon fiber, carbon fiber, or fiberglass and meet the requirements of ASTM F1216, ASTM F1743, or ASTM F2019 and ASTM D5813.

B. Fabric tube must be suitable for conveyance of municipal sewage; absorbing and carrying resins; constructed to withstand installation pressures and curing temperatures and have sufficient strength to bridge missing pipe sections and stretch to fit irregular pipe sections. The wet-out fabric tube shall have a uniform thickness and excess resin distribution so that when compressed at installation pressures will meet or exceed the design thickness after curing. The fabric tube shall be

manufactured to a size and length that when installed will tightly fit the internal circumference, meeting applicable ASTM standards or better, of the original pipe. Allowance shall be made for circumferential stretching during installation. The tube shall be properly sized according to both the diameter of the existing pipe and the rehabilitation length and shall be able to stretch to fit irregular pipe sections and negotiate bends. The Contractor shall determine the minimum tube length necessary and verify lengths in the field prior to ordering and prior to impregnation of the tube with resin. The outside and/or inside layer of the fabric tube (before inversion/pull-in, as applicable) shall be coated with an impermeable, flexible membrane that will contain the resin and facilitate, if applicable, vacuum impregnation and monitoring of the resin saturation during the resin impregnation (wet-out) procedure.

C. No material shall be included in the fabric tube that may cause delamination in the cured CIPP. The wall color of the interior pipe surface of CIPP after installation shall be a light reflective color so that a clear detailed examination with CCTV equipment may be made. Any seams in the fabric tube shall meet the requirements of ASTM D5813. The nominal fabric tube wall thickness shall be constructed, as a minimum, to the nearest 0.5 mm increment, rounded up from the design thickness for that section of installed CIPP.

D. The minimum length of the fabric shall be that deemed necessary by the Contractor to effectively span the distance between manholes or launch points so that the liner is uniform and continuous.

2.02 RESIN

General: The resin shall be compatible with the fabric tube chosen and designed for a sewage environment. The resin shall be corrosion resistant polyester or vinyl ester resin and catalyst system or epoxy and hardener system that, when properly cured within the tube composite, meets the requirements of ASTM F1216, ASTM F1743 or F2019 and ASTM D5813, the physical properties herein, and those which are to be utilized in the design of the CIPP for this project. The resin shall produce CIPP which will comply with or exceed the structural and chemical resistance requirements of this specification.

2.03 STRUCTURAL REQUIREMENTS

A. General: The CIPP shall be designed as per ASTM F1216 Appendices. The CIPP design shall assume no bonding to the original pipe wall. The CIPP shall at minimum meet or exceed the structural properties per ASTM F1216 and the Test Method ASTM D790. The required structural CIPP wall thickness shall be based, as a minimum, on the physical properties of the cured composite and per the design of the Professional Engineer and in accordance with the Design Equations contained in the Appendix of ASTM F1216 and the following design parameters:

Design Requirements	
Design Safety Factor	2.0 (1.5 for pipes 36” and larger)
Creep Retention Factor	50%
Ovality	2% or as measured by field inspection
Constrained Soil Modulus	Per AASHTO LRFD Section 12 and AWWA Manual M45
Groundwater Depth	As specified or indicated on the Plans
Soil Depth (above crown)	As specified or indicated on the Plans
Live Load	Highway, railroad or airport as applicable
Soil Load (assumed)	120 lb/cu ft
Minimum Service Life	50 years

B. The CIPP system shall conform to and comply with the requirements above with the minimum standard physical properties as follows:

Structural/Mechanical Property	ASTM Test Method	ASTM Minimum Short Term Value
Tensile Strength (@yield)	D638	4,000 psi
Tensile Modulus	D638	250,000 psi
Flexural Strength	D790	5,000 psi
Flexural Modulus	D790	300,000 psi

PART 3: EXECUTION

3.01 GENERAL

A. The liner shall provide a jointless, continuous, structurally-sound CIPP able to withstand imposed static and dynamic loads on a long-term basis. The Contractor shall follow CIPP manufacturer and installation equipment recommendations. The Contractor may, under direction of the Owner, utilize any existing manholes within the project area as installation access points.

B. Before lining materials are ordered for the project, the Contractor shall remove all internal debris from the pipe that would interfere with installation and the final product CIPP. Solid debris and deposits shall be removed from the system and disposed of by the Contractor. Moving material from manhole to manhole will not be permitted. The Contractor shall plug or bypass the system to properly clean the pipes, precaution shall be taken to not damage the existing pipes. The repair of any damage shall be the responsibility of the Contractor.

C. Contractor shall perform pre-installation, post-cleaning video inspections of the pipelines. The Contractor shall provide the Owner a copy of the videos and logs for review prior to the installation of the CIPP.

D. It shall be the responsibility of the Contractor to clear the line of obstructions that will interfere with the installation and long-term performance of the CIPP. This includes the grinding of intruding tap laterals. The Contractor shall be responsible for confirming the locations of all service connections prior to installing the CIPP.

3.02 INSTALLATION OF LINER

A. General: In accordance with manufacturer's recommendations and ASTM standards.

B. The liner shall be installed and cured in the host pipe per manufacturer's specifications.

C. If significant groundwater infiltration is present in the existing sewer, the contractor shall install a pre-liner tube or perform chemical grouting to control resin loss and contamination. The pre-liner tube shall be a reinforced plastic tube to fit the existing pipeline and shall be continuous from manhole (access) to manhole (access).

D. The wet-out tube shall be positioned in the pipeline using the manufacturer specified method. Care should be taken to avoid damage to the tube during installation. The liner should be pulled-in or inverted through an existing manhole or approved access point and fully extend to the next designated manhole or termination point.

E. Temperature shall be monitored to verify correct curing. The monitors can be placed between the host pipe and the liner bottom of the host pipe (invert) at manholes or access points. During the curing process, the Contractor shall keep logs, charts and/or graphs of the liner temperatures at the upstream and downstream manholes.

F. The manufacturer's recommended cure method and schedule shall be used for each segment installed.

G. The Contractor shall allow the CIPP to cool in accordance with manufacturer's recommendations. Temperatures and curing data shall be monitored and recorded throughout the installation process to ensure accordance with the CIPP manufacturer's recommendations.

H. The installed CIPP shall be continuous over the entire length and be free from visual defects such as foreign inclusions, dry spots, pinholes, major wrinkles and delamination. The CIPP shall be impervious and free of any leakage through the CIPP wall. Any defect shall be repaired at the Contractor's expense.

I. The beginning and end of the CIPP shall be sealed to the existing host pipe and shall be compatible with the pipe end and provide a watertight seal. If any service connections leak water between the host pipe and the installed CIPP, the connection mainline interface shall be sealed to provide a watertight connection.

J. The Contractor shall backfill voids that remain after installation of the CIPP. The material shall be of the flowable fill type and shall be injected into the void while removing all trapped air from the void.

3.03 RECONNECTIONS TO MANHOLES AND EXISTING SERVICES

A. A seal consisting of a resin mixture or hydrophilic seal compatible with the installed CIPP, shall be applied at the manhole/wall interface in accordance with the CIPP system manufacturer's recommendations.

B. Existing services shall be internally or externally reconnected unless indicated otherwise on the Plans.

C. Reconnections of existing services shall be made after the CIPP has been installed, fully cured, and cooled down. It is the Contractor's responsibility to make sure that all active service connections are reconnected. External reconnections shall be made

with a tee fitting the CIPP system manufacturer's recommendations.

D. A CCTV camera and remote cutting tool shall be used for internal reconnections. The machined opening shall be at least 90% of the service connection opening area. The opening shall not be more than 100% of the service connection opening. If an opening is greater than 100% of the service opening, the Contractor shall install a CIPP type repair. The edges of all openings shall not have pipe fragments which may obstruct flow or snag debris. Remnants of pipe material resulting from service tap cutting shall be collected at the next access point and may not pass through the system.

3.04 TESTING

A. Sampling: Shall be in accordance with ASTM F1216. The Contractor shall provide samples for testing to the Owner from the actual installed CIPP. Samples shall be provided from each section of CIPP installed or as required by the Owner. Samples shall be identified using the nearest manhole and stationing.

B. Laboratory Testing: If properties tested do no meet the minimum physical and thickness requirements the Contractor shall repair or replace the CIPP. The CIPP system shall meet ASTM requirements for thickness with a tolerance of minus 5% to plus 10%. The CIPP system shall meet the chemical resistance requirements of ASTM F1216 and ASTM D5813. The hydraulic capacity shall be maintained as large as possible, where fill capacity cannot be achieved the contractor shall submit a request to waive this requirement with reasoning.

3.05 FINAL ACCEPTANCE

Upon completion of testing the Contractor shall perform a detailed CCTV inspection in accordance with ASTM standards, after installation and reconnection of services. The final CCTV footage shall be provided to the Owner within 10 working days of the CIPP installation. CCTV footage shall note the inspection date, location of all reconnected services, debris, and any defects in the CIPP.

END OF SECTION

SECTION 33 05 00

PIPING ACCESSORIES AND APPURTENANCES

PART 1: GENERAL

1.01 DESCRIPTION

The work of this section consists of providing piping accessories and appurtenances.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Section 01 33 00: Submittals

B. Section 33 05 11: Plastic Pipe and Tubing

1.03 QUALITY ASSURANCE

Reference, American Society for Testing and Materials (ASTM).

1.04 SUBMITTALS

A. In accordance with Section 01 33 00.

B. Materials list and catalog data sheets naming each product to be used identified by manufacturer and type number.

PART 2: MATERIALS

2.01 FLEXIBLE COUPLINGS

A. Restrained Flange Coupling Adapters

Flanged coupling adapters shall conform to AWWA C219. Adapter bodies and end rings installed underground shall be ductile iron. Adapter bodies and end rings installed above ground may be fusion bonded epoxy-lined and coated steel or ductile iron. Bolts and nuts shall conform to AWWA C219. Nuts and bolts to be installed underground shall be stainless steel conforming to ASTM F593 for bolts and ASTM F594 for nuts. Bolts shall be threaded to conform to ANSI B 18.2.1, page C-1 for finished hex bolts. Nuts shall conform to ANSI B 18.2.2, Page D-1. Nuts shall be finished with TRIPAC 2000 or an approved equal fluoropolymer coating system to minimize galling and ensure proper torque. Anti-seize compound shall not be used with the blue nuts. All bolt heads and nuts shall be hexagonal. Identification on the head of the bolt shall be T-316, 316, F593G or F593H. Gaskets shall conform to AWWA C219, be suitable for use with water and shall be suitable for the type of pipe being coupled. Neoprene gaskets may be submitted for approval. Anchor studs are not allowed when coupling to PVC pipe. Manufacturer shall be Romac, EBAA, or approved equal.

B. Flexible Expansion Joints

Flexible expansion joints shall conform to the material requirements of ASTM A536 and ANSI/AWWA C153/A21.53. Flexible expansion joint shall be FLEXT-TEND, manufactured by EBAA, Romac, or approved equal.

2.02 FLANGED RUBBER FLEXIBLE CONNECTIONS

A. The flexible connection shall be manufactured with a hypalon rubber tube with synthetic fabric reinforced rubber body and a neoprene cover. Nylon is unacceptable. A hypalon rubber coating shall be applied to the outside to provide resistance to deterioration. Steel wire reinforcement shall be imbedded in the body for additional strength.

B. Flanges shall be constructed integrally with the body to resist stresses, drilled to ANSI B 16.5, class 150, and full faced to eliminate the use of gaskets. Retaining rings shall be galvanized and control rods shall be low alloy, corrosion resistant high strength.

C. The flexible connections shall have a minimum design pressure rating of 50 psi, a minimum burst ratio of 4:1, and a minimum vacuum rating of 10” Hg.

D. The flexible connections shall be capable of 1 1/8” of lateral movement without damage. Flange to flange length shall not exceed 12”.

E. Flanged rubber flexible connections shall be Redflex TM Type J-1 and Type J-10 (concentric reducing type) as manufactured by the Red Valve Company, Inc. or approved equal.

2.03 TENSION ASSEMBLIES

A. Welded

1. Assemblies per AWWA M11, Section 13.10
2. Rods shall be galvanized.
3. Buried assemblies shall receive two coats Bitumastic 50 or approved equal.

B. Socket Clamps

1. Carbon steel half bands, bolts and nuts, galvanized.
2. Socket clamps, Grinnell Fig. 595, B-Line Systems Fig. B3134, or approved equal.
3. Socket clamp washers, Grinnell Fig. 594, B-Line Fig. B3134W, or approved equal.
4. Yoke, Grinnell Fig. 181.
5. Buried assemblies shall receive two coats Bitumastic 50 or approved equal.
6. Grinnell Corporation B-Line Systems or approved equal.

2.04 GROOVED COUPLINGS AND FITTINGS

A. Couplings

1. Housing shall be malleable iron conforming to ASTM A47, Grade 32510 or 35018; or ductile iron conforming to ASTM A536, Grade 65-45-12.
2. Gasket: ASTM D2000, one of the following, for the appropriate application:

    a. Ethylene Propylene Diene (EPDM) - Grade "E"

    b. Nitrile (Buna-N) - Grade "T"

c. Halogenated Butyl - Grade "M"

3. Bolts and nuts: heat treated carbon steel, ASTM A183.
4. Coating:
    a. Exposed: enamel
    b. Buried: two coats Bitumastic 50, or approved equal, after assembly.
5. Application:
    a. Grooved Steel Pipe (nonrigid connection): Victaulic 77, Grinnell "GRUVLOK" Fig. 7001, Gustin Bacon 100, or approved equal.
    b. Grooved Cast Pipe (nonrigid connection): Victaulic 31, Gustin Bacon 500, or approved equal.

B. Flanges for Grooved Pipe
1. Class 125 standard drilling.
2. Housing shall be malleable iron conforming to ASTM A47, Grade 32510, or 35018; or ductile iron conforming to ASTM A536, Grade 65-45-12.
3. Gasket, ASTM D2000, one of the following, for the appropriate application:
    a. Ethylene Propylene Diene (EPDM) - Grade "E"
    b. Nitrile (Buna-N) - Grade "S" or "T"
    c. Halogenated Butyl - Grade "M"
4. Coating:
    a. Exposed: Enamel.
    b. Buried: Two coats Bitumastic 50, or approved equal, after assembly.
5. Application:
    a. Grooved Steel Pipe: Victaulic 741, 742; Gustin Bacon 154, or approved equal.
    b. Grooved Cast Pipe: Victaulic 341, 342, Gustin Bacon, or approved equal.

C. Cut and Rolled Grooves
1. Pipe sized ¾ through 24-inch may be cut grooved.
2. Roll groove pipe if wall thickness is less than minimum recommended by the manufacturer for cut grooving.
3. Cast pipe shall have rigid radius cut grooves.

D. Collared and Shouldered Pipe
1. In accordance with manufacturer's recommendations.
2. Victaulic Co., Gustin Bacon, Grinnell Co., or approved equal.

2.05 INSULATED (DIELECTRIC) FITTINGS

A. General: Provide complete insulation between sections of pipe when installed. All buried pipelines of dissimilar metals shall be insulated from each other.

B. Couplings and Bushings

1. Pacific Seal Industries, Calpico, Inc., or approved equal.

C. Flanges

1. Assembly consisting of gaskets, insulating bolt sleeves, and appurtenances.
2. Pacific Seal Industries, Calpico, Inc., or approved equal.

2.06 PRESSURE GAUGES (PG)

A. Liquid filled, glycerine or silicone.

B. 2½ to 3½ inch dial, scale 20 to 50% greater than normal operating pressure, 270-degree movement.

C. Stainless steel case, polycarbonate window, stainless steel bourdon tube and movement.

D. 2½ percent accuracy.

E. ¼-inch NPT bottom connection.

F. Ashcroft Type 1009, Marsh, or approved equal.

G. ¼-inch stainless steel cross handle cock, Ashcroft 7004, Marsh, or approved equal.

H. Ashcroft, Marsh Instrument Co., or approved equal.

I. Mount gauges on diaphragm seals where indicated on the Drawings.

1. Provide diaphragm seals with Type 316 stainless steel top housing, bottom housing, and bolt assemblies.

a. Bottom housing shall be fitted with a ¼-inch flushing connection.

b. This flushing connection shall be fitted with a Type 316 stainless steel close nipple and a brass shutoff cock.

c. Diaphragm Seal: Removable.

1) For pressure less than or equal to 15 pounds per square inch, provide a diaphragm seal.

2) For pressures greater than 15 pounds per square inch, provide Type 316 stainless steel diaphragm seal.

d. Fit diaphragm seal gauge assembly with a snubber.

e. Snubber shall have porous metal disc sized to dampen pressure fluctuations in the filled system.

f. Snubber shall be Stainless Steel.

g. Snubber filter disc shall be sized to prevent the gauge from pulsating.

h. Provide diaphragm seal gauge assemblies filled with silicon.

2. Pressure gauges, except gauges with diaphragm seals, shall have pulsation dampeners installed between the gauge and the shut-off valve.
3. Pulsation Dampeners shall be Stainless Steel.
4. Diaphragm seal:

   a. For pressure less than or equal to 15 pounds per square inch: Ashcroft, Type 301, Mansfield and Green, Type LG, or equal.

   b. For pressures greater than 15 pounds per square inch: Ashcroft, Type 101, Mansfield and Green, Type RG, or equal.

5. Snubber: Chemiquip, Ashcroft, or equal.
6. Pulsation Dampener:

   a. Dresser Industries, Inc., Ashcroft Figure Number 1106.

   b. Operation and Maintenance Specialties, Ray Pressure Snubbers.

   c. ¼-inch stainless steel cross handle cock, Ashcroft 7004, Marsh, or approved equal.

2.07 FLUSHING CONNECTION

A. Cast bronze swivel inlet adapter, rocker lugs.

B. 1-inch NPT inlet, hose thread outlet.

C. DeSanno Foundry & Machine Co. No. 73, Champion No. 10, or approved equal.

2.08 MECHANICAL RUBBER SEAL

A. Modular, mechanical type, consisting of interlocking synthetic rubber links shaped to continuously fill the annular space between the pipe and the wall opening.

B. EPDM seal element suitable for service to 250 degrees F, except seal element shall be silicone or viton suitable for 300 degrees F for aeration piping.

C. Composite pressure plates.

D. 316 stainless steel nuts and bolts.

E. Thunderline Link-Seal, or equal.

2.09 TRENCH DRAIN (CAST-IN-PLACE TYPE) - NOT USED

2.10 COATING SYSTEMS

A. Wedge and Wedge Assemblies, T-bolts, Bolts and Nuts:

1. Process through an iron-phosphate spray, rinse and drying in preparation for coating application.

2. The coating itself shall consist of two coats of liquid Xylan, with heat cure to follow each coat.

B. Casting shall be surface pre-treated with an iron-phosphate spray, rinse, sealer before drying. The coating shall be electrostatically applied and heat cured. Coating shall be a polyester based power to provide corrosion, impact and UV resistance.

C. The coating system shall be EBAA Iron, Inc. Mega-Bond or approved equal.

D. Where the coating systems of this section are utilized, no additional cathodic protection is required except for polyethylene encasement, which is required.

2.11 POLYETHYLENE ENCASEMENT

All buried metallic piping, specials, and fittings shall be polyethylene encased, double wrapped - 8 mils thickness, sized to pipe diameter, ANSI/AWWA C105/A21.5.

2.12 PIPELINE STRAINERS - NOT USED

2.13 PLASTIC WYE STRAINERS - NOT USED

2.14 FLANGED EXPANSION JOINT FITTING

Flanged expansion joint fittings shall conform to AWWA C221. Fitting shall be EJ400, manufactured by Romac, or approved equal.

2.15 HDPE SKIDS AND ANCHOR BOLTS

HDPE skids and anchor bolts shall be Calpico Inc. or approved equal.

2.16 RESTRAINED MECHANICAL COUPLING

A. Where specified or called for on the Drawings, mechanical couplings shall be made using restraint rings with double ended threaded rods with nuts. Internal pipe wall stiffeners must be used when restraining HDPE pipe. The restrained joining system shall meet the applicable requirements of AWWA C219, ANSI/AWWA C111/A21.11, and ASTM D2000. Restrained mechanical couplings shall be as manufactured by EBAA Iron or approved equal.

B. Ductile iron components shall meet or exceed the requirements of ASTM A536, and shall be tested in accordance with said standard. Sealing Gaskets shall be constructed of SBR and certified to the requirements of ANSI/NSF-61.

C. Coatings

1. The coupling sleeve internal surfaces shall be lined with a minimum of 15 mils of fusion bonded epoxy conforming to the applicable requirements of ANSI/AWWA C213. The coating shall meet ANSI/NSF-61.

2. Exterior surfaces shall be coated with a minimum 6 mils of fusion bonded epoxy conforming to the applicable requirements of ANSI/AWWA C116/A21.16.

3. The coating system shall be EBAA Iron, Inc. Mega-Bond or approved equal.

2.17 WARNING TAPE

A. Blue, 12-inch-wide, 4 mil thick polyethylene backed with metal foil. Tape shall be labeled with black lettering to say “CAUTION – WATER LINE BURIED BELOW”. Manufacturer shall be Calpico Inc., Reef Industries Inc., or approved equal.

B. Orange, 3-inch-wide, 5 mil thick tape that shall conform to ASTM D882 Method A.

2.18 TRACING WIRE

A. Tracing Wire: 10-gauge minimum UF rated solid copper with plastic insulation.

B. Tracing wire connectors shall be split-bolt type connectors, Permanent Seal-Wire Connectors Part #97811 or approved equal.

C. Mastic tape seal shall be 3M Mastic Tape #2229 or approved equal.

PART 3: EXECUTION

3.01 FLEXIBLE COUPLINGS

A. Install where shown on Drawings and where required for ease of installation or removal of pipe, subject to approval of Engineer.

B. Pipelines 4 inches and larger extending from a concrete structure into earth shall have at least two flexible joints within 3 feet of the structure face.

C. Provide tension assemblies as specified in subsection 2.03 of this Specification where necessary to prevent separation of pipe due to internal pressures.

3.02 GROOVED COUPLINGS AND FITTINGS

A. Grooved systems may be used in lieu of flanged, welded or screwed joints for steel or cast pipe (grey or ductile) at Contractor's option, except for chemical service.

B. Install per manufacturer's directions.

3.03 RESTRAINED MECHANICAL COUPLINGS

Install per manufacturer's directions.

END OF SECTION

SECTION 33 05 05

TESTING OF GRAVITY SEWER LINES AND MANHOLES

PART 1: GENERAL

1.01 DESCRIPTION

A. The work of this section consists of testing gravity sewer lines and gravity sewer manholes. Repaired work shall be retested.

B. Testing Methods: Gravity sewer lines - air test; manholes – vacuum test.

1.02 QUALITY ASSURANCE

A. Flow meters shall record the actual volume plus or minus 2 percent.

B. Air test gauges shall be ANSI/ANSI B40.1, Grade 3A (plus or minus 0.25 percent of full-scale accuracy), and 15 psi dial range.

1.03 SUBMITTALS

A. Accuracy certification by approved independent testing labs for flow meters and test gauges. Certifications shall be dated no more than 90 days prior to actual system testing.

B. Prior to testing, provide the following information:

1. All Tests: Describe precautions that will be taken to protect system equipment that might be damaged under test pressures, and the proposed method for rerouting sewer flows where the system must remain in service.
2. Air Test: Describe safety devices on air test equipment and personnel safety precautions during air.

1.04 PROJECT CONDITIONS

A. Testing shall not be performed until each system has been flushed or thoroughly cleaned in accordance with procedures in the section that describes sewer line installation.

PART 2: MATERIALS - NOT USED

PART 3: EXECUTION

3.01 GENERAL

A. Prepare each section for testing, using adequate bracing; protect system equipment susceptible to damage by test pressures; make provision for installation of District's pressure gauge in parallel with Contractor's gauge, if so requested; and maintain services where required.

3.02 GRAVITY SEWER SYSTEMS

A. Air Test: Test lines less than or equal to 30 inches in diameter between manholes with low pressure air. Safety requires regulator or relief valve on pressurizing equipment,

set at 8 psig. No one will be allowed in manholes while there is air pressure against test plugs.

B. Lines greater than 30-inches in diameter shall include individual joint testing as specified per these specifications or the manufacturer.

C. Plug all pipe outlets to resist test pressure. Give special attention to laterals. Plug all other pipes in both upstream and downstream manholes.

D. Supply air into the line until the test pressure of 3.5 psi in excess of the ground water pressure is attained or 8 psi, whichever is greater. Allow at least 5 minutes for air temperature in the test section to stabilize.

E. Reestablish the test pressure and start a stopwatch. Determine the time required for pressure to drop 1.0 psig.

F. For 6-inch and smaller pipe only, if the pressure does not drop during the stabilization period, and no additional air has been added, the section undergoing test will have passed without further testing.

G. The pipe section will also have passed if the time observed for the pressure to drop 1.0 psig is greater than that determined by using Table 1.

H. Determine the test time from Table 1 (minimum time 60 seconds).

Size	Time per 100-feet	Size	Time per 100-feet	Size	Time per 100-feet
4-inch	0.3 min.	12-inch	1.8 min.	24-inch	3.6 min
6-inch	0.7 min.	15-inch	2.1 min.	27-inch	4.2 min.
8-inch	1.2 min.	18-inch	2.4 min.	30-inch	4.8 min.
10-inch	1.5 min.	21-inch	3.0 min.		

I. When a combination of more than one pipe size is under test, the calculated time for the larger pipe shall apply.

J. For larger sewer pipes, refer to the material specification for testing requirements.

3.03 VISUAL TEST FOR PIPELINES

A. Interior visual inspection shall be conducted by the Contractor. The Contractor's Inspector shall visibly inspect the line and record findings. Copies of video inspection shall be provided to the District Engineer for review and acceptance of work.

B. The sewer system shall be completely cleaned by an approved method prior to visual inspection. The sewer system shall be rejected if any of these conditions exist:

1. Standing water or sags greater than ½-inch in depth.
2. Standing water in services.
3. Offset joints.
4. Cracked pipe.
5. Infiltration.

3.04 DEFLECTION TESTING OF FLEXIBLE PIPE

All flexible PVC pipe shall be tested for over-deflection and not exceed maximum deflection as specified by the Manufacturer.

3.05 LEAKAGE TEST FOR MANHOLES

Sewer manholes shall pass a vacuum test consisting of the following criteria and procedures:

A. The Contractor shall notify the Engineer at least 72-hours in advance to be present during testing without exception.

B. The test shall be performed after assembly of the manhole, but prior to backfilling. The Contractor shall perform the test and supply all test equipment. A District Inspector shall witness the test results.

C. Lift holes shall be filled with non-shrinking grout prior to testing.

D. Pipe entering and existing the manhole shall be plugged. Securely brace the plugs to prevent them from being drawn into the manhole. Unused channels shall be permanently plugged with a plastic or clay stop and filled with grout.

E. A vacuum of 10-inches of mercury shall be drawn to start the test. The amount of time required for the vacuum to drop to 9-inches shall be measured. The manhole will pass the test if the amount of elapsed time is greater than 60 seconds for a 48-inch manhole, 75 seconds for a 72-inch manhole, and 120 seconds for an 84-inch manhole. A liquid filled with vacuum gauge shall be used for testing.

F. If the manhole fails the initial test, necessary repairs shall be made with a non-shrink grout while the vacuum is still being drawn. Retesting shall proceed until the elapsed times are satisfactory.

G. After passing the vacuum test, all joints shall then be mortared, inside and out. Outside mortared joints shall be allowed to dry before backfilling.

END OF SECTION

SECTION 33 05 11

PLASTIC PIPE AND FITTINGS

PART 1: GENERAL

1.01 DESCRIPTION

The work of this section consists of furnishing and installing polyvinyl chloride pipe and fittings.

1.02 PIPE DESIGNATIONS

The following plastic pipe and tubing designations are defined:

Designation	Definition
HDPE	High Density Polyethylene
PVC	Polyvinyl chloride

1.03 RELATED WORK SPECIFIED ELSEWHERE

A. Section 01 33 00: Submittals
B. Section 31 23 33: Trenching, Backfilling, and Compacting
C. Section 33 01 30: Cured-in-Place Pipe
D. Section 33 05 00: Piping Accessories and Appurtenances

1.04 QUALITY ASSURANCE REFERENCES

This section contains references to some or all the following documents, most recent edition. They are a part of this section as specified and modified. In case of conflict between the requirements of this section and those of the listed documents, the requirements of this section shall prevail.

Reference	Title
ASTM D638	Standard Test Method for Tensile Properties of Plastics
ASTM D1248	Polyethylene Plastics Extrusion Materials for Wire and Cable.
ASTM D1784	Rigid Poly(Vinyl Chloride) (PVC) Compounds and Chlorinated Poly(Vinyl Chloride) (CPVC) Compounds
ASTM D1785	Poly(Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80, and 120
ASTM D2241	Poly(Vinyl Chloride) (PVC) Pressure Rated Pipe (SDR series)
ASTM D2464	Threaded Poly(Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 80
ASTM D2466	Poly(Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 40
ASTM D2467	Socket Type Poly(Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 80
ASTM D2564	Solvent Cements for Poly(Vinyl Chloride) (PVC) Plastic Piping Systems
ASTM D3034	Type PSM Poly(Vinyl Chloride) (PVC) Sewer Pipe and Fittings
ASTM D3035	Polyethylene (PE) Plastic Pipe (DR-PR) Based on Controlled Outside Diameter
ASTM D3261	Butt Heat Fusion Polyethylene (PE) Plastic Fittings for Polyethylene (PE) Plastic Pipe and Tubing
ASTM D4101	Propylene Plastic Injection and Extrusion Materials

Reference	Title
ASTM F402	Safe Handling of Solvent Cements, Primers, and Cleaners Used for Joining Thermoplastic Pipe and Fittings
ASTM F714	Polyethylene (PE) Plastic Pipe (DR-PR) Based on Outside Diameter

1.05 SUBMITTALS

A. In accordance with Section 01 33 00.

B. Submit materials list and catalog data sheets naming each product to be used identified by manufacturer and type number.

C. The Contractor shall prepare and submit one copy to the District of shop drawings and laying diagrams of all pipe, joints, bends, special fittings, and piping appurtenances.

PART 2: MATERIALS

2.01 PIPE SCHEDULE

	Nominal Pipe Size (inches)	Outside Diameter (inches)	Wall Thickness (inches)	Material
Force Main	3	3.500	0.318	IPS, DR 11
Force Main	4	4.500	0.409	IPS, DR 11
Gravity Sewer Main	8	8.400	0.240	SDR 35

2.02 HDPE PRESSURE PIPE

A. HDPE Sewer Pipe. Force mains shall be HDPE pressure pipe conforming to AWWA C901 or AWWA C906, as applicable, and DR 11, as noted on the Project Plans. HDPE shall be PPI TR-4 PE 4710 per ASTM D3350. HDPE outside diameters shall be iron pipe size per AWWA C901 and AWWA C906.

B. Pipe shall contain no recycled compound except for rework material generated in the manufacturer's own plant that has the same cell classification as the material to which it is being added. The pipe shall be homogeneous throughout and free of visible cracks, holes, voids, foreign inclusions, or other defects that may affect the wall integrity.

C. Permanent identification of water piping service shall be provided by coextruding longitudinal blue stripes into the pipe outside surface. The striping material shall be the same material as the pipe material except for color. Stripes printed or painted on the outside surface shall not be acceptable.

D. The nominal pipe diameter and DR (dimension ratio) are provided on the Project Plans.

E. HDPE may be deflected subject to approval by the Engineer. Bending radius allowed by the manufacturer can vary. Contractor shall verify pipe bending radius with manufacturer and shall not exceed 125% of the manufacturer's recommendations.

2.03 PVC SEWER PIPE

A. General: Pipe and fittings shall be made of PVC plastic having a cell classification of 12454-B as defined in ASTM D1784 and shall be SDR-35 (PVC). Additives and filters including but not limited to stabilizers, antioxidants, lubricants, colorants, etc. shall not exceed 10 parts by weight per 100 of PVC resin in the compound.

B. Pipe: All sewer mains shall be eight-inch minimum diameter pipe and shall be continuously and permanently marked with the manufacturer's name, pipe size, dimension ratio and/or pressure rating in psi. PVC pipe shall have a solid cross-section rubber ring gasket. The gasket shall be securely attached to the pipe to prevent displacement of the gasket when installed in the field. All rubber ring gaskets shall be in accordance with ASTM F477. Lubricant used for field assembly of gasketed PVC pipe shall have no detrimental effect on the gasket, joint, fitting, or pipe and shall be as recommended by the manufacturer. Provide rubber waterstops at the entry of all PVC pipe into manhole bases. PVC gravity sewer pipe and fittings shall conform to ASTM D3034 for diameters from 4-inches to 15-inches. Pipe joints shall conform to ASTM D3212. Pipe shall be solid wall only; profile wall pipe is not allowed.

C. Fittings: Pipe fittings shall be gasketed fittings matching the pipe SDR and conforming to ASTM D3034, Class SDR-35. The ring groove and gasket ring shall be compatible with PVC pipe ends. Flanged fittings shall be compatible with cast-iron or ductile-iron pipe fittings. The strength class of the fittings shall be not less than the strength class of any adjoining pipe.

PART 3: EXECUTION

3.01 GENERAL

A. All laying, jointing, and testing for defects and for leakage shall be performed in the presence of the Engineer and shall be subject to inspection before acceptance. All material found during the progress of the work to have defects will be rejected, and the Contractor shall promptly remove such defective materials from the site of the work.

B. Installation shall conform to the requirements of ASTM D2321 and to the supplementary requirements or modifications specified herein. Wherever the provisions of this Section and the requirements of ASTM D2321 are in conflict, the more stringent provision shall apply.

3.02 PIPE AND FITTING JOINING

A. Butt fusion procedures shall be in accordance with the manufacturer's recommendations. Surfaces must be clean and dry before joining. The fusion equipment operator shall be fully trained in the use of the respective equipment, and certified/qualified in accordance with the requirements of the manufacturer's recommendations. The wall thicknesses of the adjoining pipes shall have the same DR at the point of fusion.

B. Butt fusion equipment shall be equipped with a Data Logger to record and document key parameters of each fusion process including heater temperature, fusion pressure, melt time, hold time, etc. Information from the Data Logger shall be

collected and filed daily. A record of each fused joint including a graph of the fusion cycle shall be submitted to the Engineer.

C. The temperature of the heating tool surfaces shall be monitored daily with a temperature measuring device, such as, a thermometer or temperature indicating crayons, to assure the temperature measuring device on the equipment is in sound working condition and that the appropriate temperature range is maintained.

D. Each HDPE joint shall be traceable to the fusion operator and equipment. Also, the fusion joint number and fusion operator ID shall be stenciled on the pipe.

E. Mechanical (compression) joining of pipe and fittings is only permissible when joining polyethylene pipe to unlike materials. HDPE stiffeners shall be utilized with all mechanical (compression) fittings. Blocking must be provided at changes in direction for any mechanical fittings. Use of positive restrained joints fittings (non-friction type) is permissible when approved by the Engineer.

3.03 INSTALLATION OF PIPE AND FITTINGS

A. General: In accordance with manufacturer's recommendations and ASTM 2321, whichever is more stringent.

B. Plastic piping exposed to sunlight shall be painted with two coats of latex paint. Color shall be white unless otherwise specified.

C. Pipe and fittings shall be of the sizes indicated. Clean pipe interior of all foreign matter before installing. Pipe shall be square cut with fine tooth saw or other cutter or knife designed for use with plastic pipe. Remove burrs by smoothing edges with a knife, file, or sandpaper. Replace any section of pipe found to be defective or damaged with new acceptable pipe. Handle pipe carefully to prevent gouging or scratching. Any length of pipe having a gouge, scratch, or other permanent indentation more than 10 percent of the wall thickness in depth shall be rejected.

3.04 INSTALLATION OF SOLVENT WELD JOINT TYPE PIPE

In accordance with the recommendations of the pipe manufacturer and the following supplementary requirements:

A. Do not solvent weld joints if it is raining, if atmospheric temperature is below 40 degrees F or above 90 degrees F, if the pipe is exposed to direct sunlight.

B. Test fit dry pipe and fittings before applying cement. Pipe should enter socket without forcing at least one third but not more than two thirds the depth of socket. Fittings that are looser or tighter shall not be used. Thoroughly clean and dry the pipe end and socket of fitting with methyl ethyl ketone, acetone, or similar cleaner. Apply cement evenly to outside surface and end of pipe and inside surface of socket. Avoid excess application of cement but insure complete coverage of all bonding surfaces. Mark depth of socket on pipe to guide application of cement and insure full insertion of pipe. Insert pipe in socket, twisting pipe or fitting approximately ½ turn as pipe is being seated in socket. Make sure pipe is fully seated providing a bond between end of pipe and shoulder of socket. Immediately wipe excess cement from pipe leaving no more than a 1/8-inch fillet at fitting end. Hold assembled joint in place for approximately 15 seconds and allow to set for 30

minutes before moving. Avoid rough handling for 48 hours. Longer periods may be required in cold or wet weather.

3.05 INSTALLATION OF PUSH-ON JOINT TYPE PIPE

Clean gaskets and seats of foreign materials prior to joint assembly. Apply lubricant as recommended by the pipe manufacturer. Carefully insert the spigot end into the bell to prevent entry of dirt and incorrect entry angle. With suitable fork tool, crowbar, or by hand, make the joint to the insertion depth recommended by the manufacturer. When the selected pipe uses joints not designed for full depth insertion, prevent further closure of previously completed joints by restraining movement of the installed line while making succeeding joints.

3.06 INSTALLATION OF TUBING - NOT USED

3.07 TESTING

A. Pressure Testing: Shall be in accordance with Section 33 31 00.

B. Field Inspection for Plastic Pipe and Fittings: Installed pipe shall be tested to ensure that vertical deflections for plastic pipe do not exceed the maximum allowable deflection. All SDR 26 and 35 PVC Sewer Pipe shall be mandrel tested by the Contractor as outlined below. All C905 PVC pipe may be measured by the Engineer for overdeflection above 3%. Maximum allowable deflections for SDR 26 and 35 pipe shall be governed by the mandrel requirements stated herein and shall nominally be the percentage listed of the maximum average ID.

Nominal Pipe Size	Percentage
Up to and including 12-inch	5.0
Over 12-inch to and including 30-inch	4.0
Over 30-inch	3.0

The maximum average ID shall be equal to the average OD per applicable ASTM Standard minus two minimum wall thicknesses per applicable ASTM Standards. Manufacturing and other tolerances shall not be considered for determining maximum allowable deflections.

Deflection tests shall be performed not sooner than 30 days after completion of placement and densification of backfill. The pipe shall be cleaned and inspected for offsets and obstructions prior to testing.

For all pipes less than 24-inch ID, a rigid mandrel shall be pulled through the pipe by hand to ensure that maximum allowable deflections have not been exceeded. Prior to use, the mandrel shall be certified by the Engineer. Use of an uncertified mandrel or mandrel altered or modified after certification will invalidate the test. If the mandrel fails to pass, the pipe will be deemed to be overdeflected.

Unless otherwise permitted by the Engineer any overdeflected pipe shall be uncovered and, if not damaged, reinstalled. Damaged pipe shall not be reinstalled but shall be removed from the Work site. Any pipe subjected to any method or process other than removal, which attempts, even successfully, to reduce or cure

any overdeflection, shall be uncovered, removed from the Work site and replaced with new pipe.

The mandrel shall:

1. Be rigid, non-adjustable, odd-numbering-leg (9 legs minimum) mandrel having an effective length not less than its nominal diameter.

2. Have a minimum diameter at any point along the full length as follows:

Pipe Material	Nominal Size (inches)	Minimum Mandrel Diameter * (inches)
PVC-ASTM D 3033 (SDR 35)	6	5.619
	8	7.309
	10	9.137
	12	10.963
	15	13.849
PVC-ASTM F 679 (T-1 Wall)	18	16.924
	21	19.952
	24	22.446
	27	25.297
	30	28.502
	36	35.03

* Mandrel diameters of SDR 26 pipe shall be based on 4% deflection of the average inside diameter.

3. Be fabricated of steel, be fitted with pulling rings at each end, be stamped or engraved on some segment other than a runner indicating the pipe material specification, nominal size and mandrel OD, (e.g., PVC D 3034-8”-7.524”; and be furnished in a suitable carrying case labeled with the same data as stamped or engraved on the mandrel.

All costs incurred by the Contractor attributable to mandrel and deflection testing, including any delays, shall be borne by the Contractor at no cost to the Owner.

END OF SECTION

SECTION 33 31 00

TESTING OF PIPELINES

PART 1: GENERAL

1.01 DESCRIPTION

A. The work of this section consists of leak testing all pipelines and related valves and fittings. Rejected work shall be retested, and if still rejected shall be repaired or replaced to the satisfaction of the Engineer at no additional cost to the Owner.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Section 01 33 00: Submittals

1.03 QUALITY ASSURANCE

A. Flow meters shall record the actual volume plus or minus 2 percent.

B. Air and vacuum test gauges shall be ANSI B40.1, Grade 3A (plus or minus 0.25 percent of full scale accuracy), with a dial range approximately twice the required test pressure.

C. Water test gauges shall be ANSI B40.1, Grade 2A (plus or minus 0.5 percent of full scale accuracy), with a dial range approximately twice the required test pressure.

1.04 SUBMITTALS

A. In accordance with Section 01 33 00.

B. Accuracy certification by approved independent testing laboratories for flow meters and test gauges. Certifications shall be dated no more than 90 days prior to actual system testing.

C. Prior to testing, provide the following information:

1. All Tests: Describe precautions that will be taken to protect system equipment that might be damaged under test pressures, and the proposed method for rerouting reclaimed water or sewer flows where the systems must remain in service.
2. Air Test: Describe safety devices on air test equipment and personnel safety precautions during air tests.
3. High or Low Pressure Water Test: Describe the proposed method for disposal of water used in line testing.
4. Test Bulkheads: Submit test bulkhead locations and design calculations, pipe attachment details, and methods to prevent excessive pipe wall stresses.

1.05 PROJECT CONDITIONS

A. Testing shall not be performed until each system has been flushed or thoroughly cleaned in accordance with procedures in the section that describes pipeline installation.

B. Water for flushing and testing is available as described in Section 33 05 05.

1.06 TEST RECORDS

Provide records of each piping installation during the testing. These records shall include:

A. Date of Test.

B. Identification of pipeline, or pipeline section, tested or retested.

C. Identification of pipeline material.

D. Identification of pipe specification.

E. Test fluid.

F. Test pressure.

G. Remarks: Leaks identified (type and location), types of repairs, or corrections made.

H. Certification by Contractor that the leakage rate measured conformed to the specifications.

PART 2: MATERIALS

2.01 MANUAL AIR-RELEASE VALVES FOR BURIED PIPING

Provide temporary manual air-release valves for pipeline test. Construct the pipe outlet in the same manner as for a permanent air valve and after use, seal with a blind flange, pipe cap, or plug and coat the same as adjacent pipe.

2.02 TEST BULKHEADS

Design and fabricate test bulkheads per section VIII of the ASME Boiler and Pressure Vessel Code. Materials shall comply with Part UCS of said code. Design pressure shall be at least 2.0 times the specified test pressure for the section of pipe containing the bulkhead. Limit stresses to 70% of yield strength of the bulkhead material at the bulkhead design pressure. Include air-release and water drainage connections.

PART 3: EXECUTION

3.01 GENERAL

A. Perform testing in the Engineer's presence after backfill and proper compaction of trenches. Where lines are installed under roadways and parking areas, perform tests before and after completion of final subgrade preparation and prior to application of surface courses. Notify Engineer in writing at least 48 hours prior to testing. Notification shall be by the Contractor submitting a test form which shall indicate test date, pipeline to be tested, test requirements and requirements of the Owner.

B. Prepare each section for testing, using adequate bracing; protect system equipment susceptible to damage by test pressures; make provision for installation of Owner's pressure gauge in parallel with Contractor's gauge, if so requested; and maintain services where required.

C. Testing requirements are stipulated in Laws and Regulations; are specified in the specifications covering the various types of piping; and are specified herein. Requirements in Laws and Regulations supersede other requirements of Contract Documents, except where requirements of Contract Documents are more stringent, including higher test pressures, longer test times, and lower leakage allowances.

3.02 TEST PROCEDURE

A. After completion of the installations, Contractor shall test all piping and pipework as herein specified. The Contractor shall furnish all material, equipment, and labor for testing the piping systems.

B. Each system may be tested as a unit or in sections as directed by the Engineer, but each complete system shall successfully meet the requirements specified herein before acceptance by the Engineer.

C. Clean piping before pressure or leak tests.

D. For water testing, the test shall be made by closing valves or providing bulkheads or plugs and filling the pipe lines with water, with provisions made for the release of all air in the lines. Lines shall be filled with water 24 hours prior to testing for leakage to allow for absorption of water by pipe or joint material.

E. Specified pressures or heads of water shall be maintained for the periods of time tabulated herein, except where indicated to be air or vacuum, and the leakage determined. Leakage shall not exceed the tabulated values.

F. Test pressures shall be as indicated herein. The pressure shall be maintained at all times during the test by restoring it whenever it falls an amount of 5 psi for test pressures above 20 psi and 2 psi for test pressures below 20 psi.

G. If leakage is more than allowable, the Contractor shall repair or replace the pipeline and retest it. Do not use paints, asphalts, tars, or other type of pipe compounds to eliminate leaks.

H. The Contractor shall take all necessary precautions to prevent any joints from drawing while the pipelines and their appurtenances are being tested and he shall, at his own expense, repair any damage to the pipes and their appurtenances, or to any other structures, resulting from or caused by these tests.

I. Where any section of the piping contains concrete thrust blocks or encasement, wait at least 10 days after the pour to begin testing.

J. After a satisfactory test, remove the testing fluid, remove test bulkheads and other test facilities, and restore the pipe coatings.

Testing Requirements

Type of Pipe	Test Medium	Minimum Test Period	Maximum Allowable Leakage
Gas	(a)	(a)	(a)
Sanitary Drain	(a)	(a)	(a)
Storm Drain/Culverts	-	-	No Test
Service Air	Air	1 hour	0
Low Pressure Air Piping	Air	1 hour	0
Liquid-Containing Lines Not Listed Above	Water	2 hours	(b)

(a) Per applicable plumbing code

(b) Exposed pipe shall have no visible leaks.
Otherwise, allowable leakage shall be determined by the following formula:

$$L = \frac{S*D*(P)^{½}}{133{,}200}$$

Where: L = allowable leakage, in gallons per hour
S = length of pipe tested, in feet
D = nominal diameter of the pipe, in inches
P = average test pressure during the leakage test, in pounds per square inch (gauge), where test pressure shall be a minimum of 150 psi, unless indicated otherwise.

3.03 TELEVISION TEST FOR PIPELINES

Any portion of the new piping system may be TV'd by the Owner. Any construction deficiencies discovered during TV'ing shall be corrected by the Contractor and the line TV'd again. There will be no cost to the Contractor for the initial TV test. Retesting shall be performed at no additional cost to the Owner. All re-inspection costs including soil density testing, quality assurance observation, and re-testing inspection, shall be at no additional cost to the Owner.

END OF SECTION

SECTION 33 39 13

ABANDONMENT OF PIPELINES AND MANHOLES

PART 1: GENERAL

1.01 DESCRIPTION

This section specifies abandonment of existing pipelines and manholes indicated on the Drawings for abandonment.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Section 01 33 00: Submittals

B. Section 31 23 33: Trenching, Backfilling, and Compacting

1.03 QUALITY ASSURANCE REFERENCES

This section contains references to some or all the following documents, most recent edition. They are a part of this section as specified and modified. In case of conflict between the requirements of this section and those of the listed documents, the requirements of this section shall prevail.

Reference	Title
ASTM C150	Standard Specification for Portland Cement.
ASTM C494	Standard Specification for Chemical Admixtures for Concrete.
ASTM C618	Standard Specification for Coal Ash and Raw or Calcined Natural Pozzolan for use in Concrete.
ASTM C940	Standard Test Method for Expansion and Bleeding of Freshly Mixed Grouts for Preplaced-Aggregate Concrete in the Laboratory.
ASTM C1017	Standard Specification for Chemical Admixtures for Use in Producing Flowing Concrete.
ASTM C1107	Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Non-Shrink).

1.04 DEFINITIONS

A. Abandonment. Pipeline abandonment consists of filling or plugging portions of existing pipelines with flowable fill or grout plugs, as indicated on the Drawings. Manhole abandonment consists of removing cylinders, rings, and lids above the depth indicated on the Drawings, and filling the remainder with flowable fill.

B. Flowable Fill. Flowable fill shall be controlled low-strength material (CLSM) consisting of fluid mixture of cement, fly ash, aggregate, water, and with admixtures as necessary to provide workable properties. Placement of flowable fill may be by grouting techniques in pipelines or other restricted areas, or as mass placement by chutes or tremie methods in unrestricted locations with open access. Long-term hardened strength shall be within specified range.

C. Backgrouting. Secondary stage pressure grouting to ensure that voids have been filled within abandoned pipes. Backgrouting will only be required if there is evidence of incomplete flowable fill placements.

1.05 SUBMITTALS

A. Submit flowable fill mix design report.

1. Flowable fill type and production method. Describe if fill will be mixed to final proportions and consistency in batch plant or if constituents will be added in transit mixer at placement location.
2. Aggregate gradation of fill. Aggregate gradation of mix shall be used as pilot curve for quality control during production.
3. Fill mix constituents and proportions including materials by weight and volume, and air content. Give types and amounts of admixtures including air entrainment or air generating compounds.
4. Fill densities and viscosities, including wet density at point of placement.
5. Initial time of set.
6. Bleeding and shrinkage.
7. 28-day compressive strength.

B. Submit technical information for equipment and operational procedures including projected injection rate, grout pressure, method for controlling grout pressure, bulkhead and vent design and number of stages for grout application.

PART 2: MATERIALS

2.01 FLOWABLE FILL

A. Design Mix Criteria. Provide design of one or more mixes to meet design criteria and conditions for placement. Present information required by Part 1, Paragraph 1.05-A in mix design, to include the following:

1. Cement: ASTM C150 Type I or II. Volume and weight per cubic yard of fill. Provide minimum cement content of 50 pounds per cubic yard.
2. Fly ash: ASTM C618, Class C or F. Volume and weight per cubic yard of fill. Provide minimum fly ash content of 200 pounds per cubic yard.
3. Potable water: Volume and weight per cubic yard of fill. Amount of water determined by mix design testing.
4. Aggregate gradation: 100 percent passing 3/8-inch sieve and not more than 10 percent passing No. 200 sieve. Mix design report shall define pilot gradation based on following sieve sizes: 3/8 inch, No. 4, 8, 16, 30, 50, 100, and 200. Do not deviate from pilot gradation by more than plus or minus 10 percentage points for any sieve for production material.
5. Aggregate source material: Screened or crushed aggregate, pit or bank run fine gravels or sand, or crushed concrete. If crushed concrete is used, add at least 30 percent natural aggregate to provide workability.
6. Admixtures: Use admixtures meeting ASTM C494 and ASTM C1017 as needed to improve pumpability, to control time of set and to reduce bleeding.
7. Fluidifier: Use fluidifier meeting ASTM C937 as necessary to hold solid constituents in suspension. Add shrinkage compensator if necessary.
8. Performance additive: Use flowable fill performance additive, if needed, to control fill properties.

B. Flowable Fill Requirements:

1. Unconfined compressive strength: minimum 75 psi and maximum 150 psi at 56 days as determined based on an average of three tests for same placement. Present at least three acceptable strength tests for proposed mix design in mix design report.
2. Placement characteristics: self-leveling.
3. Shrinkage characteristics: non-shrink.
4. Water bleeding for fill to be placed by grouting method in pipes: not to exceed 2 percent according to ASTM C940.
5. Minimum wet density: 90 pounds per cubic foot.

C. Grout Plugs

1. Cement-based dry-pack grout conforming to ASTM C1107, Grade B or C.

PART 3: EXECUTION

3.01 REQUIREMENTS BY PIPE LOCATION, SIZE, AND DEPTH

A. Pipes indicated on the Drawings to be abandoned in place shall be filled with flowable fill. Pipes 8-inch diameter and smaller may be cut and capped with grout plugs at the District's discretion.

B. No sewer laterals shall be abandoned as part of this Project.

C. Pipes under structures, waterways, roads, railroad tracks, rail right-of-way, or similar surface obstructions to be abandoned in place shall be filled with flowable fill.

D. No existing pipeline facility shall be abandoned until all new facilities serving the same area are in operation and as authorized by the Construction Manager. In the case of water or sewer pipelines that are to be removed due to conflicts with new work, the existing pipelines may be removed after the bypass system has been installed and tested.

E. Where existing pipe is to be abandoned, the Contractor shall cut back the abandoned pipe five feet from any connecting structure. All holes in existing structures shall be repaired. The abandoned pipe shall be filled with CLSM or approved alternate pumpable mix design and capped or plugged with at least a 2-foot depth of concrete at both ends prior to backfill.

3.02 PREPARATION

A. Notify inspector at least 24-hours in advance of grouting with flowable fill.

B. Select fill placement equipment and follow procedures with sufficient safety and care to avoid damage to existing underground Utility and structures. Operate equipment at pressure that will not distort or imperil portions of the work, new or existing.

C. Cut and cap portions of the piping system to remain, as shown on the Drawings. Drain water mains to be abandoned.

D. Clean sewer lines and video to identify connections and locate obstructions. Locate

previously unidentified connections which have not been redirected or reconnected as part of the work and report them to the Project Manager. During placement of fill, compensate for irregularities in sewer pipe, such as obstructions or open joints, to ensure no voids remain unfilled.

E. Perform demolition work prior to starting fill placement. Clean placement areas for pipes and manholes of debris that may hinder fill placement. Remove excessive amounts of sludge and other substances that may degrade performance of the fill. Do not leave sludge or other debris in place if filling more than 2 percent of placement volume. Dispose of waste material in accordance with applicable codes and regulations.

F. Remove free water prior to fill placement.

3.03 EQUIPMENT

A. Mix flowable fill in automated batch plant and deliver it to site in ready-mix trucks. Performance additives may be added at placement site if required by mix design.

B. Use concrete or grout pumps capable of continuous delivery at planned placement rate.

3.04 DEMOLITION OF SEWER MANHOLES PRIOR TO ABANDONMENT

A. Remove manhole frames and covers and castings and dispose or recycle as applicable. Obtain District approval before reusing frames and covers.

B. Demolish and remove precast concrete rings to the depth indicated on the plans. Minimum depth of removal shall be 3 feet below finished grade or 12 inches below any crossing utility, whichever is greater.

3.05 INSTALLATION OF FLOWABLE FILL

A. Abandon pipelines, as required in Part 3, Paragraph 3.01, by completely filling with flowable fill. Abandon manholes by filling the portion not removed with flowable fill.

B. Place flowable fill equal to volume of pipe being filled. Continuously place flowable fill from manhole to manhole with no intermediate pour points, but not exceeding 500 linear feet of pipe per fill segment.

C. Perform operation with experienced crews with equipment to monitor density of flowable fill and to control pressure.

D. Temporarily plug or cap pipe segments which are to remain in operation during filling to keep lines free of flowable fill.

E. Pump flowable fill through bulkheads or use other suitable construction methods to contain flowable fill in lines to be abandoned.

F. Place flowable fill under pressure flow conditions into properly vented open system until flowable fill emerges from vent pipes. Pump flowable fill with sufficient pressure to overcome friction. Fill sewers from the downstream end to vent at upstream end.

G. Backfill excavations per Section 31 23 33, Trenching, Backfilling, and Compacting.

H. Collect and dispose of excess flowable fill material and debris.

3.06 INSTALLATION OF GROUT PLUGS

A. Abandon pipelines of diameter 8-inches and below, as required in Part 3, Paragraph 3.01, by cutting and placing grout plugs.

B. Clean inside surface of pipe at least 12-inches from ends, achieving firm bond and seal grout plug to pipe surface. Similarly, clean and prepare exterior surface if manufactured cap is to be used.

C. Place temporary plug or bulkhead approximately 12-inches inside pipe. Fill pipe end completely with dry-pack grout mixture.

D. Backfill excavations per Section 31 23 33, Trenching, Backfilling, and Compacting.

E. Collect and dispose of excess grout material and debris.

3.07 QUALITY CONTROL

A. Provide batch plant tickets for each truck delivery of flowable fill. Note on tickets addition of admixtures at site.

B. Check flow characteristics and workability of fill as placement proceeds.

C. Obtain at least three test cylinders for each placement area for determination of 28-day compressive strength and bleeding. Acceptance of placement will be based on average strength of three tests.

D. Record volume of flowable fill placement to demonstrate that voids have been filled. If voids exceed 10% of pipeline volume, injection grouting may be required at the direction of the Project Manager.

3.08 PROTECTION OF PERSONS AND PROPERTY

A. Provide safe working conditions for employees throughout demolition and removal operations. Observe safety requirements for work below grade.

B. Maintain safe access to adjacent property and buildings. Do not obstruct roadways, sidewalks, or passageways adjacent to the work.

END OF SECTION

SECTION 40 67 16

CONTROL PANEL

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. The Contractor shall provide the design, panel layouts, schematics, interconnects, wiring, procurement, fabrication, of Control Panel to be located within the Shed. Contractor to include field testing, configuration, start up, and confirmation of operation of the Control Panel.

B. Control Panel shall be NEMA 12, including breakers, control power transformer, float controller, power supply, control devices, relays, power fail relay, surge device, autodialer with antenna, LED light, heater, fan, filtered louvers, digital display, uninterruptable power supply (UPS), wireways, conductors, terminal blocks, nameplates, and all other accessories and appurtenances required for complete and operable Control Panel. Panel fabricating shop shall be UL-508A certified.

1. Any deviations from the Contract Drawings or Specifications, will need to be approved by the Engineer and Owner.

2. Provide a detailed list of any anticipated or requested deviations from the Contract Drawings or Specifications with bid.

C. The requirements of Section 40 70 00 - Process Control and Instrumentation Systems, and 26 05 00 – Electrical Work, General apply to this Section.

D. Cellular autodialer shall be compatible with Owner phone service, Verizon. Contractor shall initiate service with autodialer for first year, in the name of the Owner.

1.02 REFERENCE SPECIFICATIONS, CODES, AND STANDARDS

A. ISA - S 5.1 Instrumentation Symbols and Identification

1.03 CONTRACTOR SUBMITTALS

A. Shop Drawings: Submittals shall be furnished in accordance with Section 26 05 00 – Electrical Work, General and Section 40 70 00 – Process Control and Information Systems. Shop Drawings to include:

1. Control Panel elevation views: exterior door view with mounted devices, and back panel view with mounted devices. Provide scaled views with dimensions and equipment name call outs and nameplate schedule. Show space for conduit window. Show side view including filters and louvers. Show light. Show nameplates.

2. Drawings shall include terminal block numbers, wire numbers, device names, wire size, wire color, and cross reference to submitted Bill of Materials. Refer to Section 40 70 00 for further drawing requirements. Drawings to be in PDF and AutoCAD (version per Owner) formats.

3. Bill of Materials in Excel format, as well as PDF and AutoCAD formats. Bill of Materials to include exact make and model number of all components of Control Panel.

4. Provide catalog cuts of all devices, components, relays, transformers, power supplies, etc. for approval.

5. Provide hardcopy printout of autodialer configuration settings. Include same in O&M Manual.

B. Operation and Maintenance Manuals: Provide O&M Manuals per Sections 40 70 00. Provide O&M Manuals in both electronic (PDF and AutoCAD drawings) and a hard copy format.

C. Provide three (3) hard copy versions of O&M Manual in a 3-ring binder with rigid covers not exceeding 3 inches, typical for each site. Utilize tab sheets to organize information. As a minimum, the hard copy O&M Manual shall include:

1. Cover Page: Equipment name, equipment tag number, project name, vendor contact information, manufacturer contact information, and appropriate date.

2. Table of Contents: General description of information provided within each tab section.

3. Drawings:

   a. 11” x 17” size, approved as-built record drawings.

   b. Include configured settings, setpoints, alarm points, etc. on drawings.

4. Preventative Maintenance Procedures: Recommended steps and schedules for maintaining equipment.

5. Hardcopy printout of autodialer configuration settings.

6. Parts List: Generic title and identification number of each component part of equipment.

7. Spare Parts List: Recommended number of parts to be stored at the site and special storage precautions.

8. Factory Acceptance Test (suppliers’ standard procedures) and Field Test (functional test procedures) results.

D. Electronic version of O&M Manual shall be formatted and include:

1. The O&M text content shall be delivered in PDF format. The PDF content should make proper use of PDF bookmarking tools for Headings and Heading levels, paragraphs, tables, unordered lists (bulleted lists), and numbered lists. All files shall be organized in a manner which directly corresponds to the order and nomenclature for the submittal table of contents, utilizing PDF bookmarking for each section and sub-section of the submittal.

2. PDF content should not include any unnecessary scripting, images, framesets, decoration, or style.

3. If portions of the O&M Manual text are only available as photocopy, these materials may be submitted in Searchable Image PDF format. All other materials, derived from digital source materials shall be delivered in PDF. Materials shall not be scanned if available in digital format

4. All drawings included in the O&M Manuals shall be provided in the following formats: AutoCAD (version per Owner) and PDF.

5. Submit one electronic version of O&M Manual on USB thumb drive.

1.04 QUALITY ASSURANCE

A. Standard of Quality: The Contractor shall provide equipment of the types and sizes specified which has been demonstrated to operate successfully. Provide equipment which is new and of recent proven design.

B. IEEE - Institute of Electrical and Electronic Engineers.

C. NEMA – National Electrical Manufacturers' Association.

D. UL – Underwriters' Laboratories.

E. NFPA – National Fire Protection Association, NEC and NFPA 70E.

F. Control Panel shall be provided by UL-508A listed shop. Provide shop UL-508A sticker within panel.

1.05 GUARANTEES, WARRANTIES

A. After completion, the Contractor shall furnish to the Owner the supplier's written guarantees, that the Control Panel will operate within the published accuracies and ranges and meet these Specifications. The Contractor shall also furnish the manufacturer's warranties as published in its literature, and submit within the O&M Manuals.

1.06 PRE-FACTORY ACCEPTANCE TEST

A. Instrumentation Supplier shall conduct the following tests prior to arrival of the Owner and Engineer to witness factory testing:

1. Alarm circuits rung out to determine their operability.
2. Electrical circuits checked for continuity and where applicable, operability.
3. Rung by rung verification and confirmation of approved panel schematics.
4. Any other test required to place the panel in an operating condition, including all tests that will be performed for the witnessed Factory Acceptance Test.

PART 2 - PRODUCTS

2.01 GENERAL

A. All equipment specified herein shall conform to the requirements of Section 40 70 00 - Process Control and Instrumentation Systems.

B. Environmental Suitability: Control Panel shall be suitable for operation in the ambient conditions and elevation associated with the locations designated in the Contract Documents. Supplier shall provide forced air intake and exhaust fans with removable filters, and heaters with fans, all thermostat controlled. The Contractor shall provide power wiring for these devices.

C. Components shall be UL listed and NEMA rated. IEC rated components are not allowed. Components shall be rated for 40 degree C ambient. Provide panel equipment with finger safe guards.

D. Control Panel shall be provided by UL listed 508A panel shop.

E. Provide space for back panel mounting of flow transmitter.

2.02 CONTROL PANEL ENCLOSURE

A. Control Panel shall be NEMA 12, painted steel, two door, three-point latch, wall mount, fabricated from 12 gauge stainless steel. Control Panel to be nominal 48 inches high, 48 inches wide, and maximum 12 inches deep. Door handle to be pad lockable. Provide panel drawing pocket suitable for 11" x 17" drawings. Ship Control Panel with one copy of accepted submittal drawings, modified as required from FAT results, in a sealed plastic bag stored in the panel drawing pocket. Provide with lifting eyes.

B. Control Panel to include interior back panel and shelf for UPS.

C. Suitably brace panel structure for sufficient strength to support equipment mounted on or within, to withstand handling and shipment, to maintain alignment, to be rigid and freestanding and resist seismic forces.

D. Enclosure to be Hoffman Products, Gaylord, or approved equal.

2.03 POWER FAIL RELAY

A. Power Fail Relay (PFR) shall detect low voltage, phase loss and reversal. PFR shall be automatic reset. Include base for 8 pin relay.

B. Provide with fuses in finger safe fuse holder, three pole, indicating type, Allen-Bradley 1492-FB series or equal.

C. PFR shall be TimeMark 258B, or approved equal.

2.04 CIRCUIT BREAKERS

A. Main breaker and 480 VAC feeder breakers shall be three pole, 600 VAC rated, with rating per Contract Drawings, Eaton C Series, F Frame or approved equal.

B. Single pole circuit breakers, less than 15 amps, shall be Allen-Bradley 1489-M series (AC), 1492-D series (DC), or approved equal.

2.05 UPS

A. UPS shall be 120 VAC input, 120 VAC output, 15 minute minimum run time at connected load, minimum 500 VA, APC Smart-UPS SMT Series, or approved equal. UPS shall include fail to line voltage control. Provide UPS with dry contact smart card for discrete signal for UPS "low battery" and UPS "on battery".

B. Provide dedicated, 20 amp, 125 VAC, single receptacle for UPS input power plug.

2.06 DIGITAL DISPLAY

A. Digital display shall be self-contained instrument that display process signals directly in engineering units, plus totalizer. The unit shall be suitable for door mounting and shall utilize a 3½ digit LED display of no less than 0.5-inch height. The input signal to the digital process indicator shall be 4-20 mA. Provide with two Form C relays, programmed for alarming or interlocking. Provide with analog output. The input sample rate of the unit shall be a minimum of two per second. The unit shall have an auto-zeroing feature and shall have provisions for field adjustable scaling and/or offset. Accuracy shall be plus and minus one least significant digit. Input power to the digital display shall be 120 VAC, 60 Hz.

B. Digital display shall be Kessler-Ellis Products INT69RT-A-L-2-A, or approved equal.

2.07 CONTROL POWER TRANSFORMER

A. Control power transformer shall be industrial type, 5 KVA, single phase, 480 VAC input, 120/240 VAC output.

B. Provide with breaker protection on both primary and secondary side of transformer.

C. Transformer to be Square D, Eaton, or approved equal.

2.08 SURGE SUPPRESSOR

A. Provide Surge Suppressor for flow transmitter and digital display 120 VAC circuit. Surge Suppressor shall be UL1499 listed, utilize MOV technology, provide 120 VAC, 75 kA surge current rating, with visual fault indicator.

B. Provide spare Surge Suppressor as part of Spare Parts.

2.09 FLOAT CONTROLLER

A. Float Controller shall be intrinsically safe relay (ISR-A1) for wet well LSL and LSH float switches shall be Warrick 67-E-1-A-0-A, or approved equal.

B. Provide barrier for intrinsically safe wiring, relay, or 2” wiring separation.

C. Provide Spare Parts as listed below.

2.10 POWER DISTRIBUTION BLOCKS

A. Power distribution blocks shall be UL 1953 and 508A listed, 480 VAC, minimum 100 amps, enclosed finger safe type, Cooper Bussman Series PDBFS220, or approved equal.

2.11 AUTODIALER

A. Autodialer shall be cellular type, compatible with Owner’s cell phone plan. Autodialer with up to 10 digital inputs, capable of 12 programmed phone numbers, 24VDC, with 24 hours of battery back-up. Provide with antenna “cabinet cable” to connect to external mounted antenna.

B. Control Panel supplier shall configure autodialer. Coordinate call out phone numbers and recorded messages with Owner. Mount antenna to exterior of Control Panel.

C. Contractor shall provide configuration and programming of autodialer, including first year subscription fees plus support services, as required for complete and satisfactory operation. Coordinate with Owner for name to be included with subscription.

D. Provide 24 VDC power supply as required, refer to specifications within this Section.

E. Autodialer shall be Raco Alarm Agent WRTU, 24VDC, antenna cabinet cable, and antenna, and first year subscription and support services, or approved equal.

2.12 CONTROL DEVICES

A. Control devices including pushbuttons, selector switches, pilot lights, shall be NEMA 4X, 30mm, Allen-Bradley 800H, or approved equal. Pilot lights shall be LED, push to test, transformer type.

B. Control relays shall be pin type, indicating, with number of contacts as required by Contract Drawings or follower relay provided. Include base for relay. Control relays shall be IDEC RR series, or approved equal.

C. Time delay relays shall be true on type, indicating, timing ranges and units configurable, with number of contacts as required by Contract Drawings or follower relay provided. Include base for relay. Control relays shall be IDEC GT3A series, or approved equal.

2.13 24 VDC POWER SUPPLY

A. 120 to 24 VDC power supply, sized for 150% of Autodialer load plus instrumentation load, or minimum of 30 watts, whichever is larger.

B. 24 VDC power supply shall be IDEC PS5R-VC24, Weidmuller, SOLA or approved equal.

2.14 MISCELLANEOUS EQUIPMENT

A. Panel light shall be door switch activated, LED type.

B. Panel UPS receptacle to be Leviton, or approved equal, as specified in Section 26 27 26 – Wiring Devices.

C. Heaters and Thermostat: provide 120 VAC heaters and thermostat control. Strip heaters are not allowed. Heaters shall be Square D Themoventil heaters #NSYCRP1W120VTVC, Hoffman, or approved equal.

D. Control Panel exhaust Fan thermostats shall be Hoffman #ATEMNCF, or approved equal. Exhaust Fans shall be sized per supplier and be 120 VAC, Hoffman, or approved equal. Provide louvers with removable filters. VFD fans shall have switch that can be turned off when well pump is not required.

2.15 TERMINAL BLOCKS

A. Terminal blocks shall be suitable for specified wire gauge, rated 20 amperes at 600 volts; with marking strip, covers, pressure connectors, and labeled terminals. Provide minimum 25 percent spare terminals. All control terminal blocks shall be screw clamping yoke style.

B. Field terminal blocks shall be disconnecting type. Analog terminal blocks shall be fused.

C. Terminal blocks shall be Feed-Through (high density is not allowed) Weidmuller WDU 2.5, or approved equal.

D. Provide minimum 3 inches clearance between terminal strips vertical wireways for space for wire labels.

2.16 WIRING

A. Control Panel wiring shall be MTW or SIS, stranded copper wire, insulated for not less than 600 volts, with a moisture-resistant and flame-retardant covering rated for not less than 90 degrees Celsius except for electronic circuits and special instrument interconnect wiring which shall be in accordance with Manufacturer requirements.

B. Wire Size:

1. Power distribution wiring on line side of panel fuses minimum 12 AWG.

2. Control circuit wiring shall be 14 AWG.

3. Analog circuit wiring minimum 16 AWG twisted and shielded pairs rated not less than 300 volts.

C. DC control circuits (including but not limited to analog circuits), and 120 VAC and greater circuits, shall be separated as much as possible. In areas where this separation is not possible, wires should be routed in such a manner as to minimize induced voltage between circuits, i.e., circuits should not be routed parallel to each other, but should cross perpendicular.

D. Group cables, and firmly support wiring to the panel.

E. Individually fuse each control loop or system.

F. Clearly label and locate fuses or circuit breakers for maintenance.

G. Control Panel interior wiring insulation color shall be per Table in Section 26 05 19 – Wires and Cables.

2.17 GROUNDING

A. Furnish and install equipment grounding conductor in accordance with Contract Documents and UL-508A.

B. Provide copper ground bus bar.

2.18 NAMEPLATES

A. Provide nameplates on all equipment, devices, breakers, timers, receptacles, etc.

B. Nameplate materials and approximate dimensions with inscription legends are indicated on the Contract Drawings.

C. Nameplates shall be made of laminated phenolic material, having engraved letters approximately 1/8 inch high minimum, extending through the black face into the white layer, unless noted otherwise on Contract Drawing Nameplate Schedule. Attach nameplates to panel with stainless steel screws, adhesive not acceptable.

D. Circuit breakers and fuses shall be provided with nameplates showing the designation and identifying the current rating of the breaker or fuse.

2.19 SPARE PARTS

A. Include spares within manufacturer original containers and provide with Control Panel during shipment from factory.

B. Provide three fuses of each type and size.

C. Provide one spare float controller (intrinsically safe relay).

D. Provide one spare surge suppressor.

PART 3 - EXECUTION

3.01 CONTROL PANEL WIRING AND TERMINALS

A. Wires shall be run in plastic wireways on back panel. Where wires cross door hinge, protect in plastic spiral wrap.

B. Wire Marking: Each signal, control, alarm, and indicating circuit conductor connected to a given electrical point shall be designated by unique numbers which

shall be shown on Shop Drawings. These numbers shall be marked on conductors at every terminal.

C. Circuit breakers and fuses shall be provided with nameplates showing the designation and identifying the current rating of the breaker or fuse.

D. Coordinate status from field devices to Control Panel for complete and operational system. This includes revisions to control relays and configurable relays for proper status signals.

E. Terminal Blocks:

1. All power, control and instrument wires entering and leaving panel shall terminate on terminal blocks with wire numbers on terminals and on both ends of the wires.

2. Numbers shall be assigned to all blocks except grounding blocks.

3. Each terminal block shall have a unique identifying alphanumeric designation. Plastic marking strip segments shall be provided to label terminal blocks. Numbers on this marking strip shall be machine printed and 1/8-inch high minimum.

4. Terminal blocks shall be physically separated into groups by the level of signal and voltage served. Power and control wiring above 100 volts shall have a separate group of terminal blocks from terminal blocks for wiring below 100 volts, intermixing of these two types of wiring on the same group of terminal blocks is not allowed.

3.02 FACTORY ACCEPTANCE TESTING

A. Refer to Section 40 70 00 – Process Control and Instrumentation Systems for testing requirements.

B. The Contractor shall perform a thorough Factory Acceptance Test. The Factory Acceptance Test shall include:

1. The Contractor shall submit a complete Factory Acceptance Test plan for submittal, review and approval prior to the factory test.

2. Review all hardware, including part numbers, for compliance with approved submittal. Provide check list for all items on Bill of Material listing.

3. Verify nameplates, wire labels, drawings.

4. Verify operation of all breakers and fuses.

5. Verify operation of all relays.

6. Verify operation of all power supplies.

7. Verify wiring continuity by simulating floats to controller, and contacts to autodialer.

8. Verify operation of autodialer, complete to Owner cell phones.

9. Verify digital display and totalizer.

10. Verify all interlocks, alarms, etc.

11. Verify spare parts.

12. Upon completion of Factory Acceptance Testing, submit a report certifying that the panel is operable and meets the Specifications.

13. Any drawing changes that were noted in the Factory Acceptance Test shall be as-built and provided to Owner and Engineer.

3.03 SHIPMENT AND INSTALLATION

A. Control Panel shall be crated for shipment using a heavy framework and skids. Instruments that are shipped with the panel shall have suitable shipping stops and cushioning material installed to protect parts that could be damaged due to mechanical shock.

B. Installation of Control Panel shall be per submitted and approved anchoring means.

C. Exercise care at all times after installation of Control Panel to keep out foreign matter, dust, dirt, debris, or moisture.

D. Carefully repair any damage to the structure, components or finish to the satisfaction of the Engineer.

E. Clean Control Panel interior and exterior prior to start-up.

F. Contractor to provide additional bracing, including plywood backboard within Shed to mount Control Panel. Plywood shall be minimum 1-1/4" thick, painted white (exterior paint), and 2' larger in all dimensions to Control Panel.

3.04 FIELD TESTING

A. Refer to Section 40 70 00 – Process Control and Instrumentation Systems for testing requirements.

B. The Contractor shall perform a thorough Field Test, in conjunction with the Owner and Engineer. Provide two week notification of when Field Test to occur for approval from Owner. Field Testing shall include:

1. Point-to-point verification of all field devices to Control Panel. Contractor to manually activate each device and check for status change at the appropriate input or output point. Confirm float controller action, ATS configuration and settings, field instrumentation, and autodialer monitoring and dialing out and messages. etc.

2. Verification of all analog and discrete loops, from field device to Control Panel.

3. Contractor to provide Final As-builts and Operation and Maintenance Manuals that reflect all changes and revisions made in field.

END OF SECTION

SECTION 40 70 00

PROCESS CONTROL AND INSTRUMENTATION SYSTEMS

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Provide all Process Control and Instrumentation Systems (PCIS) complete and operable, in accordance with the Contract Documents.

B. The requirements of this Section apply to all components of the PCIS unless indicated otherwise.

C. Responsibilities:

1. Provide, install, label, terminate, configure, test and start up all field instrumentation and all configurable devices supplied as part of this work.

2. Design, provide, install, label, terminate, program, configure, test and start up the Control Panel, including floats and float controller, generator call, and autodialer. Initiate autodialer service and include first year subscription, with service support, as part of work. Program autodialer with Owner's cell phone numbers, and record approved messages.

3. As a minimum perform the following work:

a. Implementation of the PCIS.

1) Prepare instrument submittals. Include spare parts.

2) Design, develop, and electronically draft Interconnect Diagrams, Control Panel Drawings (Schematics, scaled Panel Elevations), and Instrument Installation Details.

3) Interconnect Diagrams shall include information required for installation of field cables between equipment. Interconnect Diagrams shall include cable quantities, cable sizes, cable labeling information, cable insulation color, termination block labels, conduit sizes, and conduit labels information. Show all pull boxes, handholes, j-boxes, etc. Wires may be pulled prior to Interconnect Diagrams approval at Contractor risk. No wiring shall be terminated prior to approval of Interconnect Diagrams.

4) Instrument Installation Detail shall include information for installation of each supplied instrument. Show instrument supporting hardware, cable securing, switch tripping elevations, etc.

5) Prepare drawings for submittal review and as-built record drawings. All drawings shall be done in PDF and AutoCAD format for all submittals.

6) Procure hardware.

7) Submit Instrumentation Supplier certifications that installed instruments are per manufacturer specifications.

8) Submit Control Panel supplier UL-508A certificate.

9) Prepare and submit Factory and Field Testing procedures and results to confirm Control Panel inputs and outputs to field devices are functional, and float controller is operational. Confirm autodialer is operational based on each alarm input verification.

10) Submit hard copy of autodialer configurations.

11) Submit hard copy of ATS configurations (coordinated with ATS supplier and/or standby generator supplier).

12) Prepare Operation and Maintenance Manuals in hardcopy and electronic (PDF) formants for supplied instruments. As-built drawings shall be provided in PDF and AutoCAD formats. Include Interconnect Diagrams, Control Panel Schematic Diagrams and scaled Elevation Diagrams (swing panel door front and back panel). Also submit power quality meter, pump controller, autodialer and ATS final configurations (hardcopy), and Factory and Field Test sheets in O&M Manuals.

1.2 CONTRACTOR SUBMITTALS

A. General: Submittals shall be furnished in accordance with Section 26 05 00 - Electrical Work, General, and the following:

1. Coordinate the instrumentation work so that the complete instrumentation system will be provided and will be supported by accurate shop drawings and record drawings.

2. Symbology and Nomenclature: In these Contract Documents, all systems, all meters, all instruments, and all other elements are represented schematically, and are designated by symbology as derived from Instrument Society of America Standard ANSI/ISA S5.1 – Instrumentation Symbols and Identification. The nomenclature and numbers designated herein and, on the Drawings, shall be employed exclusively throughout shop drawings, and similar materials.

B. Shop Drawings

1. General:

a. All shop drawings shall include the letter head or title block of the Instrumentation Supplier. The title block shall include, as a minimum, the Instrumentation Supplier's registered business name and

address, project name, drawing name, revision level, and personnel responsible for the content of the drawing.

b. Organization of the shop drawing submittals shall be compatible with eventual submittals for later inclusion in the O&M Manual.

c. Shop drawing information shall be bound in standard size, 3-ring, loose leaf, vinyl plastic, hard cover binders suitable for bookshelf storage. Binder ring size shall not exceed three (3) inches.

d. All shop drawings shall be in hardcopy and electronic PDF along with AutoCAD drawings. Electronic submittal shall have both PDF and AutoCAD versions of all drawings.

2. Hardware and Drawing Submittal:

a. A complete index which lists each device. A separate technical brochure or bulletin shall be included with each instrument data sheet. The data sheets shall be indexed in the submittal by specification section.

b. Instrument Installation Details for each specific instrument shall be submitted in PDF format and an electronic AutoCAD version. Each instrument shall have a dedicated 8½-inch x 11-inch detail which only pertains to the specific instrument. Each detail shall be certified by the instrument manufacturer that the proposed installation is in accordance with the instrument manufacturer's recommendations and is fully warrantable.

c. Control Panel drawings including: scaled panel elevation and scaled layout drawings (Panel door and back panel), schematic diagrams, bill of materials, and component catalog cut sheets.

d. Fully executed instrument data sheets according to ISA-S20 – Specification Forms for Process Measurement and Control Instruments, Primary Elements and Control Valves, for each component, together with a technical product brochure or bulletin. The technical product brochures shall be complete enough to verify conformance to all Contract Document requirements. The data sheets, as a minimum, shall show:

1) Component functional description.

2) Manufacturer's model number or other product designation.

3) Instrument tag number per Contract Drawings, if applicable. Reference installation detail.

4) Project location or assembly at which the component is to be installed.

5) Input and output characteristics.

6) Scale, range, units, and multiplier (if any).

7) Requirements for electric supply (if any), communication protocol (if any), signals.

8) Materials of component parts to be in contact with or otherwise exposed to process media and corrosive ambient air.

9) Special requirements or features.

10) Local supplier including contact name, phone number, and address.

e. Priced list of manufacturers recommended spare parts for all devices.

f. Priced list of spare parts for all devices.

g. All drawings shall be done in 11-inch x 17-inch PDF and AutoCAD with 0.0625-inch minimum text height.

3. Test Procedure Submittals: Submit the factory and field testing procedures for approval. Submit certified results of factory and field tests, for review and inclusion in O&M Manuals. All testing results to include an Owner or Engineer signature as witness.

C. Operation and Maintenance Manual

1. General: Information in the O&M Manual shall be based upon the approved shop drawing submittals as modified for conditions encountered in the field during the work.

2. The O&M Manuals shall be organized and contain information as outlined in specifications.

3. Signed and certified results from all factory and field testing shall be included in O&M Manuals. Include ISA data sheets.

D. As-Built Drawings

1. All such drawings shall be submitted and approved prior to beginning of 7 day Demonstration Test.

PART 2 - PRODUCTS

2.1 GENERAL

A. Code and Regulatory Compliance: All PCIS work shall conform to the National Electrical Code. Conflicts between the requirements of the Contract Documents and any codes or referenced standards or specifications shall be brought to the attention of the Engineer.

B. Hardware Commonality: All instruments which utilize a common measurement principle (for example, float switches) shall be furnished by a single manufacturer. All panel mounted instruments shall have matching style and general appearance.

Instruments performing similar functions shall be of the same type, model, or class, and shall be from a single manufacturer.

C. Instrument and Loop Power: Instrument power requirements and input/output connections for all components going to Control Panel shall be compatible with pump controller. Power for transmitted signals shall, in general, originate in and be supplied by the control panel devices. The use of "2-wire" transmitters is preferred.

2.2 OPERATING CONDITIONS

A. The PCIS shall be designed and constructed for satisfactory operation and long, low maintenance service under the following conditions:

1.	Environment	–	Sewage lift station
2.	Temperature Range	–	20 through 104 degrees F
3.	Elevation	–	5,500 feet above sea level

2.3 SPARE PARTS AND SPECIAL TOOLS

A. All spare parts and special tools shall be provided on site before startup commences, suitably wrapped and identified. Provide spare parts in original manufacturer containers.

2.4 FACTORY AND FIELD TESTING

A. Coordinate and schedule with Owner and Engineer for factory and field testing. Contractor is responsible to provide two-week notice to Owner and Engineer for scheduled testing.

B. Test forms shall be submitted and approved prior to testing.

2.5 INSTRUMENT IDENTIFICATION

A. Submit list of instruments, each with tag inscription and tag materials for approval by the Owner and the Engineer. Tags shall be engraved stainless steel plates, with 1/4-inch lettering. Inscriptions shall be reviewed during submittal stage.

PART 3 - EXECUTION

3.1 MANUFACTURER'S SERVICES

A. Furnish the following manufacturer's services for the instrumentation listed below provided during the field testing period:

1. Perform bench and field calibrations as required.
2. Submit for approval installation details for all instruments.
3. Oversee installation. Verify installation of installed instrument. Certify installation and reconfirm the manufacturer's accuracy statement. Apply company certification sticker on instrument.
4. Coordinate and conduct testing, prepare testing sheets, and certify testing.

B. Manufacturer's services shall be furnished for the following equipment:

1. Control Panel, Specification 40 67 16 – Control Panel.

2. Measuring systems (not part of pumping system supply), Specification 40 91 01 – Process Measurement Devices.

3.2 INSTALLATION

A. General

1. All instrumentation, including instrumentation furnished under other Divisions, shall be installed under Division 40 and the manufacturers' instructions. All instruments and equipment shall be tagged.

2. Equipment Locations: The locations of equipment are approximate. The exact locations and routing of wiring and cables shall be governed by structural conditions and physical interferences and by the location of electrical terminations on equipment. All equipment shall be located and installed so that it will be readily accessible for operation and maintenance. Where job conditions require reasonable changes in approximated locations and arrangements, or when the Owner exercises the right to require changes in location of equipment which do not impact material quantities or cause material rework, make such changes without additional cost to the Owner. Coordinate proposed equipment and instrument locations in the field with Owner prior to installing or submitting details.

B. Instrumentation Tie-Downs: All instruments, control panels, and equipment shall be anchored by methods which comply with seismic requirements applicable to the site, and per approved Shop Drawings.

C. Ancillary Devices: Provide any additional or different type connections as required by the instruments and specific installation requirements at no additional cost to the Owner to provide a complete and operational system. All such additions and all such changes, including the proposed method of installation, shall be submitted to the Engineer for approval prior to commencing the work.

D. Installation Criteria and Validation: All field-mounted components and assemblies shall be installed and connected according to the requirements below:

1. Installation personnel have at least one copy of the approved shop drawings and installation detail.

2. All mounting stands and bracket materials and workmanship shall comply with requirements of the Contract Documents.

3. Verify the correctness of each installation, including polarity of electric power and signal connections, and making sure all process connections are free of leaks. Certify in writing that for each loop or system checked out, all discrepancies have been corrected.

3.3 CALIBRATION

A. General: All instrumentation provided under Division 40 shall be calibrated, and ranges set, according to the manufacturer's recommended procedures to verify operational readiness and ability to meet the indicated functional and tolerance requirements. Work shall be completed during field testing period, prior to 7 day Demonstration Test.

B. Calibration Points: Each instrument shall be calibrated at 0, 10, 50, 90 and 100 percent of span using test instruments to simulate inputs. The test instruments shall have accuracies traceable to National Institute of Testing Standards.

C. Field Calibration: Instruments shall be calibrated in the field to insure proper operation in accordance with the instrumentation data sheets.

D. Calibration Sheets: Calibration sheets to be submitted prior to start-up of any system. Each instrument calibration sheet shall provide the following information and a space for sign-off on individual items and on the completed unit (as applicable):

1. Project name.
2. Tag number.
3. Manufacturer.
4. Model number.
5. Serial number.
6. Calibration range.
7. Calibration data: Input, output, and error at 10 percent, 50 percent, 90 percent, and 100 percent of span.
8. Switch setting, contact action, and deadband for discrete elements.
9. Space for comments. Confirm conduit and cable tags are installed.
10. Space for approval sign-off by Instrumentation Supplier and date.
11. Provide sticker on instrument that it has been calibrated by supplier and ready for service.

3.4 FIELD TESTING

A. Field testing shall be provided by the Contractor and approved by the Owner and Engineer. Notify the Engineer of scheduled tests a minimum of 14 calendar days prior to the testing date, for approval. The Field testing shall be witnessed by the Owner and Engineer. Field Testing shall be completed prior to start of 7 day Demonstration Test.

3.5 TRAINING

A. General: Train the Owner’s personnel on the maintenance, calibration and repair of: ATS, float controller and float switches, autodialer. Standby Generator training shall be provided by Standby Generator supplier.

B. Instructions: The training shall be performed by qualified representatives of the equipment manufacturers, or supplier representative, and shall be specific to installed equipment.

C. Duration: Training shall be given once and shall be a minimum of four hours in duration and shall cover, as a minimum, operational theory, maintenance, troubleshooting/repair, and configuration. Training class shall be provided on site, with scheduled date per Owner approval.

D. Schedule: Training shall be performed during the field testing phase of the project. The training sessions shall be scheduled a minimum of two weeks in advance of when the course is to be initiated. The Owner and the Engineer will review the course outline for suitability and provide comments that shall be incorporated.

E. Agenda: The training shall include operation and maintenance procedures, troubleshooting with necessary test equipment, changing setpoints and ranges, for that specific piece of equipment as applicable.

F. Documentation: Within 10 days after the completion of each session submit the following:

1. A list of all Owner personnel that attended the session.
2. A copy of the training materials utilized during the lesson with all notes, drawings, and comments.

3.6 ACCEPTANCE

A. For the purpose of this Section, the following conditions shall be fulfilled before the Work is considered complete and start of 7 day Demonstration Test.

1. All submittals have been completed and approved.
2. All equipment and instruments and conduits and cables are labeled.
3. Equipment and devices and instruments are configured, calibrated, tested and demonstrated.
4. All controls, interlocks, alarms, and instrumentation are functional and settings approved.
5. Control Panel, Standby Generator, and ATS are functional and settings approved.
6. Autodialer system is functional to the satisfaction of the Owner.
7. The training has been performed.
8. All spare parts have been delivered to the Owner.
9. All punch-list items have been corrected.
10. Revisions to the O&M Manuals that may have resulted from the field tests have been made and reviewed.
11. All as-built and record drawings in both hard copy and electronic format have been submitted.

12. All debris associated with installation of instrumentation has been removed.

13. All instruments, transmitters, electrical equipment and enclosures have been cleaned and are in like-new condition. Cleaning to include vacuuming interior of panels, wipe down of exteriors, and paint touch up as required by the Owner and Engineer.

END OF SECTION

SECTION 40 91 01

PROCESS MEASUREMENT DEVICES

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Furnish and install all level measurement systems with associated instrumentation and controls as shown and specified herein, complete and operable, for functions including flow measurement and float switches (for generator permissive controls), in accordance with the requirements of the Contract Documents.

B. Flow measuring system include:

1. Flow measurement from sewage pump station discharge, with remote transmitter in Control Panel, and connected to digital display for instantaneous flow and totalizer.

2. Coordinate with pumping system supplier.

C. Level Float Switches include:

1. Level Switch Low (LSL) and Level Switch High (LSH) in wet well. Float switches wired to float controller in Control Panel.

D. The requirements of Section 40 70 00 – Process Control and Instrumentation Systems apply to this section.

1.2 REFERENCE SPECIFICATIONS, CODES, AND STANDARDS

A. ISA - S 5.1 Instrumentation Symbols and Identification

1.3 CONTRACTOR SUBMITTALS

A. Shop Drawings: Submit complete shop drawings of all instruments in accordance with Section 40 70 00 – Process Control and Instrumentation Systems.

B. Submit specific installation details for float switches and level transducer.

C. Operation and Maintenance Manuals.

1.4 QUALITY ASSURANCE

A. Inspection and Testing Requirements: After installation, obtain the services of a technical representative to inspect and test all instruments for proper performance and installation. Verify accuracies.

1.5 GUARANTEES, WARRANTIES

A. After completion, furnish to the Owner the supplier’s written guarantees that the measuring systems will operate to within manufacturer’s stated accuracies. Furnish the manufacturer's warranties as published in its literature, and submit within the O&M Manuals.

PART 2 - PRODUCTS

2.1 GENERAL

A. All devices specified herein shall conform to the requirements of Section 40 70 00 – Process Control and Instrumentation Systems.

B. Instrument manufacturers shall provide 2 year warranty. Submit signed warranty.

C. Instrument Supplier shall provide Instrument Installation Details (complete with float switch setting elevations), start-up, and testing.

D. All instruments shall have stainless steel nameplates with tag number and description. Provide phenolic red round nameplates for wet well instruments on cables near access hatch.

E. Instruments in wet well to be supported via cables tied off to stainless steel hooks. Once instrument elevation is set, use black nylon cable ties to prevent instrument from slipping off hook.

F. Provide engraved phenolic tag, 2” red, round tag, with white letters, cable tied on cable near hook so each instrument is identified: “LSL” and “LSH”.

G. Instruments shall be provided with manufacturer cables long enough to be routed from device to Control Panel. Splices are not allowed.

2.2 FLOWMETER SYSTEM

A. Coordinate supply of flowmeter system with pumping systems supplier.

B. Flowmeter system shall be made up of flow tube (potted for NEMA 6P submergence rating), manufacturer cables with strain relief fittings, and remote mounted flow transmitter. Accuracy shall be minimum of 0.5% of actual flow.

C. Flow tube shall be rated 150 PSI, flange type per Contract Drawings, 316 stainless steel electrodes, potted electronics, with strain reliefs on power and signal cables. Liner shall be suitable for raw sewage applications. Flow tube to be rated NEMA 6P rated.

D. Provide flowmeter with two stainless steel ground rings. Ground and bond per Contract Drawings, and manufacturer recommendations.

E. Transmitter shall be remote type, 120 VAC, 4-20 mA output, pulse output, suitable for mounting on back panel. Transmitter shall display in GPM and totalize in MGD.

F. Flow Tube, FE: 4”, hard rubber liner.

G. Remote Transmitter, FIT:

1. Output: 4-20 mA
2. Power: 120 VAC
3. Range: 0-2000 GPM. Mount within Control Panel.

H. Manufacturer Cables: Manufacturer cables: 80’ minimum, Contractor to confirm.

I. Flowmeter system shall be: Endress + Hauser Proline Promag W400 with remote transmitter, flow tube, ground rings, and manufacturer cables, of Rosemount 8750W with remote transmitter, flow tube, ground rings, and manufacturer cables, or Siemens Sitrans FM MAG 5100W Flow Tube with MAG 6000 Remote Transmitter, grounding rings, and manufacturer cables, no equal.

2.3 FLOAT SWITCHES

A. Float switches designated as “LSL” and “LSH” on the Contract Drawings, shall include mechanical switch encapsulated in waterproof floating ball, with internal weighted. Switch shall be single pole double throw, with contacts rated 200 VA up to 120 VAC. Switches shall be mercury-free.

B. Switches shall be suitable for raw sewage applications, Class 1, Division 1 hazardous location. Switch housing shall be polypropylene. Cord with PVC jacket shall include fine strand, #16 AWG conductors plus ground, suitable for heavy flexing service.

C. Manufacturer cable length shall be provided to route to Control Panel, no splices. Bid to include a minimum 100 feet of cable length, although the Contractor is responsible for actual cable length required as dependent on conduit routing. Float switches shall be hung from cable that is secured to Float Bracket hook with nylon cable tie. Provide two float switches (LSL, LSH) in wet well.

D. Refer to Contract Drawings for desired switch configuration.

E. Float Switches shall be mercury free versions of Flygt ENM-10, or approved equal. Include float switch with sufficient cable lengths.

F. This specification does not account for float switches as part of pumping system supply, but those float switches shall be similar.

2.4 FLOAT BRACKET WITH HOOKS

A. Provide 316 stainless steel bracket with hooks to mount within wet well, to secure level devices (two float switches). Provide minimum of 2 hooks. Hooks shall be mounted within 6” to top of wet well access, coordinate location of hooks with Owner.

B. Float bracket with minimum 2 hooks shall be manufactured by Conery Model 3HB, or approved equal.

PART 3 - EXECUTION

3.1 GENERAL

A. Process measurement systems shall be executed according to the requirements of Section 40 70 00 – Process Control and Instrumentation Systems.

B. Installations shall follow submitted and approved instrument installation details. Add red phenolic tag to instrument cable at Float Bracket hooks after secured within wet well.

3.2 FIELD TESTING

A. Each item shall be subjected to an operating test over the total range of the equipment. All testing shall be witnessed by the Owner and Engineer. Verify level float switch trip setting elevations with the Owner and Engineer as witnesses.

B. Refer to Section 40 70 00 – Process Control and Instrumentation Systems for testing requirements.

C. Confirm instruments have nameplates, and connected conduits and conductors are labeled per approved Interconnect Drawings.

D. All Field Testing shall be completed prior to 7 day Demonstration Test.

END OF SECTION